PEMBROKE

**Olive Downs Coking Coal Project**

Draft Environmental Impact Statement

**Appendix B**

# Terrestrial Fauna Assessment

# Olive Downs Coking Coal Project – Terrestrial Fauna Assessment

August 2018

# Olive Downs Coking Coal Project – Terrestrial Fauna Assessment

August 2018

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20 August 2018

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# EXECUTIVE SUMMARY

DPM Envirosciences Pty Ltd was engaged by Pembroke Olive Downs Pty Ltd to undertake terrestrial fauna surveys and to prepare an impact assessment for the proposed Olive Downs Project (herein referred as the Project). The Project is a proposed coal mine and associated infrastructure within the Bowen Basin, located approximately 40 kilometres (km) south-east of Moranbah, Queensland (Qld).

In a regional context, the Project is located within the Brigalow Belt North Bioregion. The Project spans across two sub-regions, with the northern extent (including the electricity transmission line [ETL] corridor, rail loop and spur, and water pipeline) falling within the Northern Bowen Basin subregion and the mine site falling within the Isaac – Comet Downs subregion.

In a local context, the Project area is located within the Bowen Basin mining area where, in parallel with agricultural activities, open cut (and underground) coal mining is a key land use. As a result, the majority of the Study area comprises agricultural grasslands with tracts of remnant vegetation.

The scope of this assessment was to verify fauna habitat mapping for the Project area; identify any conservation significant fauna species under the Qld *Nature Conservation Act 1992* (NC Act) and Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act); identify and describe any Matters of State and National Environmental Significance; and identify proposed avoidance and mitigation measures to protect the natural values, including consideration of biodiversity offset requirements.

The findings discussed in this report are based on a desktop assessment of readily available information on the fauna characteristics in a study area covering the Project (i.e. the Study area), supplemented by targeted fauna surveys in spring (November 2016, September and November 2017) and autumn (April – May 2017).

The fauna surveys were undertaken in accordance with the relevant State and Commonwealth survey guidelines. Survey methods included trapping (i.e. Elliott, cage, pitfall, funnel and harp traps), bat detection devices, motion detection cameras, spotlighting, diurnal bird surveys, active searches, call playback, koala spot assessments, searches for scats and other signs and habitat assessments. Targeted searches for threatened fauna species listed under the NC Act and EPBC Act were also conducted.

Features of the Project area that provide fauna with opportunities for foraging and breeding are represented by:

- eucalypt dry woodlands on inland depositional plains;
- eucalypt open forests to woodlands on floodplains;
- acacia dominated open forests, woodlands and shrublands;
- palustrine wetlands (swamps);
- lacustrine wetlands (dams);
- other coastal communities and heaths; and
- waterways (watercourses and drainage features).

The external connectivity of the habitats is relatively low, except for habitat along watercourses and drainage features.

A total of five conservation significant fauna species were recorded within the Project locality during the fauna surveys, namely:

- Ornamental snake (*Denisonia maculata*) – listed as 'Vulnerable' under the EPBC Act and NC Act; and

- Australian painted snipe (*Rostratula australis*) – listed as 'Endangered' under the EPBC Act and 'Vulnerable' under the NC Act.
- Squatter pigeon (southern) (*Geophaps scripta scripta*) – listed as 'Vulnerable' under the EPBC Act and NC Act;
- Koala (*Phascolarctos cinereus*) – listed as 'Vulnerable' under the EPBC Act and NC Act; and
- Greater glider (*Petauroides volans*) – listed as 'Vulnerable' under the EPBC Act and NC Act.

In addition, scats of the short-beaked echidna (*Tachyglossus aculeatus*), listed as 'Special Least Concern' under the NC Act, were recorded within the Project area.

Matters of National Environmental Significance (MNES), relevant to this terrestrial fauna assessment, recorded within the Study area were limited to the five threatened fauna species listed above. Matters of State Environmental Significance (MSES) relevant to this Terrestrial Fauna Assessment identified within the Project area include the following:

- Connectivity Areas; and
- Protected Wildlife Habitat (i.e. for the ornamental snake, Australian painted snipe, squatter pigeon (southern), koala and greater glider).

The Project would require the clearance of various patches of woodland / forest (totalling approximately 5,661.5 ha) occurring in four stages over the 79 years of construction and operation. All of the native fauna habitat types to be cleared occur more extensively in the surrounding landscapes and subregions. The fauna habitat types that would be cleared by the Project include:

- approximately 4,805 ha of eucalypt dry woodlands on inland depositional plains;
- approximately 658.5 ha of eucalypt open forests to woodlands on floodplains;
- approximately 78 ha of acacia dominated open forests, woodlands and shrublands;
- approximately 110.5 ha of palustrine wetlands (swamps); and
- approximately 9.5 ha of lacustrine wetlands (dams).

Indirect impacts that have been considered in this assessment include potential impacts associated with feral animals, vehicle strike, hydrological changes, impacts to groundwater dependant ecosystems, artificial noise and lighting, and potential cumulative impacts. It is concluded that the Project is unlikely to have a significant impact on terrestrial fauna as a result of these potential indirect impacts.

To mitigate unavoidable adverse impacts on terrestrial fauna associated with the Project, Pembroke has committed to a number of mitigation and management measures, including:

- vegetation clearance procedures that specify when and how vegetation would be cleared with the view of minimising impacts on terrestrial fauna;
- preparation of a Species Management Program (in accordance with section 332 of the Nature Conservation [Wildlife Management] Regulation 2006);
- progressive establishment of woodland / forest cover on the post-mine landforms;
- measures to prevent, monitor and control feral animals;
- measures to manage bushfire risk; and
- various measures to manage other environmental factors (e.g. dust suppression, erosion and sediment control, and water management).

To address the residual significant adverse impacts (on MSES and MNES), an offset strategy has been developed by Pembroke in accordance with relevant State and Commonwealth offset requirements.

Pembroke proposes a staged environmental offset in consideration of the staged land clearing described above. The offset for each stage of clearance would be provided before clearing the relevant stage. The result of implementing the offset strategy would be an increase in the area of land being conserved and managed for conservation in the medium to long term.

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Appendix D: Significant Impact Assessments
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# Acronyms

| Acronym | Description |
|---|---|
| AKF | Australian Koala Foundation |
| BD status | Biodiversity status |
| BoT | Back on Track |
| BVG | Broad Vegetation Group |
| CE | Critically Endangered (threatened fauna species status) |
| DERM | The former Queensland Department of Environment and Resource Management |
| DEHP | Queensland Department of Environment and Heritage Protection |
| DES | The Queensland Deparment of Environment and Science |
| DNRM | The Queensland Department of Natural Resources and Mines |
| DotE | The former Commonwealth Department of the Environment |
| DSEWPC | The former Australian Government Department of Sustainability, Environment, Water, Population and Communities |
| DSITI | The former Queensland Department of Science, Information Technology and Innovation |
| DSITIA | The former Queensland Department of Science, Information Technology, Innovation and the Arts |
| DSDIP | The former Queensland Department of State Development, Infrastructure and Planning |
| E | Endangered (threatened fauna species status) |
| EA | Environmental Authority |
| EH | Essential Habitat |
| EIS | Environmental Impact Statement |
| EO Act | Queensland *Environmental Offsets Act* 2014 |
| EO Regulation | Queensland Environmental Offsets Regulation 2014 |
| EP Act | Queensland *Environmental Protection Act 1994* |
| EP Regulation | Queensland Environmental Protection Regulation 2008 |
| EPBC Act | Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* |
| ERE | Endangered Regional Ecosystem |
| ESA | Environmentally Sensitive Area |
| ESD | Ecologically Sustainable Development |
| EVNT | Endangered, Vulnerable or Near Threatened (threatened fauna species) |
| HES | High Ecological Significance |
| HRA | High Risk Area |
| LC | Least Concern species listed under the NC Act |
| LGA | Local Government Area |
| MLA | Mining Lease Area |
| MNES | Matters of National Environmental Significance |
| MSES | Matters of State Environmental Significance |
| NC Act | Queensland *Nature Conservation Act 1992* |
| NC Regulation | Nature Conservation (Wildlife) Regulation 2006 |
| NRM | Natural Resource Management |
| NT | Near Threatened (fauna species status) |
| RE | Regional Ecosystem |
| SAT | Spot Assessment Technique |

| Acronym | Description |
|---|---|
| SLC | Special Least Concern |
| SPP | State Planning Policy |
| TEC | Threatened Ecological Community |
| V | Vulnerable (threatened fauna species status) |
| VM Act | Queensland *Vegetation Management Act 1999* |
| WONS | Weeds of National Significance |
| WPA | Wetland Protection Area |

# Definitions

| Term | Description |
|---|---|
| Biosecurity matter | A living thing, other than a human or part of a human; or<br>a pathogenic agent that can cause disease in a living thing, other than a human, or a pathogenic agent that can cause disease in a human, by the transmission of a pathogenic agent from an animal to a human; or<br>a disease; or a contaminant. |
| Restricted matter | Listed in Schedule 2 of the Queensland *Biosecurity Act 2014*, and refers to biosecurity matter that are currently found in Queensland and that are known to have a significant impact on human health, social amenity, the economy or the environment. |

# 1 INTRODUCTION

Pembroke Olive Downs Pty Ltd (Pembroke) proposes to develop the Olive Downs Project (the Project), a metallurgical coal mine and associated infrastructure within the Bowen Basin, located approximately 40 kilometres south-east of Moranbah, Queensland (Figure 1). The Project provides an opportunity to develop an open cut metallurgical coal resource within the Bowen Basin mining precinct that can deliver up to 20 million tonnes per annum (Mtpa) of run-of-mine (ROM) coal.

The Project comprises the Olive Downs South and Willunga mining domains and associated linear infrastructure corridors, including a rail spur connecting to the Norwich Park Branch Railway, a water pipeline connecting to the Eungella pipeline network, an electricity transmission line (ETL) and access roads (Figure 2). The coal resource would be mined by conventional open cut mining methods, with product coal to be transported by rail to the Dalrymple Bay Coal Terminal. Up to 20 Mtpa of ROM coal would be extracted over the anticipated Project operational life of approximately 79 years.

## 1.1 Purpose

The Coordinator-General has declared the Olive Downs Project to be a 'coordinated project for which an EIS is required' under section 26(1)(a) of the *State Development and Public Works Organisation Act 1971* (SDPWO Act). This declaration initiates the statutory environmental impact assessment procedure of Part 4 of the Act, which requires a proponent to prepare an EIS for the project. Further, several referrals have been made under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) regarding the four different components of the Project. The Commonwealth Minister for the Environment and Energy (DEE) has determined the following controlling provisions apply for each proposed action under the EPBC Act:

1. Olive Downs Project Mine Site and Access Road (EPBC 2017/7867)
   a) listed threatened species and communities (sections 18 and 18A);
   b) listed migratory species (sections 20 and 20A); and
   c) a water resource, in relation to coal seam gas development and large coal mining development (sections 24D and 24E).
2. Olive Downs Project Water Pipeline (EPBC 2017/7868)
   i. listed threatened species and communities (sections 18 and 18A).
3. Olive Downs Project Electricity Transmission Line (EPBC 2017/7869)
   i. listed threatened species and communities (sections 18 and 18A).
4. Olive Downs Project Rail Spur (EPBC 2017/7870)
   i. listed threatened species and communities (sections 18 and 18A).

The EIS process has been accredited under the Bilateral Agreement for the assessment of the Project under the EPBC Act, hence the EIS must state the controlling provisions for the Project and describe the particular aspects of the environment that led to the controlled action decision.

In December 2017, Pembroke lodged an application to vary the Action to incorporate the latest Project layout designs for the Olive Downs Project Mine Site and Access Road (EPBC 2017/7867) and the Olive Downs Project Water Pipeline (EPBC 2017/7868). These variations were accepted by the DEE on 17 April 2018.

The purpose of the Terrestrial Fauna Assessment is to describe the fauna values of the Subject site as relevant to current Commonwealth and Stage legislation, assess the impacts of the

proposed actions on these values and present strategies to avoid, minimise or mitigate impacts to significant fauna values. This document is a supporting document to the EIS.

## 1.2 Scope of work

The scope of work for this terrestrial fauna assessment includes the following tasks:

- conduct a desktop review of available literature and previous studies in the vicinity of the Study area, and conduct database searches for conservation significant fauna species;
- undertake fauna surveys throughout the Study area using appropriate methodology to:
  - identify the species that occur;
  - target potentially occurring conservation significant fauna listed under the Commonwealth EPBC Act or Queensland *Nature Conservation Act 1992* (NC Act);
  - characterise the broad fauna habitat types and map them;
  - identify habitat resources for known and potentially occurring conservation significant species;
  - identify pest species that occur within the Study area; and
- prepare a terrestrial fauna assessment report that identifies the methods and results of the desktop and field studies, assesses the potential impacts of the Project, and presents mitigation measures and any offset requirements.

## 1.3 Terms of Reference

Sections of the Terms of Reference (ToR) (June 2017) addressed by this report and the accompanying Terrestrial Flora Assessment and Aquatic Ecology Assessment (DPM Envirosciences 2018a and 2018b) are shown in Table 1.

**Table 1 Location of information addressing ToR within the ecological reports**

| Terms of Reference | Section in this report |
|---|---|
| ***Matters of National Environmental Significance – listed threatened species and communities*** | |
| *11.16 For each proposed action the EIS must:*<br>*(a) describe the relevant listed threatened species and ecological communities (TEC) (including EPBC Act listing status, distribution, life history and habitat);* | Sections 4.5.5, 5.3 (Table 7) and 5.5<br>Appendix D |
| *(b) provide details of the scope, methodology, timing and effort of surveys for each proposed action (including areas outside of each proposed action area which may be impacted by each proposed action); and include details of:*<br>*(i) the application of best practice survey guidelines*<br>*(ii) how studies or surveys are consistent with (or a justification for divergence from) published Australian Government guidelines and policy statements;* | Section 4.5 (Table 6) |
| *(c) describe and assess the impacts to listed threatened species and ecological communities identified below and any others that are found to be or may potentially be present in areas that may be impacted by each proposed action in* | Sections 6.1, 6.9 and 6.10<br>Appendix D |

| Terms of Reference | Section in this report |
|---|---|
| *accordance with the Matters of National Environmental Significance, Significant impact guidelines 1.1, Environment Protection and Biodiversity Conservation Act 1999;* | |
| *(d) identify which aspect of each proposed action is of relevance to each listed threatened species or ecological community or if the threat of impact relates to consequential actions; and* | Section 6.10<br>Appendix D |
| *(e) where relevant, have regard to any approved conservation advice.* | Appendix D |
| *11.17 Where relevant, the EIS must demonstrate that each proposed action will not be inconsistent with:* | |
| *(a) Australia's obligations under:*<br>*(i) the Biodiversity Convention;*<br>*(ii) the Convention on Conservation of Nature in the South Pacific (Apia Convention);*<br>*(iii) the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES); and* | Sections 5.3.2 and 6.9 |
| *(b) a recovery plan or threat abatement plan.* | Appendix D |
| *11.18 The EIS must address impacts on the following listed threatened species for each proposed action:* | |
| ***Fauna***<br>*(a) Red Goshawk (Erythrotriorchis radiatus) – vulnerable;*<br>*(b) Australian Painted Snipe (Rostratula australis) – endangered;*<br>*(c) Curlew Sandpiper (Calidris ferruginea) – critically endangered;*<br>*(d) Squatter Pigeon (southern) (Geophaps scripta scripta) – vulnerable;*<br>*(e) Painted Honeyeater (Grantiella picta) – vulnerable;*<br>*(f) Star Finch (eastern) (Neochmia ruficauda ruficauda) – endangered;*<br>*(g) Black-throated Finch (southern) (Poephila cincta cincta) – endangered;*<br>*(h) Northern Quoll (Dasyurus hallucatus) – endangered;*<br>*(i) Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) (Phascolarctos cinereus (combined populations of Qld, NSW and the ACT)) – vulnerable;*<br>*(j) Greater Glider (Petauroides volans) – vulnerable;*<br>*(k) Grey-headed Flying-fox (Pteropus poliocephalus) – vulnerable;*<br>*(l) Ghost Bat (Macroderma gigas) – vulnerable;*<br>*(m) Corben's Long-eared Bat (Nyctophilus corbeni) – vulnerable;* | Sections 5.3 (Table 7), 5.5 and 6.10<br>Appendix D |

| Terms of Reference | Section in this report |
|---|---|
| *(n) Southern Snapping Turtle (Elseya albagula) – critically endangered;*<br>*(o) Fitzroy River Turtle (Rheodytes leukops) – vulnerable;*<br>*(p) Yakka Skink (Egernia rugosa) – vulnerable;*<br>*(q) Allan's Lerista (Lerista allanae) – endangered;*<br>*(r) Ornamental Snake (Denisonia maculata) – vulnerable;*<br>*(s) Dunmall's Snake (Furina dunmalli) – vulnerable;* | |
| ***Flora***<br>*(t) Cycas ophiolitica – endangered;*<br>*(u) King Blue-grass (Dichanthium queenslandicum) – endangered;*<br>*(v) Bluegrass (Dichanthium setosum) – vulnerable;*<br>*(w) Black Ironbox (Eucalyptus raveretiana) – vulnerable; and*<br>*(x) Quassia (Samadera bidwillii) – vulnerable.* | Flora are addressed in the Terrestrial Flora Assessment (DPM Envirosciences 2018a) |
| *11.19 The EIS must address impacts on the following listed threatened ecological communities for each proposed action:*<br>*(a) Brigalow (Acacia harpophylla dominant and co-dominant) – endangered;*<br>*(b) Natural Grasslands of the Queensland Central Highlands and the northern Fitzroy Basin – endangered; and*<br>*(c) Semi-evergreen Vine Thickets of the Brigalow Belt (North and South) and Nandewar Bioregions – endangered.* | Flora are addressed in the Terrestrial Flora Assessment (DPM Envirosciences 2018a) |
| *11.20 For the proposed mine site and access road (EPBC 2017/7867) the EIS must:*<br>*(a) describe the listed migratory species identified below (including distribution, life history and habitat);* | Sections 5.3.2 (Table 8) and 6.9 |
| *(b) provide details of the scope, methodology, timing and effort of surveys for the proposed action (including areas outside of the proposed action area which may be impacted by the proposed action); and include details of:*<br>*(i) the application of best practice survey guidelines;*<br>*(ii) how studies or surveys are consistent with (or a justification for divergence from) published Australian Government guidelines and policy statements;* | Section 4.5 |
| *(c) describe and assess the impacts to the listed migratory species identified below and any others that are found to be or may potentially be present in areas that may be impacted by the proposed action in accordance with the Matters of National Environmental Significance, Significant impact guidelines 1.1, Environment Protection and Biodiversity Conservation Act 1999; and* | Sections 5.3.2 (Table 8) and 6.9 |

| Terms of Reference | Section in this report |
|---|---|
| *(d) identify which aspect of the proposed action is of relevance to each species or if the threat of impact relates to consequential actions.* | Section 6.9<br>Appendix D |
| *11.21 Where relevant, demonstrate that the proposed action will not be inconsistent with:*<br>*(a) Australia's obligations under:*<br>*(i) the Bonn Convention;*<br>*(ii) CAMBA;*<br>*(iii) JAMBA; and*<br>*(iv) an international agreement approved under subsection 209(4) of the EPBC Act.* | Sections 5.3.2 (Table 8) and 6.9 |
| *11.22 The EIS must address impacts on the following migratory species:*<br>*(a) Glossy Ibis (Plegadis falcinellus);*<br>*(b) Caspian Tern (Hydroprogne caspia) ;*<br>*(c) Fork-tailed Swift (Apus pacificus);*<br>*(d) Oriental Cuckoo (Cuculus optatus);*<br>*(e) White-throated Needletail (Hirundapus caudacutus);*<br>*(f) Black-faced Monarch (Monarcha melanopsis);*<br>*(g) Yellow Wagtail (Motacilla flava);*<br>*(h) Satin Flycatcher (Myiagra cyanoleuca);*<br>*(i) Curlew Sandpiper (Calidris ferruginea);*<br>*(j) Latham's Snipe (Gallinago hardwickii);*<br>*(k) Osprey (Pandion haliaetus); and*<br>*(l) Common Greenshank (Tringa nebularia).* | |
| ***Offsets***<br>*11.27 The EIS must describe the residual impacts of each proposed action for each relevant matter protected by the EPBC Act, after all proposed avoidance and mitigation measures are taken into account.* | Sections 6.9 and 8 |
| *11.28 The EIS must identify whether the residual impacts are significant with reference to the Matters of National Environmental Significance, Significant impact guidelines 1.1, Environment Protection and Biodiversity Conservation Act 1999.* | Sections 6.9 and 8<br>Appendix D |
| *11.29 If those residual impacts are significant the EIS must propose offsets for relevant matters protected by the EPBC Act consistent with the Environment Protection and Biodiversity Conservation Act 1999, Environmental Offsets Policy.* | Section 8 |
| ***Information requirements—flora and fauna***<br>*11.46 Describe the likely impacts on the biodiversity and natural environmental values of affected areas arising from the construction, operation and eventual decommissioning of the* | Section 6 |

| Terms of Reference | Section in this report |
|---|---|
| *project (where known) in accordance with EHP's EIS information guidelines relevant to terrestrial and aquatic ecology.* | |
| *11.47 Take into account any proposed avoidance and/or mitigation measures. The assessment should include, but not be limited to, the following key elements:* | Section 7.1 and 7.2 |
| *(a) matters of state environmental significance and national environmental significance* | Sections 5.5, 5.6, 6.9 and 6.10 |
| *(b) terrestrial and aquatic ecosystems (including groundwater-dependent ecosystems) and their interaction* | Section 6.4<br>Aquatic ecology is addressed in the Aquatic Ecology Assessment (DPM Enviroscences 2018b) |
| *(c) biological diversity including listed flora and fauna species and regional ecosystems* | Section 5 |
| *(d) the existing integrity of ecological processes, including habitats of threatened, near-threatened or special least-concern species* | Sections 5.3, 5.5 and 5.6 |
| *(e) the integrity of landscapes and places, including wilderness and similar natural places* | Section 5.3 |
| *(f) actions of the project that require an authority under the Nature Conservation Act 1992, and/or would be assessable development for the purposes of the Vegetation Management Act 1999 (VMA) and the Fisheries Act 1994* | Section 7.2 (Table 13) |
| *(g) impacts on native fauna due to wastes at the site, particularly those related to any form of toxicants in supernatant water of any tailings storage facility.* | Section 6.4 |
| *11.48 Propose practical measures for protecting or enhancing natural values, and assess how the nominated quantitative indicators and standards may be achieved for nature conservation management. In particular, address measures to protect or preserve any threatened or near-threatened species.* | Sections 7.1, 7.2 (Table 13) |
| *11.49 Assess the need for buffer zones and the retention, rehabilitation or planting of movement corridors, and propose measures that would avoid the need for waterway barriers, or propose measures to mitigate the impacts of their construction and operation.* | Section 7.1 |
| *11.50 The measures proposed for the progressive rehabilitation of disturbed areas should include rehabilitation success criteria in relation to natural values that would be used to measure progress and adjust practices if necessary to ensure success over time.* | The Project rehabilitation strategy is detailed within Section 4 of the main text of the EIS. |
| *11.51 Describe how the achievement of the rehabilitation objectives would be monitored and audited, and how corrective actions would be managed.* | |

| Terms of Reference | Section in this report |
|---|---|
| *11.52 Proposals for the rehabilitation of disturbed areas should incorporate, where appropriate, provision of nest hollows, watering points and ground litter.* | |
| ***Offsets***<br>*11.53 The EIS should identify whether the project will result in a significant residual impact on matters of State environmental significance (MSES) with reference to the Queensland Environmental Offsets Policy, Significant Residual Impact Guideline 2014.* | Section 8 |
| *11.54 For staged offsets, the full extent of potential impacts on prescribed environmental matters from the entire proposal needs to be taken into account as part of the significant residual impact test.* | Section 8 (Table 14) |
| *11.55 The proposed offsets should be in line with the requirements set out in the Queensland Environmental Offsets Policy (Version 1.2) 2016.* | Section 8 |

# 2 PROJECT DESCRIPTION

The main activities associated with the development of the Project would include:

- up to 20 Mtpa of ROM coal production for an operational mine life of approximately 79 years (commencing approximately in 2020 or upon grant of all required approvals), including mining operations using conventional mining equipment (e.g. excavators, dozers, front end loaders and trucks) and strip mining, associated with:
  - development of the Olive Downs South domain open cut pits and out-of-pit waste rock emplacements within Mining Lease Application (MLA) 1, MLA 2 (within Mineral Development Licenses [MDL] 3012 and MDL 3013), Specific Purpose Mining Lease Application (SPMLA) 1 and SPMLA 2; and
  - development of the Willunga domain open cut pits and out-of-pit waste rock emplacements within MLA 3 (within MDL 3014).
- exploration activities;
- progressive development of soil stockpiles, laydown areas and borrow areas (e.g. for road base and ballast material);
- use of local quarries to source road base and ballast material (e.g. in the case where material is unavailable from sources within MLA 1, MLA 2 and MLA 3);
- drilling and blasting of competent waste rock material;
- progressive placement of waste rock in emplacements adjacent to and nearby the open pit extents;
- progressive backfilling of the mine voids with waste rock behind the advancing open cut mining operations;
- construction of an access road from Annandale Road to the Olive Downs South domain infrastructure area including a crossing of the Isaac River, and a second access road from the Fitzroy Developmental Road to the Willunga infrastructure facilities;
- progressive development of new haul roads and internal roads, including an Isaac River road crossing to provide access between the Olive Downs South and Willunga domains;
- installation and operation of on-site ROM coal handling and crushing facilities at the Willunga domain;
- transfer of crushed ROM coal from the Willunga domain to the CHPP at the Olive Downs South domain, via either haul road or conveyor with an Isaac River crossing;
- storage and disposal of CHPP rejects (coarse and fine rejects) during the initial years (until in-pit containment facilities become available) in initial rejects storage facilities including tailings cells;
- disposal of CHPP rejects (coarse and fine rejects) on-site within appropriate in-pit containment facilities, including mine voids behind the advancing open cut mining operations, and where circumstances allow, disposal in other out-of-pit containment facilities;
- progressive development of sediment dams and water storage dams (including the North Eastern Water Dam, North Western Water Dam, Central Water Dam, mine affected water dams, raw water dams, etc.) and installation of pumps, pipelines and other water management equipment and structures (including up-catchment diversions and levees);
- wastewater and sewage treatment by package sewage treatment plants;
- advance dewatering of Olive Downs South and Willunga domain open cut pits and construction and use of a groundwater supply borefield subject to the prevalence of suitable hydrogeological conditions;

- installation of a raw water supply pipeline from the existing Eungella pipeline network;
- discharge of excess water off-site in accordance with relevant principles and conditions of the Final Model Water Conditions for Coal Mines in the Fitzroy Basin;
- electricity supply from the existing regional power network, via construction of a 66 kilovolt (kV) ETL and switching/substation;
- construction of a new rail loop and rail spur from the Norwich Park Branch Railway, and rail-loadout facility including product coal stockpiles at the Olive Downs South domain for rail transport of coking and PCI coal products and by-products (i.e. thermal coal) for the export market via the DBCT (subject to availability of rail and port allocation); and
- other associated minor infrastructure, plant, equipment and activities.

The general arrangement of the mine site and the assessment areas are shown in Figure 2 and Figure 3 respectively.

## 2.1 Study area

The Study area covers all components of the proposed Project, including (Figure 4):

- Olive Downs Project Mine Site and Access Road (EPBC 2017/7867);
- Olive Downs Project Water Pipeline (EPBC 2017/7868);
- Olive Downs Project Electricity Transmission Line (EPBC 2017/7869); and
- Olive Downs Project Rail Spur (EPBC 2017/7870).

The overall Study area for the Project covers approximately 27,000 ha of land including the full extent of the Project MDLs, MLAs and SPMLAs. The Study area extends between 75 and 175 m either side of the proposed infrastructure corridors.

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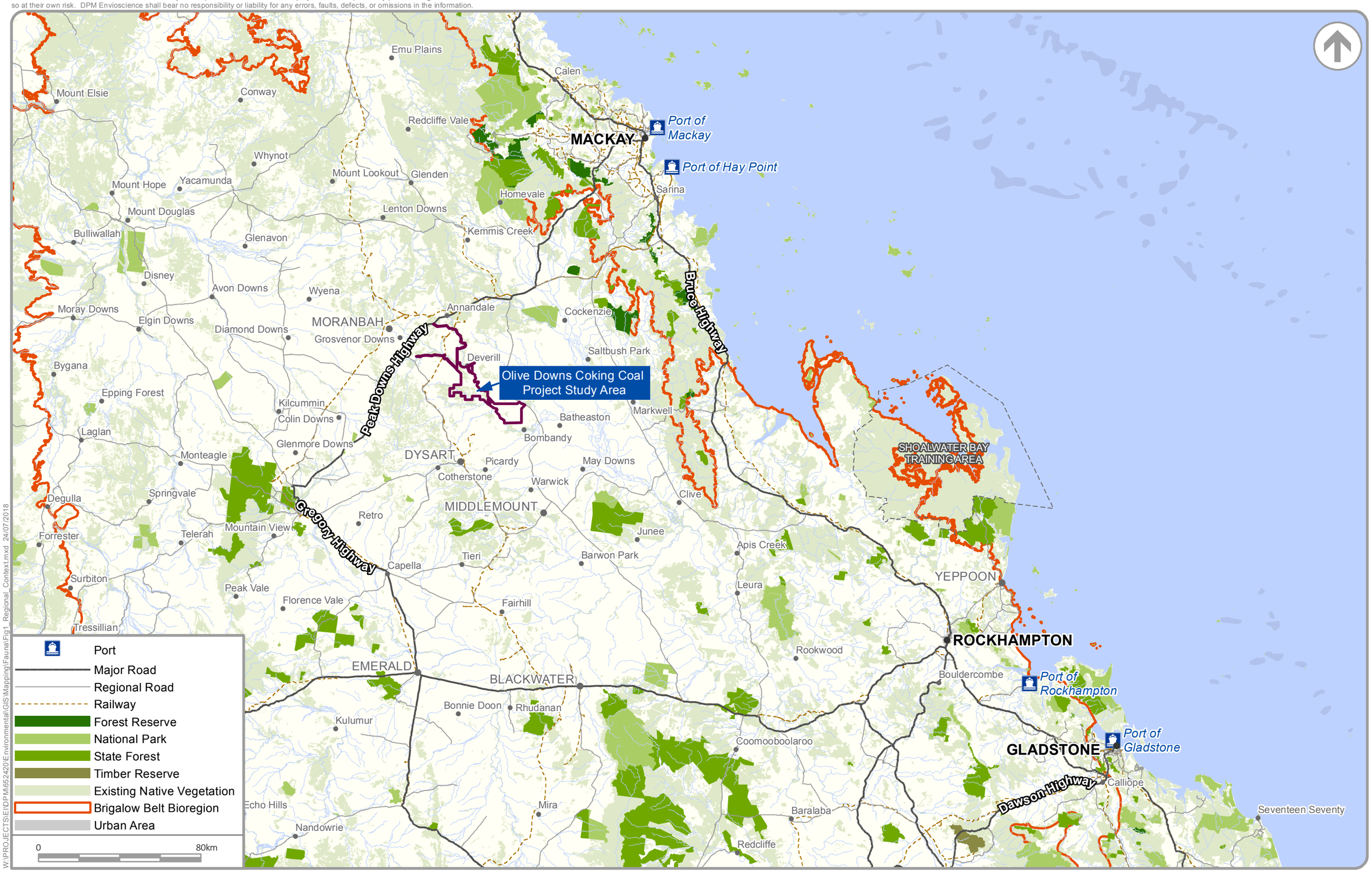


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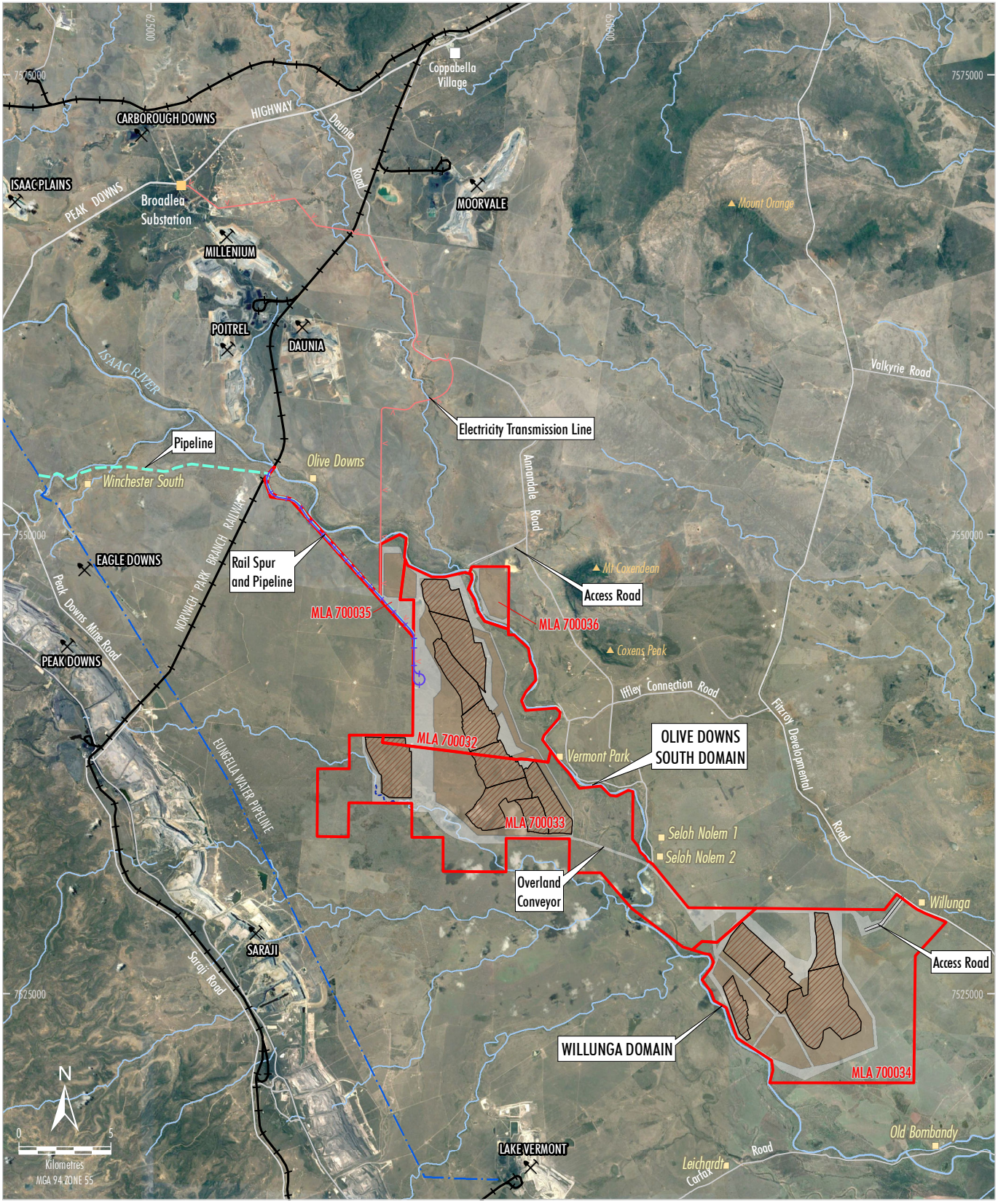
DPM ENVIROSCIENCES

REGIONAL CONTEXT

Olive Downs Coking Coal Project – Terrestrial Fauna Assessment

**FIGURE 1**




LEGEND

- Mining Lease Application Boundary
- Approved/Operating Coal Mine
- Dwelling
- Eungella Pipeline Network
- Railway
- Proposed Electricity Transmission Line
- Proposed Rail
- Proposed Water Pipeline
- Proposed Creek Diversion
- Open Cut Pit Extent
- Out-of-Pit and In-Pit Waste Rock Emplacement
- Infrastructure Area

*Source: Geoscience Australia - Topographical Data 250K (2006)*
*Department of Natural Resources and Mines (2016)*
*Orthophotography: Google Image (2016)*

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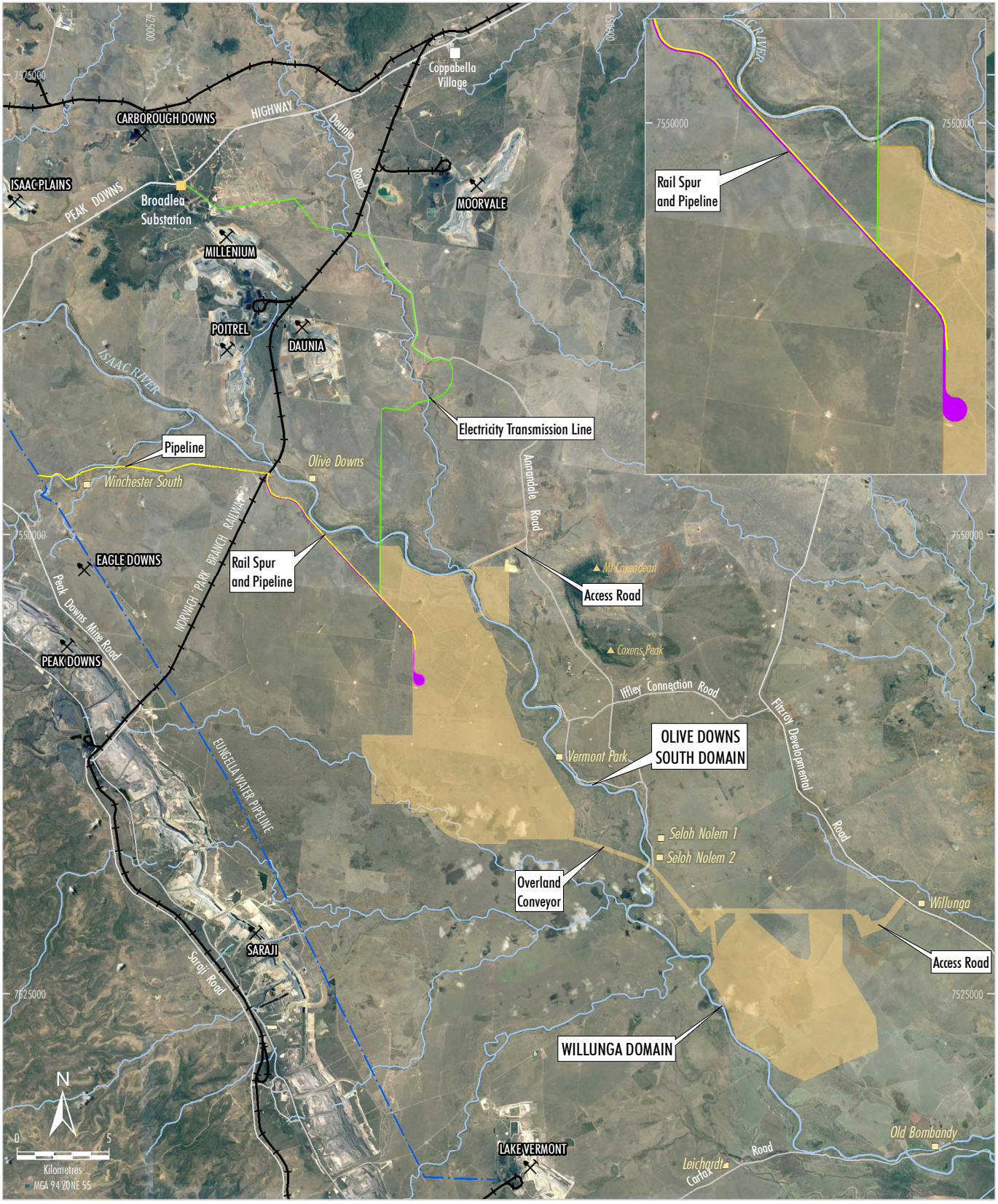
OLIVE DOWNS COKING COAL PROJECT

**Project General Arrangement**

**Figure 2**




LEGEND

- Approved/Operating Coal Mine
- Eungella Pipeline Network
- Railway
- Dwelling
- Proposed Creek Diversion
- Olive Downs Project Mine Site and Access Road (EPBC 2017/7867)
- Olive Downs Project Water Pipeline (EPBC 2017/7868)
- Olive Downs Project Rail Spur (EPBC 2017/7870)
- Olive Downs Project Electricity Transmission Line (EPBC 2017/7869)

*Source: Pembroke (2018); Department of Natural Resources and Mines (2018); Orthophotography; Google Image (2016)*

PEMBROKE

OLIVE DOWNS COKING COAL PROJECT

**EPBC Act Assessment Areas**

**Figure 3**

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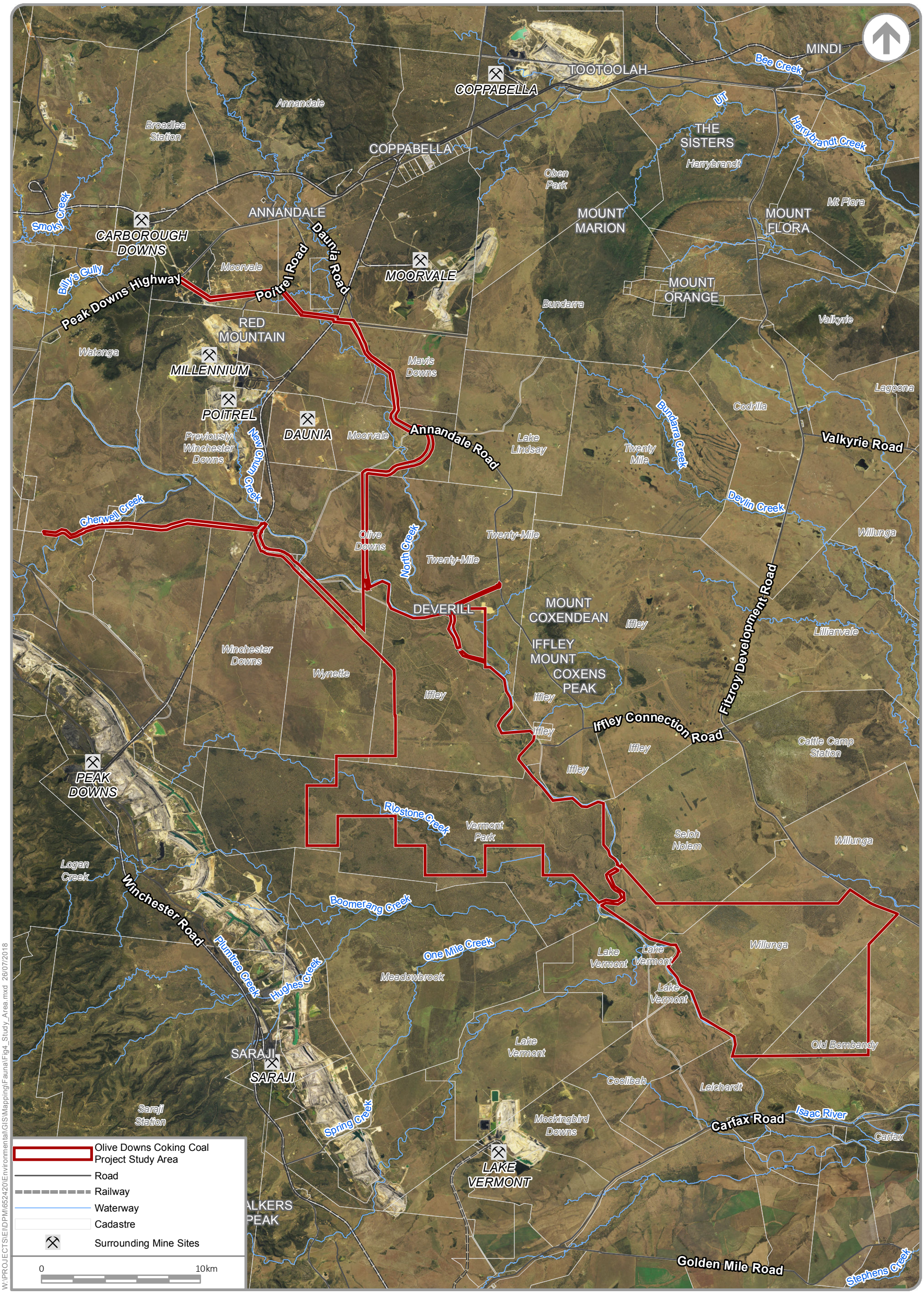
Aerial Imagery: © The State of Queensland, 2017. Includes material © Planet Labs Netherlands B.V. 2017, reproduced under licence from Planet and Geoplex, all rights reserved. Landsat data available from the U.S. Geological Survey. Data acquired under the Spatial Imagery Subscription Plan (SISP) and QSat initiative.

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DPM ENVIROSCIENCES

STUDY AREA

Olive Downs Coking Coal Project – Terrestrial Fauna Assessment

**FIGURE 4**

# 3 EXISTING ENVIRONMENT

## 3.1 Regional setting

The Study area is located centrally within the Isaac Regional Council Local Government Area (Isaac LGA). It is approximately 40 km south-east of Moranbah and within the Brigalow Belt Bioregion. The Project spans across two biodiversity sub-regions, with the northern extents (including the ETL, rail spur and water pipeline) falling within the Northern Bowen Basin subregion and the mine site in the Isaac – Comet Downs subregion. The context of the Study area on a regional scale is shown in Figure 1.

## 3.2 Climate

The climate of the Study area is sub-tropical with December through to February typically the warmest months, with mean maximum daily temperatures around mid-30°C (Figure 5). The mean maximum daily temperature at the Moranbah monitoring station was 33.8 degrees Celsius (°C), recorded during the summer season. The mean minimum daily temperature at the monitoring station is 9.9°C, recorded during winter.

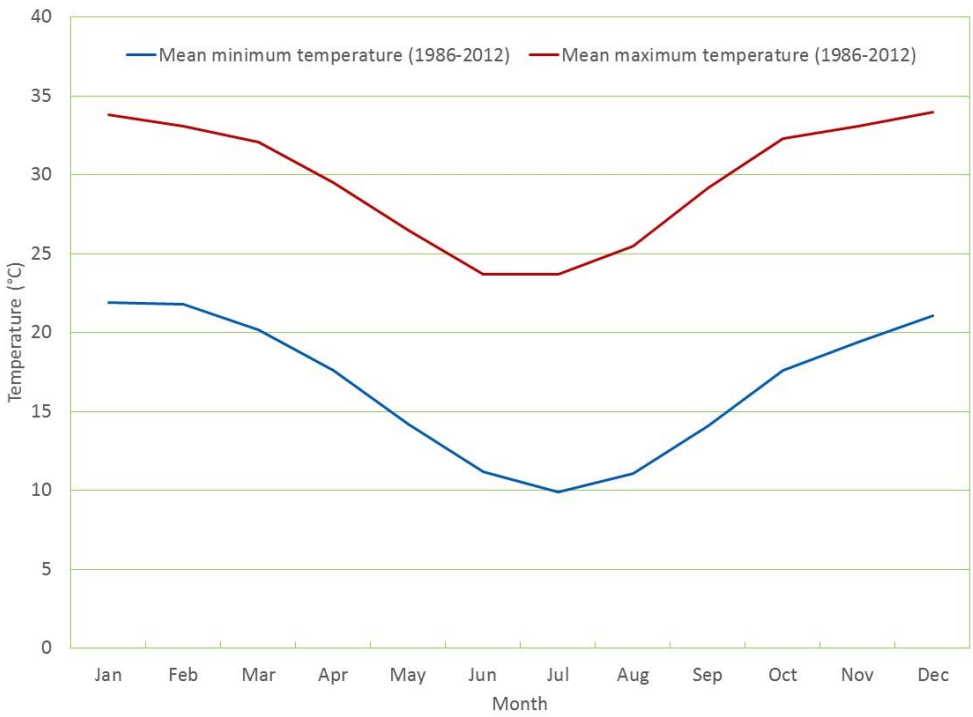


**Figure 5 Temperature statistics for Moranbah Water Treatment Plant (BoM station 034038) (BoM 2018)**

The annual average rainfall is 614 millimetres (mm), with the wettest period occurring during the warmer months from December to February when, on average, 50% of the annual rainfall occurs (Figure 6).

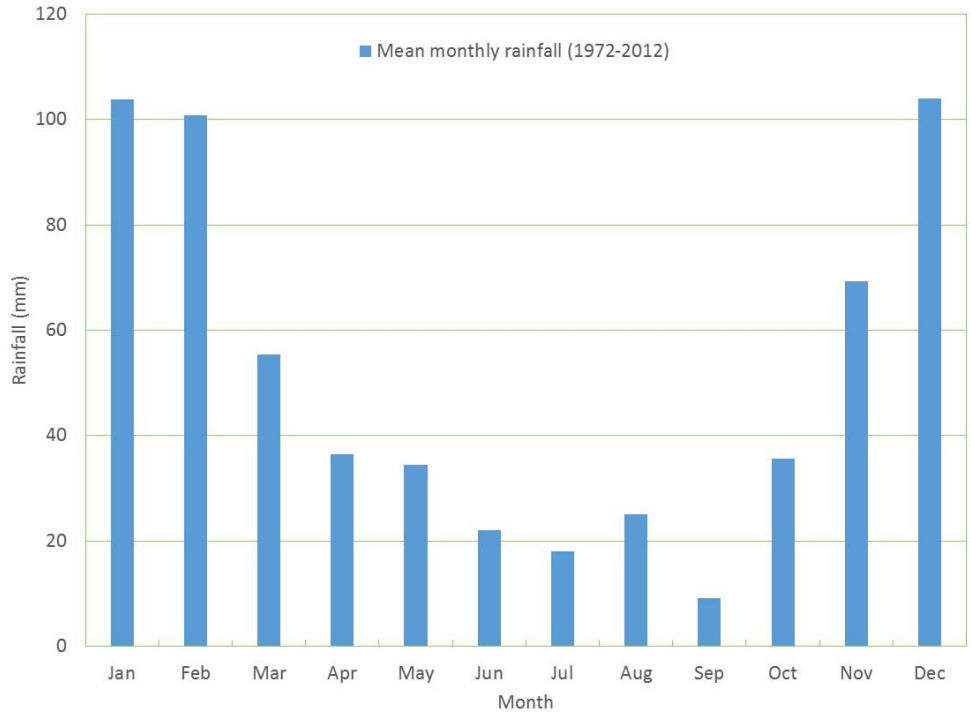


**Figure 6 Rainfall statistics for Moranbah Water Treatment Plant (BoM station 034038)**

## 3.3 Topography

The surrounding land is gently undulating to flat and low-lying (i.e. 200 m AHD or less). The overall elevation of the Project area ranges from 150 m in the low-lying south-east of the Willunga domain to 200 m in the higher areas to the west and north-west of the Project area. Immediately adjacent to the east of the Study area is a small isolated hill known as Mt Coxendean (470m AHD), Coxen's Peak (415 m AHD) and Iffley Mount (310 m).

## 3.4 Hydrology

The Study area is located within the headwaters of the Isaac River catchment of the greater Fitzroy Basin (Hatch 2018). The Isaac River is the main watercourse which bisects the Study area and flows in a north-west to south-east direction, passing the township of Moranbah. The existing Isaac Plains, Millennium, Poitrel and Daunia mines are immediately upstream of the Study area. The Isaac River flows to the north-east of the Olive Downs South domain and then further downstream to the south of the Willunga domain before continuing in a south-easterly direction.

The Connors River flows into the Isaac River approximately 85 km downstream of the Study area (Hatch 2018), with the Isaac River finally converging with the Mackenzie River a further approximate 50 km downstream (Figure 1). Ultimately, the Mackenzie River joins the Fitzroy River, which flows initially north and then east towards the east coast of Queensland and discharges into the Coral Sea southeast of Rockhampton near Port Alma (Hatch 2018).

At a regional scale, the greater Isaac-Connors sub-catchment area (at the confluence with the Mackenzie River) is approximately 22,364 square kilometres (km²) of the total Fitzroy River catchment of 142,665 km², or if represented as a percentage, it accounts for 15% of the overall Fitzroy River catchment area (Hatch 2018).

DNRM has confirmed (via a letter dated 5 February 2018) that the only tributaries of the Isaac River in the vicinity of the Study area which have been determined to meet the definition of a 'watercourse' under the *Water Act 2000* include (from upstream to downstream) (Figure 2):

- North Creek;
- Ripstone Creek;
- Boomerang Creek (including One Mile Creek); and
- Phillips Creek.

## 3.5 Land zones and soils

The following land zones occur in the Study area:

- Land Zone 3 – Recent Quaternary alluvial systems, including closed depressions, paleo-estuarine deposits currently under freshwater influence, inland lakes and associated wave built lunettes. Excludes colluvial deposits such as talus slopes and pediments. Includes a diverse range of soils, predominantly Vertosols and Sodosols; also with Dermosols, Kurosols, Chromosols, Kandosols, Tenosols, Rudosols and Hydrosols; and Organosols in high rainfall areas.
- Land Zone 4 – Tertiary-early Quaternary clay deposits, usually forming level to gently undulating plains not related to recent Quaternary alluvial systems. Excludes clay plains formed in-situ on bedrock. Mainly Vertosols with gilgai microrelief, but includes thin sandy or loamy surfaced Sodosols and Chromosols with the same paleo-clay subsoil deposits.
- Land Zone 5 – Tertiary-early Quaternary extensive, uniform near level or gently undulating plains with sandy or loamy soils. Includes dissected remnants of these surfaces. Also includes plains with sandy or loamy soils of uncertain origin, and plateau remnants with moderate to deep soils usually overlying duricrust. Excludes recent Quaternary alluvial systems (Land Zone 3), exposed duricrust (Land Zone 7), and soils derived from underlying bedrock (Land Zones 8 to 12). Soils are usually Tenosols and Kandosols, also minor deep sandy surfaced Sodosols and Chromosols. There may be a duricrust at depth.
- Land Zone 9 (present in areas with higher relief) – Fine grained sedimentary rocks, generally with little or no deformation and usually forming undulating landscapes. Siltstones, mudstones, shales, calcareous sediments, and labile sandstones are typical rock types, although minor interbedded volcanics may occur. Includes a diverse range of fine textured soils of moderate to high fertility, predominantly Vertosols, Sodosols, and Chromosols.

## 3.6 Land use

The Study area is located within the Bowen Basin where open cut coal mining is a key land use, and a number of existing and approved coal mines, including Moorvale, Daunia, Poitrel, Millennium, Eagle Downs, Peak Downs, Saraji, Lake Vermont surround the Study area. Coal and petroleum (e.g. coal seam gas) mining exploration activities have been conducted within the Study area and surrounds for decades, and continues.

Land within the Study area is used predominately for cattle grazing, with small areas showing some evidence of opportunistic cropping. The land has been largely cleared through past agricultural practices; however some tracts of remnant vegetation exist, particularly along the riparian corridor of the Isaac River.

The properties associated with the Study area are owned by Pembroke (i.e. Iffley and Deverill), other mining companies (i.e. Wynette) and private landholders (i.e. Vermont Park, Willunga, Seloh Nolem, Old Bombandy and Winchester South). Surrounding land to the west of the Study area is owned predominantly by other mining companies.

The Study area is overlapping with existing petroleum tenements in the region, including those for the approved Bowen Gas Project.

# 4 METHODS

## 4.1 Taxonomic nomenclature

Scientific names of fauna used in this report follow the CSIRO List of Australian Vertebrates (Clayton et al. 2006). Scientific names of flora used in this report follow the Australian Plant Census (CHAH 2014).

## 4.2 Determination of significance level

EVNT fauna species are defined as those taxa listed in the EPBC Act or NC Act as Critically Endangered (CE), Endangered (E), Vulnerable (V) or Near Threatened (NT). Priority species are those listed as such in the Fitzroy NRM Region Back on Track Actions for Biodiversity (DERM 2010a). All other native fauna species are designated as being Special Least Concern (SLC) or Least Concern (LC) under the NC Act.

## 4.3 EVNT species likelihood of occurrence

EVNT species identified from the desktop assessment (and subsequent field surveys) were assigned a likelihood of occurrence based on the criteria identified in Table 2. Targeted searches were undertaken in the field for species identified as either being likely to occur, or having potential to occur, within the Study area, based on the desktop sources. The methodology was applied again after surveys to determine the likelihood of occurrence once site based information became available.

**Table 2 Criteria adopted for the likelihood of Endangered, Vulnerable or Near Threatened species identified from the desktop searches occurring within the Study area**

| Likelihood of occurrence | Criteria |
|---|---|
| Unlikely | ▪ species or species habitat may occur, is likely to occur or is known to occur from the broader search area (based on database searches); but<br>▪ preferred habitat has not been identified within the Study area; and<br>▪ there are no confirmed species records within 10 km of the Study area.<br>▪ preferred habitat occurs within the Study area, but there are no confirmed species records within 50 km of the Study area. |
| Potential | ▪ species or species habitat may occur, is likely to occur or is known to occur from the broader search area (based on database searches); and<br>▪ preferred habitat occurs within the Study area; and<br>▪ there are no confirmed species records within 10 km of the Study area; however, there are confirmed species records within 50 km of the Study area; OR<br>▪ species indicated as likely during desktop assessment, but field surveys revealed no evidence of occurrence in the Study area. |
| Likely | ▪ preferred habitat occurs within the Study area; and<br>▪ confirmed species records within 10 km of the Study area; however<br>▪ species not yet confirmed as occurring within the Study area. |
| Known | ▪ confirmed species records within the Study area (generally as a result of subsequent field survey). |

## 4.4 Desktop assessment

Desktop searches were undertaken in September 2016, May 2017, December 2017 (to cater for the inclusion of the infrastructure corridors in the Study area) and July 2018 and included a review of the following:

- DEE EPBC Act Protected Matters Search Tool, to identify MNES relevant to terrestrial fauna within a search area extending at least 10 km from the Study area (DEE 2018).
- The Queensland Wildlife Online search (DES 2018b) results for EVNT and SLC species records within a search area extending 50 km from the Study area.
- Queensland Museum (2017) records search for EVNT and SLC species records
- Matters of State Environmental Significance version 4.1 (DEHP 2014), to identify known MSES relevant to terrestrial fauna within the Study area.
- Remnant Regional Ecosystem (RE) and Broad Vegetation Group (BVG) mapping (Version 10.0) for the Study area to identify vegetation communities that are likely to occur within the site (DSITI 2017).
- Regulated Vegetation Management mapping (version 1.37) (which forms part of the MSES mapping) to identify areas of assessable and non-assessable vegetation (DNRM 2017).
- Essential habitat (EH) mapping (version 4.34) to identify vegetation in which an EVNT species has been known to occur (DNRM 2017).
- Atlas of Living Australia for EVNT and SLC species records.
- Biodiversity Planning Assessment mapping (including mapped ecological corridors) for the Brigalow Belt (DEHP 2008).
- The Fitzroy Natural Resource Management Region Back on Track Actions for Biodiversity (DERM 2010).
- Previous studies from Red Hill Mine (approximately 50 km north-west) (URS 2013), Lake Vermont (12 km east) (AARC 2016a), Eagle Downs Mine (approximately 15 km east) (Hansen Bailey 2009), Saraji Mine (approximately 6 km east) (SKM 2011) and Arrow Bowen Gas Project (3d Environmental / Ecosmart Ecology 2012).

## 4.5 Field survey

The field surveys were undertaken in accordance with the following relevant survey guidelines:

- *Terrestrial Vertebrate Fauna Survey Guidelines for Queensland* (Eyre et al. 2014);
- *EPBC Act survey guidelines for Australia's threatened reptiles* (DSEWPC 2011a);
- *EPBC Act survey guidelines for Australia's threatened birds* (DEWHA 2010a);
- *EPBC Act survey guidelines for Australia's threatened bats* (DEWHA 2010b);
- *EPBC Act survey guidelines for Australia's threatened mammals* (DSEWPC 2011b);
- *EPBC Act draft referral guidelines for the nationally listed Brigalow Belt reptiles* (DSEWPC 2011c);
- *EPBC Act Referral Guidelines for the Vulnerable Koala* (DotE 2014);
- *Targeted species survey guidelines – Glossy Black-cockatoo* (Hourigan 2012);
- *Targeted species survey guidelines – Painted Honeyeater* (Rowland 2012a);
- *Targeted species survey guidelines – Ghost Bat* (Hourigan 2011);
- *Targeted species survey guidelines – Common Death Adder* (Rowland 2012b); and
- *Targeted species survey guidelines – Yakka Skink* (Ferguson and Mathieson 2014).

### 4.5.1 Survey timing

A comprehensive fauna survey was undertaken within the mine site in spring from 1-14 November 2016. A follow-up comprehensive fauna survey was undertaken within the mine site in autumn from 23 April to 4 May 2017. A targeted fauna survey was undertaken in the proposed ETL, water pipeline and rail spur corridors in autumn from 7-14 May 2017, and again in spring from 4-9 September 2017 and 14 – 20 November. This is consistent with Eyre et al. (2014) (Table 3). Seasonal surveys have been undertaken to improve the accuracy of data collected, and to capture expected peaks in vertebrate fauna activity associated with the commencement of breeding and dispersal or migration. The rationale for survey timing is summarised in Table 3, with reference to optimal fauna survey conditions for the Brigalow Belt bioregion as identified by Eyre et al. (2014).

**Table 3 Optimal time of year and conditions for vertebrate fauna surveys in the Brigalow Belt Bioregion (Eyre et al. 2014)**

| Survey timing | Rationale |
|---|---|
| spring to early Summer (September to mid November) | As temperatures begin to warm up after winter there is a peak in vertebrate activity with the commencement of breeding activity in many species. Exact timing is dependent on the timing of the onset of spring, when temperatures being to warm but before Summer temperatures become too high as many species, especially reptiles, become less active. Rainfall is also a major trigger for increased activity in many species. This period can be very dry so conducting a second survey during moist periods is critical. |
| autumn (March to mid May) | A second survey should be undertaken after Summer as the temperatures decrease but before the onset of cold Winter nights. This coincides with another active period including dispersal and migration of many species. It is also more likely to be moister than during the spring-early Summer period, and also coincides with the grass seeding and growing season (important for granivores). |

Conditions at the time of the spring 2016 survey of the MLAs (1-14 November), as inferred from weather data captured at the Bureau of Meteorology (BoM) Moranbah Airport station 34035 (BoM 2018), were warm to hot, with over 30 mm of rain recorded early in the survey period. A number of ephemeral waterways, wetlands and gilgais, as well as the seasonally flowing Isaac River, contained surface water during the survey period. The mean minimum and maximum temperatures during the 14 days of survey were 20.5°C and 35.4°C, respectively (BoM 2018). These conditions were considered suitable for surveying a diversity of fauna, including reptiles and amphibians. Daily Rainfall, mean minimum and mean maximum temperatures at the Moranbah Airport weather station throughout the spring 2016 and autumn 2017 surveys of the MLA, and the autumn 2017 and spring 2017 surveys of the infrastructure corridors are provided in Figure 7.

Conditions at the time of the autumn 2017 survey of the MLA (24 April to 3 May) were highly variable, ranging from very cold to very warm (4.5°C to 32.2°C) (BoM 2018). The mean minimum and maximum temperatures for the 10 days of survey were 12.4°C and 28.1°C, respectively (BoM 2018). No rain was recorded during the survey period, although surface water was prevalent across the Study area as a result of significant rainfall and runoff associated with Cyclone Debbie in late March 2017 (Figure 6). The Isaac River was in flow at the time of the survey, although had reduced to scattered deep pools connected by very shallow, trickling runs. Numerous wetlands and gilgais across the Study area remained full of water. Many areas of cracking clays had swollen in the moist conditions, causing a number of associated reptiles and amphibians to emerge from

the cracks and to seek alternative refuge beneath surface litter. This aided in the success of diurnal active searches for fauna, reptiles in particular.

Temperatures at the time of the autumn 2017 survey of the infrastructure corridors (15-17 May 2017) ranged from cold to warm (11.7°C to 28.8°C) (Figure 7). The survey period culminated in substantial falls of rain commencing 17 May 2017, which resulted in 75.4 mm falling over the ensuing 48 hour period (BoM 2018). This represented the last substantial fall of rain for the ensuing four months, with only 4.8 mm recorded (BoM 2018) (Figure 7).

Conditions at the time of the spring 2017 survey of the infrastructure corridors (4-9 September 2017) were relatively dry. No rain was recorded during the survey period. Temperatures ranged from cold to very warm (5.8°C to 32.1°C). The mean minimum and maximum temperatures for the six days of survey were 8.4°C and 29.9°C, respectively (BoM 2018) (Figure 7).

Temperatures at the time of the spring 2017 survey of the revised infrastructure corridors and eastern waste dump 14-20 November 2017 ranged from cool to very warm (16.2°C to 33°C). The mean minimum and maximum temperatures for the seven days of survey (encompassing flora, fauna and aquatic components) were 17.5°C and 32°C, respectively. Rainfall of 29.2 mm was recorded during the survey period (BoM 2018) and resulted in suitable conditions for surveying a diversity of fauna, including burrowing reptiles and amphibians detected during nocturnal searches in the rain (Figure 7).

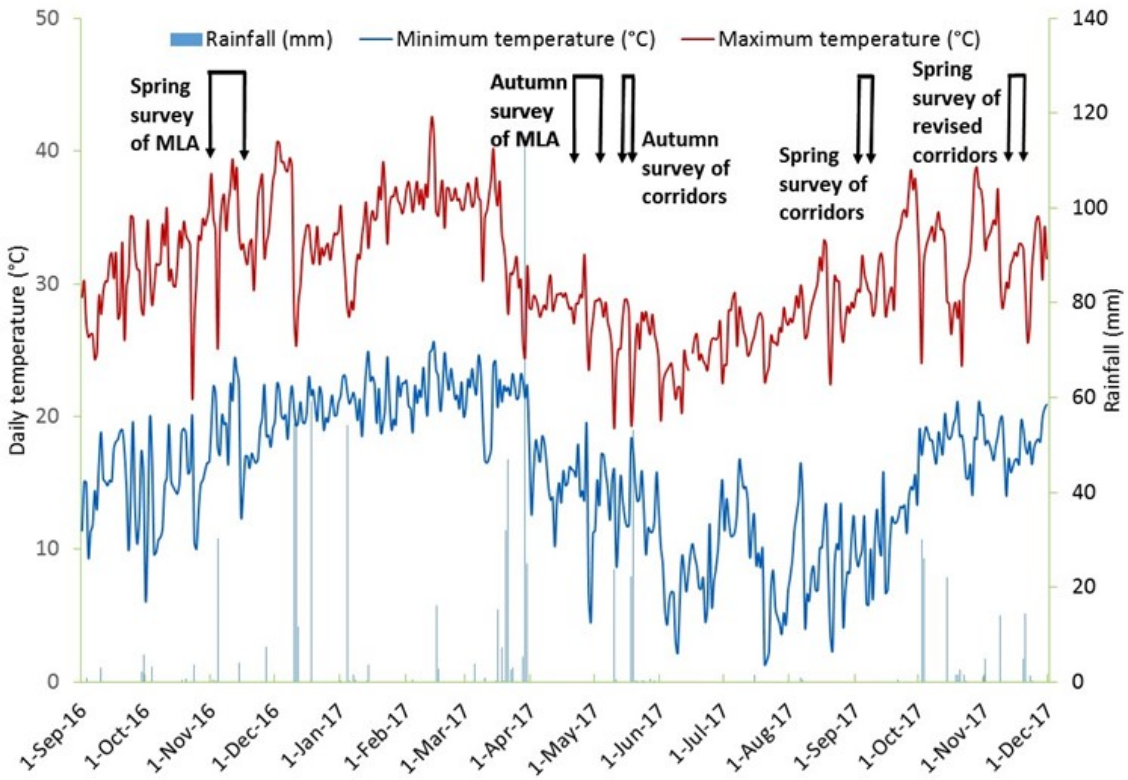


**Figure 7 Daily rainfall, mean minimum and mean maximum temperatures at the Moranbah Airport weather station throughout the spring 2016 and autumn 2017 surveys of the MLA, and the autumn 2017 and spring 2017 surveys of the infrastructure corridors**

### 4.5.2 Survey locations

Comprehensive fauna surveys were undertaken at 13 locations within the Study area (FAC1 to FAC14). Targeted survey effort for EVNT species across the broader Study area included an additional eleven camera trap sites, fourteen ultrasonic bat detector sites, four harp trap sites, 46 bird survey sites, 21 active reptile search sites, 50 spotlighting sites and eighteen koala transects. Survey efficiencies were achieved by conducting fauna habitat assessments in conjunction with flora surveys at 221 vegetation community assessment sites across the Study area (including 92 locations within infrastructure corridors) (DPM Enviosciences 2018a). Table 4 provides a summary of the fauna survey effort across the Study area. The survey effort is depicted in Figure 8.

**Table 4 Site identifier and method for each fauna habitat assessment and fauna survey site in the Study area**

| Site | Field-verified RE | Survey method | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Habitat assess. | Elliot trap | Pitfall trap | Funnel trap | Camera trap | Bird survey | Active searches | Scat / sign | Anabat | Harp trap | Spotlighting | Call playback | Koala searches | Incidental record |
| **Mine surveys – spring 2016** | | | | | | | | | | | | | | | |
| FAC1 | 11.3.2 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | * | ✓ | ✓ | ✓ | ✓ |
| FAC2 | 11.3.2 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | * | ✓ | ✓ | ✓ | ✓ |
| FAC3 | 11.3.25 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | * | ✓ | ✓ | ✓ | ✓ |
| FAC5 | 11.3.25 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | * | ✓ | ✓ | ✓ | ✓ |
| FAC6 | 11.3.2 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | * | ✓ | ✓ | ✓ | ✓ |
| FAC7 | 11.5.17 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | * | ✓ | ✓ | ✓ | ✓ |
| FAC8 | 11.4.9 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | * | ✓ | ✓ | ✓ | ✓ |
| CAM1 | lake | | | | | ✓ | | | | | | | | | ✓ |
| CAM2 | 11.3.27b | | | | | ✓ | | | | | | | | | ✓ |
| CAM3 | 11.3.27b | | | | | ✓ | | | | | | | | | ✓ |
| BIRD1 | 11.3.7 | | | | | | ✓ | | | | | | | | ✓ |
| BIRD2 | 11.3.25 | | | | | | ✓ | | | | | | | | ✓ |
| BIRD3 | 11.3.2 | | | | | | ✓ | | | | | | | | ✓ |
| BIRD4 | Non-remnant | | | | | | ✓ | | | | | | | | ✓ |
| BIRD5 | 11.3.25 | | | | | | ✓ | | | | | | | | ✓ |
| BIRD6 | lake | | | | | | ✓ | | | | | | | | ✓ |
| BIRD7 | Non-remnant | | | | | | ✓ | | | | | | | | ✓ |
| BIRD8 | 11.3.25 | | | | | | ✓ | | | | | | | | ✓ |
| BIRD9 | 11.3.27b | | | | | | ✓ | | | | | | | | ✓ |
| BIRD10 | 11.3.27f | | | | | | ✓ | | | | | | | | ✓ |
| BIRD11 | Non-remnant | | | | | | ✓ | | | | | | | | ✓ |
| AS1 | Non-remnant | | | | | | | ✓ | ✓ | | | | | | ✓ |
| AS2 | 11.5.3 | | | | | | | ✓ | ✓ | | | | | | ✓ |
| AS3 | 11.5.3 | | | | | | | ✓ | ✓ | | | | | | ✓ |
| AS4 | 11.5.3 | | | | | | | ✓ | ✓ | | | | | | ✓ |
| AS5 | 11.3.4 | | | | | | | ✓ | ✓ | | | | | | ✓ |
| ANA1 | 11.3.2 | | | | | | | | | ✓ | | | | | ✓ |

| Site | Field-verified RE | Survey method | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Habitat assess. | Elliot trap | Pitfall trap | Funnel trap | Camera trap | Bird survey | Active searches | Scat / sign | Anabat | Harp trap | Spotlighting | Call playback | Koala searches | Incidental record |
| ANA2 | 11.3.7 | | | | | | | | | ✓ | | | | | ✓ |
| ANA3 | Non-remnant | | | | | | | | | ✓ | | | | | ✓ |
| ANA4 | 11.3.25 | | | | | | | | | ✓ | | | | | ✓ |
| ANA5 | 11.3.2 | | | | | | | | | ✓ | | | | | ✓ |
| ANA6 | Isaac River | | | | | | | | | ✓ | | | | | ✓ |
| ANA7 | Isaac River | | | | | | | | | ✓ | | | | | ✓ |
| HARP1 | 11.3.7 | | | | | | | | | | ✓ | | | | ✓ |
| HARP2 | 11.3.25 | | | | | | | | | | ✓ | | | | ✓ |
| SPOT1 | Non-remnant | | | | | | | | | | | ✓ | | | ✓ |
| SPOT2 | Non-remnant | | | | | | | | | | | ✓ | | | ✓ |
| SPOT3 | Non-remnant | | | | | | | | | | | ✓ | | | ✓ |
| SPOT4 | 11.5.17 | | | | | | | | | | | ✓ | | | ✓ |
| SPOT5 | Non-remnant | | | | | | | | | | | ✓ | ✓ | | ✓ |
| SPOT6 | Non-remnant | | | | | | | | | | | ✓ | | | ✓ |
| SPOT7 | Isaac River | | | | | | | | | | | ✓ | ✓ | | ✓ |
| SPOT8 | 11.3.25 | | | | | | | | | | | ✓ | | | ✓ |
| SPOT9 | 11.5.3 | | | | | | | | | | | ✓ | | | ✓ |
| KTRANS1 | 11.3.25 | | | | | | | | ✓ | | | | | ✓ | ✓ |
| KTRANS2 | 11.3.25 | | | | | | | | ✓ | | | | | ✓ | ✓ |
| KTRANS3 | Isaac River | | | | | | | | ✓ | | | | | ✓ | ✓ |
| T1 | 11.3.7 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| T2 | 11.3.2 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| T3 | 11.3.1 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| T4 | 11.5.3 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q1 | 11.3.2 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q2 | 11.3.7 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q4 | 11.3.27i | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q5 | 11.3.2 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q6 | 11.4.8 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q7 | 11.5.17 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q8 | 11.3.7 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q9 | 11.3.7 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q10 | 11.3.7 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q11 | 11.3.2 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q12 | 11.3.2 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q13 | 11.5.17 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q14 | Non-remnant | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q15 | 11.3.2 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q16 | 11.3.2 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q17 | 11.3.2 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q18 | 11.5.17 | ✓ | | | | | | | | | | | | ✓ | ✓ |

| Site | Field-verified RE | Survey method | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Habitat assess. | Elliot trap | Pitfall trap | Funnel trap | Camera trap | Bird survey | Active searches | Scat / sign | Anabat | Harp trap | Spotlighting | Call playback | Koala searches | Incidental record |
| Q19 | 11.3.7 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q20 | 11.3.7 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q21 | 11.3.2 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q22 | 11.3.2 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q23 | 11.3.25 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q24 | 11.3.3c | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q25 | 11.3.7 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q26 | 11.5.17 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q27 | 11.5.17 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q28 | 11.3.1 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q29 | 11.3.27b | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q30 | 11.3.7 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q31 | 11.3.1 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q32 | 11.3.27f | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q33 | 11.3.3 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q34 | 11.3.2 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q35 | 11.3.7 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q36 | 11.3.2 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q37 | 11.3.25 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q38 | 11.3.2 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q39 | 11.3.27b | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q40 | 11.3.2 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q41 | 11.4.8 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q42 | 11.3.2 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q43 | 11.3.27f | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q44 | 11.3.1 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q45 | 11.3.7 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q46 | 11.4.9 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q47 | 11.5.3 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q48 | 11.5.9 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q49 | 11.4.9 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q50 | 11.4.9 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q51 | 11.5.17 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q52 | 11.5.9 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q53 | 11.5.3 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q54 | 11.4.8 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q55 | 11.5.3 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q56 | 11.3.25 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q57 | 11.4.8 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q58 | 11.4.9 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q59 | 11.5.3 | ✓ | | | | | | | | | | | | ✓ | ✓ |

| Site | Field-verified RE | Survey method | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Habitat assess. | Elliot trap | Pitfall trap | Funnel trap | Camera trap | Bird survey | Active searches | Scat / sign | Anabat | Harp trap | Spotlighting | Call playback | Koala searches | Incidental record |
| Q60 | 11.4.9 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q61 | 11.5.3 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q62 | 11.3.25 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q63 | 11.3.2 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q64 | 11.3.2 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q65 | 11.5.3 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q67 | 11.4.8 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q69 | 11.3.27b | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q70 | 11.4.8 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q71 | 11.5.3 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q72 | 11.5.3 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q73 | 11.5.9 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q74 | 11.5.3 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q75 | 11.5.3 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q76 | 11.3.27b | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q77 | 11.3.7 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q78 | 11.3.27c | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q79 | 11.3.2 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q80 | Non-remnant | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q81 | 11.3.2 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q82 | 11.3.27f | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q83 | 11.3.7 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q84 | 11.3.25 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q85 | 11.3.2 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q86 | 11.3.3 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q87 | 11.3.7 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q88 | 11.5.3 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q89 | 11.5.3 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q90 | 11.5.3 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q91 | 11.5.3 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q92 | 11.5.9 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q93 | 11.5.9 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q94 | 11.5.3 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q95 | 11.5.3 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q96 | 11.5.3 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q97 | 11.5.8c | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q98 | 11.5.17 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q99 | 11.5.3 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q100 | 11.5.3 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q101 | 11.5.3 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q102 | 11.5.9 | ✓ | | | | | | | | | | | | ✓ | ✓ |

| Site | Field-verified RE | Survey method | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Habitat assess. | Elliot trap | Pitfall trap | Funnel trap | Camera trap | Bird survey | Active searches | Scat / sign | Anabat | Harp trap | Spotlighting | Call playback | Koala searches | Incidental record |
| Q103 | 11.4.9 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q104 | 11.5.9 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q105 | 11.5.9 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q106 | 11.5.3 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q107 | 11.5.3 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q108 | 11.5.3 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q110 | 11.5.9 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q111 | 11.3.27f | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q112 | 11.5.3 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q113 | 11.3.2 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q114 | 11.3.4 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q115 | 11.5.3 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q116 | 11.3.7 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q117 | 11.3.2 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| **Mine survey – autumn 2017** | | | | | | | | | | | | | | | |
| FAC9 | 11.3.25 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | * | ✓ | ✓ | ✓ | ✓ |
| FAC10 | 11.3.7 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | * | ✓ | | ✓ | ✓ |
| FAC11 | Non-remnant | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | * | ✓ | | ✓ | ✓ |
| FAC12 | 11.3.1 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | * | ✓ | | ✓ | ✓ |
| FAC13 | 11.3.25 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | * | ✓ | | ✓ | ✓ |
| FAC14 | 11.5.3 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | * | ✓ | | ✓ | ✓ |
| CAM5 | 11.5.17 | | | | | ✓ | | | | | | | | | ✓ |
| CAM6 | 11.3.2 | | | | | ✓ | | | | | | | | | ✓ |
| CAM7 | Non-remnant | | | | | ✓ | | | | | | | | | ✓ |
| CAM8 | 11.5.17 | | | | | ✓ | | | | | | | | | ✓ |
| CAM9 | 11.3.25 | | | | | ✓ | | | | | | | | | ✓ |
| CAM10 | 11.5.9 | | | | | ✓ | | | | | | | | | ✓ |
| CAM11 | 11.3.27f | | | | | ✓ | | | | | | | | | ✓ |
| CAM12 | lake | | | | | ✓ | | | | | | | | | ✓ |
| BIRD12 | 11.5.17 | | | | | | ✓ | | | | | | | | ✓ |
| BIRD13 | 11.3.2 | | | | | | ✓ | | | | | | | | ✓ |
| BIRD14 | Non-remnant | | | | | | ✓ | | | | | | | | ✓ |
| BIRD15 | Non-remnant | | | | | | ✓ | | | | | | | | ✓ |
| BIRD16 | 11.3.2 | | | | | | ✓ | | | | | | | | ✓ |
| BIRD17 | Non-remnant | | | | | | ✓ | | | | | | | | ✓ |
| BIRD18 | 11.5.17 | | | | | | ✓ | | | | | | | | ✓ |
| BIRD20 | 11.3.25 | | | | | | ✓ | | | | | | | | ✓ |
| BIRD21 | lake | | | | | | ✓ | | | | | | | | ✓ |
| BIRD22 | 11.5.17 | | | | | | ✓ | | | | | | | | ✓ |
| AS7 | Non-remnant | | | | | | | ✓ | ✓ | | | | | | ✓ |
| AS8 | 11.3.2 | | | | | | | ✓ | ✓ | | | | | | ✓ |

| Site | Field-verified RE | Survey method | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Habitat assess. | Elliot trap | Pitfall trap | Funnel trap | Camera trap | Bird survey | Active searches | Scat / sign | Anabat | Harp trap | Spotlighting | Call playback | Koala searches | Incidental record |
| AS9 | Non-remnant | | | | | | | ✓ | ✓ | | | | | | ✓ |
| AS10 | Non-remnant | | | | | | | ✓ | ✓ | | | | | | ✓ |
| ANA13 | 11.5.17 | | | | | | | | | ✓ | | | | | ✓ |
| ANA14 | 11.3.2 | | | | | | | | | ✓ | | | | | ✓ |
| ANA15 | Non-remnant | | | | | | | | | ✓ | | | | | ✓ |
| ANA16 | 11.5.17 | | | | | | | | | ✓ | | | | | ✓ |
| ANA17 | Non-remnant | | | | | | | | | ✓ | | | | | ✓ |
| ANA18 | 11.3.2 | | | | | | | | | ✓ | | | | | ✓ |
| ANA19 | 11.3.25 | | | | | | | | | ✓ | | | | | ✓ |
| HARP3 | Isaac River | | | | | | | | | | ✓ | | | | ✓ |
| HARP4 | 11.3.25 | | | | | | | | | | ✓ | | | | ✓ |
| SPOT11 | 11.3.2 | | | | | | | | | | | ✓ | | | |
| SPOT12 | Non-remnant | | | | | | | | | | | ✓ | | | |
| SPOT13 | Non-remnant | | | | | | | | | | | ✓ | | | |
| SPOT14 | Non-remnant | | | | | | | | | | | ✓ | | | |
| SPOT15 | Non-remnant | | | | | | | | | | | ✓ | | | |
| SPOT16 | Non-remnant | | | | | | | | | | | ✓ | | | |
| SPOT17 | 11.3.27f | | | | | | | | | | | ✓ | | | |
| SPOT18 (car) | Isaac River | | | | | | | | | | | ✓ | | | |
| SPOT19 (car) | Non-remnant | | | | | | | | | | | ✓ | | | |
| SPOT20 (car) | 11.3.7 | | | | | | | | | | | ✓ | | | |
| SPOT21 (car) | Non-remnant | | | | | | | | | | | ✓ | | | |
| SPOT22 (car) | Isaac River | | | | | | | | | | | ✓ | | | |
| SPOT23 (car) | Isaac River | | | | | | | | | | | ✓ | | | |
| SPOT24 (car) | 11.3.2 | | | | | | | | | | | ✓ | | | |
| KTRANS4 | Isaac River | | | | | | | | ✓ | | | | | ✓ | ✓ |
| KTRANS5 | 11.3.25 | | | | | | | | ✓ | | | | | ✓ | ✓ |
| **Mine Surveys – spring 2017** | | | | | | | | | | | | | | | |
| Q128 | | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q129 | | ✓ | | | | | | | | | | | | ✓ | ✓ |
| Q130 | | ✓ | | | | | | | | | | | | ✓ | ✓ |
| **Infrastructure corridors – autumn 2017** | | | | | | | | | | | | | | | |
| BIRDC1 | 11.3.25 | | | | | | ✓ | | | | | | | | ✓ |
| BIRDC2 | 11.3.25 | | | | | | ✓ | | | | | | | | ✓ |
| BIRDC3 | 11.3.1 | | | | | | ✓ | | | | | | | | ✓ |
| BIRDC4 | 11.5.3 | | | | | | ✓ | | | | | | | | ✓ |
| BIRDC5 | 11.3.7 | | | | | | ✓ | | | | | | | | ✓ |
| BIRDC6 | 11.3.2 | | | | | | ✓ | | | | | | | | ✓ |
| BIRDC7 | 11.3.2 | | | | | | ✓ | | | | | | | | ✓ |
| ASC1 | 11.5.3 | | | | | | | ✓ | ✓ | | | | | | ✓ |
| SPOTC1 | 11.3.25 | | | | | | | | | | | ✓ | | | |

| Site | Field-verified RE | Survey method | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Habitat assess. | Elliot trap | Pitfall trap | Funnel trap | Camera trap | Bird survey | Active searches | Scat / sign | Anabat | Harp trap | Spotlighting | Call playback | Koala searches | Incidental record |
| SPOTC2 | 11.3.25 | | | | | | | | | | | ✓ | | | |
| SPOTC3 | 11.3.25 | | | | | | | | | | | ✓ | | | |
| SPOTC4 | 11.5.3 | | | | | | | | | | | ✓ | | | |
| SPOTC5 | 11.5.3 | | | | | | | | | | | ✓ | | | |
| SPOTC6 (car) | Non-remnant | | | | | | | | | | | ✓ | | | |
| KTRANSC1 | 11.3.25 | | | | | | | | ✓ | | | | | ✓ | ✓ |
| KTRANSC2 | 11.3.25 | | | | | | | | ✓ | | | | | ✓ | ✓ |
| KTRANSC3 | 11.3.25 | | | | | | | | ✓ | | | | | ✓ | ✓ |
| KTRANSC4 | 11.3.25 | | | | | | | | ✓ | | | | | ✓ | ✓ |
| KTRANSC5 | 11.3.25 | | | | | | | | ✓ | | | | | ✓ | ✓ |
| KTRANSC6 | 11.3.2 | | | | | | | | ✓ | | | | | ✓ | ✓ |
| KTRANSC7 | 11.5.3 | | | | | | | | ✓ | | | | | ✓ | ✓ |
| KTRANSC8 | 11.5.9 | | | | | | | | ✓ | | | | | ✓ | ✓ |
| KTRANSC9 | 11.5.3 | | | | | | | | ✓ | | | | | ✓ | ✓ |
| CQ1 | Non-remnant | ✓ | | | | | | | | | | | | ✓ | ✓ |
| CQ2 | 11.3.2 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| CQ3 | 11.4.8 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| CQ4 | Non-remnant | ✓ | | | | | | | | | | | | ✓ | ✓ |
| CQ5 | 11.5.3 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| CQ6 | 11.3.25 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| CQ7 | 11.3.27f | ✓ | | | | | | | | | | | | ✓ | ✓ |
| CQ8 | 11.3.2 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| CQ9 | 11.3.25 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| CQ10 | 11.3.27f | ✓ | | | | | | | | | | | | ✓ | ✓ |
| CQ11 | Non-remnant | ✓ | | | | | | | | | | | | ✓ | ✓ |
| CQ12 | 11.4.8 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| CQ13 | 11.4.8 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| CQ14 | 11.4.8 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| CQ15 | 11.5.3 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| CQ16 | 11.5.3 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| CQ17 | 11.5.17 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| CQ18 | 11.5.15 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| CQ19 | 11.5.3 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| CQ20 | 11.9.5 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| CQ21 | 11.9.2 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| CQ22 | 11.4.8 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| CQ23 | 11.4.8 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| CQ24 | 11.4.9 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| CQ25 | 11.5.3 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| CQ26 | 11.3.25 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| CQ27 | 11.3.2 | ✓ | | | | | | | | | | | | ✓ | ✓ |

| Site | Field-verified RE | Survey method | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Habitat assess. | Elliot trap | Pitfall trap | Funnel trap | Camera trap | Bird survey | Active searches | Scat / sign | Anabat | Harp trap | Spotlighting | Call playback | Koala searches | Incidental record |
| CQ28 | 11.3.25 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| CQ29 | 11.4.8 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| CQ30 | Non-remnant | ✓ | | | | | | | | | | | | ✓ | ✓ |
| CQ31 | 11.3.2 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| CQ32 | 11.3.25 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| CQ33 | 11.3.2 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| CQ34 | 11.3.25 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| CQ35 | 11.3.2 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| CQ36 | 11.3.25 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| CQ37 | 11.3.1 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| CQ38 | 11.3.7 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| CQ39 | 11.3.2 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| CQ40 | 11.5.3 | ✓ | | | | | | | | | | | | ✓ | ✓ |
| **Infrastructure corridors – spring 2017** | | | | | | | | | | | | | | | |
| BIRDC8 | Dam | | | | | | ✓ | | | | | | | | ✓ |
| BIRDC9 | 11.3.27b | | | | | | ✓ | | | | | | | | ✓ |
| BIRDC10 | Non-remnant | | | | | | ✓ | | | | | | | | ✓ |
| BIRDC11 | 11.5.17 | | | | | | ✓ | | | | | | | | ✓ |
| BIRDC12 | 11.3.25 | | | | | | ✓ | | | | | | | | ✓ |
| BIRDC13 | 11.3.25 | | | | | | ✓ | | | | | | | | ✓ |
| BIRDC14 | 11.3.2 | | | | | | ✓ | | | | | | | | ✓ |
| BIRDC15 | 11.4.9 | | | | | | ✓ | | | | | | | | ✓ |
| BIRDC16 | Non-remnant | | | | | | ✓ | | | | | | | | ✓ |
| BIRDC17 | 11.3.25 | | | | | | ✓ | | | | | | | | ✓ |
| ASC2 | 11.5.9 | | | | | | | ✓ | ✓ | | | | | | ✓ |
| ASC3 | 11.4.9 | | | | | | | ✓ | ✓ | | | | | | ✓ |
| ASC4 | 11.5.3 | | | | | | | ✓ | ✓ | | | | | | ✓ |
| ASC5 | 11.5.3 | | | | | | | ✓ | ✓ | | | | | | ✓ |
| ASC6 | 11.3.2 | | | | | | | ✓ | ✓ | | | | | | ✓ |
| SPOTC7 | Non-remnant | | | | | | | | | | | ✓ | | | |
| SPOTC8 | Dam | | | | | | | | | | | ✓ | | | |
| SPOTC9 | 11.3.2 | | | | | | | | | | | ✓ | | | |
| SPOTC10 | 11.5.9 | | | | | | | | | | | ✓ | | | |
| SPOTC11 | 11.5.17 | | | | | | | | | | | ✓ | | | |
| SPOTC12 | 11.4.8 | | | | | | | | | | | ✓ | | | |
| SPOTC13 | 11.5.9 | | | | | | | | | | | ✓ | | | |
| SPOTC14 | Non-remnant | | | | | | | | | | | ✓ | | | |
| SPOTC15 | 11.5.17 | | | | | | | | | | | ✓ | | | |
| SPOTC16 | Non-remnant | | | | | | | | | | | ✓ | | | |
| SPOTC17 | 11.3.2 | | | | | | | | | | | ✓ | | | |
| SPOTC18 | 11.3.25 | | | | | | | | | | | ✓ | | | |

| Site | Field-verified RE | Survey method | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Habitat assess. | Elliot trap | Pitfall trap | Funnel trap | Camera trap | Bird survey | Active searches | Scat / sign | Anabat | Harp trap | Spotlighting | Call playback | Koala searches | Incidental record |
| SPOTC19 | 11.3.2 | | | | | | | | | | | ✓ | | | |
| SPOTC20 | 11.3.2 | | | | | | | | | | | ✓ | | | |
| SPOTC21 | 11.5.3 | | | | | | | | | | | ✓ | | | |
| KTRANSC10 | 11.5.3 | | | | | | | | ✓ | | | | | ✓ | ✓ |
| KTRANSC11 | 11.3.25 | | | | | | | | ✓ | | | | | ✓ | ✓ |
| CQ41 | | ✓ | | | | | | | | | | | | ✓ | ✓ |
| CQ42 | | ✓ | | | | | | | | | | | | ✓ | ✓ |
| CQ43 | | ✓ | | | | | | | | | | | | ✓ | ✓ |
| CQ44 | | ✓ | | | | | | | | | | | | ✓ | ✓ |
| CQ45 | | ✓ | | | | | | | | | | | | ✓ | ✓ |
| CQ46 | | ✓ | | | | | | | | | | | | ✓ | ✓ |
| CQ47 | | ✓ | | | | | | | | | | | | ✓ | ✓ |
| CQ48 | | ✓ | | | | | | | | | | | | ✓ | ✓ |
| CQ49 | | ✓ | | | | | | | | | | | | ✓ | ✓ |
| CQ50 | | ✓ | | | | | | | | | | | | ✓ | ✓ |
| CQ51 | | ✓ | | | | | | | | | | | | ✓ | ✓ |
| CQ52 | | ✓ | | | | | | | | | | | | ✓ | ✓ |
| CQ53 | | ✓ | | | | | | | | | | | | ✓ | ✓ |
| CQ54 | | ✓ | | | | | | | | | | | | ✓ | ✓ |
| CQ55 | | ✓ | | | | | | | | | | | | ✓ | ✓ |
| **Revised Infrastructure Corridors – spring 2017** | | | | | | | | | | | | | | | |
| BIRDRC1 | 11.5.3 | | | | | | ✓ | | | | | | | | ✓ |
| BIRDRC2 | 11.3.25 | | | | | | ✓ | | | | | | | | ✓ |
| BIRDRC3 | 11.3.25 | | | | | | ✓ | | | | | | | | ✓ |
| BIRDRC4 | 11.4.9 | | | | | | ✓ | | | | | | | | ✓ |
| BIRDRC5 | 11.5.3 | | | | | | ✓ | | | | | | | | ✓ |
| BIRDRC6 | 11.3.1 | | | | | | ✓ | | | | | | | | ✓ |
| BIRDRC7 | 11.3.7 | | | | | | ✓ | | | | | | | | ✓ |
| BIRDRC8 | Dam | | | | | | ✓ | | | | | | | | ✓ |
| ASRC1 | 11.5.3 | | | | | | | ✓ | ✓ | | | | | | ✓ |
| ASRC2 | 11.3.25 | | | | | | | ✓ | ✓ | | | | | | ✓ |
| ASRC3 | 11.3.25 | | | | | | | ✓ | ✓ | | | | | | ✓ |
| ASRC4 | 11.4.9 | | | | | | | ✓ | ✓ | | | | | | ✓ |
| ASRC5 | 11.5.3 | | | | | | | ✓ | ✓ | | | | | | ✓ |
| ASRC6 | 11.3.1 | | | | | | | ✓ | ✓ | | | | | | ✓ |
| SPOTRC1 | 11.5.3 | | | | | | | | | | | ✓ | | | |
| SPOTRC2 | 11.3.25 | | | | | | | | | | | ✓ | | | |
| SPOTRC3 | 11.3.25 | | | | | | | | | | | ✓ | | | |
| SPOTRC4 | 11.3.7 | | | | | | | | | | | ✓ | | | |
| SPOTRC5 | 11.3.27f | | | | | | | | | | | ✓ | | | |
| SPOTRC6 | 11.3.25 | | | | | | | | | | | ✓ | | | |

| Site | Field-verified RE | Survey method | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Habitat assess. | Elliot trap | Pitfall trap | Funnel trap | Camera trap | Bird survey | Active searches | Scat / sign | Anabat | Harp trap | Spotlighting | Call playback | Koala searches | Incidental record |
| KTRANSRC1 | 11.3.25 | | | | | | | | ✓ | | | | | ✓ | ✓ |
| KTRANSRC2 | 11.3.25 | | | | | | | | ✓ | | | | | ✓ | ✓ |
| RCQ1 | | ✓ | | | | | | | | | | | | ✓ | ✓ |
| RCQ2 | | ✓ | | | | | | | | | | | | ✓ | ✓ |
| RCQ3 | | ✓ | | | | | | | | | | | | ✓ | ✓ |
| RCQ4 | | ✓ | | | | | | | | | | | | ✓ | ✓ |
| RCQ5 | | ✓ | | | | | | | | | | | | ✓ | ✓ |
| RCQ6 | | ✓ | | | | | | | | | | | | ✓ | ✓ |
| RCQ7 | | ✓ | | | | | | | | | | | | ✓ | ✓ |
| RCQ8 | | ✓ | | | | | | | | | | | | ✓ | ✓ |
| RCQ9 | | ✓ | | | | | | | | | | | | ✓ | ✓ |
| RCQ10 | | ✓ | | | | | | | | | | | | ✓ | ✓ |
| RCQ11 | | ✓ | | | | | | | | | | | | ✓ | ✓ |
| RCQ12 | | ✓ | | | | | | | | | | | | ✓ | ✓ |
| RCQ13 | | ✓ | | | | | | | | | | | | ✓ | ✓ |
| RCQ14 | | ✓ | | | | | | | | | | | | ✓ | ✓ |
| RCQ15 | | ✓ | | | | | | | | | | | | ✓ | ✓ |
| RCQ16 | | ✓ | | | | | | | | | | | | ✓ | ✓ |
| RCQ17 | | ✓ | | | | | | | | | | | | ✓ | ✓ |
| RCQ18 | | ✓ | | | | | | | | | | | | ✓ | ✓ |
| RCQ19 | | ✓ | | | | | | | | | | | | ✓ | ✓ |
| RCQ20 | | ✓ | | | | | | | | | | | | ✓ | ✓ |
| RCQ21 | | ✓ | | | | | | | | | | | | ✓ | ✓ |
| RCQ22 | | ✓ | | | | | | | | | | | | ✓ | ✓ |
| RCQ23 | | ✓ | | | | | | | | | | | | ✓ | ✓ |
| RCQ24 | | ✓ | | | | | | | | | | | | ✓ | ✓ |
| RCQ25 | | ✓ | | | | | | | | | | | | ✓ | ✓ |
| RCQ26 | | ✓ | | | | | | | | | | | | ✓ | ✓ |
| RCQ27 | | ✓ | | | | | | | | | | | | ✓ | ✓ |
| RCQ28 | | ✓ | | | | | | | | | | | | ✓ | ✓ |
| RCQ29 | | ✓ | | | | | | | | | | | | ✓ | ✓ |
| RCQ30 | | ✓ | | | | | | | | | | | | ✓ | ✓ |
| RCQ31 | | ✓ | | | | | | | | | | | | ✓ | ✓ |
| RCQ32 | | ✓ | | | | | | | | | | | | ✓ | ✓ |
| RCQ33 | | ✓ | | | | | | | | | | | | ✓ | ✓ |
| RCQ34 | | ✓ | | | | | | | | | | | | ✓ | ✓ |
| RCQ35 | | ✓ | | | | | | | | | | | | ✓ | ✓ |
| RCQ36 | | ✓ | | | | | | | | | | | | ✓ | ✓ |
| RCQ37 | | ✓ | | | | | | | | | | | | ✓ | ✓ |

Notes: FAC = comprehensive fauna assessment site, CAM = camera trap site, BIRD = bird survey site, AS = active search site, ANA = anabat site, HARP = harp trap site, SPOT = nocturnal spotlighting site (by foot or from a vehicle), KTRANS = koala transects.
* Harp traps were not deployed at sites FAC1-14 due to lack of suitable flyways. Bat survey effort covered by Anabat deployment. Suitable flyways were found at alternative locations for harp trap deployment.

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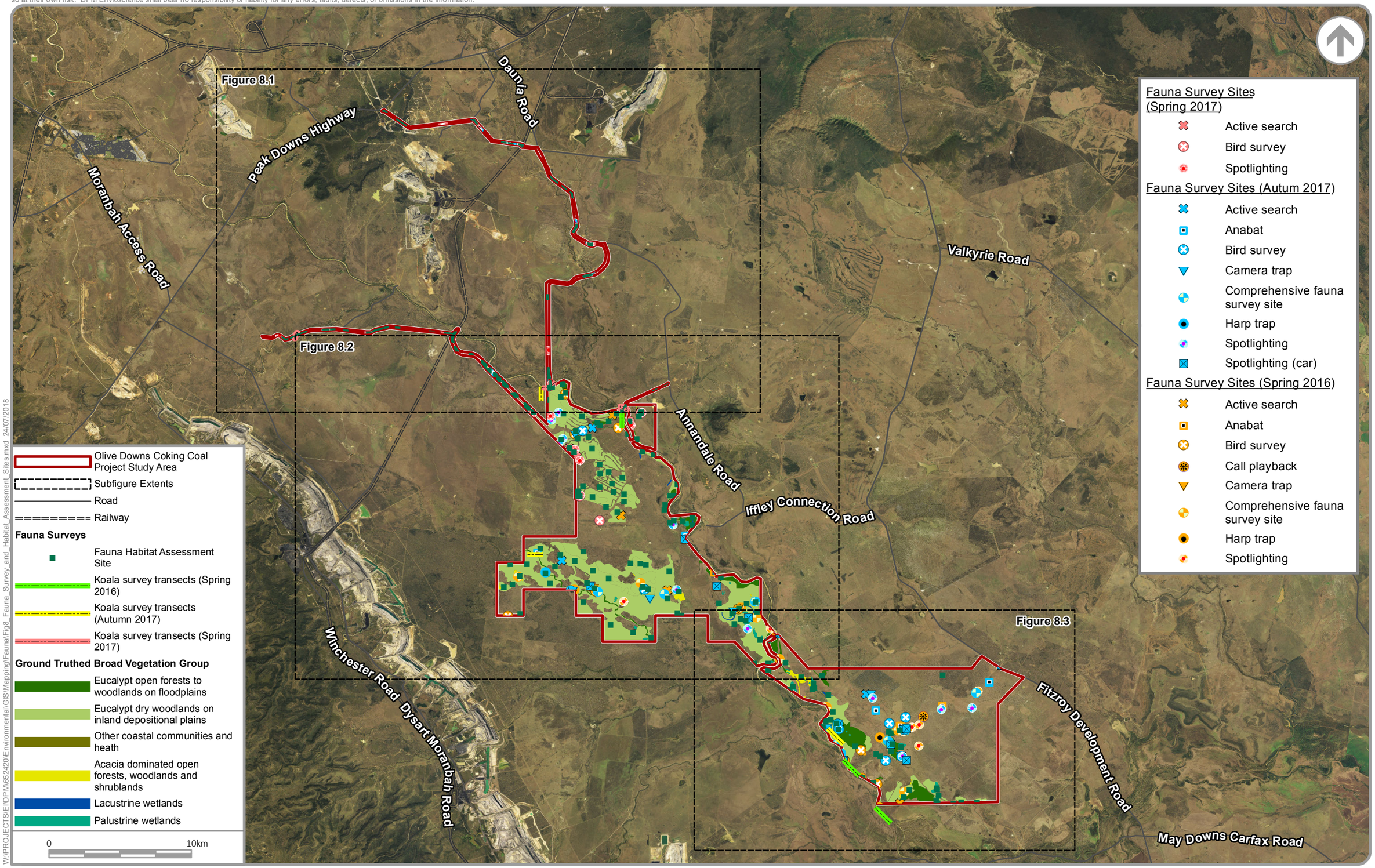


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DPM ENVIROSCIENCES

# FAUNA SURVEY AND HABITAT ASSESSMENT SITES

Olive Downs Coking Coal Project – Terrestrial Fauna Assessment

**FIGURE 8**

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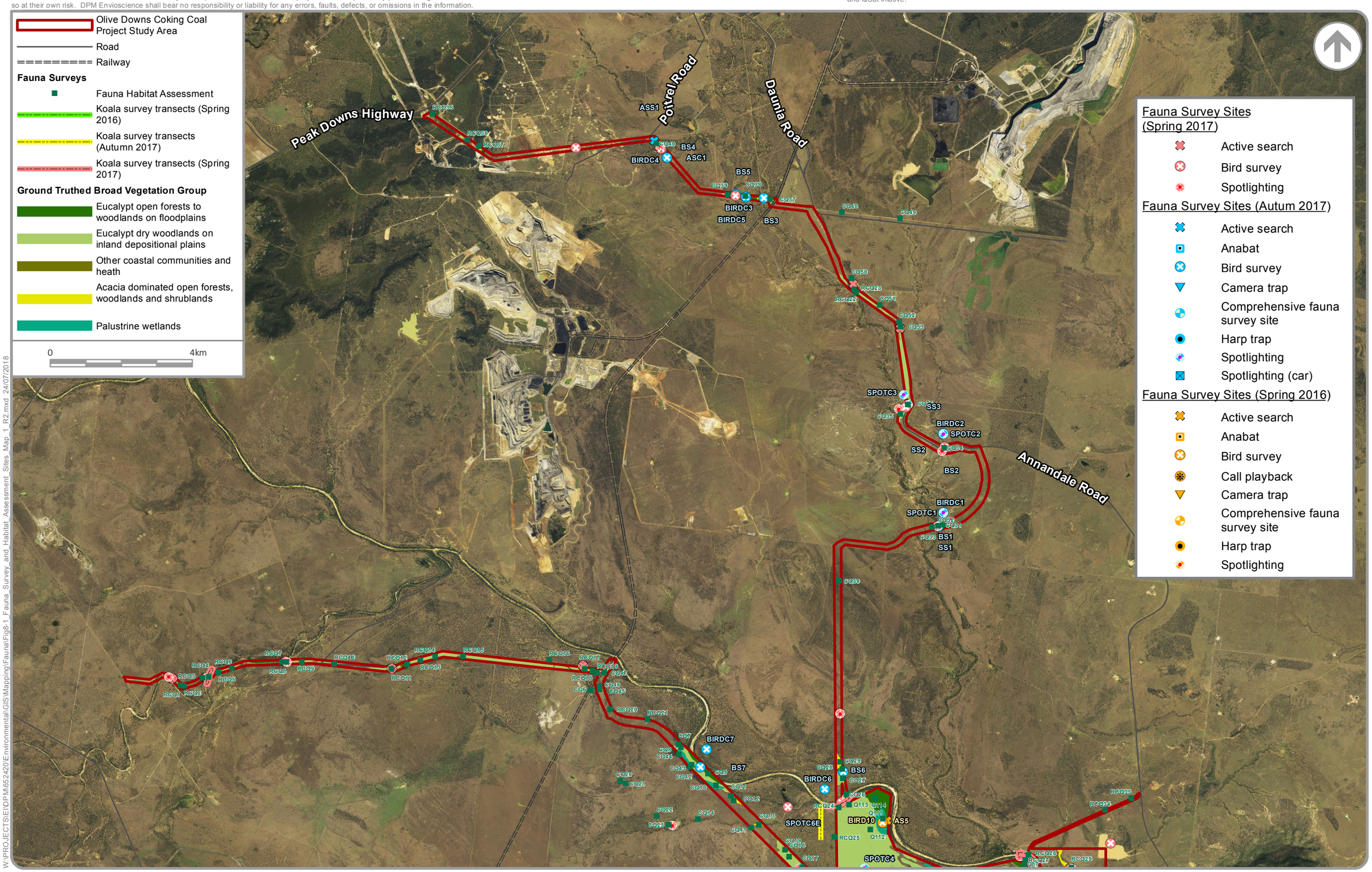


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DPM ENVIROSCIENCES

# FAUNA SURVEY AND HABITAT ASSESSMENT SITES – MAP 1

Olive Downs Coking Coal Project – Terrestrial Fauna Assessment

**FIGURE 8.1**

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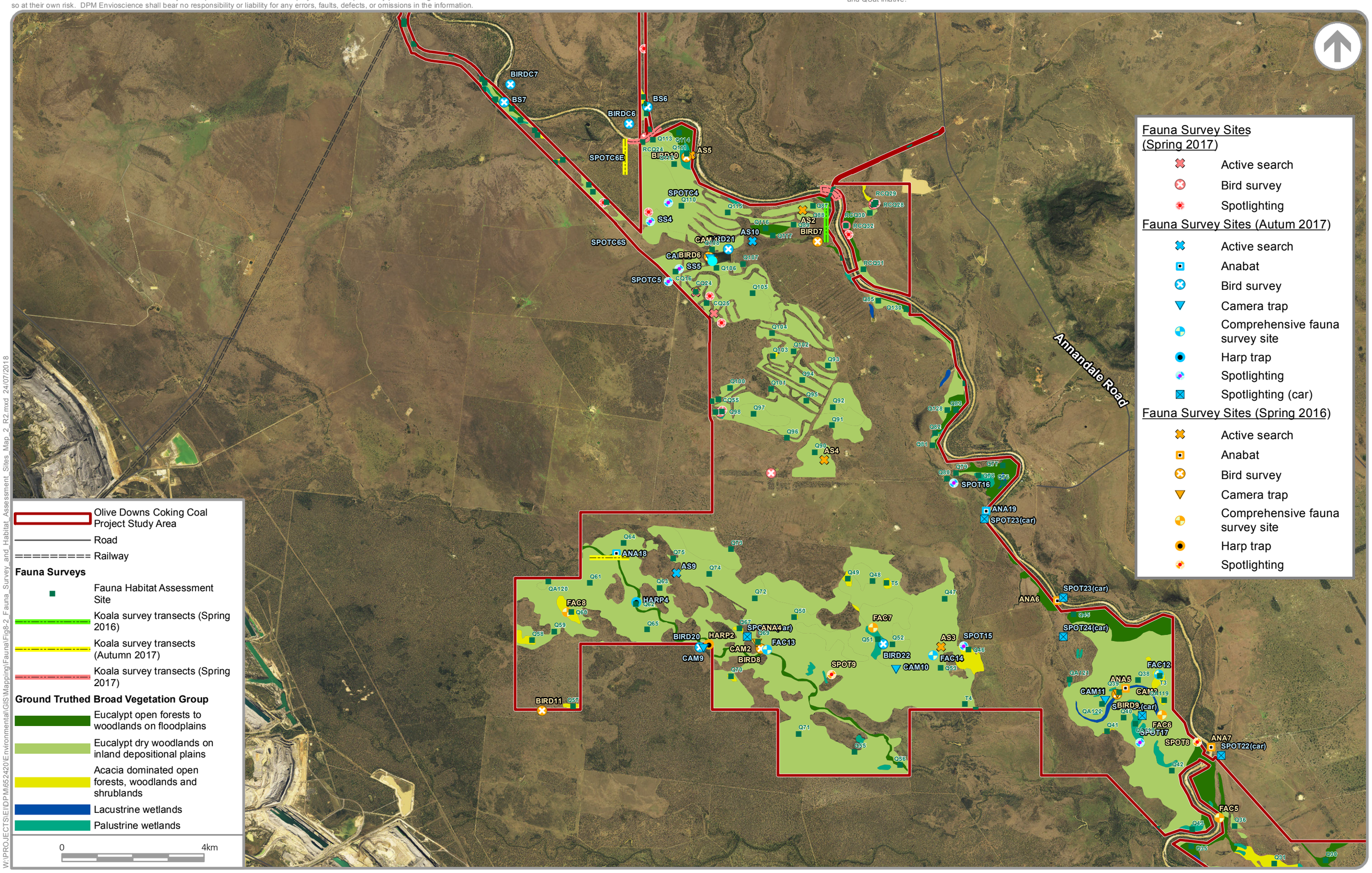


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DPM ENVIROSCIENCES

# FAUNA SURVEY AND HABITAT ASSESSMENT SITES – MAP 2

Olive Downs Coking Coal Project – Terrestrial Fauna Assessment

**FIGURE 8.2**

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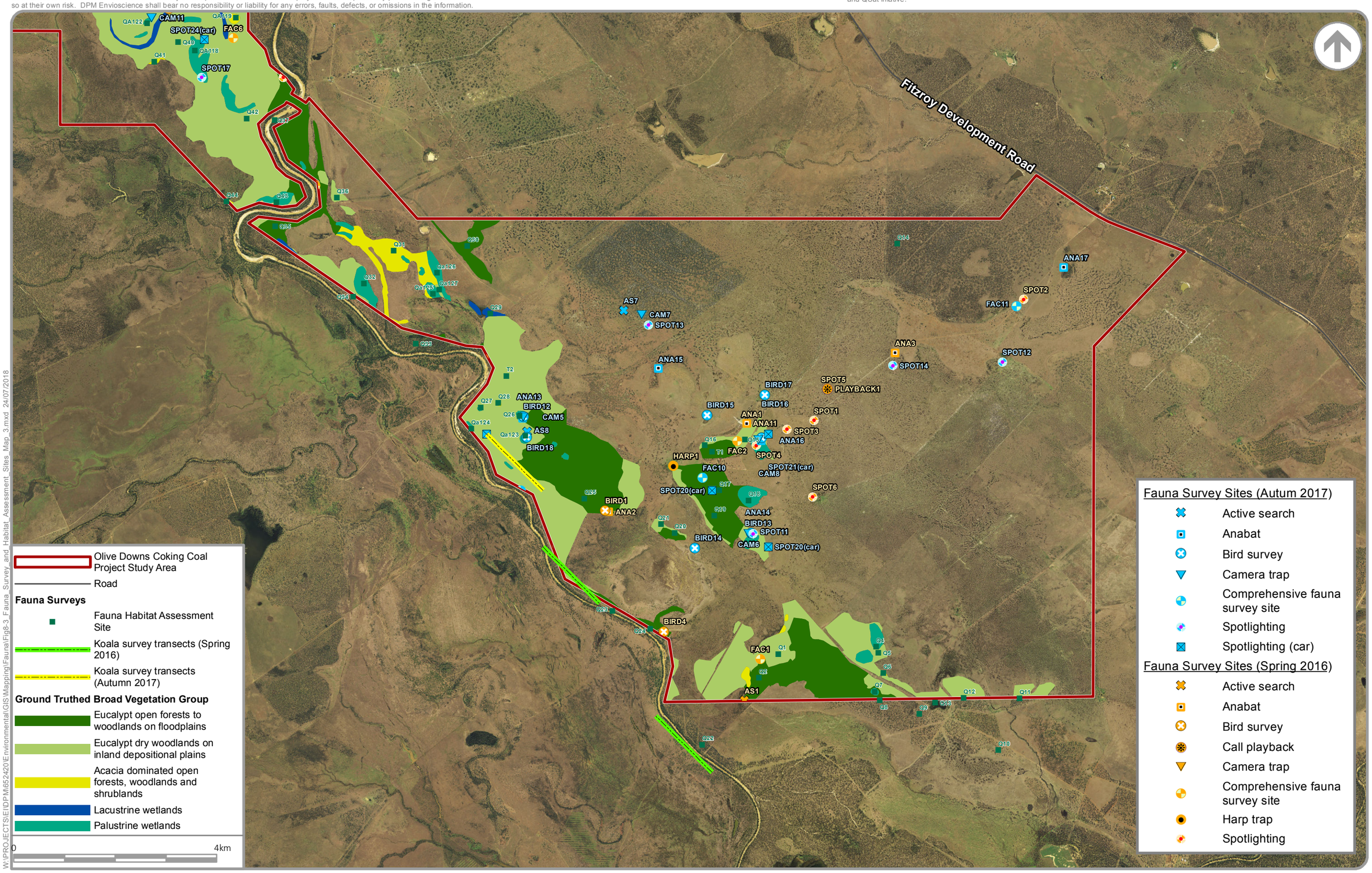


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DPM ENVIROSCIENCES

# FAUNA SURVEY AND HABITAT ASSESSMENT SITES – MAP 3

Olive Downs Coking Coal Project – Terrestrial Fauna Assessment

**FIGURE 8.3**

### 4.5.3 Habitat assessment

Fauna habitat assessments were undertaken at 225 sites across the Study area across the spring 2016, autumn and spring 2017 surveys. At each site an approximate 1 ha search area was assessed for features including:

- overall condition (pristine, very good, good, average, poor, degraded, or completely degraded);
- level of erosion (absent, scattered, frequent);
- presence and type of disturbance (grazing etc.);
- presence and accessibility of standing water;
- soil type / texture;
- presence of scats, tracks and other traces of fauna;
- abundance (absent, scattered, common, abundant) of:
  - large hollows (>20 cm);
  - small hollows (<20cm);
  - large logs (>50 cm diameter);
  - small logs (<50cm diameter);
  - cliffs and rocky outcrops;
  - large rocks (>30 cm);
  - small rocks (<30 cm);
  - leaf litter;
  - dense grass / shrub shelter;
  - decorticating bark;
  - arboreal and terrestrial termite mounds;
  - seeding grass cover;
  - fruiting plants;
  - nectar and pollen producing plants;
  - koala feed trees; and
  - gilgai.

Other important habitat features, such as creek banks and connectivity, were also noted where relevant. The locations of fauna habitat assessment sites are presented in Figure 8.1 – 8.3.

**Koala habitat assessment**

Koala habitat assessment was undertaken at each of the 13 comprehensive fauna survey sites and 212 additional fauna habitat assessment sites during the spring 2016, autumn 2017 and spring 2017 surveys. This included consideration of koala occurrence, vegetation composition, habitat connectivity, key existing threats and recovery value. For the Isaac LGA, primary food trees are considered to be river red gum (*Eucalyptus camaldulensis*) and Queensland blue gum (*E. tereticornis*); and secondary food trees are considered to be brown's box (*E. brownii*), coolabah (*E. coolabah* subsp. *coolabah*), yapunyah (*E. ochrophloia*), mountain coolibah (*E. orgadophila*) and poplar box (*E. populnea*) (AKF 2015). In addition, based on the experience of the assessment team, narrow-leaved ironbark (*E. crebra*), silver-leaved ironbark (*E. melanophloia*) and broad-leaved ironbark (*E. fibrosa*) are also eaten by koalas in the region. These ten eucalypt species have been adopted as the koala food trees for the purposes of koala habitat assessments summarised in the fauna habitat site descriptions (Appendix B). However, it has been determined that all suitable Broad Vegetation Groups (i.e. Eucalypt dry woodlands on

inland depositional plains; Eucalypt open forests to woodlands on floodplains; and palustrine and lacustrine wetlands) across the Study area represent potential koala habitat.

### 4.5.4 Comprehensive fauna survey effort

The comprehensive surveys included a number of different methods at each of the 13 (FAC1-FAC14) sites to maximise the number of species detected. Each comprehensive survey site was one hectare (100 m x 100 m, or 200 m x 50 m). Survey methods were consistent with those recommended in the '*Terrestrial Vertebrate Fauna Survey Guidelines for Queensland*' (Eyre et al. 2014). The survey effort achieved per method also met those recommended by Eyre et al. (2014) in these guidelines. Survey effort for bats was achieved by the deployment of ultrasonic bat detectors at each site. Two harp traps were deployed at four locations (HARP1-HARP4) for two nights (16 traps nights) within the Study area in locations where suitable flyways were detected. Table 5 outlines the fauna survey methods undertaken at each comprehensive survey site during both the spring and autumn surveys.

**Table 5 Fauna survey methods and survey effort undertaken at each comprehensive survey site and additional survey sites**

| Method | Target fauna | Survey effort at each Comprehensive survey site (FAC1-FAC14) | Additional survey sites |
|---|---|---|---|
| Pitfall trapping | Amphibians, reptiles, small terrestrial mammals | 4 buckets at 7.5 m intervals on T-design with a 45 m fence. Left open for four days and nights, checked each morning. | |
| Funnel trapping | Amphibians, reptiles | 6 funnels, 3 m in on distal end of T-design with a 45 m fence. Left open for four days and nights, checked each morning. | |
| Diurnal active search | Amphibians, reptiles, small terrestrial mammals | 2 x 30 person-min searches within two different 50x50 m quadrants of each site. | AS1-AS10, ASC1-ASC6, ASRC1-ASRC6 |
| Nocturnal active search | Amphibians, reptiles, small terrestrial mammals | 2 x 30 person-min searches within each site. | |
| Koala searches | Koala | A Koala SAT (Spot Assessment Technique) was employed as per (Phillips and Callaghan 2011) where searches for koala scratches and scats were conducted beneath 30 trees of >100 mm diameter at breast height (DBH) within the dedicated survey site. | KTRANS1-KTRANS5, KTRANSC1-KTRANSC11, KTRANSRC1-KTRANSRC2 |
| Elliot trapping | Small terrestrial mammals | 20-25 baited traps at 5-10 m intervals along on a 100 m transect. Left open for four days and nights, checked each morning. | |

| Method | Target fauna | Survey effort at each Comprehensive survey site (FAC1-FAC14) | Additional survey sites |
|---|---|---|---|
| Diurnal bird survey | Diurnal birds | 6 x 20 min searches within the dedicated survey sites. | BIRD1-BIRD22, BIRDC1-BIRDC17, BIRDRC1-BIRDRC8 |
| Camera trapping | Reptiles, medium-large terrestrial mammals | 1 camera per site, baited with raw chicken. Cameras left for four nights, except CAM6 – 73 nights and CAM12 – 65 nights. | CAM1-CAM12 |
| Call playback | Nocturnal birds, arboreal mammals | Two sessions of call playback of relevant species (i.e. owls and nightjars) at the midpoint of each site. | |
| Nocturnal spotlighting | Nocturnal birds, arboreal mammals, medium-large terrestrial mammals | 2 x 30 person-min spotlight search within each dedicated survey site. 2 x 30 person-min spotlight search of adjoining habitats and access tracks. | SPOT1-SPOT24,SPOTC1-SPOTC21, SPOTRC1-SPOTRC6 |
| Echo-location call detection | Microbats | One bat detector for at least one night per dedicated survey site, as well as in other areas of interest (e.g. waterbodies). These were deployed instead of harp traps (which were not utilised for the comprehensive fauna survey sites). | ANA1-ANA19 |
| Scat and sign search | Reptiles, medium-large terrestrial mammals, nocturnal birds, arboreal mammals | Scat and sign searches coinciding with systematic diurnal active searches at each dedicated survey site. | |

The fauna survey methods were consistent with DPM Envirosciences' Scientific Purposes Permit and Animal Ethics Committee approval. All captured animals were released unharmed at the point of capture. The personnel conducting these surveys were trained in animal handling and identification and had received the appropriate vaccinations (including Australian bat lyssavirus / rabies) and annual titre tests.

### 4.5.5 Targeted fauna survey effort

The desktop assessment identified eight EVNT fauna species as either being 'likely' or having 'potential' to occur within the Study area (Section 5.3), comprising:

- glossy black cockatoo (northern) (*Calyptorhynchus lathami erebus*) – Vulnerable (NC Act);
- red goshawk (*Erythrotriorchis radiatus*) – Vulnerable (EPBC Act), Endangered (NC Act);
- squatter pigeon (southern) (*Geophaps scripta scripta*) – Vulnerable (EPBC Act and NC Act);

- Australian painted snipe (*Rostratula australis*) – Endangered (EPBC Act), Vulnerable (NC Act);
- koala (*Phascolarctos cinereus*) – Vulnerable (EPBC Act and NC Act);
- greater glider (*Petauroides volans*) – Vulnerable (EPBC Act and NC Act);
- common death adder (*Acanthophis antarcticus*) – Vulnerable (NC Act); and
- ornamental snake (*Denisonia maculata*) – Vulnerable (EPBC Act and NC Act).

In addition, the ToR listed a number of species that need to be considered in this assessment, these include:

- curlew sandpiper (*Calidris ferruginea*) – Critically Endangered (EPBC Act);
- painted honeyeater (*Grantiella picta*) – Vulnerable (EPBC Act and NC Act);
- star finch (eastern) (*Neochmia ruficauda ruficauda*) – Endangered (EPBC Act and NC Act);
- southern black-throated finch (*Poephila cincta cincta*) – Endangered (EPBC Act and NC Act);
- northern quoll (*Dasyurus hallucatus*) – Endangered (EPBC Act);
- grey-headed flying-fox (*Pteropus poliocephalus*) – Vulnerable (EPBC Act);
- ghost bat (*Macroderma gigas*) – Vulnerable (EPBC Act);
- Corben's long-eared bat (*Nyctophilus corbeni*) – Vulnerable (EPBC Act and NC Act);
- yakka skink (*Egernia rugosa*) – Vulnerable (EPBC Act and NC Act);
- Allan's lerista / retro slider (*Lerista allanae*) – Endangered (EPBC Act and NC Act); and
- Dunmall's snake (*Furina dunmalli*) – Vulnerable (EPBC Act and NC Act).

These species were the subject of targeted survey effort and are identified in Table 6, along with the relevant guideline survey effort and actual survey effort employed for each species.

The fauna surveys were undertaken in accordance with the Commonwealth guidelines for the survey of MNES reptiles (DSEWPC 2011a), birds (DEWHA 2010a) and mammals (DSEWPC 2011b), as well as draft referral guidelines for the nationally listed Brigalow Belt reptiles (DSEWPC 2011c) and koala (DotE 2014). These guidelines are not mandatory but outline the recommended effort and methods for MNES species. Similarly, the Queensland government's Terrestrial Fauna Survey Guidelines for Queensland (Eyre et al. 2014) have generic guideline methods for a range of fauna species. The targeted fauna surveys were undertaken in accordance with these guidelines.

**Table 6 EVNT Fauna species predicted to occur within the Study area and the recommended survey methods for each species in comparison to the actual effort undertaken by DPM Enviro sciences**

| Species | Status | | Commonwealth survey guidelines | EPBC Act referral guidelines | Queensland guideline | Effort and method undertaken |
|---|---|---|---|---|---|---|
| | EPBC Act[1] | NC Act[2] | | | | |
| **Birds** | | | | | | |
| Glossy black cockatoo (*Calyptorhynchus lathami erebus*) | | V | Not applicable | Not applicable | • Can be surveyed year-round.<br>• A combination of diurnal bird surveys and searches for foraging and nesting signs are recommended (Hourigan, 2012).<br>• The minimum effort required for a diurnal survey is 5 hours over 1 day per 50 ha of roject area, and the minimal effort required for foraging and nesting signs is 20 hours over 4 days, per 50 ha of project area (Hourigan 2012). | • Surveys were undertaken throughout the year.<br>• Targeted bird searches were undertaken in addition to bird surveys at each site.<br>• 135.25 hours of bird surveys were conducted over 56 days.<br>The guideline requirement has been fulfilled. |
| Red goshawk (*Erythrotriorchis radiatus*) | V | E | • Search for their characteristic nests within patches of the tallest forest<br>• Area searches (50 hrs/5 days for 50 ha) (DEWHA 2010a)<br>• Driving slowly through woodland (DEWHA 2010a) | There are no referral guidelines for this species. | No species-specific guideline, but the effort for general bird surveys recommends six 5-10 minute area searches within 1 ha survey site. Species may also be detected incidentally while conducting other surveys or moving across the overall survey site. | • Surveys were undertaken throughout the year.<br>• Diurnal bird surveys were undertaken (including targeted searches for nests).<br>• 135.25 hours of bird surveys were conducted over 56 days.<br>The guideline requirement has been fulfilled. |

| Species | Status | | Commonwealth survey guidelines | EPBC Act referral guidelines | Queensland guideline | Effort and method undertaken |
|---|---|---|---|---|---|---|
| | EPBC Act[1] | NC Act[2] | | | | |
| Squatter pigeon (southern) (*Geophaps scripta scripta*) | V | V | • Area searches or transect surveys – 15 hrs/3 days; and<br>• Flushing surveys – 10 hrs/3 days.<br>• These methods apply to areas less than 50 ha (DEWHA 2010a). | There are no referral guidelines for this species. | No species-specific guideline, but the effort for general bird surveys recommends six 5-10 minute area searches within 1 ha survey site. Species may also be detected incidentally while conducting other surveys or moving across the overall survey site. | • Bird surveys and flushing surveys were conducted throughout the year.<br>• 135.25 hours of bird surveys were conducted over 56 days.<br>• 66 hours of flushing surveys were conducted over 14 days (2 hours per day on average whist traversing the site).<br>• This species was recorded during the surveys.<br>The total survey effort is 201.25 hours over 56 days. The guideline requirement has been fulfilled. The species was detected. |
| Australian Painted Snipe (*Rostratula australis*) | E | V | • Targeted stationary observations at dawn and dusk of suitable foraging locations within wetlands (10 hrs/ 5 days).<br>• Land-based area searches or transect surveys (10 hours/3 days) for sites <50 ha when wetland holds water but is not flooded (DEWHA 2010a). | There are no referral guidelines for this species. | No species-specific guideline, but the effort for general bird surveys recommends six 5-10 minute area searches within a 1 ha survey site. Species may also be detected incidentally while conducting other surveys or moving across the overall survey site. | • Bird surveys and flushing surveys were conducted throughout the year.<br>• 135.25 hours of bird surveys were conducted over 56 days.<br>• 66 hours of flushing surveys were conducted over 14 days (2 hours per day on average whist traversing the site).<br>• This species was recorded during the surveys.<br>The total survey effort is 201.25 hours over 56 days. The guideline requirement has been fulfilled. The species was detected. |

| Species | Status | | Commonwealth survey guidelines | EPBC Act referral guidelines | Queensland guideline | Effort and method undertaken |
|---|---|---|---|---|---|---|
| | EPBC Act[1] | NC Act[2] | | | | |
| Curlew Sandpiper *(Calidris ferruginea)* | C<br>E | V | There are no survey guidelines available for this species. | There are no referral guidelines for this species. | No species-specific guideline, but the effort for general bird surveys recommends six 5-10 minute area searches within 1 ha survey site. Species may also be detected incidentally while conducting other surveys or moving across the overall survey site. | • Surveys were undertaken throughout the year.<br>• Diurnal bird surveys were undertaken (including targeted searches for nests).<br>• 135.25 hours of bird surveys were conducted over 56 days.<br>The guideline requirement has been fulfilled. |
| Painted Honeyeater *(Grantiella picta)* | V | V | There are no survey guidelines available for this species. | There are no referral guidelines for this species. | • Area searches during breeding season involving searching for nesting habitat and listening for calls. Surveys should be conducted on foot<br>• The minimum effort required is 4 hours over 4 days (Rowland, 2012a). | • Surveys were undertaken throughout the year.<br>• Diurnal bird surveys were undertaken (including targeted searches for nests).<br>• 135.25 hours of bird surveys were conducted over 56 days.<br>The guideline requirement has been fulfilled. |
| Star Finch (eastern subspecies)*(Neochmia ruficauda ruficauda)* | E | E | • Area searches or transect-point surveys in suitable habitat (15 hours/5 days, areas less than 50 ha);<br>• Playback surveys during the morning | There are no referral guidelines for this species. | No species-specific guideline, but the effort for general bird surveys recommends six 5-10 minute area searches within 1 ha survey site. Species may also be detected incidentally while conducting other surveys or moving across the overall survey site. | • Surveys were undertaken throughout the year in suitable habitat.<br>• Diurnal bird surveys were undertaken (including area searches).<br>• 135.25 hours of bird surveys were conducted over 56 days.<br>The guideline requirement has been fulfilled. |

| Species | Status | | Commonwealth survey guidelines | EPBC Act referral guidelines | Queensland guideline | Effort and method undertaken |
|---|---|---|---|---|---|---|
| | EPBC Act[1] | NC Act[2] | | | | |
| | | | and evening (15 hours/3 days, areas less than 50 ha); and<br>• Targeted searches for waterholes during the dry season (10 hours/ 4 days), may also be useful (DEWHA 2010a). | | | |
| Southern black-throated finch *(Poephila cincta cincta)* | E | E | • Land based area searches for areas less than 50 ha (10 hours/5 days) and targeted searches (6 hours/2 days) of suitable habitat,<br>• Checking flocks of other finch species and suitable habitat<br>• Waterholes should be targeted for searches (DSEWPC 2010). | There are no referral guidelines for this species. | No species-specific guideline, but the effort for general bird surveys recommends six 5-10 minute area searches within 1 ha survey site. Species may also be detected incidentally while conducting other surveys or moving across the overall survey site. | • Surveys were undertaken throughout the year.<br>• Diurnal bird surveys were undertaken (including targeted searches for flocks and suitable habitat).<br>• Waterholes were targeted when present.<br>• 135.25 hours of bird surveys were conducted over 56 days. |

| Species | Status | | Commonwealth survey guidelines | EPBC Act referral guidelines | Queensland guideline | Effort and method undertaken |
|---|---|---|---|---|---|---|
| | EPBC Act[1] | NC Act[2] | | | | |
| **Mammals** | | | | | | |
| Koala (*Phascolarctos cinereus*) | V | V | Koala not included in 'Survey guidelines for Australia's threatened mammals 2011', as it was listed as Vulnerable in 2012. | These guidelines do not prescribe survey effort standards for koala surveys, but suggest a range of direct and indirect methods to detect koalas, including:<br>• Strip transects; nocturnal spotlighting; call playback; remote sensor (IR) cameras; mark-resight / mark-recapture; detection dogs; radio or satellite collars; identification of scratching and scats.<br>• Spot Assessment Technique (SAT) | No species-specific guideline, but call playback may be used and scats and scratches may also be used to determine presence. | • Scratch and scat searches undertaken across 168 sites in spring and autumn.<br>• SAT searches at 13 sites.<br>• 91.5 hours of spotlighting.<br>• 14 x 1 km strip transects undertaken across the mine site and infrastructure corridors.<br>The total survey effort satisfies the guideline requirements. The species was detected. |
| Greater glider (*Petauroides volans*) | V | V | Greater glider not included in 'Survey guidelines for Australia's threatened mammals 2011', as it was listed as Vulnerable in 2016. | There are no referral guidelines for this species. | No species-specific guideline, but call playback, vehicle spotlighting and spotlighting transects may be used to detect gliders. | • 112.5 hours of spotlighting.<br>• Scratch and scat searches undertaken across 168 sites in spring and autumn.<br>The total survey effort satisfies the guideline requirements. The species was detected. |

| Species | Status | | Commonwealth survey guidelines | EPBC Act referral guidelines | Queensland guideline | Effort and method undertaken |
|---|---|---|---|---|---|---|
| | EPBC Act[1] | NC Act[2] | | | | |
| Northern Quoll *(Dasyurus hallucatus)* | E | | In areas up to 5 ha in size:<br>• cage trapping and Elliot trapping surveys are recommended<br>• The minimum effort required for these methods is 80-160 trapping nights,<br>• Trapping to be distributed across distinct representative sampling sites (DSEWPC 2011b). | • Targeted surveying in suitable habitat<br>• remote camera surveying<br>• Targeted surveying using cages should be between April and September to avoid disturbing females with young (DotE 2016) | Not Applicable | • Elliot trapping surveys were conducted at all 13 sites in the appropriate season. 20-25 baited traps at 5-10 m intervals along on a 100 m transect. Left open for four days and nights, checked each morning (1300 trap nights).<br>• Camera trapping undertaken at 25 sites and left for four nights. Total of 100 trap nights.<br>• All suitable habitat types across the Project area were sampled.<br>The total survey effort satisfies the guideline requirements. |

| Species | Status | | Commonwealth survey guidelines | EPBC Act referral guidelines | Queensland guideline | Effort and method undertaken |
|---|---|---|---|---|---|---|
| | EPBC Act[1] | NC Act[2] | | | | |
| Grey-headed Flying-fox *(Pteropus poliocephalus)* | V | | • Search appropriate databases and information sources for the locations of camps, and to conduct vegetation surveys to identify feeding habitat.<br>• When conducting field surveys, the presence of a smell, scat and bat calls can be used to identify their presence (DSEWPC 2011b) | There are no referral guidelines for this species, | Not Applicable | • 112.5 hours of spotlighting.<br>• Searches for flying-fox camps undertaken whilst undertaking field surveys.<br>The total survey effort satisfies the guideline requirements. |

| Species | Status | | Commonwealth survey guidelines | EPBC Act referral guidelines | Queensland guideline | Effort and method undertaken |
|---|---|---|---|---|---|---|
| | EPBC Act[1] | NC Act[2] | | | | |
| Ghost Bat *(Macroderma gigas)* | V | E | No specific survey guidelines are published for the Ghost bat, however recommended survey techniques for microbats include mistnets, harp traps, and monitoring of roosting locations (DSEWPC 2011b). | There are no referral guidelines for this species. | • Active monitoring using acoustic detection. Due to their low-intensity calls, the bat must be close to the microphone (<5-7 m).<br>• Hand held bat detectors can be used, and transects should be distributed to cover the major habitat types within the Project area;<br>• Capturing using harp traps and mist nets; and<br>• Roost searches.<br>The minimum effort required for these techniques varies, however a minimum of 4 nights for trapping and monitoring is recommended (Hourigan 2011). | • One bat detector for at least one night per dedicated survey site, as well as in other areas of interest (e.g. water bodies) (at least 32 nights).<br>• Searches for roosts undertaken whilst undertaking field surveys.<br>• Two harp traps were deployed at four locations for two nights (16 traps nights) within the Study area in locations where suitable flyways were detected.<br>The total survey effort satisfies the guideline requirements. |

| Species | Status | | Commonwealth survey guidelines | EPBC Act referral guidelines | Queensland guideline | Effort and method undertaken |
|---|---|---|---|---|---|---|
| | EPBC Act[1] | NC Act[2] | | | | |
| Corben's Long-eared Bat | V | V | • Harp traps and mist nets are effective for this species<br>• Traps and nets should be distributed to give a good representation of the major habitat types in the Project area<br>• The minimum effort required for harp traps and mist nets respectively are 5 nights/ 20 traps; and 5 nights/ 20 mist nets (DSEWPC 2011b). | There are no referral guidelines for this species | There are no species specific survey guidelines for this species. | • Bat detectors were used at least one night per survey site and at other potential bat habitat areas (at least 32 nights).<br>• Bat roosts were searched for whilst undertaking field surveys.<br>• Two harp traps were deployed at four locations for two nights (16 traps nights) within the Study area in locations where suitable flyways were detected<br>The total survey effort satisfies the guideline requirements. |
| **Reptiles** | | | | | | |
| Common death adder (*Acanthophis antarcticus*) | | V | Not applicable. | Not applicable. | • Surveys should be undertaken in the breeding period (September to March), preferable at night when the species is active (Rowland 2012b).<br>• Nocturnal vehicle transects on all suitable roads with limited overlying debris on warm humid | • Surveys were undertaken in September<br>• 22.5 hours of active searching (vehicle transects)<br>• 208 pitfall trap nights and 306 funnel trap nights conducted<br>• 145.5 hours of spotlighting, including targeted spotlighting in suitable habitat and vehicle transects |

| Species | Status | | Commonwealth survey guidelines | EPBC Act referral guidelines | Queensland guideline | Effort and method undertaken |
|---|---|---|---|---|---|---|
| | EPBC Act[1] | NC Act[2] | | | | |
| | | | | | nights is preferable over two nights | The total survey effort satisfies the guideline requirements. The species was not detected. |
| Ornamental snake (*Denisonia maculata*) | V | V | • Searches around gilgai habitat while frogs are active, driving roads at night, particularly after wet weather when frogs are active<br>• diurnal searches under sheltering sites (rocks, logs), pitfall and funnel traps could also be trialled<br>• No quantitative survey effort is specified in this guideline. | • One off diurnal searches of microhabitat for 1.5 person hours per ha over a minimum 3 days.<br>• Spotlighting:<br>- target water-inundated gilgais, wetlands, riparian habitats and surrounding environs and large logs;<br>- warm humid evenings;<br>- 1.5 person hours per ha over a minimum 3 days.<br>• Opportunistic surveys:<br>- whilst driving within the Study area;<br>- following heaving rainfall events and during warm evenings;<br>• Pitfall and funnel trapping over four days: | No species-specific guideline is provided, however general reptile survey methods and effort are:<br>• 4 buckets at 7.5 m intervals on T-design with a 45 m fence (pitfall trapping);<br>• 6 funnels 3 m in on distal end of T-design with a 45m fence;<br>• 2 x 30 person-minute searches within two different 0.25 ha quadrants of the survey site. Other supplementary habitat areas of interest outside of dedicated survey sites may also be searched;<br>• 2 x 30 person-minute searches within the dedicated survey site. Other supplementary habitat areas of interest outside of dedicated survey sites may also be searched. | • Surveys were undertaken in September.<br>• 22.5 hours of active searching (vehicle transects).<br>• 208 pitfall trap nights and 306 funnel trap nights conducted - 4 buckets at 7.5 m intervals on T-design with a 45 m fence. Left open for four days and nights, checked each morning.<br>• 145.5 hours of spotlighting, including targeted spotlighting in suitable habitat.<br>The total survey effort satisfies the guideline requirements. The species was detected. |

| Species | Status | | Commonwealth survey guidelines | EPBC Act referral guidelines | Queensland guideline | Effort and method undertaken |
|---|---|---|---|---|---|---|
| | EPBC Act[1] | NC Act[2] | | | | |
| | | | | - six 20 L buckets under a 30 m drift fence;<br>- funnel at pitfall line ends;<br>- 2 replicates per habitat type. | | |
| Yakka Skink *(Egernia rugosa)* | V | V | • Searching for burrow systems and communal defecation sites<br>• Species presence can be confirmed by Elliott trapping around the burrows, distant observation with binoculars or by shining a torch down the burrows at night (DSEWPC, 2011c). | • Timed from late September to late March<br>• Active searching microhabitats (one off searches). Survey over a minimum of 1.5 person<br>• hours per hectare and survey over a minimum of 3 days (DSEWPC 2011a).Transects searching for colonies (DSEWPC 2011a)<br>• Elliot and cage trapping around suspected burrows (DSEWPC 2011a)<br>• Observation with binoculars (DSEWPC 2011a) | • Diunral searches and camera trapping are the most reliable methods of detecting species presence<br>• Confirmation of presence should be achieved through camera trapping if possible<br>• The minimum effort required varies, however 20 minutes of searching per hectare of suitable habitat is recommended for diurnal searches. | • Diurnal surveys were undertaken, including active searching for burrows and communal defecation sites.<br>• Camera trapping undertaken at 25 sites and left for four nights. Total of 100 trap nights.<br>• 208 pitfall trap nights and 306 funnel trap nights conducted.<br>• 145.5 hours of spotlighting, including targeted spotlighting in suitable habitat.<br>The total survey effort satisfies the guideline requirements. |

| Species | Status | | Commonwealth survey guidelines | EPBC Act referral guidelines | Queensland guideline | Effort and method undertaken |
|---|---|---|---|---|---|---|
| | EPBC Act[1] | NC Act[2] | | | | |
| | | | | • Spotlighting (DSEWPC 2011a) | | |
| Allan's Lerista / Retro Slider *(Lerista allanae)* | E | E | • Raking surface soil under logs or at the base of bushes and trees, and turning objects under which they shelter<br>• This can be used with pitfall trapping at a time of year when the species is most likely to be active.<br>• Six 10 L buckets spread along a 15 m fence would be adequate for the detecting the species (DSEWPC, 2011a). | There are no referral guidelines for this species. | No species-specific guideline is provided, however general reptile survey methods and effort are:<br>• 4 buckets at 7.5 m intervals on T-design with a 45 m fence;<br>• 6 funnels 3 m in on distal end of T-design with a 45m fence;<br>• 2 x 30 person-minute searches within two different 0.25 ha quadrants of the survey site. Other supplementary habitat areas of interest outside of dedicated survey sites may also be searched;<br>• 2 x 30 person-minute searches within the dedicated survey site. Other supplementary habitat areas of interest outside of dedicated survey sites may also be searched. | • 208 pitfall trap nights and 306 funnel trap nights conducted.<br>• 2 x 30 person-minute searches within two different 50 x 50 m quadrants at each survey site.<br>• 4 buckets at 7.5 m intervals on T-design with a 45 m fence. Left open for four days and nights, checked each morning.<br>• 6 funnels, 3 m in on distal end of T-design with a 45 m fence. Left open for four days and nights, checked each morning.<br>The total survey effort satisfies the guideline requirements. |

| Species | Status | | Commonwealth survey guidelines | EPBC Act referral guidelines | Queensland guideline | Effort and method undertaken |
|---|---|---|---|---|---|---|
| | EPBC Act[1] | NC Act[2] | | | | |
| Dunmall's Snake *(Furina dunmalli)* | V | V | None known to reliably detect the species. Recommended methods are active searching of sheltering sites (rocks, logs or human made debris), pitfall trapping, or road driving at night (particularly after we weather). | • Timed from late September to late March<br>• Active searching microhabitats (one off searches). Survey over a minimum of 1.5 person<br>• hours per hectare and survey over a minimum of 3 days (DSEWPC 2011a).Transects searching for colonies (DSEWPC 2011a)<br>• Elliot and cage trapping around suspected burrows (DSEWPC 2011a)<br>• Observation with binoculars (DSEWPC 2011a)<br>• Spotlighting (DSEWPC 2011a) | No species-specific guideline is provided, however general reptile survey methods and effort are:<br>• 4 buckets at 7.5 m intervals on T-design with a 45 m fence;<br>• 6 funnels 3 m in on distal end of T-design with a 45m fence;<br>• 2 x 30 person-minute searches within two different 0.25 ha quadrants of the survey site. Other supplementary habitat areas of interest outside of dedicated survey sites may also be searched;<br>• 2 x 30 person-minute searches within the dedicated survey site. Other supplementary habitat areas of interest outside of dedicated survey sites may also be searched. | • 208 pitfall trap nights and 306 funnel trap nights conducted.<br>• 2 x 30 person-minute searches within two different 50 x 50 m quadrants of each survey site.<br>• 4 buckets at 7.5 m intervals on T-design with a 45 m fence. Left open for four days and nights, checked each morning.<br>• 6 funnels, 3 m in on distal end of T-design with a 45 m fence. Left open for four days and nights, checked each morning.<br>The total survey effort satisfies the guideline requirements. |

Notes:

[1] Conservation status under the EPBC Act. E = Endangered, V = Vulnerable

[2] Conservation status under the NC Act. E = Endangered, V = Vulnerable.

### 4.5.6 Opportunistic fauna observations

Any fauna species heard or seen during the fauna surveys, fauna habitat assessments, and whilst moving throughout the Study area, were recorded, along with signs of animals (scats, bones, tracks, scratches, diggings etc.).

## 4.6 Analysis and interpretation

Animals were identified using appropriate field guides and identification keys in the field. Bat call recordings were analysed by Greg Ford (Consultant Ecologist, Balance Environmental).

# 5 FAUNA CHARACTERISTICS OF THE STUDY AREA

## 5.1 Fauna habitat types

The Study area contains both remnant and regrowth forest and woodland, as well as broad open grazed grassland. There is approximately 17,838 ha of land in the Study area that is not associated with any remnant native vegetation. This area has been classified as 'agricultural grasslands dominated by buffel grass (*Cenchrus ciliaris*)'.

Cattle grazing and associated agricultural practices have impacted and caused degradation to the vegetation (including fauna habitats) across the Study area to varying extents. Features of the Study area that provide fauna with opportunities for foraging and breeding are represented by (Figure 9):

- eucalypt dry woodlands on inland depositional plains;
- eucalypt open forests to woodlands on floodplains;
- acacia dominated open forests, woodlands and shrublands;
- palustrine wetlands (swamps);
- lacustrine wetlands (dams);
- other coastal communities and heaths; and
- waterways (watercourses and drainage features).

**Agricultural Grasslands**

A large portion of the Study area (17,838 ha of the 26,957 ha surveyed) has been cleared of native vegetation and is now agricultural grasslands dominated by buffel grass (*Cenchrus ciliaris*). Buffel grass is an introduced perennial pasture species that is highly productive, relatively palatable, and persistent under heavy grazing conditions, making it a useful pasture species for cattle. Buffel grass dominates the ground layer. Trees are largely absent but generally consist of isolated acacias and eucalypts. The fauna habitat value of agricultural grasslands across the Study area is typically low, owing to the relative lack of shelter / cover and food resources.

**Plate 1 Agricultural grassland dominated by buffel grass (*Cenchrus ciliaris*), on Iffley, 30 November 2016**

**Eucalypt Dry Woodlands on Inland Depositional Plains**

The most prevalent remnant vegetation across the Study area is eucalypt dry woodlands on inland depositional plains (approximately 7,297 ha of the 26,957 ha surveyed). RE's constituting this habitat type within the Study area include:

- 11.3.2 – Poplar box (*Eucalyptus populnea*) woodland to open woodland on alluvial plains;
- 11.5.3 – Poplar box (*E. populnea*) +/- silver-leaved ironbark (*E. melanophloia*) +/- Clarkson's bloodwood (*C. clarksoniana*) woodland on Cainozoic sand plains and / or remnant surfaces;
- 11.5.8c – Poplar gum (*E. platyphylla*) woodland on white-yellow weathered sands, with grassy ground layer. Occurs on Quaternary sediments;
- 11.5.9 – Narrow-leaved ironbark (*E. crebra*) and other *Eucalyptus* spp. and *Corymbia* spp. woodland on Cainozoic sand plains and / or remnant surfaces;
- 11.5.9b – Narrow-leaved ironbark (*E. crebra*), narrow-leaved white mahogany (*E. tenuipes*), budgeroo (*Lysicarpus angustifolius*) +/- Corymbia spp. woodland; and
- 11.9.2 – Silver-leaved ironbark (*Eucalyptus melanophloia*) and / or Coolibah (*E. orgadophila*) grassy woodland to open woodland. Occurs on rises on undulating plains with cracking clay or texture contrast soils.

These woodlands typically provide good fauna habitat value across the Study area, with a variety of shelter / cover including small and large hollows, small and large logs, leaf litter, as well as shrub and grass shelter of varying densities. Food potential within these woodlands typically includes seeding grass cover, fleshy fruiting plants, nectar / pollen producing plants as well as secondary koala feed trees species, including poplar box (*E. populnea*), coolabah (*E. coolabah*), narrow-leaved ironbark (*E. crebra*) and silver-leaved ironbark (*E. melanophloia*).

**Plate 2 Poplar box (*Eucalyptus populnea*) woodland on alluvial plains on Iffley, 30 November 2016**

**Eucalypt Open Forests to Woodlands on Floodplains**

Eucalypt open forests to woodland on floodplains are located within the riparian corridor of the Isaac River and parts of Ripstone Creek, and make up approximately 1,270 ha of the Study area (Figure 9). REs constituting this habitat type within the Study area include:

- 11.3.3 – Coolabah (*E. coolabah*) open woodland to woodland on alluvial plains;
- 11.3.4 – Queensland blue gum (*Eucalyptus tereticornis*) and / or *Eucalyptus* spp. woodland to open forest on alluvial plains;
- 11.3.7 – Bloodwood (*Corymbia* spp.) tall woodland to open woodland on alluvial plains (BVG5M:3); and
- 11.3.25 – Queensland blue gum (*E. tereticornis*) and / or river red gum (*E. camaldulensis*) open forest to woodland fringing drainage lines.

These open forests and woodlands typically provide good to very good fauna habitat value across the Study area, providing corridors for movement as well as a variety of shelter / cover, including small and large hollows for a diversity of birds and arboreal mammals, logs and leaf litter providing refuge for amphibians, reptiles and ground-dwelling fauna, as well as dense shrub and grass shelter. Food potential within these open forests and woodlands typically includes nectar / pollen producing plants, primary koala food trees including Queensland blue gum (*E. tereticornis*) and river red gum (*E. camaldulensis*), as well as seeding grass cover and fleshy fruiting plants.

**Plate 3 Queensland blue gum (*Eucalyptus tereticornis*) open forest fringing the Isaac River on Iffley, 28 November 2016**

**Acacia Dominated Open Forests, Woodlands and Shrublands**

Much of the acacia dominated open forests, woodlands and shrublands of the Study area have been cleared to make way for agricultural grasslands, and are now represented in only approximately 244.5 ha of the Study area. REs constituting this habitat type within the Study area include:

- 11.3.1 – Brigalow (*A. harpophylla*) and / or belah (*Casuarina cristata*) open forest on alluvial plains;
- 11.4.8 – Dawson gum (Eucalyptus *cambageana*) woodland to open forest with brigalow or blackwood (*Acacia argyrodendron*) on Cainozoic clay plains;
- 11.4.9 – Brigalow (*A. harpophylla*) shrubby woodland to open forest with yellowwood (*Terminalia oblongata*) on Cainozoic clay plains;
- 11.7.2 - Monospecific stands of Acacia spp. forest/woodland on Cainozoic lateritic duricrusts. Lancewood (*A. shirleyi*) and/or bendee (*A. catenulata*) usually predominate the woodland to low woodland to low open forest tree canopy (7-12m high); and
- 11.9.5 - Open forest dominated by brigalow (*A. harpophylla*) and/or belah (*C. cristata*) (10-20m) or brigalow with a semi-evergreen vine thicket understorey.

These open forests, woodlands and shrublands are generally dominated by brigalow (*A. harpophylla*). They typically exhibit cracking clay soils that provide suitable refuge for a diversity of frogs and reptiles such as the Vulnerable (EPBC Act and NC Act) ornamental snake (*Denisonia maculata*) (two records from the Study area come from this habitat type). These areas also provide logs and leaf litter as cover for amphibians, reptiles and ground-dwelling mammals; as well as fleshy fruiting plants and seeding grass cover. These acacia forests, woodland and shrublands provide valuable nesting and foraging habitat for a diversity of woodland birds, but are largely void of tree hollows as well as koala feed tree species.

**Plate 4 Brigalow (*Acacia harpophylla*) open forest on Vermont Park, 25 November 2016**

**Palustrine Wetlands (Swamps)**

Palustrine wetlands represent approximately 262.7 ha of the Study area, including the following REs:

- 11.3.27c – Mixed grassland or sedgeland with areas of open water +/- aquatic species. Dominated by a range of species including *Eleocharis spp., Nymphoides spp*. and sometimes *Phragmites australis*. Occurs on closed depressions on alluvial plains that are intermittently flooded in inlands parts of the bioregion;
- 11.3.27f – Coolibah (*Eucalyptus coolibah*) and / or Queensland blue gum (*E. tereticornis*) open woodland to woodland fringing swamps;
- 11.3.27i – River red gum (*E. camaldulensis*) or Queensland blue gum (*E. tereticornis*) woodland to open woodland with sedgeland ground layer;
- 11.3.3c – Coolibah (*Eucalyptus coolabah*) woodland to open woodland (to scattered trees) with a sedge or grass understorey in back swamps and old channels; and
- 11.5.17 – Queensland blue gum (*E. tereticornis*) woodland in depressions on Cainozoic sand plains and remnant surfaces.

These wetlands provide food, shelter and seasonal water for a diversity of fauna. The onset of early wet season rains is generally expected to trigger the breeding of burrowing frogs and other species as evidenced during the fauna surveys 1-14 November 2016. The tadpoles and frogs are expected to attract a diversity of predators including birds, reptiles and ground-dwelling mammals such as water rat (*Hydromys chrysogaster*) during the wet season. The wetter months are also expected to accelerate the growth of sedges, rushes and other wetland flora, providing foraging habitat for birds and mammals. Within the Study area, direct cattle access to these wetlands has resulted in ground compaction, trampling of flora and fauna, grazing competition and weed ingression to varying extents.

**Plate 5 A palustrine wetland (vegetated swamp) on Willunga, 23 November 2016**

**Lacustrine Wetlands (Dams)**

Mapped lacustrine wetlands of the Study area include dams of approximately 2 ha, 3 ha and 5 ha on Willunga, a 5 ha dam on Vermont Park, and 1 ha, 2 ha and 12 ha dams on Iffley (Plate 6), as well as a number of smaller dams (<1ha) that are too small to appear in the Queensland Wetland Mapping (DPM Enviroscences 2017b). Some of these include RE11.3.27b (approximately 45.6 ha), which ranges from open water +/- aquatics and emergents such as *Potamogeton crispus, Myriophyllum verrucosum, Chara* spp., *Nitella* spp., *Nymphaea violacea, Ottelia ovalifolia, Nymphoides indica, N. crenata, Potamogeton tricarinatus, Cyperus difformis, Vallisneria caulescens* and *Hydrilla verticillata*. Often with fringing woodland, commonly *Eucalyptus camaldulensis* or *E. coolabah* but also a wide range of other species including *Eucalyptus platyphylla, E. tereticornis, Melaleuca* spp., *Acacia holosericea* or other *Acacia* spp.).

These dams provide a water source for an array of terrestrial fauna, domestic livestock, as well as foraging and breeding habitat for waterbirds, wader birds, frogs, reptiles, water rats and other mammals.

**Plate 6 An approximate 12 ha lacustrine wetland (dam) on Iffley, 13 November 2016**

**Other coastal communities or heaths**

This habitat type is located only in one small section (0.3 ha) of the ETL (Figure 9-1) and comprises the following RE:

- 11.5.18 – *Micromyrtus capricornia* shrubland +/- emergent tree/open woodland layer dominated by species such as *Eucalyptus exserta, E. melanophloia, E. crebra, Corymbia trachyphloia, C. clarksoniana* or *Melaleuca nervosa*. Distinguished by prominent understorey of *Micromyrtus capricornia* to 1-2 m.

**Plate 7 RE11.5.18 on the Electricity Transmission Line, November 2017**

**Waterways (watercourses and drainage features)**

Waterways are located throughout the Study area, within areas of remnant vegetation or areas of agricultural grasslands. There are 22 waterways mapped for the Study area, including:

- 16 waterways of (Strahler) stream order 1;
- three waterways of stream order 2;
- one waterway of stream order 3 (Ripstone Creek);
- one waterway of stream order 4 (North Creek); and
- one waterway of stream order 6 (the Isaac River).

Further detailon the waterways in the Study area is available in the Olive Downs Coking Coal Project Aquatic Ecology Assessment (DPM Envirosciences 2018b).

DPM Enviroscience does not warrant the accuracy or completeness of information displayed in this map and any person using it does so at their own risk. DPM Envioscience shall bear no responsibility or liability for any errors, faults, defects, or omissions in the information.

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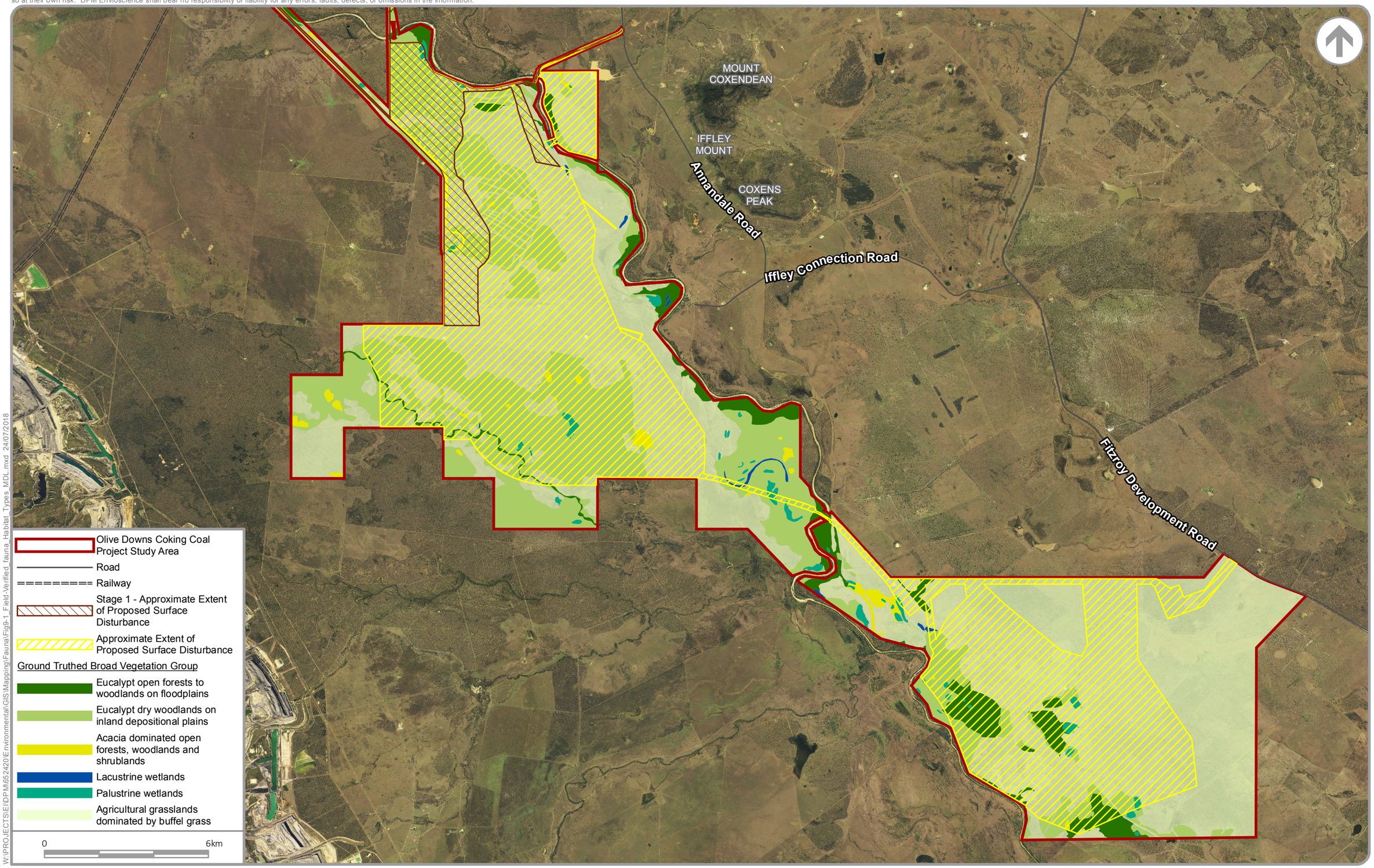


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DPM ENVIROSCIENCES

# FIELD-VERIFIED FAUNA HABITAT TYPES – MAP 1

Olive Downs Coking Coal Project – Terrestrial Fauna Assessment

**FIGURE 9.1**

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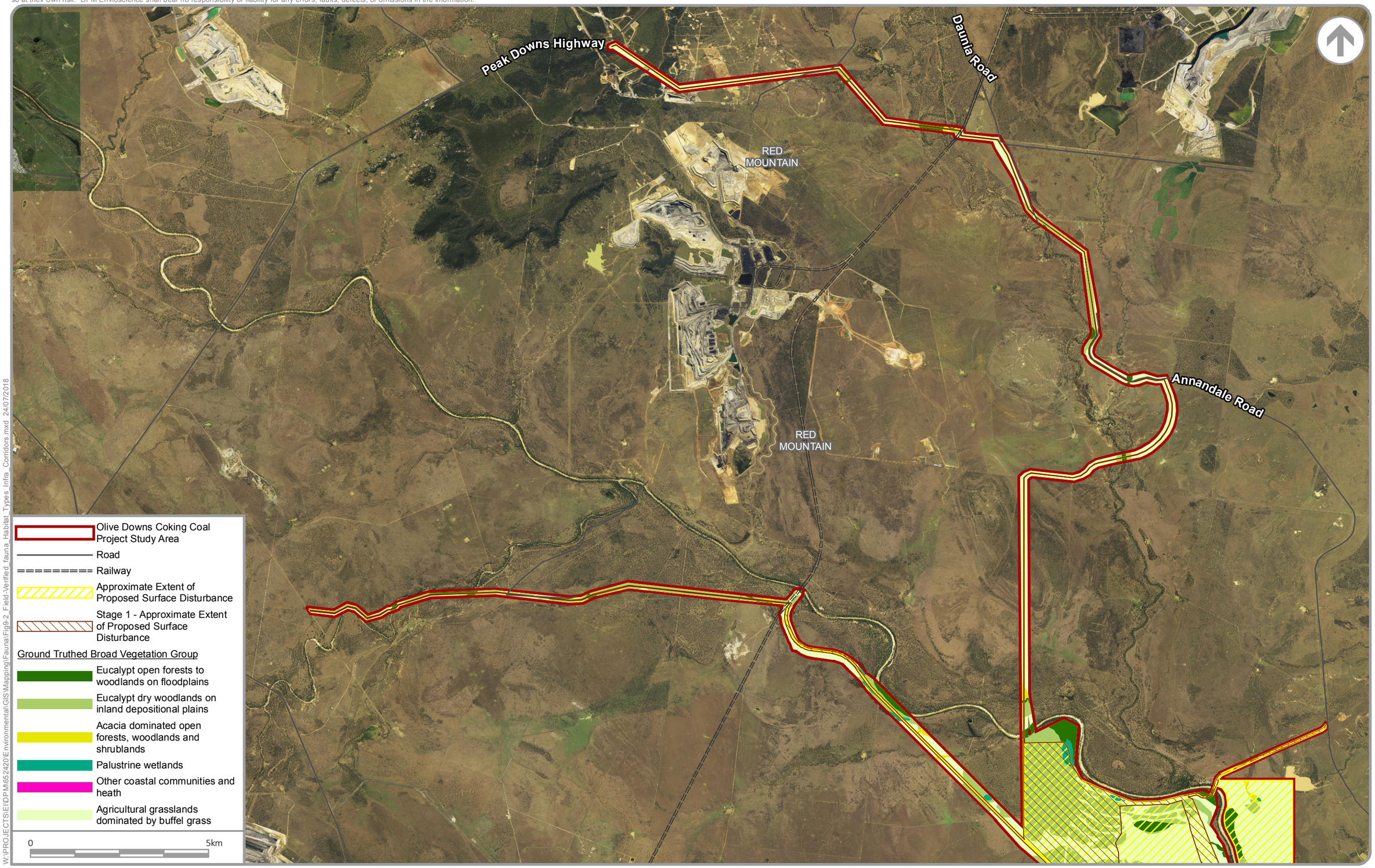


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DPM ENVIROSCIENCES

# FIELD-VERIFIED FAUNA HABITAT TYPES – MAP 2

Olive Downs Coking Coal Project – Terrestrial Fauna Assessment

**FIGURE 9.2**

## 5.2 Fauna species

A total of 176 terrestrial fauna species were recorded from the Study area during the spring 2016 field surveys, another 39 species were recorded during the autumn 2017 surveys and another 24 species were recorded during the spring 2017 surveys – a total of 239 terrestrial fauna species (Appendix C). The following sections discuss each of the fauna groups recorded.

**Amphibians**

Nine species of native amphibians were recorded during the spring 2016 field surveys and an additional two species were recorded during autumn 2017 (Appendix C). Each of these species are common Least Concern species which are generally found in the vicinity of dams, creeks and other moist habitats of central Queensland. One exotic amphibian, cane toad (**Rhinella marinus*), was recorded regularly across the Study area. No new species were recorded in spring 2017.

Eastern snapping frog (*Cyclorana novaehollandiae*)

Broad-palmed rocket frog (*Litoria latopalmata*)

**Plates 7-8 LC amphibians photographed from the Study area, 1-14 November 2016**

**Birds**

A total of 117 species of birds were recorded during the spring 2016 surveys, another 27 species were recorded during autumn 2017 and another 15 were recorded in spring 2017, all of which were native. Of these, 153 are Least Concern species, two are EVNT species, and four are Migratory and Special Least Concern species listed under the EPBC Act and NC Act, respectively (Section 5.3). The majority of species recorded from the Study area are common species associated with woodland. Waterbirds and wader birds were recorded in most waterbodies encountered, with the highest abundance and diversity recorded from the large dam on Iffley.

Royal spoonbill (*Platalea regia*)

Cotton pygmy goose (*Nettapus coromandelianus*)

**Plates 9-10 LC birds photographed from the Study area, 1-14 November 2016**

### Mammals

Twenty-eight species of native mammal were recorded from the Study area, including 25 Least Concern species, one Special Least Concern species and two EVNT species (Section 5.3) (Appendix C). There were six introduced species (dog, cat, hare, rabbit, mouse and pig).

Three species of glider were recorded, primarily in riparian forest and adjoining floodplains in areas dominated by Queensland blue gum (*Eucalyptus tereticornis*) and river red gum (*E. camaldulensis*). Each of these species are dependent on hollow-bearing trees for shelter and their distribution across the site is expected to be limited by the abundance of hollow-bearing trees.

Eastern grey kangaroo (*Macropus giganteus*) was the most prevalent macropod recorded. swamp wallaby (*Wallabia bicolor*), red necked wallaby (*Macropus rufogriseus*) and rufous bettong (*Aepyprymnus rufescens*) were also recorded.

Thirteen species of microchiropteran bats were recorded from the Study area, primarily from the analysis of data obtained on the ultrasonic bat detectors, but also from harp trapping (including the lesser long-eared bat [*Nyctophilus geoffroyi*], which cannot be definitively determined from ultrasonic bat detector alone). Each of these species are common throughout central Queensland and roost in tree hollows and / or rock crevices.

Squirrel glider (*Petaurus norfolcensis*)

Strip-faced dunnart (*Sminthopsis macroura*)

**Plates 11-12 LC mammals photographed from the Study area, 1-14 November 2016**

### Reptiles

Nineteen species of native terrestrial reptiles were recorded from the Study area in spring 2016, a further 10 species in autumn 2017 and a further five species in spring 2017, including 33 Least Concern species and one EVNT species (Section 5.3). This included 13 species of skink, two legless lizard, ten snakes, three geckoes, three dragons, one turtle and two species of monitor.

Frilled lizard (*Chlamydosaurus kingii*)

Brigalow scaly-foot (*Paradelma orientalis*)

**Plates 13-14 LC reptiles photographed from the Study area, 1-14 November 2016**

## 5.3 Conservation significant fauna species

### 5.3.1 EVNT species

Searches of the EPBC Act Protected Matters database (DEE 2018) and Queensland Wildlife Online database (DES 2018a and DES 2018b) identified the potential occurrence of 22 EVNT fauna species within a search area extending 10 km and 50 km (respectively) from the Study area boundaries (Table 7). Of these, six EVNT fauna species were considered 'likely' to occur within the Study area based on the likely occurrence of their preferred habitat within the Study area, as well as previous species records from within 10 km of the Study area. Five of these six species were subsequently recorded within the Study area.

The following EVNT fauna species were recorded from the Study area during the field surveys (Figure 10):

- ornamental snake (*Denisonia maculata*) – Vulnerable (EPBC Act and NC Act) – Plate 18;
- Australian painted snipe (*Rostratula australis*) – Endangered (EPBC Act); Vulnerable (NC Act) – Plate 19;
- squatter pigeon (southern) (*Geophaps scripta scripta*) – Vulnerable (EPBC Act and NC Act) – Plate 15;
- koala (*Phascolarctos cinereus*) – Vulnerable (EPBC Act and NC Act) – Plate 16; and
- greater glider (*Petauroides volans*) – Vulnerable (EPBC Act and NC Act) – Plate 17.

In addition to the above, the common death adder (*Phascolarctos cinereus*), listed as Vulnerable under the NC Act, has previously been recorded in the Study area (3d Environmental / Ecosmart Ecology 2012).

squatter pigeon (southern) (*Geophaps scripta scripta*)

koala (*Phascolarctos cinereus*)

greater glider (*Petauroides volans*)

ornamental snake (*Denisonia maculata*)

Australian painted snipe (*Rostratula australis*)

**Plates 15-19 EVNT fauna species photographed from the Study area, 2016-2017**

**Table 7 EVNT fauna species, or their habitat, identified from the search area**

| Scientific name | Common name | Status | | Potential habitat | Likelihood of occurrence within Study area based on desktop | Likelihood of occurrence within Study area post field survey | Source | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | EPBC Act[1] | NC Act[2] | | | | DEE 2018 | DES 2018b | Previous study | Field survey |
| **Birds** | | | | | | | | | | |
| *Calidris ferruginea* | Curlew sandpiper | CE<br>Mi | - | Intertidal mudflats of estuaries, lagoons, mangrove channels, around lakes, dams, floodwaters, flooded saltbush surrounds of inland lakes (Morcombe 2003). | **Unlikely**. Species or species habitat may occur within the broader search area (DEE 2018). Potential habitat occurs within the Study area. However, no confirmed records from within 50 km of the Study area (DES 2018b). | **Unlikely**. Not detected during field surveys. | ✓ | | | |
| *Calyptorhynchus lathami erebus* | Glossy black cockatoo (northern) | - | V | Forest and woodland with abundant Casuarina sp. (Morcombe 2003). | **Potential**. Species habitat known to occur within the broader search area and likely to occur within the study corridors. Confirmed records within 50 km of the Study area (DES 2018b). | **Unlikely**. Not detected during field surveys. | | ✓ | | |

| Scientific name | Common name | Status | | Potential habitat | Likelihood of occurrence within Study area based on desktop | Likelihood of occurrence within Study area post field survey | Source | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | EPBC Act[1] | NC Act[2] | | | | DEE 2018 | DES 2018b | Previous study | Field survey |
| *Erythrotriorchis radiatus* | Red goshawk | V | E | Tall open forest, woodland, lightly treed savannah and the edge of rainforest (DEHP 2013). | **Potential**. Species or species habitat known to occur within the broader search area (DEE 2018). Potential habitat occurs within the Study area. No records from within 10 km of the Study area, although confirmed records within 50 km of the Study Area (DES 2018b). | **Unlikely**. Not detected during field surveys. | ✓ | ✓ | | |
| *Geophaps scripta scripta* | Squatter pigeon (southern) | V | V | Open grassy woodlands on sandy soils interspersed with low gravelly ridges, never far from water (Morcombe 2003). | **Likely**. Existing records occur within 10 km of the Study area (DES 2018b). Also recorded during field surveys for neighbouring mines, e.g. Olive Downs North adjacent north (MEMS 2005), Lake Vermont 12 km east (AARC 2016a), Saraji 6 km east (SKM 2011) and Red Hill 50 km north-west (URS 2013). | **Known**. Recorded within the Study area during field surveys November 2016. | ✓ | ✓ | ✓ | ✓ |

| Scientific name | Common name | Status | | Potential habitat | Likelihood of occurrence within Study area based on desktop | Likelihood of occurrence within Study area post field survey | Source | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | EPBC Act[1] | NC Act[2] | | | | DEE 2018 | DES 2018b | Previous study | Field survey |
| *Grantiella picta* | Painted honeyeater | V | V | Dry, open forests and woodlands (box, ironbark, yellow gum, melaleuca, casuarina, callitris, acacia), usually in areas with flowering and fruiting mistletoe and flowering eucalypts (DES 2018e). | **Unlikely**. Species or species habitat may occur within the broader search area (DEE 2018). Potential habitat occurs within the Study area. However, no confirmed records from within 50 km of the Study area (DES 2018b). | **Unlikely**. Not detected during field surveys. | ✓ | | | |
| *Neochmia ruficauda ruficauda* | Star finch (eastern / southern sub-species) | E | E | Tall grass and reed beds associated with swamps and watercourses; also grassy woodlands, open forests and mangroves (DES 2018d). | **Unlikely**. Species or species habitat likely to occur within the broader search area (DEE 2018). Potential habitat occurs within the Study area. However, no confirmed records from within 50 km of the Study area (DES 2018b) and no sightings in the wild since 1995. | **Unlikely**. Not detected during field surveys. | ✓ | | | |

| Scientific name | Common name | Status | | Potential habitat | Likelihood of occurrence within Study area based on desktop | Likelihood of occurrence within Study area post field survey | Source | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | EPBC Act[1] | NC Act[2] | | | | DEE 2018 | DES 2018b | Previous study | Field survey |
| *Numenius madagascariensis* | Eastern curlew | CE<br>Mi | V | Tidal mudflats, sand spits of estuaries, mangroves, lake shores and ocean beaches (Morcombe 2003). | **Unlikely**. Species habitat may occur within the broader search area (DEE 2018), although unlikely within the Study area. No confirmed records within 50 km of the Study area (DES 2018b). | **Unlikely**. Not detected during field surveys. | ✓ | | | |
| *Phaethon rubicauda* | Red-tailed tropic bird | | V | Ranges throughout tropical and subtropical zones of the Indian and West Pacific Oceans, breeding on oceanic islands. Lord Howe Island is said to have the greatest breeding concentration in the world. Breeds in coastal cliffs and under bushes in tropical Australia (OEH 2017). | **Unlikely**. Species habitat unlikely to occur within the Study area. Confirmed records within 50km of the Study area (DES 2018b). | **Unlikely**. Not detected during field surveys. | | ✓ | | |

| Scientific name | Common name | Status | | Potential habitat | Likelihood of occurrence within Study area based on desktop | Likelihood of occurrence within Study area post field survey | Source | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | EPBC Act[1] | NC Act[2] | | | | DEE 2018 | DES 2018b | Previous study | Field survey |
| *Poephila cincta cincta* | Southern black-throated finch | E | E | Inhabits grassy woodland dominated by eucalypts, paperbarks or acacias where there is accessibility to seeding grasses, with riparian habitat being particularly important (DEHP 2012a). | **Unlikely**. Species or species habitat may occur within the broader search area (DEE 2018). Potential habitat occurs within the Study area. However, there are no confirmed records from within 50 km of the Study area (DES 2018b). | **Unlikely**. Not detected during field surveys. | ✓ | | | |
| *Rostratula australis* | Australian painted snipe | E | V | Shallow terrestrial freshwater (occasionally brackish) wetlands, including temporary and permanent lakes, swamps and claypans (DEtE 2018). | **Likely:** The species was recorded at two locations to the west of the Project area (Figure 10). | **Known**. Species was recorded during the recent field surveys. | ✓ | | ✓ | ✓ |
| **Mammals** | | | | | | | | | | |
| *Dasyurus hallucatus* | Northern quoll | E | | Hilly or rocky areas close to permanent water; but occurs in a range of habitats, including open dry sclerophyll forest and woodland, riparian woodland, low dry vine thicket, the margins of notophyll vineforest, | **Unlikely**. Species or species habitat likely to occur within the broader search area (DEE 2018). Potential habitat may occur within the Study area; however, no records from within 50 km of the Study area. | **Unlikely**. Not detected during field surveys. | ✓ | | | |

| Scientific name | Common name | Status | | Potential habitat | Likelihood of occurrence within Study area based on desktop | Likelihood of occurrence within Study area post field survey | Source | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | EPBC Act[1] | NC Act[2] | | | | DEE 2018 | DES 2018b | Previous study | Field survey |
| | | | | mangroves, sugarcane farms and in urban areas (DES 2018f). | | | | | | |
| *Lasiorhinus krefftii* | Northern hairy-nosed wombat | E | E | Currently, northern hairy-nosed wombats live at two sites: Epping Forest National Park and the Richard Underwood Nature Refuge. Northern hairy-nosed wombats require deep sandy soils, in which to dig their burrows, and a year-round supply of grass, which is their primary food. These areas usually occur in open eucalypt woodlands (DES 2018g). | **Unlikely**. Species habitat is unlikely to occur within the Study area. The distribution of the species is very well known and is restricted to the area immediately around Epping National Park, which does not include the Study area. | **Unlikely**. Not detected during field surveys. | | ✓ | | |
| *Macroderma gigas* | Ghost bat | V | | Spinifex hillsides, black soil grasslands, monsoon forest, open savannah woodland, tall open forest, deciduous vine forest and tropical rainforest, influenced by the | **Unlikely**. Species or species habitat likely to occur within the broader search area (DEE 2018). Potential habitat likely to occur within the Study area. However, no | **Unlikely**. Not detected during field surveys. No caves or mine shafts detected within the Study area. | ✓ | | | |

| Scientific name | Common name | Status | | Potential habitat | Likelihood of occurrence within Study area based on desktop | Likelihood of occurrence within Study area post field survey | Source | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | EPBC Act[1] | NC Act[2] | | | | DEE 2018 | DES 2018b | Previous study | Field survey |
| | | | | availability of caves and mines for roosting (Churchill 2008). | confirmed records from within 50 km of the Study area (DES 2018b). | | | | | |
| *Nyctophilus corbeni* | Corben's long-eared bat | V | V | Areas with a cluttered understorey layer in river red gum, black box, *Allocasuarina*, belah, mallee, open woodlands, and savannahs; roosting in fissures in branches and under dried sheets of bark still attached to the trunks of trees; utilising tree hollows for maternity sites (Churchill 2008). | **Unlikely**. Species or species habitat may occur within the broader search area (DEE 2018). Potential habitat likely to occur within the Study area. However, no confirmed records from within 50 km of the Study area (DES 2018b). | **Unlikely**. Not detected during field surveys. | ✓ | | | |
| *Phascolarctos cinereus* | Koala | V | V | Sclerophyll forest and woodland on foothills and plains (Strahan 1995). | **Likely**. Existing records occur within 10 km of the Study area (DES 2018b). Also recorded during field surveys for neighbouring mines, e.g. Saraji 6 km east (SKM 2011) and Red Hill 50 km north-west (URS 2013). | **Known:** Recorded within the Study area during field surveys November 2016. | ✓ | ✓ | ✓ | ✓ |

| Scientific name | Common name | Status | | Potential habitat | Likelihood of occurrence within Study area based on desktop | Likelihood of occurrence within Study area post field survey | Source | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | EPBC Act[1] | NC Act[2] | | | | DEE 2018 | DES 2018b | Previous study | Field survey |
| *Petauroides volans* | Greater glider | V | V | Eucalypt dominated habitats, ranging from low, open forests on the coast to tall forests in the ranges and low woodland westwards of the Dividing Range (Strahan 1995). | **Likely**. No previous records from within 10 km of the Study area, although confirmed records within 50 km of the Study area (DES 2018b) (Figure 10). Also recorded during field surveys for neighbouring mines, e.g. Saraji 6 km east (SKM 2011) and Red Hill 50 km north-west (URS 2013). | **Known**: Recorded within the Study area during field surveys November 2016. | ✓ | ✓ | ✓ | ✓ |
| *Pteropus poliocephalus* | Grey-headed flying-fox | V | | Roost in native vegetation near water, including mangrove, rainforest, melaleuca or casuarina (Churchill 2008). Typically commute within 15 km to feed on flowering and fruiting plants, including blossoms of various species of eucalypt, angophora, tea-tree and banksia (Strahan 1995). | **Unlikely**. Foraging, feeding or related behaviour likely to occur within the broader search area (DEE 2018). Potential habitat may occur within the Study area. However, no records from within 50 km of the Study area (DES 2018b). | **Unlikely**. Not detected during field surveys. | ✓ | | | |

| Scientific name | Common name | Status | | Potential habitat | Likelihood of occurrence within Study area based on desktop | Likelihood of occurrence within Study area post field survey | Source | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | EPBC Act[1] | NC Act[2] | | | | DEE 2018 | DES 2018b | Previous study | Field survey |
| **Reptiles** | | | | | | | | | | |
| *Acanthophis antarcticus* | Common death adder | | V | Broad range of habitats, from rainforest to shrublands and heaths (Wilson and Swan 2013). | **Potential**. Suitable habitat is known to occur within the Study area. The closest record of this species is located approximately 90 km north-east of the Project area (ALA 2018). | **Known**: A dead specimen (presumably from toad poisoning) was recorded from a patch of brigalow (*Acacia harpophylla*) with gilgai (pers. comm. Mark Sanders, 16 February 2018) as part of fieldwork for the Arrow Bowen Gas Project in 2011 (3d Environmental / Ecosmart Ecology 2012). | | ✓ | ✓ | |
| *Denisonia maculata* | Ornamental snake | V | V | Low-lying areas with cracking clay soils (Wilson and Swan 2013). | **Likely**. Existing records occur within 10 km of the Study area (DES 2018b) (Figure 10). Also recorded during field surveys for neighbouring mines, e.g. Eagle Downs 15 km east (Hansen Bailey 2009), Saraji 6 km east (SKM 2011) and Red Hill 50 km north-west (URS 2013). | **Known:** Recorded during field surveys November 2016 and autumn 2017. | ✓ | ✓ | ✓ | ✓ |

| Scientific name | Common name | Status | | Potential habitat | Likelihood of occurrence within Study area based on desktop | Likelihood of occurrence within Study area post field survey | Source | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | EPBC Act[1] | NC Act[2] | | | | DEE 2018 | DES 2018b | Previous study | Field survey |
| *Egernia rugosa* | Yakka skink | V | V | Dry open forests, woodlands and rocky areas (Wilson and Swan 2013). | **Unlikely**. Species or species habitat may occur within the broader search area (DEE 2018). Potential habitat likely to occur within the Study area. However, no confirmed records from within 50 km of the Study area (DES 2018b). | **Unlikely**. Not detected during field surveys. | ✓ | | | |
| *Fuirina dunmalli* | Dunmall's snake | V | V | Woodlands and dry sclerophyll forest, particularly areas featuring brigalow (Wilson and Swan 2013). | **Unlikely**. Species or species habitat may occur within the broader search area (DEE 2018). Potential habitat likely to occur within the Study area. However, no records from within 50 km of the Study area (DES 2018b). | **Unlikely**. Not detected during field surveys. | ✓ | | | |
| *Lerista allanae* | Allan's Lerista / Retro slider | E | E | Restricted to road verges and other small areas with friable soils, amid pastoral land dominated by heavy soils in the vicinity of Capella, Clermont and Logan Downs Station (Wilson and Swan 2013). | **Unlikely**. Species or species habitat may occur within the broader search area (DEE 2018). The species has highly specific habitat requirements that are not fulfilled in the Study area. No | **Unlikely**. Not detected during field surveys. | ✓ | | | |

| Scientific name | Common name | Status | | Potential habitat | Likelihood of occurrence within Study area based on desktop | Likelihood of occurrence within Study area post field survey | Source | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | EPBC Act[1] | NC Act[2] | | | | DEE 2018 | DES 2018b | Previous study | Field survey |
| | | | | | records from within 50 km of the Study area (DES 2018b). | | | | | |

Notes:

[1] Conservation status under the EPBC Act. CE = Critically Endangered, E = Endangered, V = Vulnerable, Mi = Migratory.

[2] Conservation status under the NC Act. E = Endangered, V = Vulnerable.

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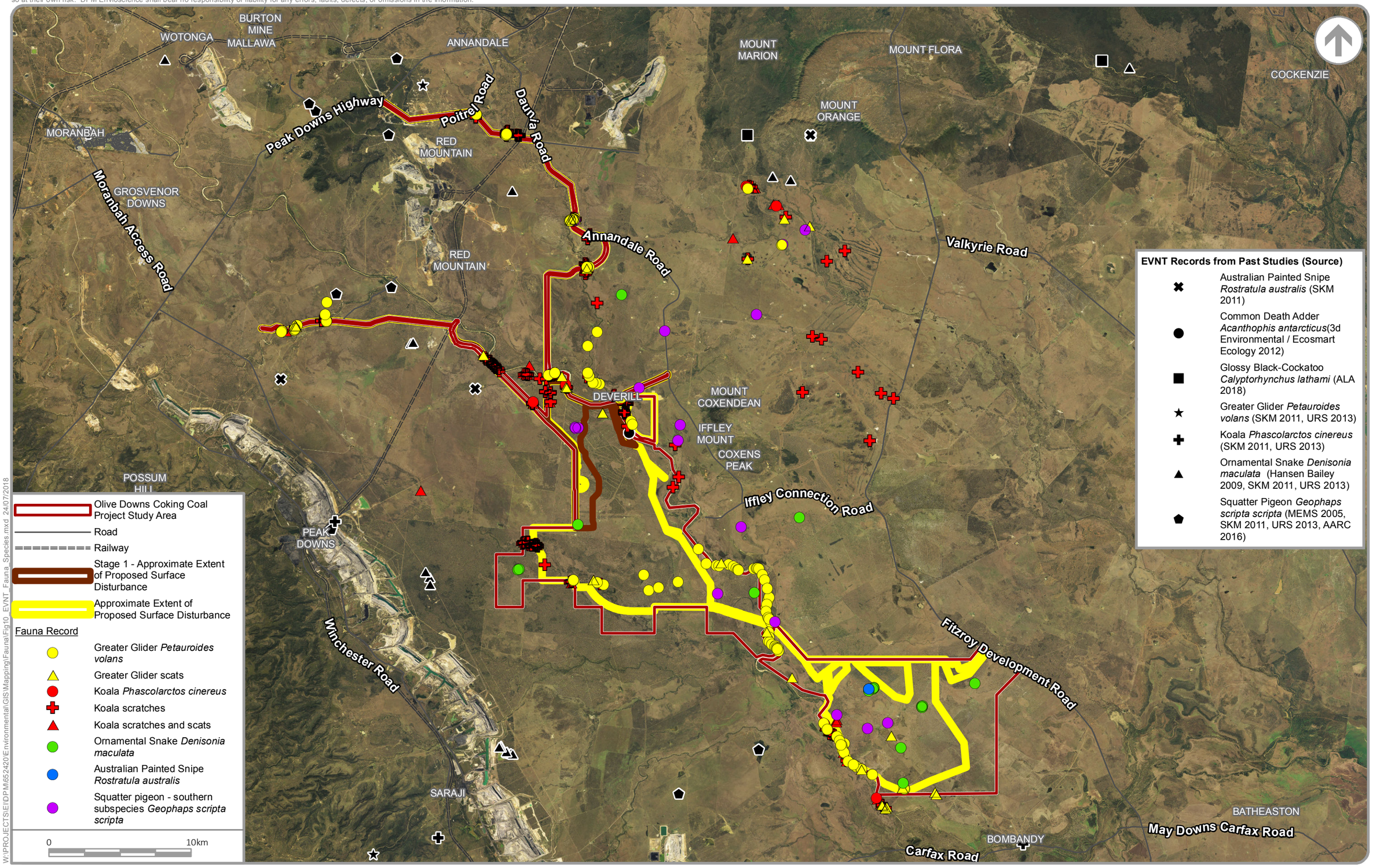


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# EVNT FAUNA SPECIES IDENTIFIED FROM THE STUDY AREA

Olive Downs Coking Coal Project – Terrestrial Fauna Assessment

**FIGURE 10**

**Squatter pigeon (southern) habitat**

The squatter pigeon (southern) has a large distribution extending from the Burdekin-Lynd divide in Central Queensland, west to Charleville and Longreach, east to the coastline between Proserpine and Port Curtis (near Gladstone) and south to a number of scattered sites throughout south-eastern Queensland (DEE 2018). All of the relatively small isolated and sparsely distributed sub-populations occurring south of the Carnarvon Ranges in Central Queensland are considered to be important subpopulations of the subspecies (DEE 2018).

The squatter pigeon (southern) was identified on ten occasions within Eucalypt dry woodlands on inland depositional plains in the Study area (Figure 11). This includes three locations within the Willunga domain and a further five locations within the Olive Downs Domain. This species was also recorded along the ETL for the Project. Futher to this, the squatter pigeon (southern) has been recorded on numerous occasions within 10 km of the Study area (Figure 11).

The squatter pigeon (southern) occurs mainly in grassy woodlands and open forests that are dominated by eucalypts (DEE 2018). In the Study area all areas of Eucalypt dry woodlands on inland depositional plains and Eucalypt open forests to woodlands on floodplains are considered potential habitat for this species. Potential habitat mapping for the squatter pigeon (southern) within the Study area is shown on Figure 11.1 and 11.2.

Other broad habitat types were not considered potential habitat because they do not support the grassy understorey with a high density of native grasses necessary to provide a food resource for the species.

**Australian painted snipe habitat**

The Australian painted snipe generally inhabits shallow terrestrial freshwater wetlands, including temporary and permanent lakes, swamps and claypans. They also use inundated or waterlogged grassland or saltmarsh, dams, rice crops, sewage farms and bore drains. Typical sites include those with rank emergent tussocks of grass, sedges, rushes or reeds, or samphire (DEE 2018).

A single Australian painted snipe was observed during the field surveys in a small wetted gilgai within the Agricultural grasslands habitat type in the Willunga Domain (Figure 12). Additional records for this species existing within the wider locality and are all located along waterways, with the closest being approximately 2.5 km south of the proposed water pipeline (Figure 12).

In the Study area all areas of wetlands (lacustrine or palustrine) are considered potential habitat for this species (Figure 12). Although the species was observed in wetted gilgai habitat, this habitat is only suitable for a short period after rainfall when the gilgai are full. It is not considered optimal or primary habitat.

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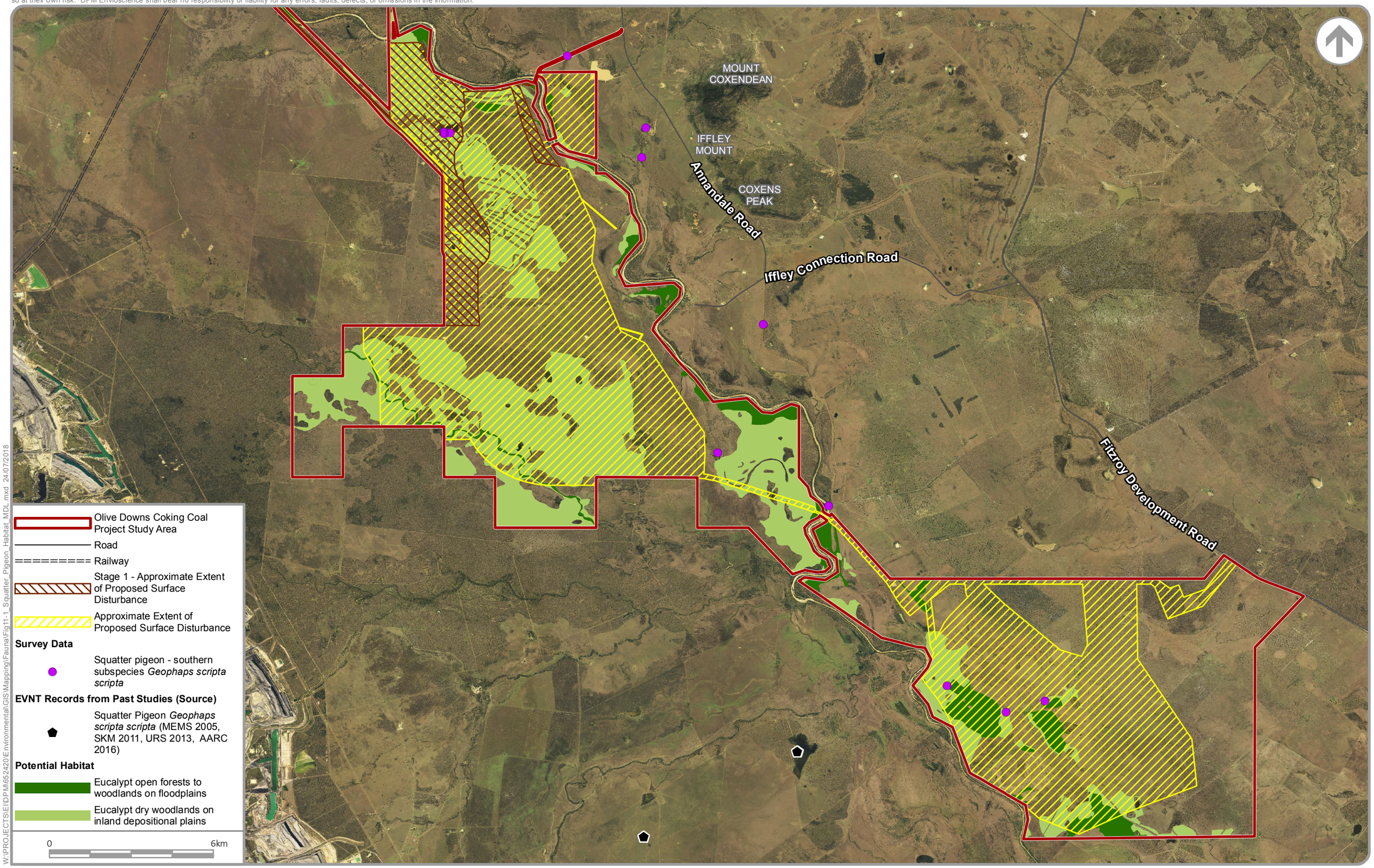


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# SQUATTER PIGEON HABITAT MAPPING – MAP 1

Olive Downs Coking Coal Project – Terrestrial Fauna Assessment

**FIGURE 11.1**

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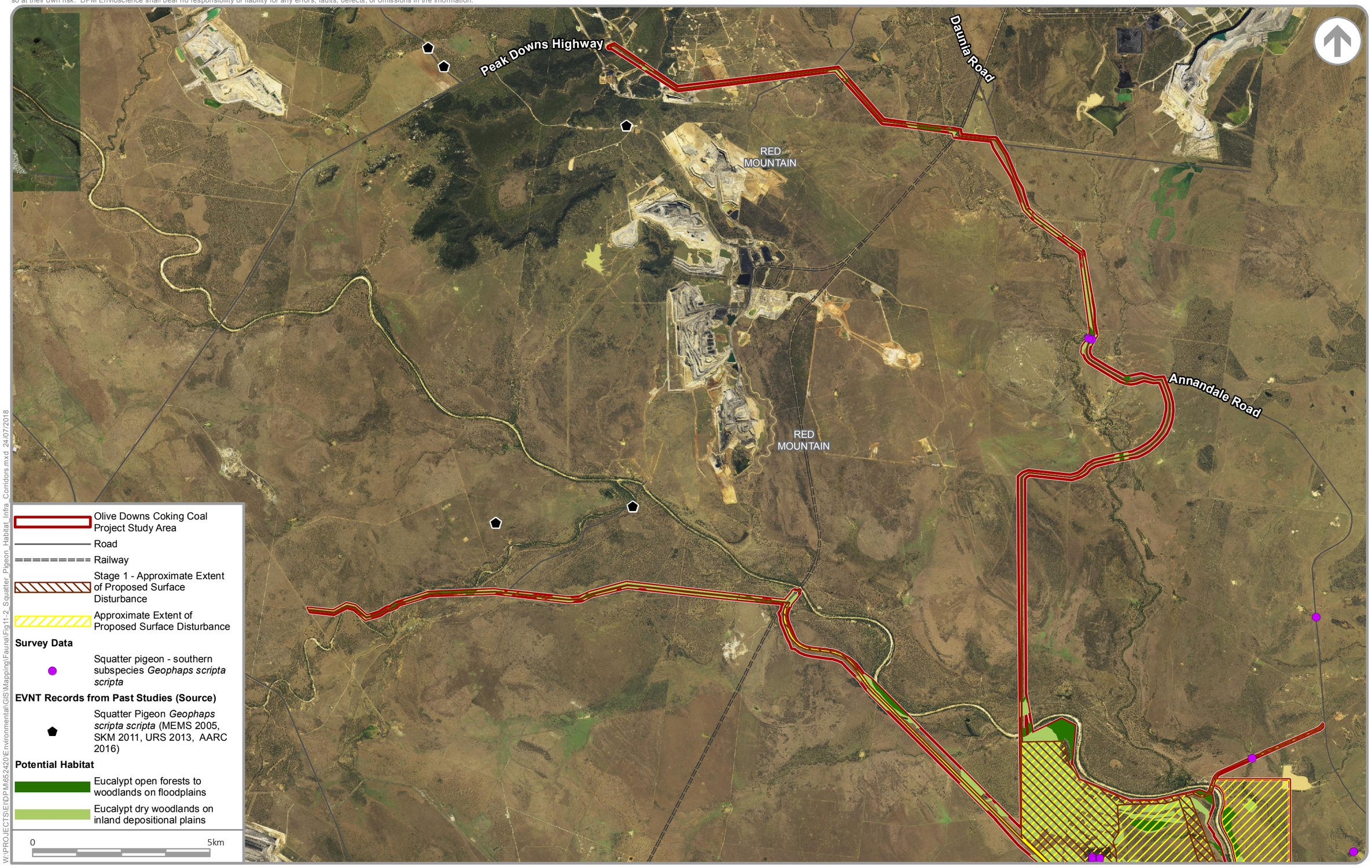


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SQUATTER PIGEON HABITAT MAPPING – MAP 2

Olive Downs Coking Coal Project – Terrestrial Fauna Assessment

**FIGURE 11.2**

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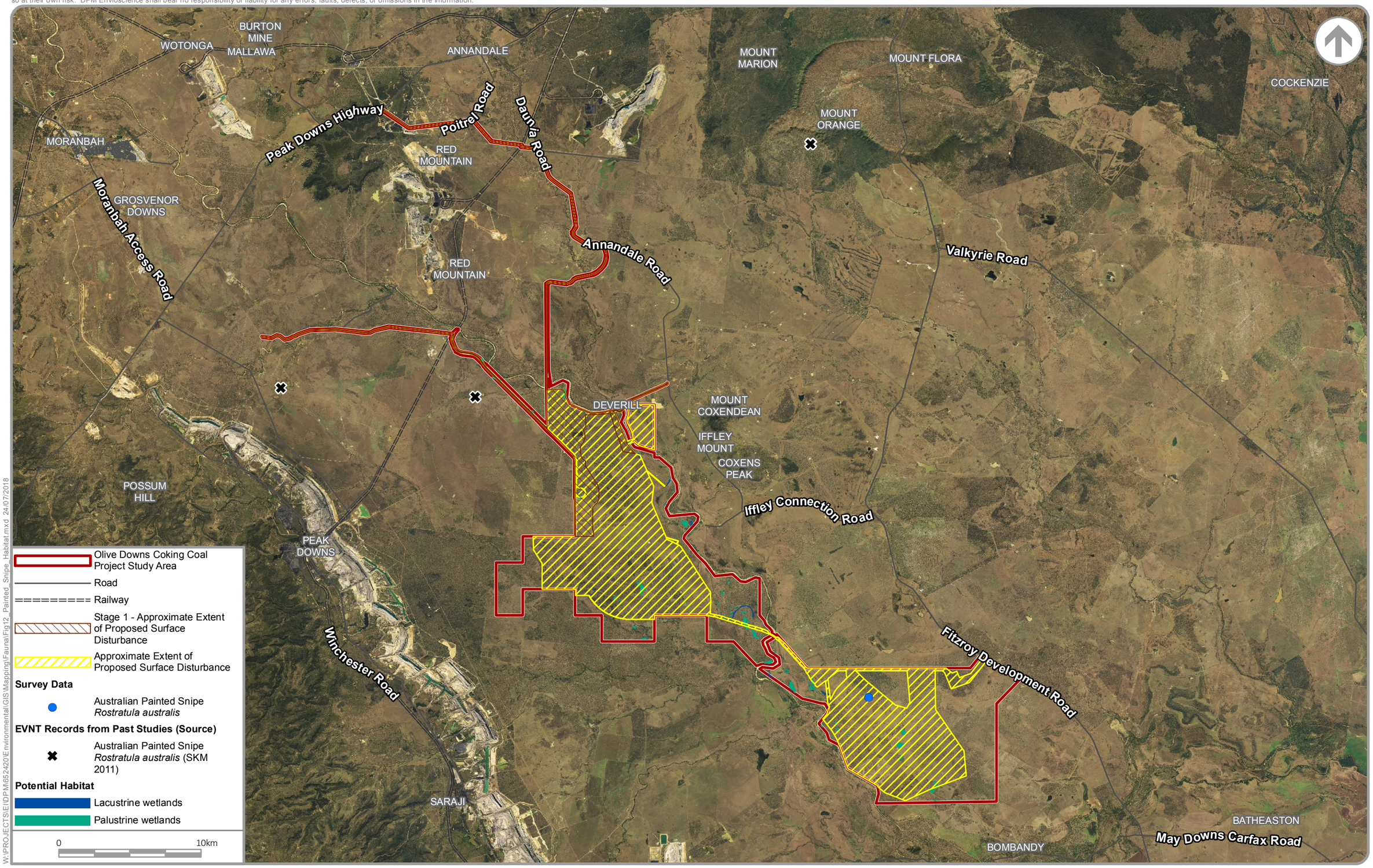


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# AUSTRALIAN PAINTED SNIPE HABITAT MAPPING

Olive Downs Coking Coal Project – Terrestrial Fauna Assessment

**FIGURE 12**

**Koala habitat**

The koala has one of the largest distributions of any terrestrial threatened species listed under the EPBC Act (DotE 2014). It occupies a variety of vegetation types across this large distribution, is capable of moving long distances, and is variably affected by a range of threats (DEE 2018). Koala habitat is defined by the vegetation community present and the vegetation structure; koalas do not necessarily have to be present (DotE 2014). Any forest or woodland containing species that are known koala food trees, or shrubland with emergent food trees can be considered as 'potential koala habitat' (DEE 2018). This can include remnant and non-remnant vegetation in natural, agricultural, urban and peri-urban environments. Koala food trees can generally be considered to be those of the genus *Angophora, Corymbia, Eucalyptus, Lophostemon* and *Melaleuca* (DEE 2018).

Within the Study area, the koala was recorded on numerous occasions along the Isaac River and associated tributaries (Figure 13.1 and 13.2). Recordings included direct observation and identification of scats and scratches within Eucalypt dry woodlands on inland depositional plains, Eucalypt open forest to woodlands on floodplains, and around wetlands. Koala, or evidence of koala presence, was also recorded along each of the three proposed infrastructure corridors (Figure 13.1 and 13.2).

Within the Study area, potential koala habitat is located within the areas mapped as eucalypt open forests to woodlands on floodplains, eucalypt dry woodlands on inland depositional plains and the vegetation surrounding and within the lacustrine and palustrine wetlands (Figure 13.1 and 13.2). The potential habitat connections along the waterways (primarily the Isaac River and Ripstone Creek) provide movement corridors and refuge habitat for this species in an otherwise cleared and generally unsuitable landscape.

Those areas of non-remnant vegetation in the Study area are included in the 'Agricultural Grasslands' habitat type, which does not contain an adequate density of koala trees (*Eucalyptus spp*. *Corymbia spp. Lophostemon spp*. or *Melaleuca spp*. that are > 4 m in height and > 10 cm DBH) to support the species. Other habitat types, such as 'Other coastal communities and heath' and 'Acacia dominated open forests, woodlands and shrublands', also do not contain an adequate density of koala trees to support the species.

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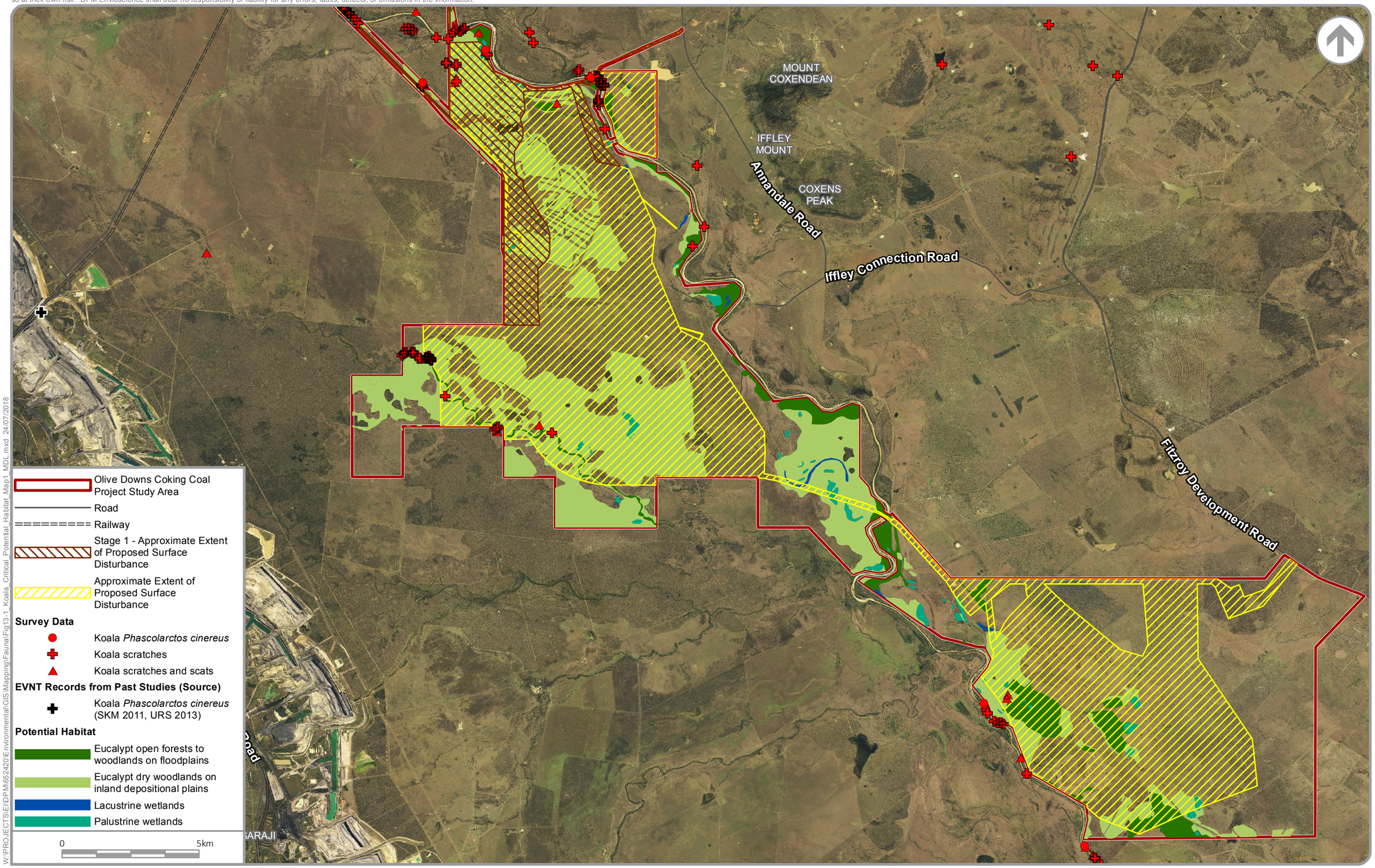


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# KOALA POTENTIAL HABITAT - MAP 1

Olive Downs Coking Coal Project – Terrestrial Fauna Assessment

**FIGURE 13.1**

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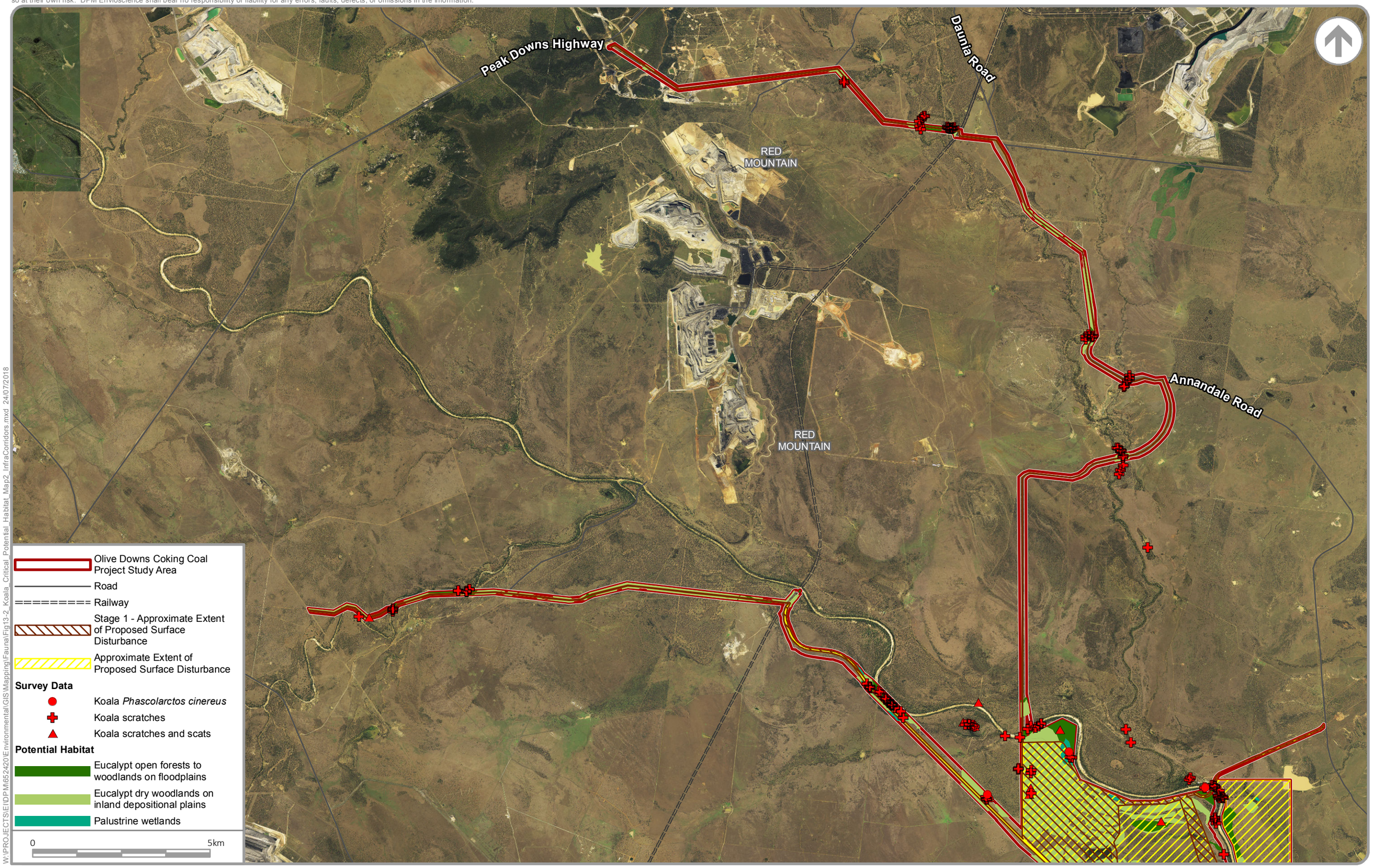


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# KOALA POTENTIAL HABITAT - MAP 2

Olive Downs Coking Coal Project – Terrestrial Fauna Assessment

**FIGURE 13.2**

### Greater glider habitat

The greater glider is largely restricted to eucalypt forests and woodlands. It is typically found in higher abundance in taller, montane, moist eucalypt forests with relatively old trees and abundant hollows (TSSC 2016). The distribution may be patchy even in suitable habitat. The greater glider favours forests with a diversity of eucalypt species, due to seasonal variation in its preferred tree species (TSSC 2016).

Within the Study area, the greater glider was recorded on numerous occasions along the Isaac River and associated tributaries and around wetland habitats (Figure 14). Recordings included direct observation and identification of scats within Eucalypt dry woodlands on inland depositional plains and Eucalypt open forest to woodlands on floodplains and wetlands. The greater glider, or evidence of its presence, was also recorded along each of the three proposed infrastructure corridors (Figure 14).

In the Study area all areas of eucalypt open forests to woodlands on floodplains, eucalypt dry woodlands on inland depositional plains and wetlands are considered potential habitat (Figure 14.1 and 14.2). The potential habitat connections along the waterways (primarily the Isaac River and Ripstone Creek) provide movement corridors and refuge habitat for this species in an otherwise cleared and generally unsuitable landscape.

Other habitat types within the Study area (including the 'Agricultural Grasslands' habitat type) are not considered suitable for the species because they lack a high density of large mature eucalypts, which are important for foraging and denning.

### Ornamental snake

The ornamental snake prefers habitat that is close to its prey (frogs). It prefers moist woodlands and open forests, particularly gilgai mounds as well as lake margins and wetlands (DEE 2018). It is found in low-lying subtropical areas with deep-cracking clay soils (DERM 2010b) and persists in cleared, disturbed habitat, particularly where brigalow communities have been cleared (DSEWPC 2011c).

Four ornamental snake were recorded at three locations within the Olive Downs South Domain and a further five locations within the Willunga Domain (Figure 15). The species was identified via a combination nocturnal spotlighting. These records occurred within agricultural grasslands on cracking clays, around palustrine wetlands, within Acacia dominated open forests, woodland and shrublands, and also one record within Eucalypt dry woodlands on inland depositional plains (expected to be a transient individual). Database records for this species are relatively common in the wider locality, with more than 14 records within 15 km of the Project area.

Ground-truthed soils mapping produced for the *Olive Downs Coking Coal Project Soils and Land Suitability Assessment* by GT Environmental (2018) across the Study area identified areas of gilgai relief, which are the most accurate reflection of potential habitat for this species. GT Environmental (2018) has mapped the following two soil types within the Project area that would provide suitable habitat for the ornamental snake:

- brown light clays with gilgai; and
- grey to brown light to medium clay with gilgai.

In accordance with the *Draft referral guidelines for the nationally listed Brigalow Belt reptiles* mapping in the Study area identified four patches of Brigalow TEC that form potential habitat for the ornamental snake. The patches comprise a total of 18 ha and include REs 11.3.1, 11.4.8 and 11.4.9 all of which are associated with the presence of gilgai formations. Other patches of Brigalow regrowth have been mapped as potential habitat where suitable habitat features are present (i.e. gilgais, wetlands and suitable prey habitat).

Based on observations of ornamental snake across the Study area, areas of potential habitat occur in a significant portion of agricultural grasslands (where there was once brigalow), and small patches of palustrine wetlands (swamps) and Acacia dominated open forests, woodlands and shrublands where these soil types are also present (Figure 15.1 and 15.2).

The areas mapped on Figure 15.1 and 15.2 as potential habitat for the ornamental snake also contain woody debris (which would provide sheltering habitat for the ornamental snake when cracks are not available), are low lying, and during the wet season they would hold water long enough for frogs to inhabit them, providing a food source for the ornamental snake.

As the majority of the potential habitat for this species is mapped within the agricultural grasslands, there are a number of existing threats to the ornamental snake. These include heavy weed infestation, presence of introduced fauna species (including cane toads), agricultural grazing and habitat fragmentation.

The other habitat types within the Project area (including the remaining non-remnant vegetation) are not considered to provide potential habitat for the Ornamental Snake on the basis that they are lacking the cracking clay soils, gilgai habitat and microhabitat features required by this species.

**Common Death Adder**

The common death adder occurs from the Gulf region of the Northern Territory across to central and eastern Queensland and New South Wales, and through to the southern parts of South Australia and Western Australia (DES, 2018h). Within this range the species is found in a wide variety of habitats in association with deep leaf litter, including rainforests, wet sclerophyll forests, woodland, grasslands, chenopod dominated shrublands, and coastal heathlands (DEHP 2018e).

The common death adder (*Acanthophis antarcticus*) has previously been recorded from the Study area, but was not detected during the fauna surveys by DPM Envirosciences. The next closest database record of this species is located approximately 90 km north-east of the Project area (ALA 2018).

The existing record was reported to be a large specimen found dead (presumably by cane toad poisoning) on the Iffley property during fauna surveys by 3d Environmental / Ecosmart for the Arrow Bowen Gas Project in 2011, in a patch of brigalow (*Acacia harpophylla*) with gilgai (pers. comm. Mark Sanders 16 February 2018). This isolated patch of vegetation falls within the Study area approximately 100 m west of the Isaac River (Figure 10).

The species has a very broad habitat range and may be associated with any of the habitat types containing remnant vegetation located in the Project area. However, if it were to occur, it would only be expected to occur in very low numbers given it was not recorded despite targeted surveys.

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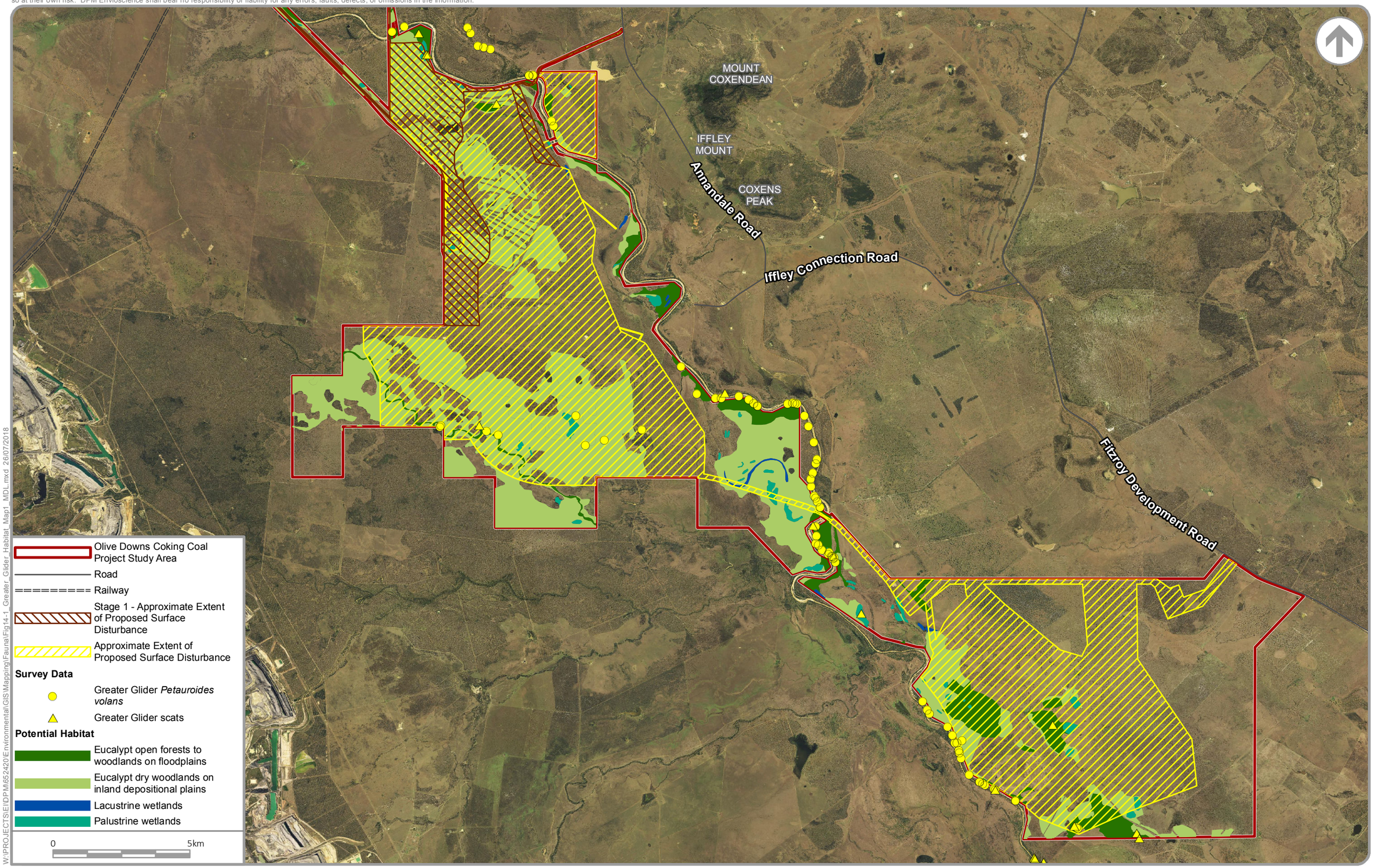


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# GREATER GLIDER HABITAT MAPPING – MAP 1

Olive Downs Coking Coal Project – Terrestrial Fauna Assessment

**FIGURE 14.1**

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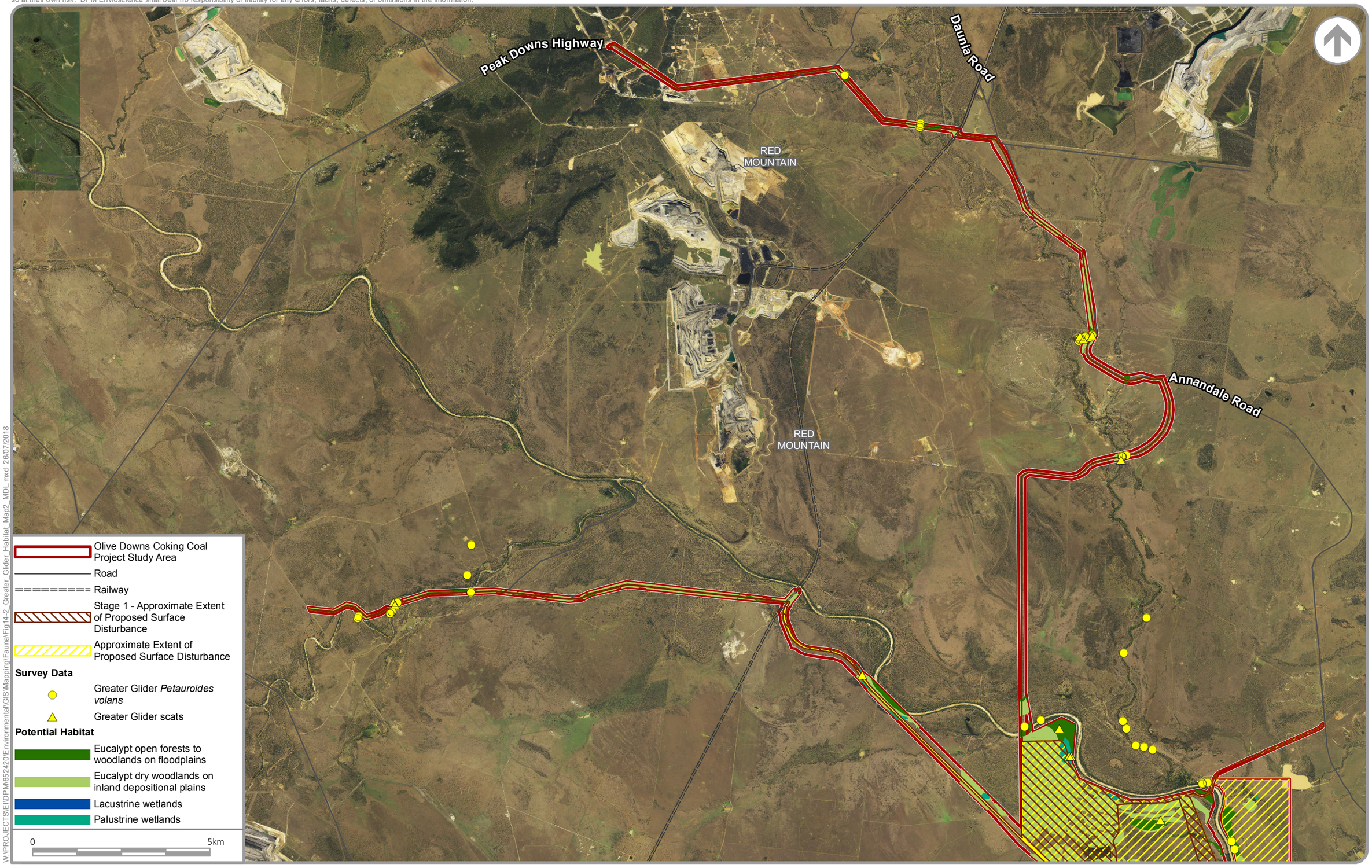


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# GREATER GLIDER HABITAT MAPPING – MAP 2

Olive Downs Coking Coal Project – Terrestrial Fauna Assessment

**FIGURE 14.2**

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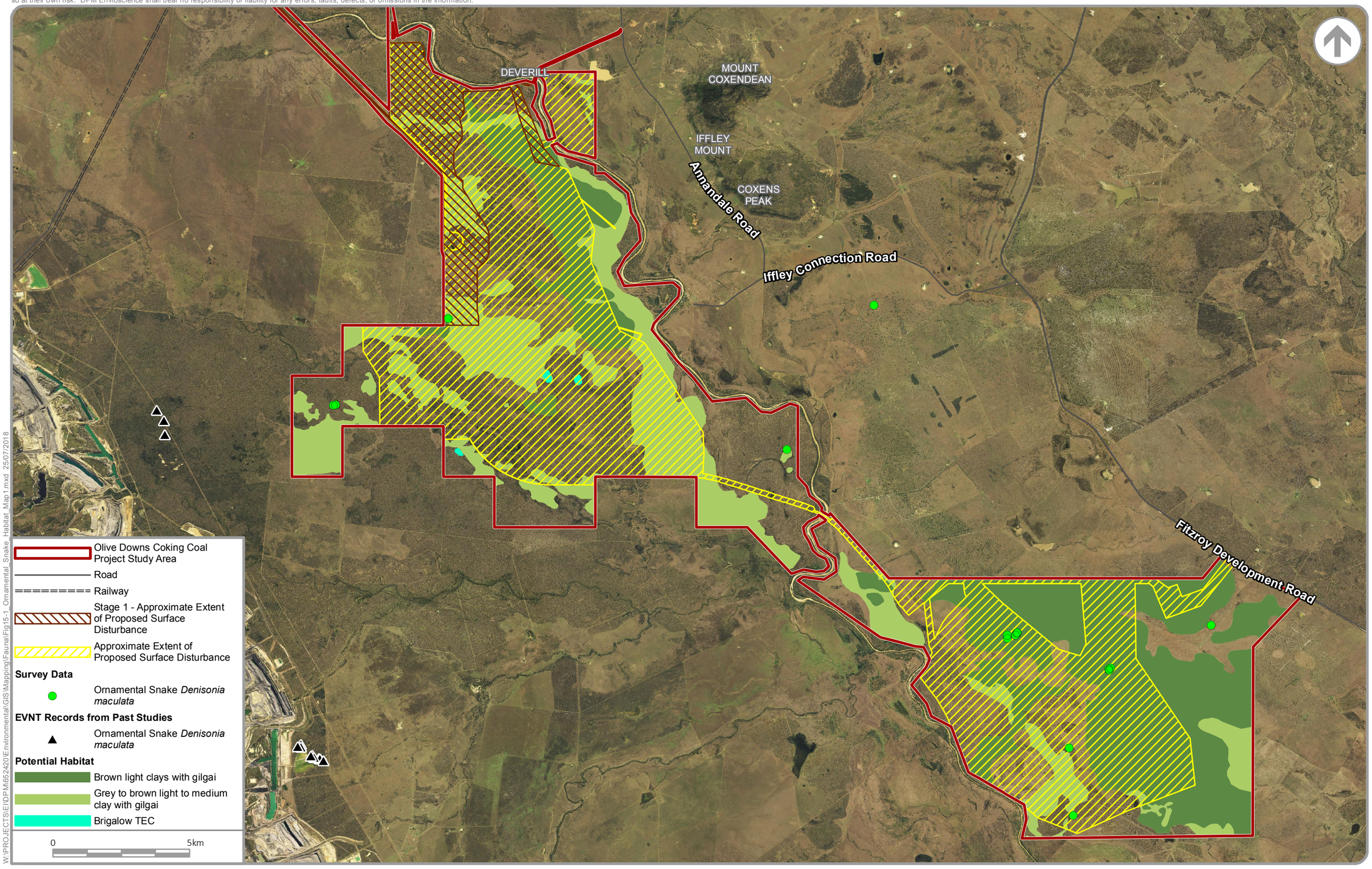


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# ORNAMENTAL SNAKE HABITAT MAPPING – MAP 1

Olive Downs Coking Coal Project – Terrestrial Fauna Assessment

**FIGURE 15.1**

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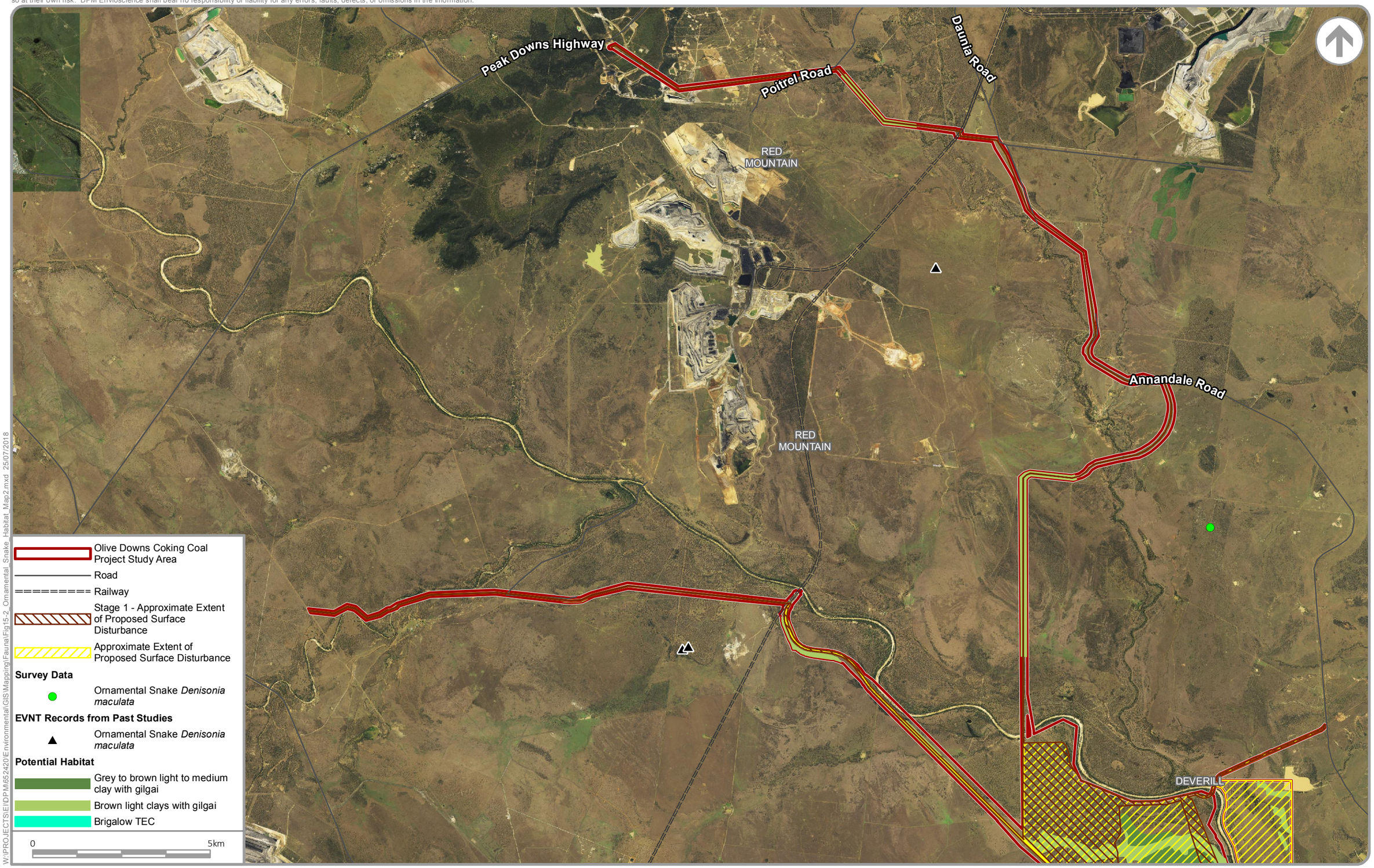


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# ORNAMENTAL SNAKE HABITAT MAPPING – MAP 2

Olive Downs Coking Coal Project – Terrestrial Fauna Assessment

**FIGURE 15.2**

### 5.3.2 Migratory species

Searches of the EPBC Act Protected Matters database (DEE 2018) and Queensland Wildlife Online database (DES 2018b) identified the possible occurrence of 21 migratory species within a search area extending 10 km and 50 km from the Study area boundaries, respectively (Table 8). Of these, eight migratory birds were identified as having potential to occur within the Study area based on the likely occurrence of their preferred habitat, generally a lack of previous species records from within 10 km of the Study area, but previous species records from within 50 km of the Study area. Those species listed as 'Marine' under the EPBC Act were excluded from the search results.

Four migratory species were recorded from the Study area, comprising:

- satin flycatcher;
- Latham's snipe – Plate 20;
- Caspian tern (*Hydroprogne caspia*) – Plate 21; and
- glossy ibis (*Plegadis falcinellus*).

It was determined that the Study area does not contain important habitat for migratory species as it does not include (DotE 2013):

- *habitat utilised by a migratory species occasionally or periodically within a region that supports an ecologically significant proportion of the population of the species, and / or*
- *habitat that is of critical importance to the species at particular life-cycle stages, and / or*
- *habitat utilised by a migratory species which is at the limit of the species range, and / or*
- *habitat within an area where the species is declining.*

Latham's snipe (*Gallinago hardwickii*) on camera trap

Caspian tern (*Hydroprogne caspia*)

**Plates 20-21 Migratory birds photographed from the Study area, 2016-2017**

**Table 8 Migratory species, or their habitat, identified from the Search area**

| Scientific name | Common name | Status | | Potential habitat | Likelihood of occurrence in the Study Area | Source | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | EPBC Act[1] | NC Act[2] | | | DEE 2018 | DES 2018b | Previous study | Field survey |
| *Actis hypoleucos* | Common sandpiper | Mi | SL | Varied coastal and interior wetlands – narrow muddy edges of billabongs, river pools, mangroves, among rocks and snags, reefs or rocky beaches (Morcombe 2003). | **Unlikely**. Species or species habitat may occur within the broader search area (DEE 2018). Potential habitat occurs within the Study area. However, no confirmed records from within 50 km of the Study area (DES 2018b). | ✓ | | | |
| *Apus pacificus* | Fork-tailed swift | Mi | SL | Low to very high airspace over varied habitat, rainforest to semi-desert, most active just ahead of summer storm fronts (Morcombe 2003). | **Potential**. Species or species habitat likely to occur within the broader search area (DEE 2018). Potential habitat occurs within the Study area. No confirmed records from within 50 km of the Study area (DES 2018b). Field surveys at Saraji Mine (6 km east) detected the species (SKM 2011). Furthermore, unlikely to substantially utilise ground resources of the Study area. | ✓ | | ✓ | |
| *Calidris acuminata* | Sharp-tailed sandpiper | Mi | SL | Fresh or salt wetlands – the muddy edges of wetlands and dams (Morcombe 2003). In Queensland, they are recorded in most regions, being widespread along much of the coast and are very sparsely scattered inland, particularly in central and south-western regions (DEE 2018). | **Potential**. Species or species habitat known to occur within the broader search area (DEE 2018). Potential habitat occurs within the Study area. Recorded from within 10 km of the Study area (DES 2018b; ALA 2018) (Figure 16). Not detected during field surveys. | ✓ | ✓ | | |

| Scientific name | Common name | Status | | Potential habitat | Likelihood of occurrence in the Study Area | Source | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | EPBC Act[1] | NC Act[2] | | | DEE 2018 | DES 2018b | Previous study | Field survey |
| *Calidris melanotos* | Pectoral sandpiper | Mi | SL | Usually coast wetlands, both fresh and saline, but also inland on permanent and temporary wetlands; utilises sites with mudflats, fringing vegetation, swamps with heavy overgrowth of vegetation (Morcombe 2003). | **Unlikely**. Species or species habitat may occur within the broader search area (DEE 2018). Potential habitat occurs within the Study area. However, no confirmed records from within 50 km of the Study area (DES 2018b). | ✓ | | | |
| *Calidris ferruginea* | Curlew sandpiper | Mi<br>C<br>E | SL | Occur on intertidal mudflats in sheltered coastal areas, such as estuaries, bays, inlets and lagoons, and also around non-tidal swamps, lakes and lagoons near the coast, and ponds in saltworks and sewage farms. They are also recorded inland, though less often, including around ephemeral and permanent lakes, dams, waterholes and bore drains, usually with bare edges of mud or sand. They occur in both fresh and brackish waters (DEE 2018). | **Unlikely**. Species or species habitat may occur within the broader search area (DEE 2018). Potential habitat occurs within the Study area. However, no confirmed records from within 50 km of the Study area (DES 2018b). | ✓ | | | |

| Scientific name | Common name | Status | | Potential habitat | Likelihood of occurrence in the Study Area | Source | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | EPBC Act[1] | NC Act[2] | | | DEE 2018 | DES 2018b | Previous study | Field survey |
| *Cuculus optatus* | Oriental cuckoo | Mi | SL | Rainforest margins, monsoon forest, vine scrubs, riverine thickets, wetter, densely canopied eucalypt forests, paperbark swamps and mangroves (Morcombe 2003). | **Unlikely**. Species or species habitat known to occur within the broader search area (DEE 2018). However, potential habitat has not been identified within the Study area. No confirmed records from within 50 km of the Study area (DES 2018b). | ✓ | | | |
| *Gallinago hardwickii* | Latham's snipe | Mi | SL | Low vegetation around wetlands in shallows, sedges, reeds, heath, salt marsh, irrigated crops (Morcombe 2003). A non-breeding visitor that will readily move between locations as conditions become more or less favourable (DEE 2018). | **Known**. Species or species habitat may occur within the broader search area (DEE 2018). Potential habitat occurs within the Study area. No previous confirmed records from within 50 km of the Study area (DES 2018b). However, recorded within the Study area during November 2016 field surveys. | ✓ | | ✓ | ✓ |
| *Gelochelidon nilotica* | Gull-billed tern | Mi | SL | An inland species, found in freshwater swamps, brackish and salt lakes, beaches and estuarine mudflats, floodwaters, sewage farms, irrigated croplands and grasslands (Birdlife Australia 2017). | **Unlikely**. Species habitat unlikely within the Study area, however, confirmed records within 50 km of the Study area (DES 2018b). | | ✓ | | |

| Scientific name | Common name | Status | | Potential habitat | Likelihood of occurrence in the Study Area | Source | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | EPBC Act[1] | NC Act[2] | | | DEE 2018 | DES 2018b | Previous study | Field survey |
| *Hirundapus caudacutus* | White-throated needletail | Mi | SL | Although they occur over most types of habitat, they are probably recorded most often above wooded areas, including open forest and rainforest, and may also fly between trees or in clearings, below the canopy, but they are less commonly recorded flying above woodland (DEE 2018). | **Unlikely**. Species habitat unlikely within the Study area, however, records from Saraji Mine (6 km to west) (SKM 2011). | | | ✓ | |
| *Hydroprogne caspia* | Caspian tern | Mi | SL | Mostly found in sheltered coastal embayments (harbours, lagoons, inlets, bays, estuaries and river deltas) and those with sandy or muddy margins are preferred. They also occur on near-coastal or inland terrestrial wetlands that are either fresh or saline, especially lakes (including ephemeral lakes), waterholes, reservoirs, rivers and creeks. They also use artificial wetlands, including reservoirs, sewage ponds and saltworks (DEtE 2018). | **Known**. Species detected in surveys for Saraji Mine (6 km east) (SKM 2011). Recorded within the Study area during November 2016 field surveys. | | | ✓ | ✓ |

| Scientific name | Common name | Status | | Potential habitat | Likelihood of occurrence in the Study Area | Source | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | EPBC Act[1] | NC Act[2] | | | DEE 2018 | DES 2018b | Previous study | Field survey |
| *Monarcha melanopsis* | Black-faced monarch | Mi | SL | Rainforests, mangroves, eucalypt forests and woodlands (Morcombe 2003). | **Potential**. Species or species habitat known to occur within the broader search area (DEE 2018). Potential habitat occurs within the search area. No previous records from within 10 km of the Study area, although confirmed records within 50 km of the Study area (DES 2018b). | ✓ | ✓ | | |
| *Motacilla flava* | Yellow wagtail | Mi | SL | Open habitats, often near water; in Queensland it is usually coastal (Morcombe 2003). | **Unlikely**. Species or species habitat may occur within the broader search area (DEE 2018). Study area is not coastal. No confirmed records from within 50 km of the Study area (DES 2018b). | ✓ | | | |
| *Myiagra cyanoleuca* | Satin flycatcher | Mi | SL | Forests and woodlands, mangroves, coastal heath scrubs; in breeding season favours dense, wet gullies of heavy eucalypt forests (Morcombe 2003). | **Known**. Species or species habitat may occur within broader search area (DEE 2018). Potential habitat occurs within the Study area. No previous records from within 50 km of the Study area (DES 2018b). However, recorded within the Study area during November 2016 field surveys. | ✓ | | | ✓ |
| *Numenius madagascariensis* | Eastern curlew | Mi<br>C<br>E | V | Tidal mudflats, sand spits of estuaries, mangroves, lake shores and ocean beaches (Morcombe 2003). | **Unlikely**. Species habitat may occur within the broader search area (DEE 2018), although unlikely within the Study area. No confirmed records within 50 km of the Study area (DES 2018b). | ✓ | | | |

| Scientific name | Common name | Status | | Potential habitat | Likelihood of occurrence in the Study Area | Source | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | EPBC Act[1] | NC Act[2] | | | DEE 2018 | DES 2018b | Previous study | Field survey |
| *Pandion cristatus* | Eastern osprey | Mi | SL | Eastern Ospreys occur in littoral and coastal habitats and terrestrial wetlands of tropical and temperate Australia and offshore islands. They are mostly found in coastal areas but occasionally travel inland along major rivers, particularly in northern Australia. They require extensive areas of open fresh, brackish or saline water for foraging (DEtE 2018). | **Unlikely**. Species habitat unlikely within the Study area, however, confirmed records within 50 km of the Study area (DES 2018b). | | ✓ | | |
| *Pandion haliaetus* | Osprey | Mi | SL | Coastal waters and estuaries, beaches, islets and reefs; also follows major rivers and wetlands far inland from the coast to large river pools (Morcombe 2003). | **Unlikely**. Species or species habitat likely to occur within the broader search area (DEE 2018). No records from within 10 km of the Study area, but confirmed records within 50 km of the Study area (DES 2018b). However, potential habitat unlikely to occur within the Study area. | ✓ | | | |

| Scientific name | Common name | Status | | Potential habitat | Likelihood of occurrence in the Study Area | Source | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | EPBC Act[1] | NC Act[2] | | | DEE 2018 | DES 2018b | Previous study | Field survey |
| *Plegadis falcinellus* | Glossy ibis | Mi | SL | Fresh water marshes at the edges of lakes and rivers, lagoons, flood-plains, wet meadows, swamps, reservoirs, sewage ponds, rice-fields and cultivated areas under irrigation. The species is occasionally found in coastal locations such as estuaries, deltas, saltmarshes and coastal lagoons (Morcombe 2003). | **Known**. Recorded within the Study area during November 2016 and April-May 2017 field surveys**.** | | | | ✓ |
| *Rhipidura rufifrons* | Rufous fantail | Mi | SL | In east and south-east Australia, the Rufous Fantail mainly inhabits wet sclerophyll forests. They are also recorded from parks and gardens when on passage. In north and north-east Australia, they often occur in tropical rainforest and monsoon rainforests, including semi-evergreen mesophyll vine forests, semi-deciduous vine thickets or thickets of Paperbarks (Melaleuca spp.) (DEtE 2018). | **Unlikely**. Species habitat unlikely within the Study area, however, confirmed records within 50 km of the Study area (DES 2018b). | ✓ | ✓ | | |

| Scientific name | Common name | Status | | Potential habitat | Likelihood of occurrence in the Study Area | Source | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | EPBC Act[1] | NC Act[2] | | | DEE 2018 | DES 2018b | Previous study | Field survey |
| *Symposiachrus trivirgatus* | Spectacled monarch | Mi | SL | The Spectacled Monarch prefers thick understorey in rainforests, wet gullies and waterside vegetation, as well as mangroves (Birdlife Australia 2017). | **Unlikely**. Species habitat unlikely within the Study area, however, confirmed records within 50 km of the Study area (DES 2018b). | | ✓ | | |
| *Tringa nebularia* | Common greenshank | Mi | SL | Diverse inland and coastal areas; away from the coast uses both permanent and temporary wetlands – billabongs, swamps, lakes, floodplains, flooded irrigated crops, sewage farms and saltworks ponds; prefers wet and flooded mud and clay rather than sand (Morcombe 2003). | **Potential**. Species or species habitat may occur within the broader search area (DEE 2018). Potential habitat occurs within the Study area. No records from within 10 km of the Study area, but confirmed records within 50 km of the Study area (DES 2018b). | ✓ | | | |
| *Tringa stagnatilis* | Marsh sandpiper | Mi | SL | Found on coastal and inland wetlands throughout Australia, including permanent or ephemeral wetlands of varying salinity, including swamps, lagoons, billabongs, saltpans, saltmarshes, estuaries, pools on inundated floodplains, and intertidal mudflats and also regularly at sewage farms and saltworks (DEE 2018). | **Unlikely**. Species habitat unlikely within the Study area, however, confirmed records within 50 km of the Study area (DES 2018b). | | ✓ | | |

Notes:

[1] Conservation status under the EPBC Act. Mi = Migratory E = Endangered, V = Vulnerable

[2] Conservation status under the NC Act. SL = Special Least Concern.

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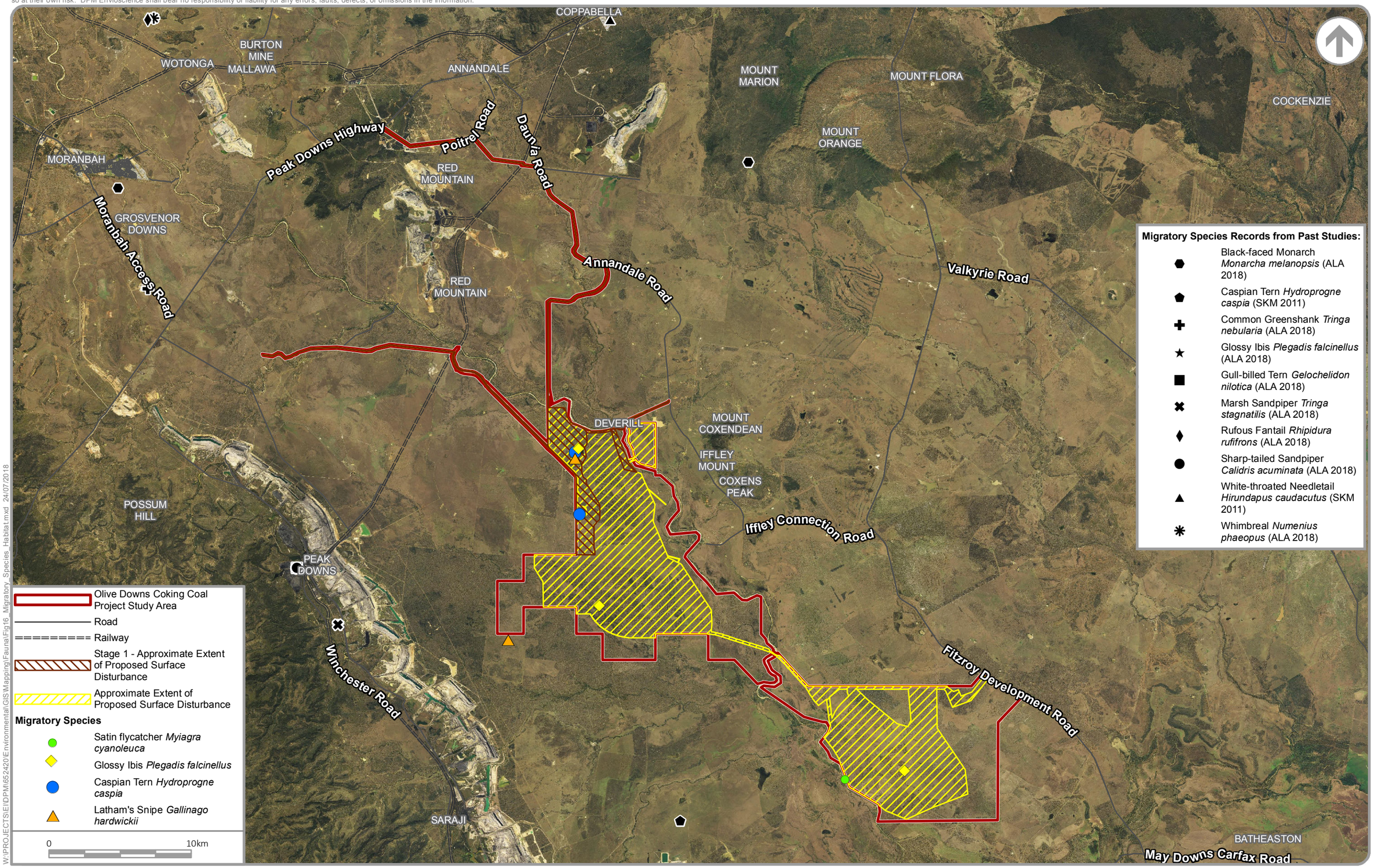


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DPM ENVIROSCIENCES

# MIGRATORY SPECIES RECORDS

Olive Downs Coking Coal Project – Terrestrial Fauna Assessment

**FIGURE 16**

### 5.3.4 Special Least Concern species

Special Least Concern (SLC) species are protected under the NC Act for their cultural significance or their listing under international migratory bird agreements, and include:

- echidna (*Tachyglossus aculeatus*);
- platypus (*Ornithorhynchus anatinus*); and
- migratory bird species listed under the:
  - Japan Australia Migratory Bird Agreement (JAMBA);
  - China Australia Migratory Bird Agreement (CAMBA); and the
  - Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention).

Echidna scats were recorded within brigalow (*Acacia harpophylla*) woodland at site Q28 and within poplar box (*Eucalyptus populnea*) woodland at site Q99 (Appendix B) in November 2016. Echidnas are expected to inhabit many patches of remnant vegetation within the Study area.

Platypus occur in the broader Fitzroy River catchment, with the nearest mapped record approximately 47 km west of the Study area on the Connors River (ALA 2018). Platypus inhabit freshwater streams, ranging from alpine creeks to tropical lowland rivers, as well as lakes, shallow reservoirs and farm dams; preferring areas with steep vegetated banks with clay or loam substrates in which to burrow (Menkhorst and Knight 2004). The Aquatic Ecology Assessment determined that the platypus is unlikely to occur within the Study area, owing to the relative lack of permanent water, the disturbed nature of palustrine and lacustrine wetlands, and lack of suitable breeding habitat (DPM Envirosciences 2018b).

The Study area provides known, likely and potential habitat for a number of migratory bird species, including four species recorded from the Study area during the field surveys (Section 5.3.2).

### 5.3.5 Priority species

The Fitzroy Natural Resource Management Region Back on Track Actions for Biodiversity (DERM 2010) recognises 45 fauna species that are considered to be of Medium, High, or Critical priority for conservation. Only one of these species was recorded from the Study area during the spring 2016 and autumn 2017 surveys, being the ornamental snake (*Denisonia maculata*) – ranked as High (by the Fitzroy Basin Association) and Medium (by the DERM) Priority species for conservation. The ornamental snake is also an EVNT species (Section 5.3.1).

## 5.4 Introduced species

Seven introduced fauna species were recorded from the Study area. Introduced species that have been identified as Restricted Matters are listed in Schedule 2 of the Queensland *Biosecurity Act 2014*. This refers to biosecurity matters that are currently found in Queensland and that are known to have a significant impact on human health, social amenity, the economy or the environment. Introduced species recorded in the Study area include:

- cane toad (*Rhinella marina*);
- cat (*Felis catus*) – Restricted matter categories 3, 4 and 6;
- dog (*Canis lupus familiaris*) – Restricted matter categories 3, 4 and 6;
- hare (*Lepus europaeus*);
- European rabbit (*Oryctolagus cuniculus*) – Restricted matter categories 3, 4, 5 and 6
- house mouse (*Mus musculus*); and

- feral pig (*Sus scrofa*) – Restricted matter categories 3, 4 and 6.

Cane toads were encountered throughout the Study area. Pig diggings were encountered commonly throughout the Study area, as well as direct sightings of bores, sows and their young on numerous occasions throughout the spring 2016 and autumn and spring 2017 surveys.

## 5.5 Matters of National Environmental Significance

**Threatened species**

Five threatened species listed under the EPBC Act were recorded within the Study area, namely (Figure 10):

- ornamental snake (*Denisonia maculata*) – Vulnerable;
- Australian painted snipe (*Rostratula australis*) – Endangered;
- squatter pigeon (southern) (*Geophaps scripta scripta*) – Vulnerable;
- koala (*Phascolarctos cinereus*) – Vulnerable; and
- greater glider (*Petauroides volans*) – Vulnerable.

Details of these recordings and the potential habitat within the Study area for these species is detailed in Section 5.3.1.

**Migratory species**

Four species, listed as 'Migratory' under the EPBC Act were recorded from the Study area during fauna surveys by DPM Envirosciences in November 2016 (Figure 16):

- satin flycatcher (*Myiagra cyanoleuca*);
- Latham's snipe (*Gallinago hardwickii*);
- Caspian tern (*Hydroprogne caspia*); and
- glossy ibis (*Plegadis falcinellus*).

## 5.6 Matters of State Environmental Significance

The environmental offsets framework in Queensland includes the *Environmental Offsets Act 2014* (EO Act), the *Environmental Offsets Regulation 2014* (EO Regulation) and the *Queensland Environmental Offsets Policy* (EO Policy). MSES are defined in the EO Regulation and are a component of the biodiversity state interest identified in the *Queensland State Planning Policy* (DILGP 2017).

A number of Matters of State Environmental Significance (MSES) were identified during the desktop review as occurring within the Study area (DES 2018b). MSES of relevance to this assessment comprise Protected Wildlife Habitat and Connectivity areas. Protected Wildlife Habitat is shown in Figure 11 to 15. Connectivity areas, based on the field-verified REs (Terrestrial Flora Assessment, DPM Envirosciences 2018a) are shown in Figure 17.

There are no areas mapped as 'Wildlife Habitat' MSES (i.e. State mapped Essential Habitat) within the Study area (DNRM 2017).

MSES (relevant to terrestrial fauna) affected by the infrastructure corridors and mining area are presented in Table 9.

**Table 9 MSES located in the Study area**

| Prescribed Environmental Matter | Present in the Study area | Detail |
|---|---|---|
| Regulated vegetation | Yes | Refer to DPM Envirosciences (2018a) |
| Connectivity areas | Yes | The outcomes of the Landscape Fragmentation and Connectivity (LFC v1.5) tool have determined that the Project will have a significant impact on connectivity. |
| Wetlands and watercourses | Yes | Refer to DPM Envirosciences (2018b) |
| Protected Wildlife Habitat | Yes | A number of protected wildlife were recorded during the surveys (or previous surveys) within the Study area, with habitat located on site, including:<br>▪ Ornamental Snake (Figure 15);<br>▪ Common Death Adder;<br>▪ Australian Painted Snipe (Figure 12);<br>▪ Squatter Pigeon (southern) (Figure 11);<br>▪ Koala (Figure 13);<br>▪ Echidna; and<br>▪ Greater Glider (Figure 14). |
| Koala Habitat in South-East Queensland | No | The Study area is not located in South-east Queensland |
| Protected Areas | No | The Study area does not contain protected areas. |
| Fish Habitat Areas and Highly Protected Zones of State Marine Parks | No | The Study area is not located in a State Marine Park. |
| Waterway providing for fish passage | Yes | Refer to DPM Envirosciences (2018b). |

| Prescribed Environmental Matter | Present in the Study area | Detail |
|---|---|---|
| Marine Plants | No | The Study area is not located in a marine environment. |
| Secured Offset Area | No | The Study area does not contain legally secured offset areas. |

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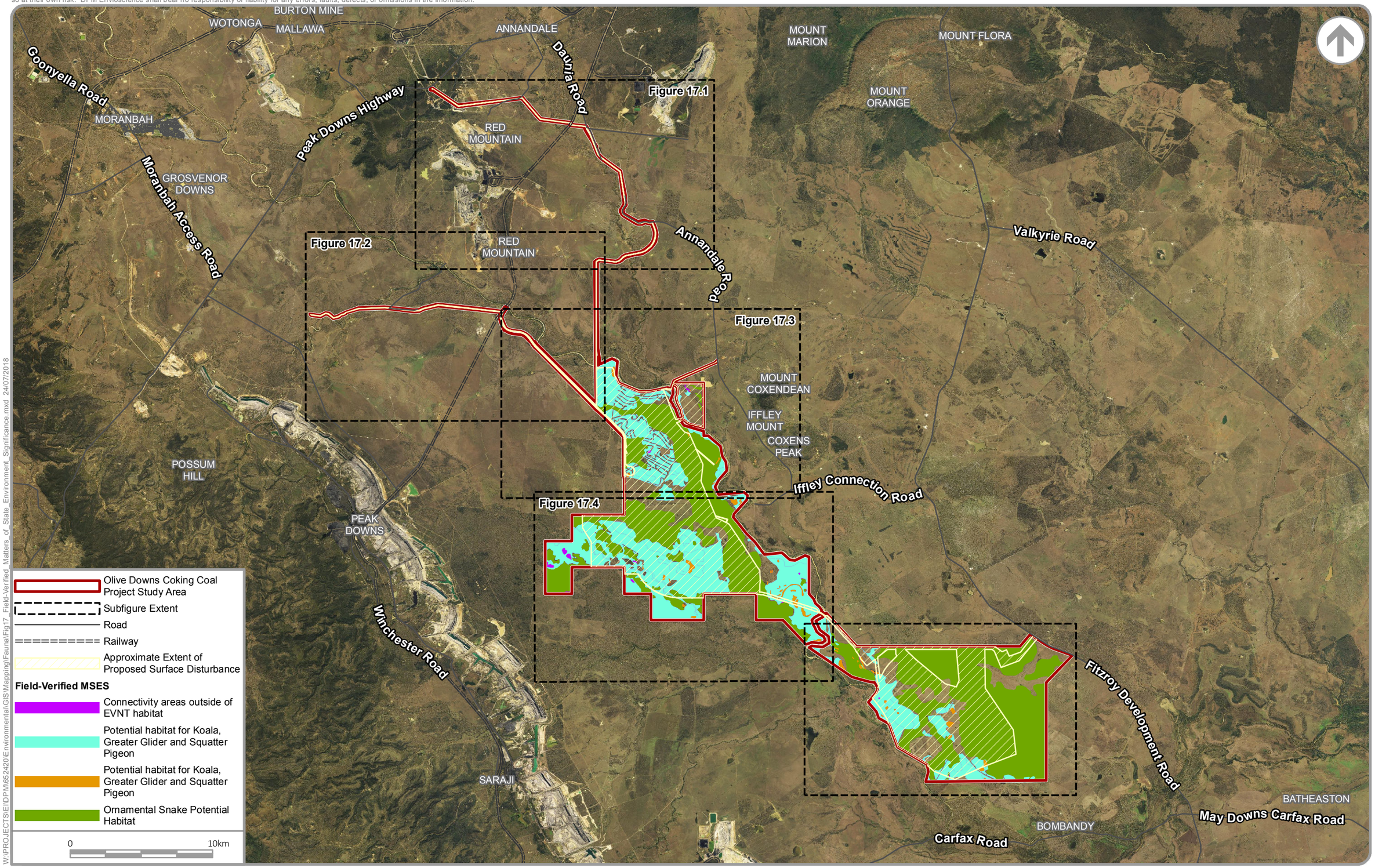


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DPM ENVIROSCIENCES

# FIELD-VERIFIED MATTERS OF STATE ENVIRONMENTAL SIGNIFICANCE MAP

Olive Downs Coking Coal Project – Terrestrial Fauna Assessment

**FIGURE 17**

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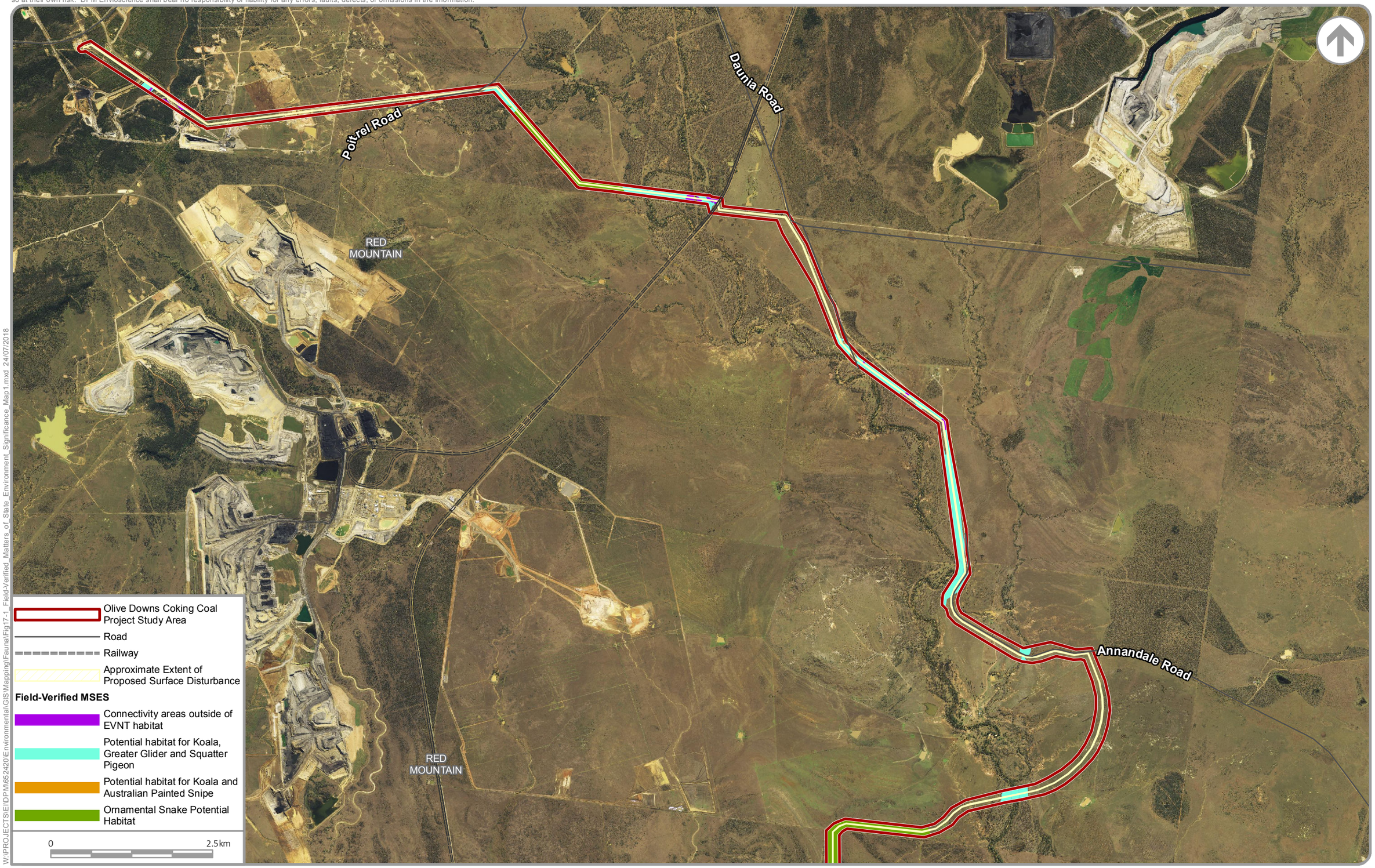


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DPM ENVIROSCIENCES

# FIELD-VERIFIED MATTERS OF STATE ENVIRONMENTAL SIGNIFICANCE – MAP 1

Olive Downs Coking Coal Project – Terrestrial Fauna Assessment

**FIGURE 17-1**

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DPM ENVIROSCIENCES

# FIELD-VERIFIED MATTERS OF STATE ENVIRONMENTAL SIGNIFICANCE – MAP 2

Olive Downs Coking Coal Project – Terrestrial Fauna Assessment

**FIGURE 17-2**

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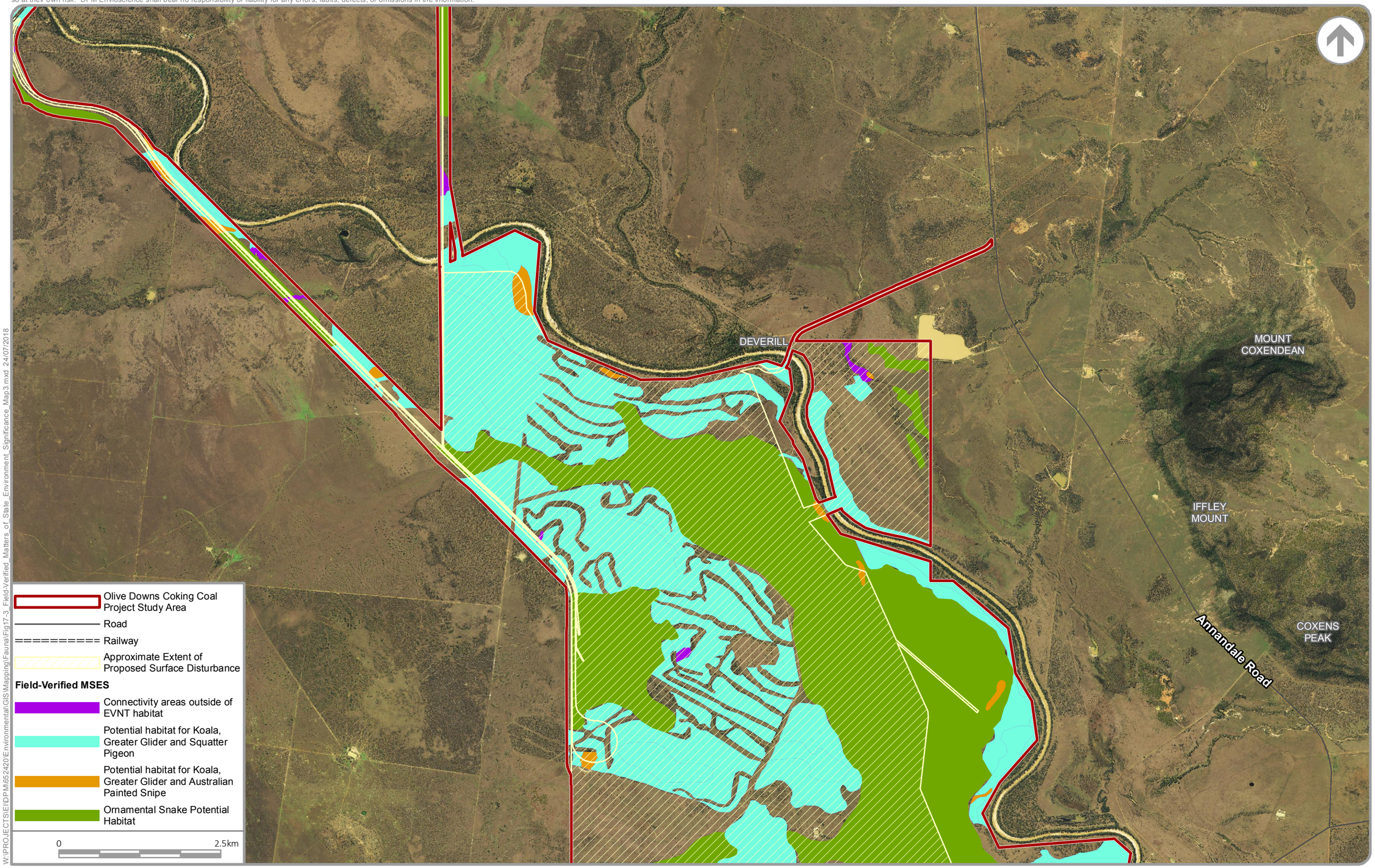


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DPM ENVIROSCIENCES

# FIELD-VERIFIED MATTERS OF STATE ENVIRONMENTAL SIGNIFICANCE – MAP 3

Olive Downs Coking Coal Project – Terrestrial Fauna Assessment

**FIGURE 17-3**

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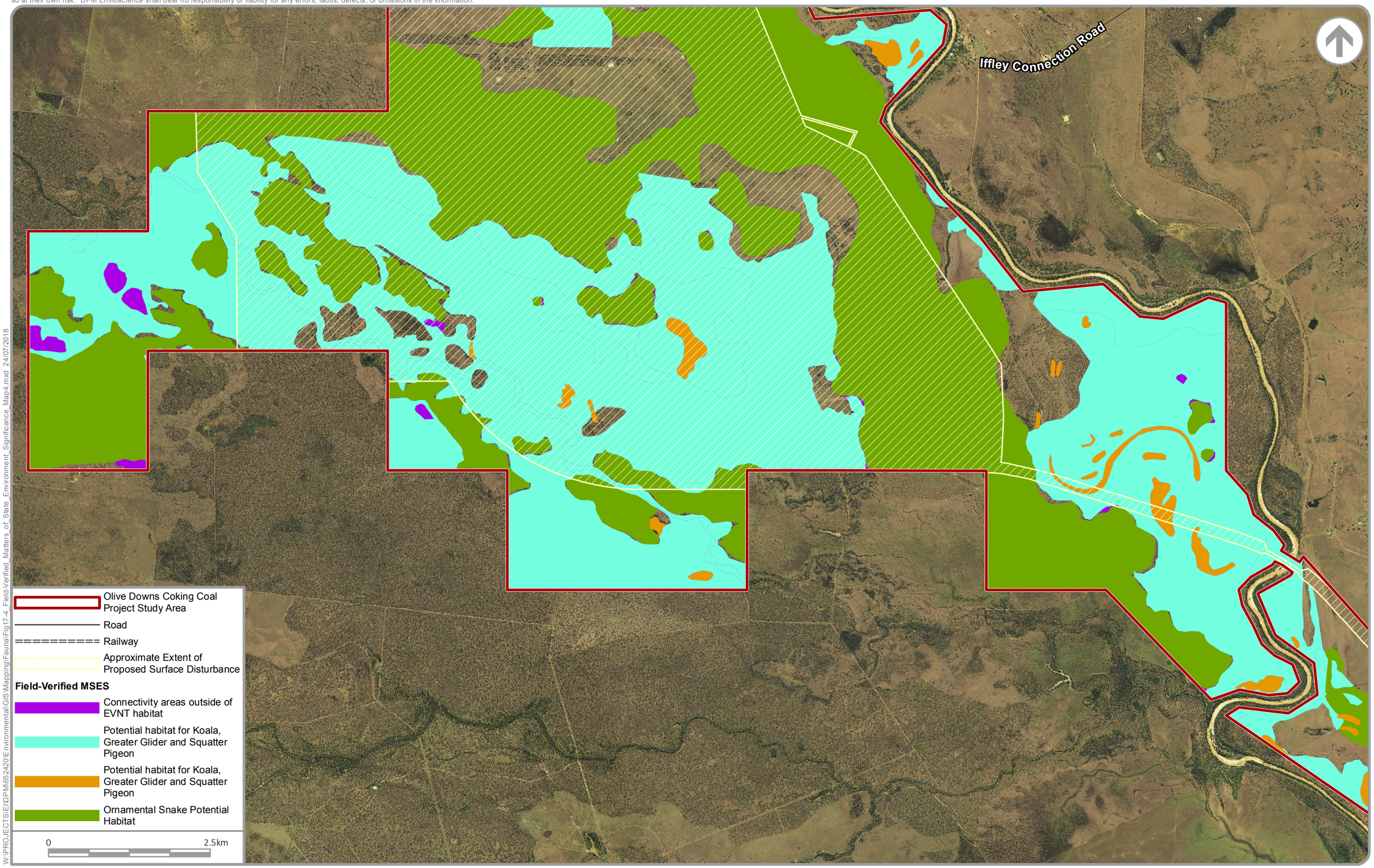


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DPM ENVIROSCIENCES

# FIELD-VERIFIED MATTERS OF STATE ENVIRONMENTAL SIGNIFICANCE – MAP 4

Olive Downs Coking Coal Project – Terrestrial Fauna Assessment

**FIGURE 17-4**

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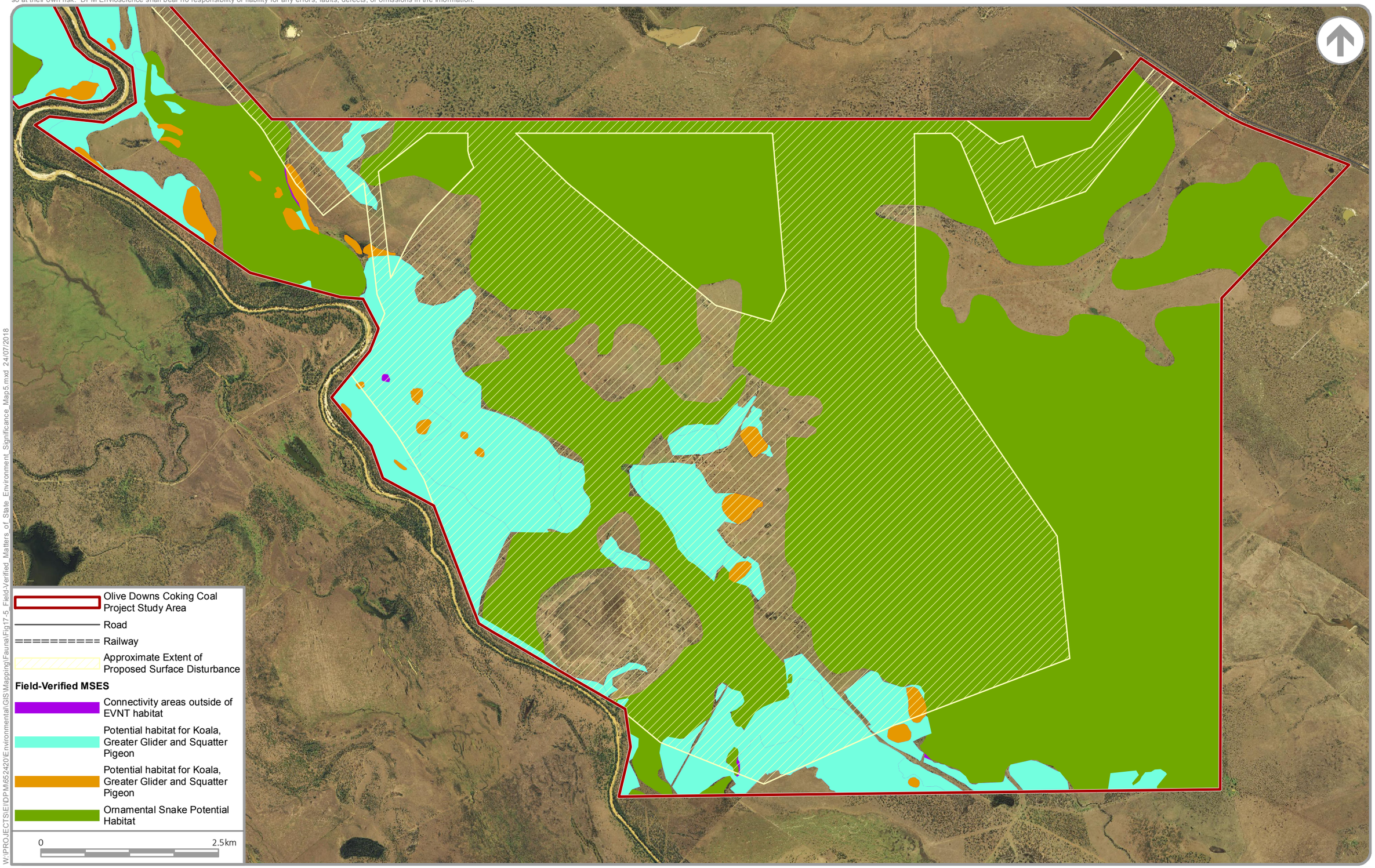


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DPM ENVIROSCIENCES

# FIELD-VERIFIED MATTERS OF STATE ENVIRONMENTAL SIGNIFICANCE – MAP 5

Olive Downs Coking Coal Project – Terrestrial Fauna Assessment

**FIGURE 17-5**

# 6 POTENTIAL IMPACTS

## 6.1 Fauna habitat clearance

### 6.1.1 General description

The Project area covers approximately 16,300 ha. Of this, about 5,661.5 ha is remnant vegetation, while approximately 65% (approximately 10,638.5 ha) of the Project area comprises non-remnant modified grassland and regrowth.

The habitat type most affected by the Project would be Eucalypt dry woodlands on inland depositional plains, with approximately 4,805 ha proposed to be cleared. The approximate areas of impact for the four components of the Project are:

- Mine site and access roads – 5,573 ha remnant vegetation;
- Water pipeline (20 m corridor) – 30.5 ha remnant vegetation;
- ETL (10 m corridor) – 14.0 ha remnant vegetation; and
- Rail spur (45m corridor) – 44.0 ha remnant vegetation.

It is apparent that the Project would have an impact on various habitat types present in the Project area, particularly in areas where remnant vegetation is prevalent along the Isaac River. The Project would result in clearing of approximately 5,661.5 ha of remnant vegetation in total.

**Staged Clearance**

Land clearing is proposed to occur in the following four stages:

- Stage 1- 2019-2024;
- Stage 2 – 2025-2030;
- Stage 3 – 2031-2050; and
- Stage 4 –2051- end of mine.

Stage 1 of the Project would include the following works (Figure 18):

- construction of each of the infrastructure corridors:
  - rail corridor;
  - ETL;
  - water pipeline;
  - Olive Downs South access road;
- construction of the mine infrastructure area (including offices, workshops, CHPP, ROM pad, ILF cells);
- development of the north-western waste emplacement;
- construction of temporary flood levees located within the Stage 1 boundary; and
- commencement of open cut mining in Pit 1.

The subsequent stages include (Figure 18):

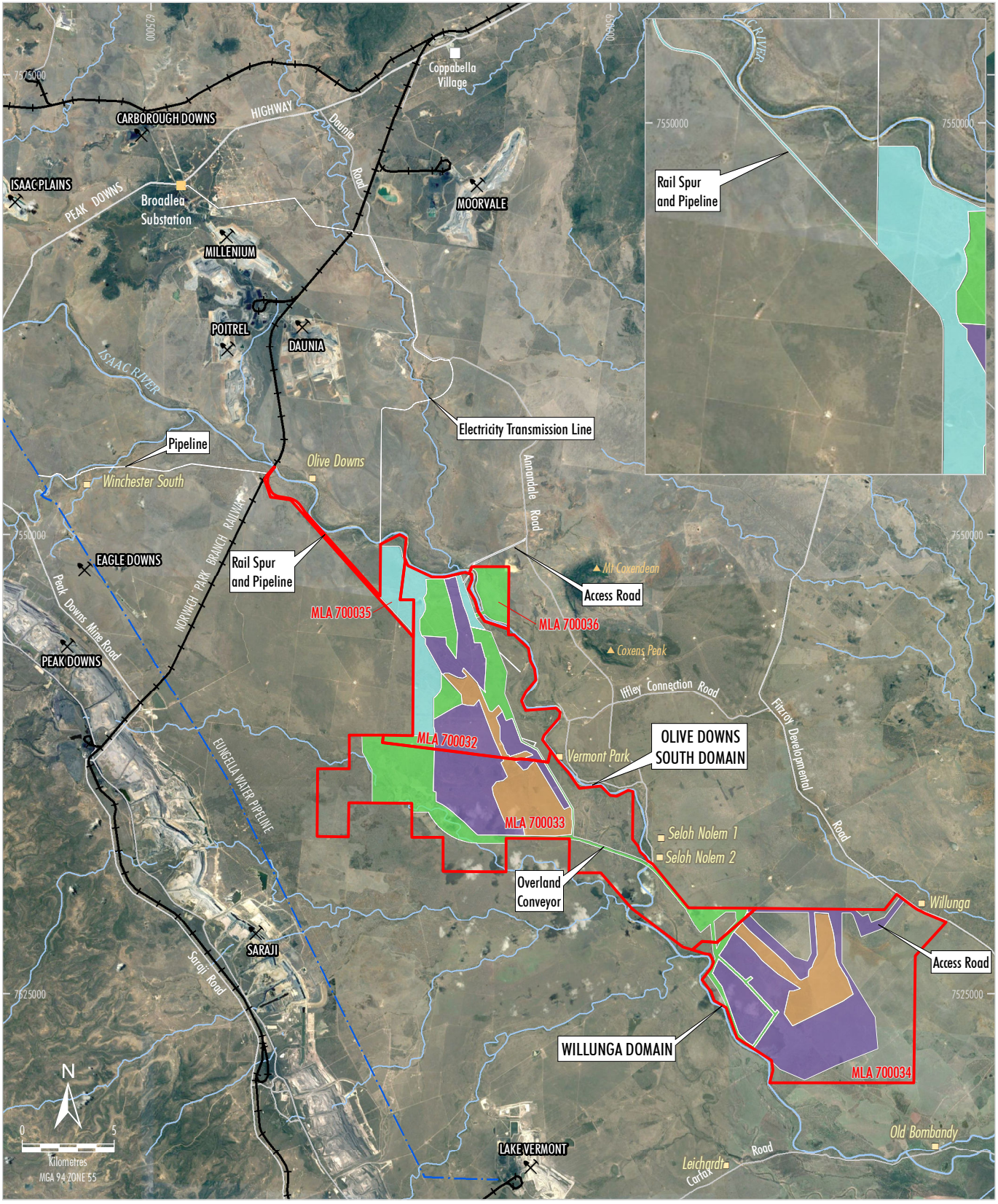
- Stage 2 – all works proposed during the Willunga domain construction period;
- Stage 3 – all works proposed up until year 2050; and
- Stage 4 – all works required until completion of the Project.

Table 10 outlines the clearing of each habitat type located within the Project area.

**Table 10 Proposed clearing of each habitat type within the Project area**

| Habitat Type | Stage 1 impact (ha) | Stage 2 impact (ha) | Stage 3 impact (ha) | Stage 4 impact (ha) | Total Impact area (ha) |
|---|---|---|---|---|---|
| **Mine Site and Access Road (EPBC 2017/7867)** | | | | | |
| Agricultural grasslands dominated by buffel grass (*Cenchrus ciliaris*) | 814.0 | 2473 | 5140 | 2087 | 10,514 |
| Eucalypt dry woodlands on inland depositional plains | 724.5 | 1557 | 1810 | 640 | 4,731.5 |
| Eucalypt open forests to woodlands on floodplains | 4.5 | 181 | 401 | 69 | 655.5 |
| Acacia dominated open forests, woodlands and shrublands | 1.0 | 10 | 27 | 35 | 73.0 |
| Palustrine wetlands (swamps) | 14.0 | 14.5 | 50.5 | 24.5 | 103.5 |
| Lacustrine wetlands (dams) | 0 | 9.5 | 0 | 0 | 9.5 |
| **Water Pipeline (EPBC 2017/7868)** | | | | | |
| Agricultural grasslands dominated by buffel grass (*Cenchrus ciliaris*) | 26.5 | 0 | 0 | 0 | 26.5 |
| Eucalypt dry woodlands on inland depositional plains | 25.5 | 0 | 0 | 0 | 25.5 |
| Eucalypt open forests to woodlands on floodplains | 2.0 | 0 | 0 | 0 | 2.0 |
| Acacia dominated open forests, woodlands and shrublands | 2.0 | 0 | 0 | 0 | 2.0 |
| Palustrine wetlands (swamps) | 1.0 | 0 | 0 | 0 | 1.0 |

| Habitat Type | Stage 1 impact (ha) | Stage 2 impact (ha) | Stage 3 impact (ha) | Stage 4 impact (ha) | Total Impact area (ha) |
|---|---|---|---|---|---|
| **Electricity Transmission Line (EPBC 2017/7869)** | | | | | |
| Agricultural grasslands dominated by buffel grass (*Cenchrus ciliaris*) | 28.0 | 0 | 0 | 0 | 28.0 |
| Eucalypt dry woodlands on inland depositional plains | 11.0 | 0 | 0 | 0 | 11.0 |
| Eucalypt open forests to woodlands on floodplains | 1.0 | 0 | 0 | 0 | 1.0 |
| Acacia dominated open forests, woodlands and shrublands | 2.0 | 0 | 0 | 0 | 2.0 |
| **Rail Spur (EPBC 2017/7870)** | | | | | |
| Agricultural grasslands dominated by buffel grass (*Cenchrus ciliaris*) | 59.5 | 0 | 0 | 0 | 59.5 |
| Eucalypt dry woodlands on inland depositional plains | 37.0 | 0 | 0 | 0 | 37.0 |
| Acacia dominated open forests, woodlands and shrublands | 1.0 | 0 | 0 | 0 | 1.0 |
| Palustrine wetlands (swamps) | 6.0 | 0 | 0 | 0 | 6.0 |




PRN-16-02_EIS_App Fauna4_201B

LEGEND

- Mining Lease Application Boundary
- Approved/Operating Coal Mine
- Dwelling
- Eungella Pipeline Network
- Railway

Indicative Mine Stage

- Stage 1
- Stage 2
- Stage 3
- Stage 4

*Source: Pembroke (2018); Department of Natural Resources and Mines (2018); Orthophotography; Google Image (2016)*

PEMBROKE

OLIVE DOWNS COKING COAL PROJECT

**Indicative Mine Stages for Biodiversity Offset**

**Figure 18**

## 6.2 Fauna mortality

### 6.2.1 Clearance activities

Fauna present in the areas proposed to be cleared would be at risk of injury or fatality during clearance activities.

A staged and controlled land clearance method would be adopted for the Project. Land clearance would occur progressively over the life of the mine and only in areas required for mining activities within the following year.

The habitat to be cleared would be subject to targeted pre-clearance surveys for native fauna and their habitats. Fauna or habitat features identified during the pre-clearance surveys would be managed to minimise injury to resident fauna during clearance activities.

The removal of habitat would also result in displacement of mobile species (such as birds and mammals) to similar habitats in the surrounding area. All of the fauna habitats mapped in the Project area occur more extensively within the surrounding landscape. However, many habitats are highly fragmented and located on agricultural land so their capacity to accommodate displaced fauna is likely to vary.

While some individual fauna may perish and some may be confined to sink habitats where they would be unlikely to breed, the fauna species in the Project area already exist in a highly fragmented landscape and appear to be prevalent outside of the Project area.

### 6.2.2 Vehicle strike

Road and rail haulage also has the potential to result in fauna mortality through vehicle or rail strike. Road mortality has been implicated in the decline of wildlife populations, including species of conservation significance (Taylor and Goldingay 2004; Rowden, Steinhardt and Sheehan 2008) though there is little research that has investigated fauna mortality related to the operation of railways (Bennett 1991).

Koalas and gliders are known to be particularly susceptible to vehicle strike when attempting to cross road corridors whilst migrating between areas of habitat (DEHP 2012b).

The Project rail corridor has been located through areas of relatively low habitat value, i.e. primarily agricultural grasslands and regrowth vegetation. The frequency of services, the speed of the trains (< 70 km/hr) and rail embankment height indicates that the likelihood of incidents of fauna strike is low.

Similarly, the access road for the Project is located through areas of relatively low habitat value and, for the vast majority, makes use of existing roads and previously cleared lands. Given this, the additional use of the road for the Project likely poses minimum additional risk to fauna.

There are two locations, however, where access roads would cross the Isaac River and associated riparian woodlands, which serves as a movement corridor and refuge habitat for native fauna. To minimise the risk of fauna vehicle strike in these areas, an on-site speed limit would be applied.

## 6.3 Exotic fauna

The field surveys have recorded the presence of a variety of exotic fauna, including species identified as restricted matters under the Queensland *Biosecurity Act 2014*, namely:

- cane toad (*Rhinella marina*);

- cat (*Felis catus*) – Restricted matter categories 3, 4 and 6;
- dog (*Canis lupus familiaris*) – Restricted matter categories 3, 4 and 6;
- hare (*Lepus europaeus*);
- European rabbit (*Oryctolagus cuniculus*) – Restricted matter categories 3, 4, 5 and 6
- house mouse (*Mus musculus*); and
- feral pig (*Sus scrofa*) – Restricted matter categories 3, 4 and 6.

Most feral species are assumed to have resident populations in in the Study area and surrounds, though their abundance is likely to vary with the seasons. Feral animals threaten populations of native wildlife in two main ways: direct predation (for example by foxes, cats and dogs); or competition for limited resources (rabbits, rodents, cane toads and pigs). As most of the Study area contains patchy remnant vegetation surrounded by agricultural uses, feral and pest animals already have access to (and have been recorded within) most habitat areas.

Activities associated with the Project may provide increased refuge and scavenging resources (e.g. discarded food scraps) for introduced fauna species. Feral animals would be discouraged within the Project area by maintaining a clean, rubbish-free environment, and appropriately qualified persons would be engaged to undertake pest animal monitoring within the Project area. Feral animal control strategies (e.g. baiting, trapping) would be implemented by Pembroke in accordance with relevant standards to maintain low abundance of declared animals. The following threat abatement plans would be relevant:

- *Threat Abatement Plan for Competition and Land Degradation by Rabbits* (DEE 2016).
- *Threat Abatement Plan for Predation by Feral Cats* (DotE 2015).
- *Threat Abatement Plan for Predation, Habitat Degradation, Competition and Disease Transmission by Feral Pigs (Sus scrofa)* (DEE 2017b).
- *Threat Abatement Plan for the Biological Effects, Including Lethal Toxic Ingestion, Caused by Cane Toads* (DSEWPC 2015).

## 6.4 Hydrological changes

### 6.4.1 Surface water quality

The surface water assessment (supported by site water balance modelling) by Hatch (2018) concludes that:

- No uncontrolled spills of mine-affected water from the worked water dams are predicted under normal operating conditions.
- Some overflow of water from sediment dams (designed in accordance with the Best Practice Erosion and Sediment Control guideline [Institute for Environmental Monitoring and Research 2008]) may occur during wet periods; however, it is unlikely that this would have a measurable impact on receiving water quality.
- There is a predicted negligible impact on the downstream water quality through releases from the Project.

Based on the implementation of management strategies (e.g. erosion and sediment controls and land contamination controls), the risks of elevated dissolved solids and other contaminants impacting downstream waters is considered to be low (Hatch 2018).

Based on the analysis undertaken by Hatch (2018), no measurable impacts on surface water quality are likely to occur from changes in surface water. If no measurable impacts on surface water quality are likely to occur, no adverse impacts are likely to occur on surrounding habitats.

Further to this, elevated landforms (i.e. waste rock emplacements) would be progressively rehabilitated (e.g. by establishment of a protective vegetation cover [i.e. cover crop], construction of graded banks, rock-lined waterways, and/or diversion banks) which would minimise potential for sediment transport downstream of the Project.

Surface runoff from the waste rock emplacements would be directed to dedicated sediment dams.

Sediment dams would be retained until the revegetated surface of the waste rock emplacements are stable and runoff water quality reflects runoff water quality from similar un-mined areas, at which time these controls would be removed and the areas would be free-draining.

Given the above, the final landform is unlikely to lead to an increase in sediment transport downstream of the Project that would result in adverse impacts on terrestrial fauna or their habitat.

### 6.4.2 Surface water quantity

During active mining operations, the mine water management system would capture runoff from areas that would have previously flowed to the receiving waters. The maximum mine affected catchment areas represent (Hatch 2018):

- approximately 13% of the Ripstone Creek catchment to its confluence with the Isaac River; and
- less than 1% of the Isaac River at a location downstream of the Project.

The changed topography as a result of the Project final landform would have the following impacts on catchment areas (Hatch 2018):

- The catchment draining to Ripstone Creek would reduce by around 19 $km^2$ (compared to pre-mining conditions), a decrease of less than 7%.
- The catchment draining to the Isaac River would reduce by around 49 $km^2$ (compared to pre-mining conditions), a decrease of less than 1%.

Based on the analysis undertaken by Hatch (2018), no measurable impacts on surface water quantity are likely to occur regardless of changes in captured catchment areas. If no measurable impacts on surface water quantity are likely to occur, no adverse impacts are likely to occur on surrounding habitats.

## 6.5 Connectivity

Habitat fragmentation is a reduction in the continuity of a habitat through disturbance or loss. It often results in the creation of many smaller habitat patches (with varying degrees of connectivity) in a previously large and continuous remnant. The survival of species in a fragmented landscape depends, in part, on their ability to disperse. Discontinuity of habitat areas may present barriers that can impede or even prevent movement or dispersal between habitats.

In the Project area the Isaac River and North Creek (a major tributary) and associated floodplain vegetation connects areas of habitat north (Burton Range and Lake Elphinstone) to north-west (Harrow Range) of the Project area to the south-east (around Junnee National Park and State Forest). Field surveys indicate many records of native fauna potentially moving through this area, including the greater glider and koala (EVNT species). The Project would retain the vast majority of the Isaac River corridor to allow continued fauna movement, with only three locations where Project infrastructure would cross the river. This includes the access road / haul road in the north-eastern extent of the Olive Downs South domain and the conveyor/road crossing between the two mining domains.

Connectivity in the landscape is considered a Matter of State Environmental Significance (MSES) and is measured by the Landscape Fragmentation and Connectivity (LFC v1.5) tool designed by

DES (2018). In deciding if an offset is required for connectivity areas, the significance of the ecosystem tract in the context of the local and the regional landscape is considered. A development impact on connectivity areas is determined to be significant if either of the following tests are true:

1. The change in the core remnant ecosystem extent at the local scale (post impact) is greater than a threshold determined by the level of fragmentation at the regional scale; or
2. Any core area that is greater than or equal to 1 ha is lost or reduced to patch fragments (core to non-core).

The outcomes of the Landscape Fragmentation and Connectivity (LFC v1.5) tool conclude that the Project would have a significant impact on connectivity.

## 6.6 Noise

The effects of noise and vibration on fauna are widely studied. In a review of scientific literature by Dawe and Goosem (2008), the effects of traffic noise was grouped into two categories:

- physiological impacts such as ear trauma and raised hormone levels; and
- behavioural responses such as elevated stress levels, acoustic adjustment and road avoidance.

While this is not a direct comparison to construction noise or mine-related noise, it is considered sufficiently close to gain an understanding of some of the potential impacts on wildlife in natural areas surrounding the Project area.

The construction and operation of the mine would cause ongoing and localised increases in noise and vibration disturbance in habitats directly adjacent to the Project. The extent of this impact would depend on the distance between the Project and the adjacent habitat, the level of noise emanating from the Project, the type of habitat (dense forest is more resilient) and the hours of operation. Nocturnal animals would be more susceptible to this disturbance, due to their sensitivity to noise.

Any potential noise-related impact on fauna residing in surrounding habitat would likely be localised and minor, given fauna often readily habituate to continuous noise and sudden noises from blasting would only occur in intervals. This has been evidenced through sightings of fauna using habitat adjacent to active mining areas in the wider locality (Figure 10).

## 6.7 Artificial lighting

Impacts to fauna associated with artificial lighting are expected to include avoidance of lit areas and disturbance to activity levels (particularly for birds and amphibians). Some species may be attracted to lit areas. For example, insectivorous bats may be attracted to swarming insects that congregate around lit areas at night.

The Project would result in an increase in the use of artificial lighting within the Project locality. Despite this, the incremental impact of this additional night-lighting is expected to be minor given the lights would be operated in accordance with the relevant Australian Standards.

## 6.8 Cumulative impacts

The Isaac Region is founded on mining, grain production and beef grazing. The land use in the Study area and surrounds is reflective of this. The Study area is made up of some patches of remnant vegetation and grazing land, utilised for cattle grazing. It is immediately south of the

approved (yet not constructed) Olive Downs North Mine and within 6 km of an existing mine to the east (Peak Downs and Saraji Mine) and there are many more mines within a 30 km radius of the site to the north and west, including Moorvale, Daunia, Poitrel, Millennium, Eagle Downs and Lake Vermont (Figure 4). There are 25 operating coal mines in the region.

The cumulative effect of these mines and beef grazing is already evident in the landscape; with small, fragmented patches of remnant vegetation and large tracts of cleared land in the Isaac River floodplain from Moranbah to Dysart and Rockhampton. The clearing for the Project proposed within the Project area would remove a further 5,661.5 ha of remnant vegetation and would create further fragmentation in the landscape. The native vegetation communities fauna habitats to be cleared during the life of the Project all occur more widely in surrounding landscapes and subregions (Accad et al*.,* 2017), with clearance associated with the Project representing approximately 0.42% of the remaining remnant vegetation in the Northern Bowen Basin and Isaac-Comet Downs biodiversity sub-regions.

The Project would result in the diversion of the Ripstone Creek linkage and surrounding woodland habitat, however, the Project has prioritised avoidance of the Isaac River riparian habitat. It is recognised that the Project alone is unlikely to have a significant adverse impact on wildlife movement and distribution of conservation significant species in the localilty, but in combination with existing and planned development in the sub-region, the risk of a significant impact is increased.

The proposed offset area would provide a beneficial conservation outcome for regulated vegetetaion as demonstrated by preliminary surveys and its continued regeneration will help offset biodiversity losses from the Project. In addition, the progressive rehabilitation of mining areas over the life of the Project would provide habitat in the medium to long term.

## 6.9 Impacts on Matters of National Environmental Significance (MNES)

An assessment of potential impacts to each fauna species recorded (or considered to have potential to occur) within the Project area was conducted in accordance with the *Matters of National Significance Significant Impact Guidelines 1.1, Environment Protection and Biodiversity Act 1999* (DotE 2013), draft *Referral Guidelines for the nationally listed Brigalow Belt Reptiles* (DSEWPC 2011c) and the *EPBC Act Referral Guidelines for the Vulnerable Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory* (DotE 2014) and is presented in Appendix D.

A summary of the results of the Significant Impact Assessments is shown in Table 11.

The significant impact analyses indicated that the ornamental snake, Australian painted snipe, squatter pigeon, koala and greater glider may be subject to significant impacts as a result of the Project.

Further, although the Water Pipeline (EPBC 2017/7868), Electricity Transmission Line (EPBC 2017/7869) and Rail Spur and Loop (EPBC 2017/7870) may not result in significant impacts to each of these MNES on their own, the potential impacts of the Project as a whole would be mitigated and offset (Section 8).

### 6.9.1 Mine site and access road action area (EPBC 2017/7867)

The following areas would be cleared within the mine site and access road as part of the Project:

- 5,500 ha of koala potential habitat;

- 5,500 ha of greater glider potential habitat;
- 7,621.5 ha of ornamental snake potential habitat;
- 5,387 ha of squatter pigeon (southern) potential habitat; and
- 113.0 ha of Australian painted snipe potential habitat.

### 6.9.2 Water pipeline action area (EPBC 2017/7868)

The following areas would be cleared within the water pipeline corridor (which is part of Stage 1) as part of the Project:

- 28.5 ha of koala potential habitat;
- 28.5 ha of greater glider potential habitat;
- 7 ha of ornamental snake potential habitat;
- 27.5 ha of squatter pigeon (southern) potential habitat; and
- 1.0 ha of Australian painted snipe potential habitat.

### 6.9.3 Electricity transmission line action area (EPBC 2017/7869)

The following areas would be cleared within the ETL corridor (which is part of Stage 1) as part of the Project:

- 12.0 ha of koala potential habitat;
- 12.0 ha of greater glider potential habitat;
- 10.5 ha of ornamental snake habitat; and
- 12.0 ha of squatter pigeon (southern) potential habitat.

### 6.9.4 Rail spur action area (EPBC 2017/7870)

The following areas would be cleared within the rail spur corridor (which is part of Stage 1) as part of the Project:

- 43.0 ha of koala potential habitat;
- 43.0 ha of greater glider potential habitat;
- 27.0 ha of ornamental snake potential habitat;
- 37.0 ha of squatter pigeon (southern) potential habitat; and
- 6.0 ha of Australian painted snipe potential habitat.

**Table 11 Summary of Impacts on Matters of National Environmental Significance**

| MNES | Potential Significant Impact | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Mine Site and Access Road (EPBC2017/7867) | | Water Pipeline (EPBC2017/7868) | | Electricity Transmission Line (EPBC2017/7869) | | Rail Spur (EPBC2017/7870) | | Total impact (ha) |
| | Approximate area to be cleared (ha) | Significant residual impact likely | Approximate area to be cleared (ha) | Significant residual impact likely | Approximate area to be cleared (ha) | Significant residual impact likely | Approximate area to be cleared (ha) | Significant residual impact likely | |
| Koala | **5,500** | **Yes** | **28.5** | **Yes** | 12 | No | **43.0** | **Yes** | 5,583.5 |
| Greater glider | **5,500** | **Yes** | 28.5 | No | 12 | No | 43.0 | No | 5,583.5 |
| Ornamental snake | **7,621.5** | **Yes** | **7** | **Yes** | **10.5** | **Yes** | **27.5** | **Yes** | 7,666 |
| Squatter pigeon (southern) | 5,387 | **Yes** | 27.0 | No | 12 | No | 37 | No | 5,463.5 |
| Australian painted snipe | 113 | **Yes** | 1 | No | 0 | No | 6 | No | 120 |

***Migratory species***

There are eight migratory species that are indicated as known or potentially occurring in the Study area that may be subject to impacts from the Project. These species are listed as Special Least Concern under the Nature Conservation (Wildlife) Regulation 2006 and / or Migratory under the EPBC Act and include:

- Fork-tailed swift – potential;
- Sharp-tailed sandpiper – potential;
- Latham's snipe – known;
- Caspian tern – known;
- Black-faced monarch – potential;
- Satin flycatcher – known;
- Glossy ibis – known; and
- Common greenshank – potential.

None of the Migratory species recorded in the Study area were observed in significant numbers. There appears to be sub-optimal habitat in the Study area for satin flycatcher, which normally occurs in wet forest types where breeding resources are found. The wetland areas appear to support occasional Migratory species, including Latham's snipe, Caspian tern and glossy ibis. However, these species breed in colonies outside of the Study area. No significant impact on Migratory species is expected to occur as a result of the Project in accordance with the *Matters of National Environmental Significance Significant Impact Guidelines 1.1, Environment Protection and Biodiversity Act 1999* (DotE 2013) and the Project would not be inconsistent with Australia's obligations under:

(i) the Bonn Convention;

(ii) CAMBA;

(iii) JAMBA; or

(iv) an international agreement approved under subsection 209(4) of the EPBC Act.

## 6.10 Impacts on Matters of State Environmental Significance (MSES)

The *Queensland Environmental Offsets Policy Significant Residual Impact Guideline* (DEHP 2014b) is used to determine if a prescribed activity would have a significant residual impact on MSES. A significant residual impact is defined as an adverse impact, whether direct or indirect, of a prescribed activity on all or part of a prescribed environmental matter that:

a) remains, or will or is likely to remain, (whether temporarily or permanently) despite on-site avoidance and mitigation measures for the prescribed activity; and

b) is, or will or is likely to be significant.

There are seven fauna species listed under the NC Act that are known to occur in the Project area that may be subject to impacts from the Project. These species include:

- ornamental snake (Vulnerable NC Act & EPBC Act);
- common death adder (Vulnerable NC Act);
- Australian painted snipe (Vulnerable NC Act & Endangered EPBC Act);
- squatter pigeon (southern) (Vulnerable NC Act & EPBC Act);
- koala (Vulnerable NC Act & EPBC Act);
- short-beaked Echidna (Special Least Concern NC Act); and

- greater glider (Vulnerable NC Act & EPBC Act).

An assessment of potential impact on each of these species is presented in Appendix D.

The significant impact assessment indicated that the Project may result in a significant impact to the ornamental snake, Australian painted snipe, squatter pigeon, koala and greater glider and therefore potential impacts on these entities would also be mitigated and offset.

***Ornamental Snake***

As detailed in Section 5.3.1, the ornamental snake was recorded in various habitats throughout the Project area and is shown on Figure 15.1 and 15.2.

The Project would remove approximately 7,666 ha of potential habitat for the ornamental snake which would be mitigated and offset as described in Sections 7 and 8.

***Common Death Adder***

As detailed in Section 5.3.1, the common death adder (*Acanthophis antarcticus*) has previously been recorded from the Study area (Figure 10) and is considered to have the potential to occur within the Project area, although if it were to occur, is only expected to occur in very low numbers as it was not detected during targeted fauna surveys by DPM Envirosciences.

As this species has a very broad habitat range and was not recorded within the Study area despite recent targeted surveys, it is considered unlikely that there would be a significant impact on the common death adder (Appendix D).

***Australian Painted Snipe***

As detailed in Section 5.3.1, a single specimen was identified during fauna surveys of the Project area and was located within wetland habitat amongst Agricultural grasslands. The Project area does not support an isolated population due to its lack of specific habitat requirements and there is no evidence of a population in the Project area.

Despite this, the Project would remove approximately 120 ha of potential habitat for the Australian painted snipe which would be mitigated and offset as described in Sections 7 and 8.

***Squatter Pigeon (Southern)***

As detailed in Section 5.3.1, the squatter pigeon (southern) was recorded during fauna surveys of the Project area within areas of Eucalypt dry woodlands on inland depositional plains. As the Project area is north of the Carnarvon Ranges and habitat within the Project area is classified as sub-optimal.

Despite this, the Project would remove approximately 5,463.5 ha of potential habitat for the squatter pigeon (southern) which would be mitigated and offset as described in Sections 7 and 8.

***Koala***

As detailed in Section 5.3.1, the koala was recorded a number of times during fauna surveys within the Project area, the species was located within Eucalypt dry woodlands on inland depositional plains, Eucalypt open forest to woodlands on floodplains, and around wetlands.

The Project would remove approximately 5,583.5 ha of potential koala habitat which would be mitigated and offset as described in Sections 7 and 8.

***Short-beaked Echidna***

As detailed in Section 5.3.4, short-beaked echidna scats were recorded within brigalow (*Acacia harpophylla*) woodland at site Q28 and within poplar box (*Eucalyptus populnea*) woodland at site Q99 (Appendix B) in November 2016.

The short-beaked echidna would potentially occur in all habitats across the Project area including cleared areas. As this species occurs in a wide range of habitats including cleared areas, it is unlikely that the removal of the habitat within the Project area would have a significant impact on this species (Appendix D).

### *Greater Glider*

As detailed in Section 5.3.1, the greater glider was identified a number of times during fauna surveys within the Project area, particularly around Ripstone Creek and the Isaac River.

The Project would result in the removal of approximately 5,583.5 ha of potential habitat, which would be mitigated and offset as described in Sections 7 and 8.

### *Connectivity*

As outlined in Section 6.5, the outcomes of the Landscape Fragmentation and Connectivity (LFC v1.5) tool conclude that the Project would have a significant impact on connectivity. The impacts to MSES are summarised in Table 12.

**Table 12 Summary of Impacts on Matters of State Environmental Significance**

| Matters of State Environmental Significance | | | Stage 1 Impact (ha) | Stage 2 Impact (ha) | Stage 3 Impact (ha) | Stage 4 Impact (ha) |
|---|---|---|---|---|---|---|
| **Regulated Vegetation** | 'Endangered' or 'of concern' regional ecosystems* | RE11.3.1 | Refer to DPM Envirosciences (2018a) | | | |
| | | RE11.3.2 | | | | |
| | | RE11.3.3 | | | | |
| | | RE11.3.4 | | | | |
| | | RE11.4.8 | | | | |
| | | RE11.4.9 | | | | |
| | | RE11.5.17 | | | | |
| | Regional ecosystems within mapped vegetation management wetlands* | | | | | |
| | Regional ecosystems within the defined distance of a vegetation management watercourse* | | | | | |
| **Connectivity Areas** | | | 830.5 | 1773 | 2289 | 769 |
| **Wetlands and Watercourses** | | | Refer to DPM Envirosciences (2018b) | | | |
| **Designated Precinct in a Strategic Environmental Area** | | | N/A | | | |
| **Protected Wildlife Habitat*** | Ornamental Snake^ | | 506 | 1596 | 3916 | 1648 |
| | Common Death Adder | | 830.5 | 1773 | 2289 | 769 |
| | Australian Painted Snipe^ | | 21 | 24 | 50 | 25 |
| | Squatter Pigeon (southern)^ | | 805.5 | 1738 | 2211 | 709 |
| | Koala^ | | 826.5 | 1762 | 2261 | 734 |
| | Short-beaked Echidna | | 1,765 | 4245 | 7428.5 | 2855.5 |
| | Greater Glider^ | | 826.5 | 1762 | 2261 | 734 |
| **Protected Areas** | | | N/A | | | |

| Matters of State Environmental Significance | Stage 1 Impact (ha) | Stage 2 Impact (ha) | Stage 3 Impact (ha) | Stage 4 Impact (ha) |
|---|---|---|---|---|
| **Highly Protected Zones of State Marine Parks** | N/A | | | |
| **Fish Habitat Areas** | N/A | | | |
| **Waterways Providing for Fish Passage** | Refer to DPM Envirosciences (2018b) | | | |
| **Marine Plants** | N/A | | | |
| **Legally Secured Offset Areas** | N/A | | | |

Notes:

* The REs are mutually exclusive.

^ These species are also listed under the EPBC Act.

# As per Table 11.

# 7 MITIGATION MEASURES

Consistent with DES' management hierarchy, the mitigation strategy for the Project has focused on a hierarchy of:

1. avoidance;
2. minimisation;
3. mitigation; then
4. offset residual impacts.

The avoidance or minimisation of adverse impacts is most relevant to the design phase of the Project, where information collected through desktop analysis and field surveys can be incorporated into the planning and preliminary engineering work (Section 7.1). Mitigation of impacts (including the implementation of monitoring and management plans) is most relevant to the construction and operational phases of the Project. Table 13 provides a summary of the mitigation strategies for the Project, with a brief description of potential impacts and measures that can be implemented at each stage in the life of the Project.

Residual impacts, after the implementation of the mitigation strategy, may be required to be offset in accordance with Commonwealth and State legisltation. Offset requirements for the Project are discussed in Section 8.

## 7.1 Measures to avoid and minimise impacts

The following measures would be implemented to avoid and / or minimise impacts on terrestrial fauna (Figure 2):

- Mine – The location of the mine and pits are informed by geological surveys and largely determined by the location of the natural resource, as a result the location of mine impacts are relatively inflexible. Where possible, riparian vegetation along the Isaac River has been avoided in the mine design and a minimum buffer of 200 m between the mine pits and Isaac River (defined bank) has been implemented.
- Overland conveyor – to reduce impacts that would normally be associated with a haul road crossing the Isaac River, an overland conveyor spanning approximately 14 km would be used to link the Willunga Domain to the CHPP within the Olive Downs South Domain. The conveyor would run North-west from the Willunga Domain and cross the Isaac River approximately 4.5 km from its origin point. The conveyor would be restricted to a construction corridor of 180 m however this would be reduced when crossing the Isaac River; where, within 200 m of the defining bank, the construction corridor width would be limited to 45 m to reduce impact on the riparian habitat.
- Access road – the proposed 3.5 km access road would be co-located with existing public and private roads as far as possible to reduce impacts to native vegetation. The access road would make use of an existing private dirt road for a distance of 2.3 km before deviating to cross over the Isaac River. The location of the Isaac River crossing was selected due to the constructability of a low impact crossing at this point. The access road would be restricted to 40 m at the crossing point to reduce the impact on the riparian habitat.
- Haul road crossing – The haul road crossing would provide access to the waste emplacement at Deverill from the Olive Downs South Domain. The crossing would be located approximately 2 km south-south east of the access road where it crosses the Isaac River. The haul road would be restricted to a construction corridor of 60 m.

- Water pipeline – the proposed water pipeline would connect to the existing Eungella Pipeline west of the Project. The water pipeline would be approximately 23 km long and has been co-located with the rail corridor as far as possible (for a distance of 15 km from the mine site to the existing Norwich Park Branch to reduce native vegetation clearance. The corridor for the water pipeline has been reduced to 20 m.
- ETL – the proposed ETL utilises an existing easement between the sub-station on Peak Downs Highway and the rail (Norwich Park Branch), then follows Daunia Road and Annandale Road before heading south for 13 km across predominately cleared land to the MLA. The ETL would be restricted to a construction corridor of 10 m.
- Rail spur – options for the location of the rail spur were limited due to the need to connect to the Norwich Park Branch Railway and to avoid existing mining lease areas (and associated mining pits) to the south. The final location would maintain a buffer of approximately 85 m to the bank of the Isaac River at its closest point (affecting 1.5 km of the rail alignment).

## 7.2 Impact mitigation

Mitigation measures proposed to be implemented for the Project are detailed in Table 13.

**Table 13 Mitigation measures**

| Potential impact | Mitigation measures |
|---|---|
| 1. Vegetation clearing | ▪ Demarcate exclusion zones to protect areas of vegetation to be retained prior to clearing.<br>▪ Clearing of native vegetation would be undertaken progressively over the life of the mine and only in areas required for mining activities within the following year to minimise the area of exposed land.<br>▪ Salvage felled vegetation for millable timber as appropriate.<br>▪ Collection of native seed from the Project area for use in rehabilitation program.<br>▪ Salvage hollow logs, rocks and large debris removed by construction for habitat enhancement in areas for rehabilitation.<br>▪ Implement the Vegetation Clearance Procedure (Section 7.3).<br>▪ Implement Rehabilitation Plan (Section 7.3). |
| 2. Fauna mortality | ▪ Where applicable limit time of construction to avoid breeding seasons for threatened species.<br>▪ Licenced fauna spotter-catchers to undertake detailed inspection of areas to be cleared<br>▪ Where practical, retain hollow-bearing trees and large stags as potential nesting and roosting habitat.<br>▪ Appropriate signage in prominent positions to reduce vehicle speeds in the Project area.<br>▪ Vehicular traffic generally to be restricted to access tracks and an on-site speed limit would be applied.. |
| 3. Reduction of threatened fauna populations | ▪ Implement management measures for fauna mortality, as outlined above.<br>▪ Progressive rehabilitation.<br>▪ Prepare a Species Management Program (in accordance with section 332 of the *Nature Conservation [Wildlife Management] Regulation 2006*)<br>▪ Implement Rehabilitation Plan (Section 7.3).<br>▪ Implement the Fauna Species Management Plan (Section 7.3). |
| 4. Increased numbers of feral animals | ▪ Ensure site waste management measures reduce the potential to attract vermin and other fauna.<br>▪ Any waste storage facilities associated with the Project to be designed and located to restrict fauna access.<br>▪ Management of feral animals, particularly dogs, cats and pigs.<br>▪ Implement Weed and Pest Management Plan (Section 7.3) |
| 5. Fragmentation | ▪ Design bridge structures to maximise vegetation retention.<br>▪ Where applicable maintain fencing and fauna crossings to ensure safe fauna movement. |
| 6. Noise | ▪ Maintain machinery to ensure optimal operation and minimal unnecessary noise. |
| 7. Lighting | ▪ Limit Project lighting.<br>▪ Where lighting is required, use directional lighting to reduce the spill over into surrounding areas.<br>▪ Use of lighting in accordance with the relevant Australian Standard. |

## 7.3 Management and monitoring plans

The following management plans have been recommended for the ongoing management of terrestrial fauna:

1. Vegetation Clearance Procedure, including:
   - demarcate exclusion zones to protect areas of vegetation to be retained prior to clearing;
   - clearing of native vegetation would be undertaken progressively;
   - salvage of felled vegetation for millable timber, as appropriate;
   - salvage hollow logs, rocks and large debris removed by construction for habitat enhancement in areas for rehabilitation; and
   - collection of native seed from Project area prior to clearing for use in rehabilitation program.
2. Fauna Species Management Plan including:
   - time of construction to avoid breeding seasons for threatened species;
   - fauna exclusion fencing around construction sites or operational mine areas;
   - use of licenced fauna spotter-catchers;
   - habitat retention and replacement, where possible; and
   - salvage of microhabitat features (e.g. boulders and logs) for use in rehabilitation.
3. Weed and Pest Management Plan
   - identification of feral animal populations;
   - strategies for preventing spread of feral animals (i.e. maintaining a clean, rubbish-free environment);
   - appropriately qualified persons would be engaged to undertake pest animal monitoring; and
   - recommended weed feral animal control strategies (e.g. baiting and trapping);
   - feral animal monitoring protocols and follow-up control methods and protocols.
4. Rehabilitation and Mine Closure Plan, including:
   - identification of desired post-mining land use;
   - protocol for progressive rehabilitation and staging of rehabilitation or natural regeneration and site preparation;
   - rehabilitation criteria to assess the effectiveness of the rehabilitation work;
   - recommended native species to be used during rehabilitation activities; and
   - measures to monitor the success of the rehabilitation strategies.

# 8 OFFSETS

## 8.1 Biodiversity offset requirements

The Final ToR for the Project states the following in relation to environmental offsets:

*11.27 The EIS must describe the residual impacts of each proposed action for each relevant matter protected by the EPBC Act, after all proposed avoidance and mitigation measures are taken into account.*

*11.28 The EIS must identify whether the residual impacts are significant with reference to the Matters of National Environmental Significance, Significant impact guidelines 1.1, Environment Protection and Biodiversity Conservation Act 1999.*

*11.29 If those residual impacts are significant the EIS must propose offsets for relevant matters protected by the EPBC Act consistent with the Environment Protection and Biodiversity Conservation Act 1999, Environmental Offsets Policy.*

*11.53 The EIS should identify whether the project will result in a significant residual impact on matters of State environmental significance (MSES) with reference to the Queensland Environmental Offsets Policy, Significant Residual Impact Guideline 2014.*

*11.54 For staged offsets, the full extent of potential impacts on prescribed environmental matters from the entire proposal needs to be taken into account as part of the significant residual impact test.*

*11.55 The proposed offsets should be in line with the requirements set out in the Queensland Environmental Offsets Policy (Version 1.2) 2016.*

It should be noted that, despite the requirements of the ToR, the *Queensland Environmental Offsets Policy (Version 1.2) 2016* has been replaced by the *Queensland Environmental Offsets Policy (Version 1.6)* (DES 2018). The EO Act and EPBC Act and the following related policies are relevant to the environmental offset proposal for the Project:

- *Queensland Environmental Offsets Policy (Version 1.6)* (DES 2018); and
- *EPBC Act Environmental Offsets Policy* (DSEWPC 2012a) (and supporting *EPBC Act Offsets Assessment Guide*).

As described in the *Queensland Environmental Offsets Policy (Version 1.6)* (DEHP 2017b), section 15 of the EO Act removes the ability for the State government to impose an offset condition in relation to a prescribed activity if a Commonwealth decision has already been made in relation to the same or substantially the same activity, matter and area of impact.

Given all components of the Project have been determined to be controlled actions under the EPBC Act, an offset will be provided for residual significant impacts on MNES negating the need for the State government to impose an offset condition on MNES (i.e. protected wildlife habitat).

## 8.2 Significant residual impacts on state and national matters

Land clearing is proposed to occur in multiple stages. Stage 1 would include the following works:

- construction of each of the infrastructure corridors:
  - rail corridor;
  - ETL;
  - water pipeline;

  - Olive Downs South access road;
- construction of the mine infrastructure area (including offices, workshops, CHPP, ROM pad, ILF cells);
- development of the north-western waste emplacement;
- construction of temporary flood levees located within the Stage 1 boundary; and
- commencement of open cut mining in Pit 1.

The Stage 1 disturbance boundary is shown on Figure 18. The Stage 1 disturbance boundary includes the full extent of the following Actions:

- Olive Downs Project Water Pipeline (EPBC 2017/7868);
- Olive Downs Project Electricity Transmission Line (EPBC 2017/7869); and
- Olive Downs Project Rail Spur (EPBC 2017/7870).

The Stage 1 disturbance boundary would facilitate approximately the first five years of mining of the Olive Downs Project Mine Site and Access Road (EPBC 2017/7867).

Table 14 quantifies the significant residual impacts on MSES and MNES for each stage of clearance. The Offset Strategy proposed to compensate for these significant residual impacts is described below.

**Table 14 Summary of matters relevant to the offset package**

| Matter | Stage 1 Impact (ha) | Stage 2 Impact (ha) | Stage 3 Impact (ha) | Stage 4 Impact (ha) |
|---|---|---|---|---|
| **Matters of National Environmental Significance** | | | | |
| Brigalow Woodland TEC | Refer to DPM (2018a) | | | |
| Australian Painted Snipe | 21 | 24 | 50 | 25 |
| Squatter Pigeon | 805.5 | 1738 | 2211 | 709 |
| Greater Glider | 826.5 | 1762 | 2261 | 734 |
| Koala | 826.5 | 1762 | 2261 | 734 |
| Ornamental Snake | 506 | 1596 | 3916 | 1648 |
| **Matters of State Environmental Significance** | | | | |
| **Regulated Vegetation** | | | | |
| Endangered RE<br>Of Concern RE | Refer to DPM Envirosciences (2018a) | | | |
| Regional ecosystems within mapped vegetation management wetlands* | | | | |
| Regional ecosystems within the defined distance of a vegetation management watercourse | | | | |
| **Connectivity Areas** | 830.5 | 1773 | 2289 | 769 |
| **Protected Wildlife Habitat** | | | | |
| Habitat for an Animal that is Vulnerable Wildlife | As above | | | |
| Australian Painted Snipe[1] | | | | |
| Squatter Pigeon[1] | | | | |
| Greater Glider[1] | | | | |
| Koala[1] | | | | |

| Matter | Stage 1 Impact (ha) | Stage 2 Impact (ha) | Stage 3 Impact (ha) | Stage 4 Impact (ha) |
|---|---|---|---|---|
| Ornamental Snake[1] | | | | |
| **Wetlands and Watercourses** | | | | |
| A wetland of High Ecological Significance | Refer to DPM Envirosciences (2018b) | | | |
| **Waterways providing for fish passage** | Refer to DPM Envirosciences (2018b) | | | |

Notes:

[1] These species are also listed under the EPBC Act and will be offset under the federal policy

[#] As per Table 11

## 8.3 Biodiversity offset strategy

Pembroke propose to offset the significant residual impacts on Matters of National Environmental Significance in accordance with the *EPBC Act Environmental Offsets Policy* (DSEWPC 2012a) and offset the significant residual impacts on Matters of State Environmental Significance in accordance with the *Queensland Environmental Offsets Policy* (Version 1.6) (DES 2018).

Pembroke propose a staged environmental offset in consideration of the staged land clearing described above. The offset for each stage of clearance would be provided before clearing the relevant stage.

A land-based proponent-driven offset is proposed to address the relevant impacts from Stage 1. Section 1.4 provides a description of the Stage 1 Offset Area and a description of how it offsets impacts on the threatened fauna listed in Table 14 as well as 'Connectivity'. The Terrestrial Flora Assessment (DPM Envirosciences 2018a) and Aquatic Ecology Assessment (DPM Envirosciences 2018b) describe how the Stage 1 Offset Area would offset impacts on other Matters of State Environmental Significance.

The Stage 1 Offset Area would compensate for the impacts associated with each of the following Actions in full:

- Olive Downs Project Water Pipeline (EPBC 2017/7868);
- Olive Downs Project Electricity Transmission Line (EPBC 2017/7869); and
- Olive Downs Project Rail Spur (EPBC 2017/7870).

In addition, the Stage 1 Offset Area would compensate for the impacts associated with approximately the first five years of mining of the Olive Downs Project Mine Site and Access Road (EPBC 2017/7867).

For subsequent stages (Stage 2 to 4), the offset would be provided before the commencement of each stage. It is likely that the residual significant adverse impacts can be offset given the following:

- The native vegetation communities / Regional Ecosystems to be cleared during the life of the Project (including those listed as 'Endangered' and 'Of Concern') all occur extensively in the surrounding landscape and subregions.
- The surrounding landscape contains large areas of non-remnant vegetation (required to offset the significant residual impact on 'Connectivity').

## 8.4 Offset for Stage 1

### 8.4.1 General description for the Stage 1 Offset Area

A land-based offset area is proposed for Stage 1. The Stage 1 Offset Area is comprised of three distinct areas (A, B and C) located approximately 35 km south-east of Moranbah (Figure 19). The proposed offset area occurs within the Isaac-Comet Downs subregion of the North Brigalow Belt Bioregion, within the Fitzroy catchment and is on the eastern side of the Isaac River, adjacent to the Project area.

The closest National Park reserve is the Dipperu National Park located approximately 15 km east of the Stage 1 Offset Area (Figure 19).

The Stage 1 Offset Area covers an overall area of approximately 6,065 ha. There is a combined total of approximately 1,950 ha of remnant vegetation within the Stage 1 Offset Area, which greatly exceeds and is more than 2.5 times the area of remnant vegetation Stage 1 Offset AreaStage 1 Offset Areaproposed to be cleared as part of Stage 1 (approximately 832.5 ha [Table 10]).

Within the overall boundaries of the Stage 1 Offset Area, there is approximately 1,200 ha which is not required to be included in an offset area for Stage 1 and may be used to offset impacts from subsequent stages. These areas are mapped on Figure 19 as 'Areas Retained for Future Offset'. These areas would be secured along with the Stage 1 Offset Area.

Pembroke owns the land on which the Stage 1 Offset Area is proposed and there are no other relevant parties with registered interests under the Qld *Land Act 1994* or the Qld *Land Title Act 1994* (Table 15).

**Table 15 Relevant offset area details**

| Reference | Landholder details |
|---|---|
| Registered Owner on Title | Pembroke Olive Downs Pty Ltd |
| Real Property Descriptions | Twenty Mile - Lot 5, SP 113322<br>Deverill - Lot 18, SP 113322 |

### 8.4.2 Ecological surveys

***Threatened fauna surveys***

Flora and fauna surveys were undertaken by DPM Envirosciences (2018c) in accordance with contemporary Queensland and Commonwealth survey guidelines to assess the suitability of the Stage 1 Offset Area. Field surveys were undertaken in March to May 2018.

The flora surveys were undertaken in accordance with the Qld Herbarium vegetation survey methods described in Neldner *et al.* (2017). Survey techniques included quaternary surveys, identification of threatened ecological communities, targeted searches for conservation significant species, and random meanders (DPM Envirosciences 2018c).

Targeted fauna surveys were undertaken across the Stage 1 Offset Area. Fauna surveys were undertaken with the aim of confirming the presence of the target conservation significant fauna species (including koala, greater glider, ornamental snake, Australian painted snipe and squatter pigeon). This included active searches for each species as well as searches for signs of their

occupation (e.g. scratches and scats). Spotlighting searches and koala transect searches were undertaken.

Any target fauna species heard or seen during the surveys and whilst moving throughout the Stage 1 Offset Area were recorded, along with signs of animals from secondary evidence.

Vegetation mapping (DPM Envirosciences 2018c) was undertaken to improve the accuracy of Regional Ecosystem mapping across the offset Study area and to allow the development of potential habitat mapping for each of the target conservation significant species. Further to this, mapping of regrowth vegetation was also undertaken as part of the floristic surveys and provides an indication of the areas of land which could be used to offset the potential impacts to connectivity.

***Habitat quality assessments***

Terrestrial habitat quality assessments were conducted within the Stage 1 disturbance boundary and in the Stage 1 Offset Area in accordance with the *Guide to Determining Terrestrial Habitat Quality Version 1.2* (DEHP 2017b). The field survey methodologies are further described in detail in Appendix H of the Terrestrial Flora Assessment (DPM Envirosciences 2018a).

### 8.4.3 Presence of relevant matters

***Overview***

The Stage 1 Offset Area contains both remnant and regrowth forest and woodland, as well as broad open grazed grassland. It is represented by the following habitat types:

- regrowth eucalypt woodland;
- agricultural grasslands dominated by buffel grass (*Cenchrus ciliaris*);
- eucalypt dry woodlands on inland depositional plains (BVG 3 and BVG 5);
- acacia dominated open forests, woodlands and shrublands (BVG 10);
- eucalypt open forests to woodlands on floodplains (BVG 4);
- palustrine wetlands (swamps) (primarily BVG 15); and
- waterways and lacustrine waterbodies (watercourses, drainage features and farm dams).

The regrowth eucalypt woodland is generally less than 15 m in height and estimated to be less than 20 years old. It was noted that all areas of regrowth had high levels of weeds and would benefit from management.

Each of the above habitat types are described in detail in Appendix H of the Terrestrial Flora Assessment (DPM Envirosciences 2018a).

The following EVNT fauna species were recorded in the Stage 1 Offset Area (DPM Envirosciences 2018c):

- koala (*Phascolarctos cinereus*) – Vulnerable (EPBC Act and NC Act);
- greater glider (*Petauroides volans*) – Vulnerable (EPBC Act and NC Act);
- ornamental snake (*Denisonia maculata*) – Vulnerable (EPBC Act and NC Act); and
- squatter pigeon – southern subspecies (*Geophaps scripta scripta*) – Vulnerable (EPBC Act and NC Act).

Further to this, potential habitat for the Australian painted snipe (Endangered – EPBC Act and Vulnerable – NC Act) was identified within the Stage 1 Offset Area.

***Squatter Pigeon***

The squatter pigeon (southern) was identified on three occasions within various habitats throughout the Stage 1 Offset Area and a further five locations throughout the surrounding locality (Figure 14, DPM Envirosciences 2018c). Within the Stage 1 Offset Area all areas of eucalypt dry woodlands on inland depositional plains and eucalypt open forests to woodlands on floodplains are potential habitat for this species (Figure 19). Within the Stage 1 Offset Area, these habitat types comprise a number of REs, including 11.3.2, 11.3.25, 11.5.3, 11.5.9, 11.11.1 and 11.12.7, totalling 1,601 ha. These areas of remnant vegetation would provide suitable foraging, breeding and dispersal habitat for this species.

Further to this, regrowth eucalypt woodland within the Stage 1 Offset Area (1,135 ha) is potential habitat for the squatter pigeon because it also provides suitable foraging, breeding and dispersal habitat for this species.

The *EPBC Act Offsets Assessment Guide* (DSEWPC 2012b) has been used to determine the percentage of the offset liability which would be met by the Stage 1 Offset Area. The data used to inform these assessments is provided in Appendix H of the Terrestrial Flora Assessment (DPM Envirosciences 2018a). The inputs used to assess the suitability of the Stage 1 Offset Area and the justification for the values chosen is provided in Appendix E. As a result, it was confirmed that the Stage 1 Offset Area provides for more than 100% of the offset liability associated with Stage 1 of the Project.

***Greater Glider***

Within the Stage 1 Offset Area, the greater glider was recorded on five occasions in the vicinity of watercourses and wetlands (Figure 17, DPM Envirosciences 2018c). Recordings included direct observation (at two locations) and identification of scats (at three locations). This included Eucalypt dry woodlands on inland depositional plains, Eucalypt open forest to woodlands on floodplains, and Palustrine wetlands. The greater glider has also been recorded at numerous locations within the surrounding locality, particularly along the Isaac River. In the Stage 1 Offset Area all areas of Eucalypt open forests to woodlands on floodplains, Eucalypt dry woodlands on inland depositional plains and Palustrine wetlands are considered potential habitat (Figure 14). Within the Stage 1 Offset Area, these habitat types comprise a number of REs, including 11.3.2, 11.3.25, 11.3.27f, 11.5.3, 11.5.9, 11.5.17, 11.11.1 and 11.12.7, totalling 1,601 ha. These areas of remnant vegetation would provide potential foraging, denning and / or dispersal habitat for this species.

Further to this, regrowth eucalypt woodland within the Stage 1 Offset Area (1,135 ha) is potential habitat for the greater glider. These regrowth areas currently represent potential foraging habitat for the greater glider. Species-specific greater glider nest boxes are proposed as part of the management of the Stage 1 Offset Area to improve sheltering habitat for the species (Section 8.4.4).

The *EPBC Act Offsets Assessment Guide* (DSEWPC 2012b) has been used to determine the percentage of the offset liability which would be met by the Stage 1 Offset Area. The data used to inform these assessments is provided in Appendix H of the Terrestrial Flora Assessment (DPM Envirosciences 2018a). The inputs used to assess the suitability of the Stage 1 Offset Area and the justification for the values chosen is provided in Appendix E. As a result, it was confirmed that the Stage 1 Offset Area provides for more than 100% of the offset liability associated with Stage 1 of the Project.

***Koala***

Within the Stage 1 Offset Area, the koala was recorded on more than 15 occasions along the watercourses (Figure 16, DPM Envirosciences 2018c). Recordings included direct observation (on three occasions) and identification of scats and scratches within Eucalypt dry woodlands on inland depositional plains, Eucalypt open forest to woodlands on floodplains, and around Palustrine wetlands. Within the Stage 1 Offset Area, potential koala habitat is located within the areas mapped as eucalypt open forests to woodlands on floodplains, eucalypt dry woodlands on inland depositional plains and the vegetation surrounding and within palustrine wetlands (Figure 19). Within the Stage 1 Offset Area, these habitat types comprise a number of REs, including 11.3.2, 11.3.25, 11.3.27f, 11.5.3, 11.5.9, 11.5.17, 11.11.1 and 11.12.7, totalling 1,601 ha. These areas of remnant vegetation would provide suitable foraging, breeding and dispersal habitat for this species.

Further to this, regrowth eucalypt woodland within the Stage 1 Offset Area (1,135 ha) is potential habitat for the koala because the vegetation within these patches is consistent with that of the REs listed above (i.e. it is eucalypt-dominated vegetation). As such, although the vegetation is not of remnant status it does provide suitable habitat for use by the Koala.

The *EPBC Act Offsets Assessment Guide* (DSEWPC 2012b) has been used to determine the percentage of the offset liability which would be met by the Stage 1 Offset Area. The data used to inform these assessments is provided in Appendix H of the Terrestrial Flora Assessment (DPM Envirosciences 2018a). The inputs used to assess the suitability of the Stage 1 Offset Area and the justification for the values chosen is provided in Appendix E. As a result, it was confirmed that the Stage 1 Offset Area provides for more than 100% of the offset liability associated with Stage 1 of the Project.

***Ornamental Snake***

There are two database records of the ornamental snake within the Stage 1 Offset Area (ALA 2018) (Figure 18, DPM Envirosciences 2018c). The ornamental snake was also recorded on two occasions within the surrounding locality during the recent targeted surveys (Figure 18, DPM Envirosciences 2018c). Desktop mapping reviewed by GT Environmental across the Stage 1 Offset Area identified areas of gilgai relief, which are the most accurate reflection of potential habitat for this species (Figure 19).

Based on observations of ornamental snake habitat within the Stage 1 Offset Area, areas of potential gilgai habitat occur in agricultural grasslands (where there was once brigalow), regrowth eucalypt woodland as well as small patches of palustrine wetlands (swamps) and acacia dominated open forests, woodlands and shrublands where these soil types are also present.

The areas mapped on Figure 19 as potential habitat for the ornamental snake also contain woody debris (which would provide sheltering habitat for the ornamental snake when cracks are not available), are low lying, and during the wet season are expected to hold water long enough for frogs to inhabit them, providing a food source for the ornamental snake.

Areas mapped as potential habitat for this species (854 ha – Figure 19) would provide suitable sheltering, foraging and dispersal habitat for this species.

The *EPBC Act Offsets Assessment Guide* (DSEWPC 2012b) has been used to determine the percentage of the offset liability which would be met by the Stage 1 Offset Area. The data used to inform these assessments is provided in Appendix H of the Terrestrial Flora Assessment (DPM Envirosciences 2018a). The inputs used to assess the suitability of the Stage 1 Offset Area and the justification for the values chosen is provided in Appendix E. As a result, it was confirmed that the Stage 1 Offset Area provides for more than 100% of the offset liability associated with Stage 1 of the Project.

### *Australian Painted Snipe*

The Australian painted snipe was not recorded within the Stage 1 Offset Area but has previously been recorded in similar habitat within the Project area and there is a previous record of this species approximately 5 km north of the Stage 1 Offset Area (ALA 2018; Figure 15, DPM Envirosciences 2018c).

Within the Stage 1 Offset Area all areas of wetlands are considered potential habitat for this species (Figure 19). Within the Stage 1 Offset Area, these habitat types comprise REs 11.5.17 and 11.3.27f. Areas mapped as potential habitat for this species (approximately 86 ha) would provide suitable sheltering, foraging and dispersal habitat for this species.

The *EPBC Act Offsets Assessment Guide* (DSEWPC 2012b) has been used to determine the percentage of the offset liability which would be met by the Stage 1 Offset Area. The data used to inform these assessments is provided in Appendix H of the Terrestrial Flora Assessment (DPM Envirosciences 2018a). The inputs used to assess the suitability of the Stage 1 Offset Area and the justification for the values chosen is provided in Appendix E. As a result, it was confirmed that the Stage 1 Offset Area provides for more than 100% of the offset liability associated with Stage 1 of the Project.

### *Connectivity Areas*

Areas of regrowth eucalypt woodland in the Stage 1 Offset Area comprise those areas where regeneration of woodland would be expected to reach species composition, height and cover characteristics of remnant vegetation in a period of no greater than 20 years (Figure 19). It was noted that all areas of regrowth had high levels of weed abundance (including buffel grass [*Cenchrus ciliaris*] and other introduced pasture species) (Appendix H of DPM Envirosciences 2018a) and would benefit from management.

Approximately 1,135 ha of regrowth eucalypt woodland (Plate 8) is located within the Stage 1 Offset Area (Figure 19) to provide an offset for the clearance of the approximately 832.5 ha of remnant vegetation associated with Stage 1 of the Project. The regrowth vegetation would be managed by Pembroke in order to return these areas to remnant woodland within 20 years. Should monitoing indicate that the natural regeneration is not progressing towards remnant status, Pembroke would undertake revegetation activities to assist in this process.

**Plate 8 Typical area of woodland regrowth (RE 11.5.3 parent community) within the Stage 1 Offset Area, May 2018**

### 8.4.4 Management measures

Management actions proposed to be undertaken within the Stage 1 Offset Area include:

- feral animal control to reduce predator pressures (particularly from dogs, cats and foxes) and habitat degradation (particularly by feral pigs);
- reducing weed cover (reducing indirect threats that affect habitat quality);
- implementation of controlled livestock grazing regimes to encourage natural regeneration of foraging trees and prevent further degradation of habitat;
- addition of species specific greater glider nest boxes (to improve sheltering habitat);
- conservation of gilgai areas with offset agreement and covenant on title to ensure long-term protection;
- fuel management to avoid high intensity bushfires and loss of habitat trees; and
- removal of barbed wire fencing.

All management actions are additional to existing obligations for managing the land. An Offset Management Plan would provide further detail on the management of the offset area.

### 8.4.5 Long-term conservation

Pembroke would seek to secure the offset area as a Nature Refuge, as requested by DNRME and DES during consultation regarding the Project.

### 8.4.6 Commonwealth offset principles

Table 16 provides a reconciliation of the proposed offset strategy against the Commonwealth EPBC Act Environmental Offsets Policy (DSEWPC 2012a).

**Table 16 Reconciliation of the proposed offset strategy against Commonwealth offset principles**

| Offset principles* | Elements of the Project offset that address these requirements |
|---|---|
| Deliver an overall conservation outcome that improves or maintains the viability of the aspect of the environment that is protected by national environmental law and affected by the action. | The offset area has been specifically tailored to the protected matters relevant to Stage 1 of the Project (i.e. Ornamental Snake, Australian Painted Snipe, Squatter Pigeon [southern], Koala and Greater Glider) and would deliver an overall conservation outcome that improves or maintains the viability of each protected matter. |
| Be built around direct offsets but may include other compensatory measures. | The Commonwealth offset requirements for Stage 1 of the Project would be satisfied by the Stage 1 Offset Area. |
| Be in proportion to the level of statutory protection that applies to protected matter. | The Stage 1 Offset Area would provide for greater than 100% of the offset liability for each protected matter relevant to Stage 1 of the Project. This has been determined by applying the EPBC Act Offsets Assessment Guide (DSEWPC 2012b). |
| Be of a size and scale proportionate to the impacts on the protected matter. | The Stage 1 Offset Area would provide for greater than 100% of the offset liability for each protected matter relevant to Stage 1 of the Project. This has been determined by applying the EPBC Act Offsets Assessment Guide (DSEWPC 2012b). Given this, it is determined that the |

| Offset principles* | Elements of the Project offset that address these requirements |
|---|---|
| | Stage 1 Offset Area would be of a suitable size and scale proportionate to the impacts of each protected matter. |
| Effectively account for and manage the risks of the offset not succeeding. | The EPBC Act Offsets Assessment Guide (DSEWPC 2012b), which has been applied to Stage 1 of the Project accounts for the risk of the offset not succeeding.<br>In addition, measures to manage the Stage 1 Offset Area would provide for ongoing adaptive management in the unlikely event that the offset is not succeeding. The implementation of the offset strategy is likely to be a condition of Environmental Approval. |
| Be additional to what is already required, determined by law or planning regulations or agreed to under other schemes or programs. | The implementation of the offset strategy is beyond existing requirements, in that it is not part of any private conservation reserve system. The enduring protection that would be applied to the Stage 1 Offset Area would be new and additional under duty of care or any environmental planning laws. |
| Be efficient, effective, transparent, proportionate, scientifically robust and reasonable. | The Stage 1 Offset Area would efficiently and effectively compensate for the impacts on the protected matters and help maintain the viability of the protected matters.<br>Flora and fauna surveys of the Stage 1 Offset Area have been undertaken to determine:<br>▪ the area of the offset in comparison to the area of impact;<br>▪ the nationally threatened fauna species present (or predicted to occur) and their conservation status; and<br>▪ the connectivity and condition of the native vegetation / fauna habitat; and<br>▪ management actions. |
| Have transparent governance arrangements including being able to be readily measured, monitored, audited and enforced. | Pembroke would seek to secure the offset area as a Nature Refuge, as requested by DNRME and DES during consultation regarding the Project.<br>Further, the management of the Stage 1 Offset Area would be detailed within an Offset Management Plan. |

Notes:
* EPBC Act Environmental Offsets Policy (DSEWPC 2012a).

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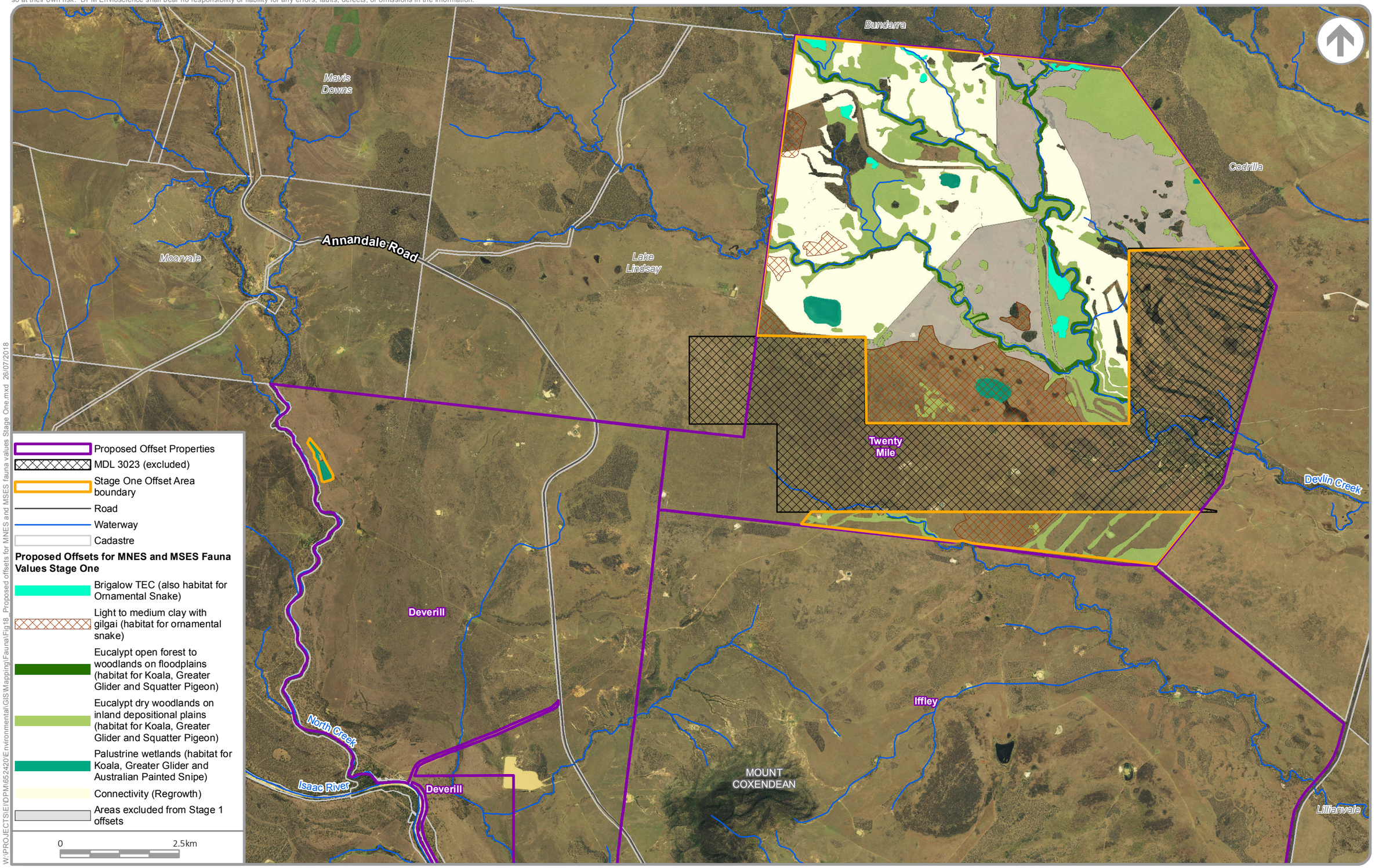


W:\PROJECTS\EI\DPM\652420\Environmental\GIS\Mapping\Fauna\Fig18_Proposed offsets for MNES and MSES fauna values Stage One.mxd 26/07/2018

DPM ENVIROSCIENCES

PROPOSED OFFSETS FOR MNES AND MSES FAUNA VALUES STAGE ONE

Olive Downs Coking Coal Project – Terrestrial Fauna Assessment

**FIGURE 19**

# 9 CONCLUSION

The scope of this assessment was to verify fauna habitat mapping for the Project area; identify any conservation significant fauna species under the Qld *Nature Conservation Act 1992* and Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*; identify and describe any Matters of State and National Environmental Significance; and to identify proposed avoidance and mitigation measures to protect the natural values, including consideration of biodiversity offset requirements.

The findings discussed in this report are based on a desktop assessment of readily available information on the fauna characteristics in a study area covering the Project (i.e. the Study area), supplemented by targeted fauna surveys in spring (November 2016, September and November 2017) and autumn (April – May 2017).

The fauna surveys were undertaken in accordance with the relevant State and Commonwealth survey guidelines. Survey methods included trapping (i.e. Elliott, cage, pitfall, funnel and harp traps), bat detection devices, motion detection cameras, spotlighting, diurnal bird surveys, active searches, call playback, koala spot assessments, searches for scats and other signs and habitat assessments. Targeted searches for threatened fauna species listed under NC Act and EPBC Act were also conducted.

A total of five conservation significant fauna species were recorded within the Project locality during the fauna surveys, namely:

- ornamental snake (*Denisonia maculata*) – listed as 'Vulnerable' under the EPBC Act and NC Act;
- Australian painted snipe (*Rostratula australis*) – listed as 'Endangered' under the EPBC Act and Vulnerable under the NC Act;
- squatter pigeon (southern) (*Geophaps scripta scripta*) – listed as 'Vulnerable' under the EPBC Act and NC Act;
- koala (*Phascolarctos cinereus*) – listed as 'Vulnerable' under the EPBC Act and NC Act; and
- greater glider (*Petauroides volans*) – listed as 'Vulnerable' under the EPBC Act and NC Act.

In addition, scats of the short-beaked echidna (*Tachyglossus aculeatus*), listed as 'Special Least Concern' under the NC Act, were recorded within the Project area.

Matters of National Environmental Significance (MNES) recorded within the Study area were limited to the five threatened fauna species listed above. Matters of State Environmental Significance (MSES) relevant to this assessment identified within the Project area include the following:

- Connectivity Areas; and
- Protected Wildlife Habitat (i.e. for the ornamental snake, Australian painted snipe, squatter pigeon (southern), koala and greater glider).

The Project would require the clearance of various patches of woodland / forest (totalling approximately 5,665 ha) occurring in four stages over the 79 years of construction and operation. Each of the native fauna habitat types to be cleared occur more extensively in the surrounding landscapes and subregions.

To mitigate unavoidable adverse impacts on terrestrial fauna associated with the Project, Pembroke has committed to a number of mitigation and management measures, including:

- vegetation clearance procedures that specify when and how vegetation would be cleared with the view of minimising impacts on terrestrial fauna;
- preparation of a Species Management Program (in accordance with section 332 of the Nature Conservation [Wildlife Management] Regulation 2006);
- progressive establishment of woodland / forest cover on the post-mine landforms;
- measures to prevent, monitor and control feral animals; and
- various measures to manage other environmental factors (e.g. dust suppression, erosion and sediment control, water management).

To address the residual significant adverse impacts (on MSES and MNES), an offset strategy has been developed by Pembroke in accordance with relevant State and Commonwealth offset requirements. Pembroke proposes a staged environmental offset in consideration of the staged land clearing described above. The offset for each stage of clearance would be provided before clearing the relevant stage. The result of implementing the offset strategy would be an increase in the area of land being conserved and managed for conservation in the medium to long term.

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# Appendix A: Database search results

Australian Government
Department of the Environment and Energy

# EPBC Act Protected Matters Report

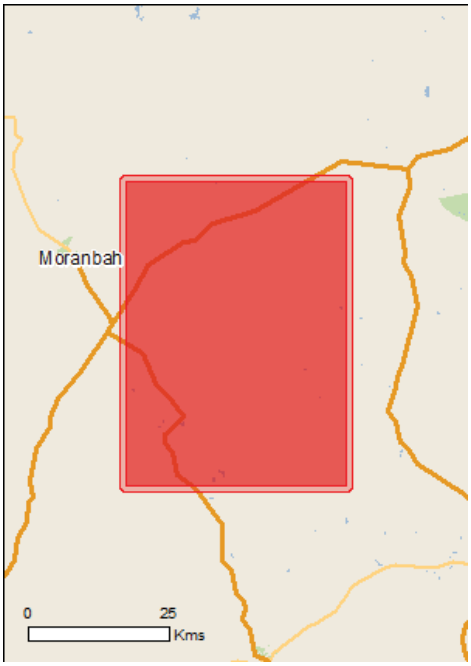
This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information is available about Environment Assessments and the EPBC Act including significance guidelines, forms and application process details.

Report created: 25/03/17 16:20:12


- Summary
- Details
  - Matters of NES
  - Other Matters Protected by the EPBC Act
  - Extra Information
- Caveat
- Acknowledgements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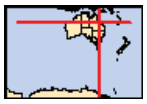
Coordinates
Buffer: 1.0Km



# Summary

## Matters of National Environmental Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

| | |
|---|---|
| World Heritage Properties: | None |
| National Heritage Places: | None |
| Wetlands of International Importance: | None |
| Great Barrier Reef Marine Park: | None |
| Commonwealth Marine Area: | None |
| Listed Threatened Ecological Communities: | 3 |
| Listed Threatened Species: | 23 |
| Listed Migratory Species: | 9 |

## Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at http://www.environment.gov.au/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

| | |
|---|---|
| Commonwealth Land: | None |
| Commonwealth Heritage Places: | None |
| Listed Marine Species: | 15 |
| Whales and Other Cetaceans: | None |
| Critical Habitats: | None |
| Commonwealth Reserves Terrestrial: | None |
| Commonwealth Reserves Marine: | None |

## Extra Information

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

| | |
|---|---|
| State and Territory Reserves: | None |
| Regional Forest Agreements: | None |
| Invasive Species: | 16 |
| Nationally Important Wetlands: | None |
| Key Ecological Features (Marine) | None |

# Details

## Matters of National Environmental Significance

### Listed Threatened Ecological Communities [ Resource Information ]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

| Name | Status | Type of Presence |
|---|---|---|
| Brigalow (Acacia harpophylla dominant and co-dominant) | Endangered | Community known to occur within area |
| Natural Grasslands of the Queensland Central Highlands and northern Fitzroy Basin | Endangered | Community likely to occur within area |
| Semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar Bioregions | Endangered | Community likely to occur within area |

### Listed Threatened Species [ Resource Information ]

| Name | Status | Type of Presence |
|---|---|---|
| **Birds** | | |
| Calidris ferruginea<br>Curlew Sandpiper [856] | Critically Endangered | Species or species habitat may occur within area |
| Erythrotriorchis radiatus<br>Red Goshawk [942] | Vulnerable | Species or species habitat likely to occur within area |
| Geophaps scripta scripta<br>Squatter Pigeon (southern) [64440] | Vulnerable | Species or species habitat known to occur within area |
| Grantiella picta<br>Painted Honeyeater [470] | Vulnerable | Species or species habitat may occur within area |
| Neochmia ruficauda ruficauda<br>Star Finch (eastern), Star Finch (southern) [26027] | Endangered | Species or species habitat likely to occur within area |
| Poephila cincta cincta<br>Southern Black-throated Finch [64447] | Endangered | Species or species habitat may occur within area |
| Rostratula australis<br>Australian Painted Snipe [77037] | Endangered | Species or species habitat likely to occur within area |
| **Mammals** | | |
| Dasyurus hallucatus<br>Northern Quoll, Digul [331] | Endangered | Species or species habitat likely to occur within area |
| Macroderma gigas<br>Ghost Bat [174] | Vulnerable | Species or species habitat likely to occur within area |
| Nyctophilus corbeni<br>Corben's Long-eared Bat, South-eastern Long- | Vulnerable | Species or species |

| Name | Status | Type of Presence |
|---|---|---|
| eared Bat [83395] | | habitat may occur within area |
| Petauroides volans<br>Greater Glider [254] | Vulnerable | Species or species habitat known to occur within area |
| Phascolarctos cinereus (combined populations of Qld, NSW and the ACT)<br>Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104] | Vulnerable | Species or species habitat known to occur within area |
| **Other** | | |
| Cycas ophiolitica<br>[55797] | Endangered | Species or species habitat likely to occur within area |
| **Plants** | | |
| Dichanthium queenslandicum<br>King Blue-grass [5481] | Endangered | Species or species habitat likely to occur within area |
| Dichanthium setosum<br>bluegrass [14159] | Vulnerable | Species or species habitat may occur within area |
| Eucalyptus raveretiana<br>Black Ironbox [16344] | Vulnerable | Species or species habitat likely to occur within area |
| Samadera bidwillii<br>Quassia [29708] | Vulnerable | Species or species habitat likely to occur within area |
| **Reptiles** | | |
| Denisonia maculata<br>Ornamental Snake [1193] | Vulnerable | Species or species habitat known to occur within area |
| Egernia rugosa<br>Yakka Skink [1420] | Vulnerable | Species or species habitat may occur within area |
| Elseya albagula<br>Southern Snapping Turtle, White-throated Snapping Turtle [81648] | Critically Endangered | Species or species habitat likely to occur within area |
| Furina dunmalli<br>Dunmall's Snake [59254] | Vulnerable | Species or species habitat may occur within area |
| Lerista allanae<br>Allan's Lerista, Retro Slider [1378] | Endangered | Species or species habitat may occur within area |
| Rheodytes leukops<br>Fitzroy River Turtle, Fitzroy Tortoise, Fitzroy Turtle, White-eyed River Diver [1761] | Vulnerable | Species or species habitat likely to occur within area |

## Listed Migratory Species

[ Resource Information ]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

| Name | Threatened | Type of Presence |
|---|---|---|
| **Migratory Marine Birds** | | |
| Apus pacificus<br>Fork-tailed Swift [678] | | Species or species habitat likely to occur within area |
| **Migratory Terrestrial Species** | | |
| Cuculus optatus<br>Oriental Cuckoo, Horsfield's Cuckoo [86651] | | Species or species habitat may occur within area |

| Name | Threatened | Type of Presence |
|---|---|---|
| Monarcha melanopsis<br>Black-faced Monarch [609] | | Species or species habitat known to occur within area |
| Motacilla flava<br>Yellow Wagtail [644] | | Species or species habitat may occur within area |
| Myiagra cyanoleuca<br>Satin Flycatcher [612] | | Species or species habitat may occur within area |
| Migratory Wetlands Species | | |
| Calidris ferruginea<br>Curlew Sandpiper [856] | Critically Endangered | Species or species habitat may occur within area |
| Gallinago hardwickii<br>Latham's Snipe, Japanese Snipe [863] | | Species or species habitat may occur within area |
| Pandion haliaetus<br>Osprey [952] | | Species or species habitat likely to occur within area |
| Tringa nebularia<br>Common Greenshank, Greenshank [832] | | Species or species habitat may occur within area |

## Other Matters Protected by the EPBC Act

| Listed Marine Species | | [ Resource Information ] |
|---|---|---|
| * Species is listed under a different scientific name on the EPBC Act - Threatened Species list. | | |
| Name | Threatened | Type of Presence |
| Birds | | |
| Anseranas semipalmata<br>Magpie Goose [978] | | Species or species habitat may occur within area |
| Apus pacificus<br>Fork-tailed Swift [678] | | Species or species habitat likely to occur within area |
| Ardea alba<br>Great Egret, White Egret [59541] | | Species or species habitat known to occur within area |
| Ardea ibis<br>Cattle Egret [59542] | | Species or species habitat may occur within area |
| Calidris ferruginea<br>Curlew Sandpiper [856] | Critically Endangered | Species or species habitat may occur within area |
| Cuculus saturatus<br>Oriental Cuckoo, Himalayan Cuckoo [710] | | Species or species habitat may occur within area |
| Gallinago hardwickii<br>Latham's Snipe, Japanese Snipe [863] | | Species or species habitat may occur within area |
| Haliaeetus leucogaster<br>White-bellied Sea-Eagle [943] | | Species or species habitat known to occur within area |

| Name | Threatened | Type of Presence |
|---|---|---|
| Merops ornatus<br>Rainbow Bee-eater [670] | | Species or species habitat may occur within area |
| Monarcha melanopsis<br>Black-faced Monarch [609] | | Species or species habitat known to occur within area |
| Motacilla flava<br>Yellow Wagtail [644] | | Species or species habitat may occur within area |
| Myiagra cyanoleuca<br>Satin Flycatcher [612] | | Species or species habitat may occur within area |
| Pandion haliaetus<br>Osprey [952] | | Species or species habitat likely to occur within area |
| Rostratula benghalensis (sensu lato)<br>Painted Snipe [889] | Endangered* | Species or species habitat likely to occur within area |
| Tringa nebularia<br>Common Greenshank, Greenshank [832] | | Species or species habitat may occur within area |

## Extra Information

### Invasive Species [ Resource Information ]

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resouces Audit, 2001.

| Name | Status | Type of Presence |
|---|---|---|
| **Birds** | | |
| Passer domesticus<br>House Sparrow [405] | | Species or species habitat likely to occur within area |
| Streptopelia chinensis<br>Spotted Turtle-Dove [780] | | Species or species habitat likely to occur within area |
| **Frogs** | | |
| Rhinella marina<br>Cane Toad [83218] | | Species or species habitat likely to occur within area |
| **Mammals** | | |
| Capra hircus<br>Goat [2] | | Species or species habitat likely to occur within area |
| Felis catus<br>Cat, House Cat, Domestic Cat [19] | | Species or species |

| Name | Status | Type of Presence |
|---|---|---|
| | | habitat likely to occur within area |
| Feral deer<br>Feral deer species in Australia [85733] | | Species or species habitat likely to occur within area |
| Mus musculus<br>House Mouse [120] | | Species or species habitat likely to occur within area |
| Oryctolagus cuniculus<br>Rabbit, European Rabbit [128] | | Species or species habitat likely to occur within area |
| Sus scrofa<br>Pig [6] | | Species or species habitat likely to occur within area |
| Vulpes vulpes<br>Red Fox, Fox [18] | | Species or species habitat likely to occur within area |
| **Plants** | | |
| Acacia nilotica subsp. indica<br>Prickly Acacia [6196] | | Species or species habitat may occur within area |
| Jatropha gossypifolia<br>Cotton-leaved Physic-Nut, Bellyache Bush, Cotton-leaf Physic Nut, Cotton-leaf Jatropha, Black Physic Nut [7507] | | Species or species habitat likely to occur within area |
| Lantana camara<br>Lantana, Common Lantana, Kamara Lantana, Large-leaf Lantana, Pink Flowered Lantana, Red Flowered Lantana, Red-Flowered Sage, White Sage, Wild Sage [10892] | | Species or species habitat likely to occur within area |
| Parkinsonia aculeata<br>Parkinsonia, Jerusalem Thorn, Jelly Bean Tree, Horse Bean [12301] | | Species or species habitat likely to occur within area |
| Parthenium hysterophorus<br>Parthenium Weed, Bitter Weed, Carrot Grass, False Ragweed [19566] | | Species or species habitat likely to occur within area |
| Vachellia nilotica<br>Prickly Acacia, Blackthorn, Prickly Mimosa, Black Piquant, Babul [84351] | | Species or species habitat likely to occur within area |

# Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World and National Heritage properties, Wetlands of International and National Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species distributions have been derived through a variety of methods. Where distributions are well known and if time permits, maps are derived using either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc) together with point locations and described habitat; or environmental modelling (MAXENT or BIOCLIM habitat modelling) using point locations and environmental data layers.

Where very little information is available for species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc). In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More reliable distribution mapping methods are used to update these distributions as time permits.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

The following groups have been mapped, but may not cover the complete distribution of the species:

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

Such breeding sites may be important for the protection of the Commonwealth Marine environment.

# Coordinates

-21.8891 148.1165,-21.8891 148.468,-22.3369 148.468,-22.3369 148.1165,-21.8891 148.1165

# Acknowledgements

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

-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

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


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

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Queensland Government

# Wildlife Online Extract

| | |
|---|---|
| Search Criteria: | Species List for a Defined Area |
| | Species: All |
| | Type: All |
| | Status: Rare and threatened species |
| | Records: All |
| | Date: All |
| | Latitude: 21.8891 to 22.3369 |
| | Longitude: 148.1165 to 148.4680 |
| | Email: dmoore@dpm-enviro.com.au |
| | Date submitted: Saturday 25 Mar 2017 14:54:13 |
| | Date extracted: Saturday 25 Mar 2017 15:00:03 |

The number of records retrieved = 5

**Disclaimer**

As the DSITIA is still in a process of collating and vetting data, it is possible the information given is not complete. The information provided should only be used for the project for which it was requested and it should be appropriately acknowledged as being derived from Wildlife Online when it is used.

The State of Queensland does not invite reliance upon, nor accept responsibility for this information. Persons should satisfy themselves through independent means as to the accuracy and completeness of this information.

No statements, representations or warranties are made about the accuracy or completeness of this information. The State of Queensland disclaims all responsibility for this information and all liability (including without limitation, liability in negligence) for all expenses, losses, damages and costs you may incur as a result of the information being inaccurate or incomplete in any way for any reason.

Feedback about Wildlife Online should be emailed to wildlife.online@science.dsitia.qld.gov.au

| Kingdom | Class | Family | Scientific Name | Common Name | I | Q | A | Records |
|---|---|---|---|---|---|---|---|---|
| animals | birds | Columbidae | *Geophaps scripta scripta* | squatter pigeon (southern subspecies) | | V | V | 8 |
| animals | mammals | Phascolarctidae | *Phascolarctos cinereus* | koala | | V | V | 4 |
| animals | reptiles | Elapidae | *Acanthophis antarcticus* | common death adder | | V | | 1 |
| animals | reptiles | Elapidae | *Denisonia maculata* | ornamental snake | | V | V | 6 |
| plants | higher dicots | Euphorbiaceae | *Bertya pedicellata* | | | NT | | 8/8 |

CODES

I - Y indicates that the taxon is introduced to Queensland and has naturalised.

Q - Indicates the Queensland conservation status of each taxon under the *Nature Conservation Act 1992*. The codes are Extinct in the Wild (PE), Endangered (E), Vulnerable (V), Near Threatened (NT), Least Concern (C) or Not Protected ( ).

A - Indicates the Australian conservation status of each taxon under the *Environment Protection and Biodiversity Conservation Act 1999.* The values of EPBC are Conservation Dependent (CD), Critically Endangered (CE), Endangered (E), Extinct (EX), Extinct in the Wild (XW) and Vulnerable (V).

Records – The first number indicates the total number of records of the taxon for the record option selected (i.e. All, Confirmed or Specimens).
This number is output as 99999 if it equals or exceeds this value. The second number located after the / indicates the number of specimen records for the taxon.
This number is output as 999 if it equals or exceeds this value.

Queensland Government

# Wildlife Online Extract

Search Criteria: Species List for a Specified Point
Species: All
Type: All
Status: Rare and threatened species
Records: All
Date: All
Latitude: -22.1130
Longitude: 148.2923
Distance: 75
Email: dmoore@dpm-enviro.com.au
Date submitted: Saturday 25 Mar 2017 15:01:59
Date extracted: Saturday 25 Mar 2017 15:10:02

The number of records retrieved = 26

**Disclaimer**

As the DSITIA is still in a process of collating and vetting data, it is possible the information given is not complete. The information provided should only be used for the project for which it was requested and it should be appropriately acknowledged as being derived from Wildlife Online when it is used.

The State of Queensland does not invite reliance upon, nor accept responsibility for this information. Persons should satisfy themselves through independent means as to the accuracy and completeness of this information.

No statements, representations or warranties are made about the accuracy or completeness of this information. The State of Queensland disclaims all responsibility for this information and all liability (including without limitation, liability in negligence) for all expenses, losses, damages and costs you may incur as a result of the information being inaccurate or incomplete in any way for any reason.

| Kingdom | Class | Family | Scientific Name | Common Name | I | Q | A | Records |
|---|---|---|---|---|---|---|---|---|
| animals | birds | Accipitridae | *Erythrotriorchis radiatus* | red goshawk | | E | V | 3 |
| animals | birds | Cacatuidae | *Calyptorhynchus lathami erebus* | glossy black-cockatoo (northern) | | V | | 6 |
| animals | birds | Columbidae | *Geophaps scripta scripta* | squatter pigeon (southern subspecies) | | V | V | 41 |
| animals | birds | Phaethontidae | *Phaethon rubricauda* | red-tailed tropicbird | | V | | 1 |
| animals | mammals | Megadermatidae | *Macroderma gigas* | ghost bat | | V | V | 1 |
| animals | mammals | Phascolarctidae | *Phascolarctos cinereus* | koala | | V | V | 96 |
| animals | mammals | Vombatidae | *Lasiorhinus krefftii* | northern hairy-nosed wombat | | E | E | 1 |
| animals | reptiles | Elapidae | *Furina dunmalli* | Dunmall's snake | | V | V | 1/1 |
| animals | reptiles | Elapidae | *Denisonia maculata* | ornamental snake | | V | V | 114/1 |
| animals | reptiles | Elapidae | *Acanthophis antarcticus* | common death adder | | V | | 1 |
| animals | reptiles | Scincidae | *Lerista allanae* | Allan's lerista | | E | E | 1/1 |
| plants | higher dicots | Amaranthaceae | *Kelita uncinella* | | | E | | 1/1 |
| plants | higher dicots | Apocynaceae | *Cerbera dumicola* | | | NT | | 5/5 |
| plants | higher dicots | Asteraceae | *Trioncinia patens* | | | E | | 3/3 |
| plants | higher dicots | Asteraceae | *Trioncinia retroflexa* | | | E | | 4/3 |
| plants | higher dicots | Capparaceae | *Capparis humistrata* | | | E | | 1/1 |
| plants | higher dicots | Combretaceae | *Macropteranthes leiocaulis* | | | NT | | 6/6 |
| plants | higher dicots | Euphorbiaceae | *Omphalea celata* | | | V | V | 2/2 |
| plants | higher dicots | Euphorbiaceae | *Bertya pedicellata* | | | NT | | 19/19 |
| plants | higher dicots | Mimosaceae | *Acacia spania* | | | NT | | 1/1 |
| plants | higher dicots | Mimosaceae | *Acacia arbiana* | | | NT | | 3/3 |
| plants | higher dicots | Solanaceae | *Solanum elachophyllum* | | | E | | 3/3 |
| plants | higher dicots | Solanaceae | *Solanum adenophorum* | | | E | | 3/3 |
| plants | monocots | Poaceae | *Dichanthium queenslandicum* | | | V | E | 25/24 |
| plants | monocots | Poaceae | *Digitaria porrecta* | | | NT | | 4/4 |
| plants | monocots | Poaceae | *Aristida annua* | | | V | V | 1/1 |

CODES

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A - Indicates the Australian conservation status of each taxon under the *Environment Protection and Biodiversity Conservation Act 1999.* The values of EPBC are Conservation Dependent (CD), Critically Endangered (CE), Endangered (E), Extinct (EX), Extinct in the Wild (XW) and Vulnerable (V).

Records – The first number indicates the total number of records of the taxon for the record option selected (i.e. All, Confirmed or Specimens).
This number is output as 99999 if it equals or exceeds this value. The second number located after the / indicates the number of specimen records for the taxon.
This number is output as 999 if it equals or exceeds this value.

# Appendix B: Fauna habitat site descriptions

| | |
|---|---|
| **Survey Code**<br>FAC1 | |
| **Location**<br>Willunga | |
| **Date**<br>2-6/11/2016 | |
| **Latitude**<br>-22.40990 | |
| **Longitude**<br>148.55850 | |
| **Slope:**<br><1° | |
| **Aspect:**<br>SW | |

| **General Site Description** | |
|---|---|
| **Landform** | Gently undulating plain; deposited low rises – old floodplain |
| **Soil** | Red-brown sandy clay loam |
| **Observed vegetation** | RE 11.3.2 (mapped as 11.3.2). Woodland dominated by poplar box (*Eucalyptus populnea*), with occasional Clarkson's bloodwood (*Corymbia clarksoniana*). Sparse mid-stratum including cocaine tree (*Erythroxylum australe*), soap tree (*Alphitonia excelsa*), Leichhardt bean (*Cassia brewsteri*), quinine tree (*Petalostigma pubescens*) and currant bush (*Carissa ovata*). Ground layer dominated by buffel grass (*Cenchrus ciliaris*) and shrubby stylo (*Stylosanthes scabra*). |
| **General Site Observations** | **BVG: Eucalypt dry woodlands on inland depositional plains.** Trees form ecologically dominant stratum; young community with few old trees; connected through large isolated vegetation unit (over 5km long) with tenuous connection through to Isaac River corridor; mostly exotic groundcover with scattered native grasses and herbs; moderate recruitment; erosion absent; no dieback detected; fire scars absent. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered small hollows, mostly dead; scattered large logs; scattered large logs; abundant small logs; leaf litter common; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Scattered seeding grass cover; scattered fleshy fruiting plants, including quinine tree, currant bush and pest pear (*Opuntia stricta*); nectar/pollen producing plants abundant; koala feed trees abundant. |
| **Species detected** | Species detected included one frog, eight reptiles, 14 mammals and 15 birds (Appendix C). Two EVNT species detected, being the Vulnerable (EPBC Act and NC Act) greater glider (*Petauroides volans*) and the Vulnerable (EPBC Act and NC Act) ornamental snake (*Denisonia maculata*). |
| **Koala Feed Trees** | Poplar box (*E. populnea*) dominant. No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: medium (1); key existing threats: medium (1); recovery value: medium (1); overall score: 5 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>FAC2 | |
| **Location**<br>Willunga | |
| **Date**<br>2-6/11/2016 | |
| **Latitude**<br>-22.37110 | |
| **Longitude**<br>148.55450 | |
| **Slope:**<br><1° | |
| **Aspect:**<br>SE | |

| **General Site Description** | |
|---|---|
| **Landform** | Gently undulating plain; deposited low rises – old floodplain |
| **Soil** | Red-brown sandy loam |
| **Observed vegetation** | RE 11.3.2 (mapped as 11.4.4 / 11.4.9). Woodland dominated by poplar box (*Eucalyptus populnea*), with frequent Clarkson's bloodwood (*Corymbia clarksoniana*). Second stratum at 9m of poplar box, white bauhinia (*Lysiphyllum hookeri*), sally wattle (*Acacia salicina*), ironwood (*Acacia excelsa*) and whitewood (*Atalaya hemiglauca*). Tall shrub layer of bean tree (*Cassia brewsteri*), poison peach (*Ehretia membranifolia*), stiff denhamia (*Denhamia oleaster*), native olive (*Notelaea microcarpa*), dead finish (*Archidendropsis basaltica*), and yellowberry bush (*Denhamia cunninghamii*). Low shrub layer of currant bush (*Carissa ovata*). Ground layer dominated by buffel grass (*Cenchrus ciliaris*), occasional wire grass (*Aristida calycina*), shrubby stylo (*Stylosanthes scabra*) and *Sida* sp. |
| **General Site Observations** | **BVG: Eucalypt dry woodlands on inland depositional plains.** Trees form ecologically dominant stratum; healthy community with mostly young trees; vegetation unit approximately 1.4 km long, isolated by clearing; mostly exotic groundcover with scattered native grasses and herbs; moderate recruitment; erosion absent; old dieback; fire scars absent. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Large hollows absent; small hollows scattered, mostly dead trees; large logs absent; small logs common; leaf litter common; dense shrub / grass shelter common. |
| **Food Potential Over Entire Year** | Seeding grass cover scattered; fleshy fruiting plants common, including yellowberry bush and currant bush; nectar / pollen producing plant common; koala feed trees common. |
| **Species detected** | Species detected included four frogs, five reptiles, seven mammals and 14 birds (Appendix C). No EVNT species detected. |
| **Koala Feed Trees** | Poplar box (*E. populnea*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: medium (1); key existing threats: medium (1); recovery value: medium (1); overall score: 5 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>FAC3 | |
| **Location**<br>Willunga | |
| **Date**<br>2-6/11/2016 | |
| **Latitude**<br>-22.35650 | |
| **Longitude**<br>148.50950 | |
| **Slope:**<br><1° along reach; 30° bank | |
| **Aspect:**<br>S along reach; W down bank | |

| **General Site Description** | |
|---|---|
| **Landform** | River bank |
| **Soil** | Brown sand |
| **Observed vegetation** | RE 11.3.25 (mapped as 11.3.25). Open forest dominated by forest red gum (*Eucalyptus tereticornis*), with occasional weeping tea-tree (*Melaleuca fluviatilis*), river she-oak (*Casuarina cunninghamiana*) and coolabah (*E. coolabah*). Second stratum at 12m of poplar box (*Eucalyptus populnea*), doolan (*Acacia salicina*), rough-barked apple (*Angophora floribunda*), flax leafed paperbark (*Melaleuca linariifolia*), black tea tree (*Melaleuca bracteata*) and white bauhinia (*Lysiphyllum hookeri*). Very sparse shrub layer of currant bush (*Carissa ovata*), stiff-leaved denhamia (*Denhamia oleaster*), bitter bark (*Alstonia constricta*) and sally wattle. Ground layer co-dominated by buffel grass *(Cenchrus ciliaris*) and green panic (*Megathyrsus maxima*). |
| **General Site Observations** | **BVG: Eucalypt open forests to woodlands on floodplains.** Trees form ecologically dominant stratum; healthy community; moderate regeneration; vegetation unit part of narrow, Isaac River riparian corridor; ground layer dominated by exotic grass; erosion absent; fire scars absent. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered large hollows and small hollows abundant, in a mixture of dead and alive trees; large logs scattered; small logs abundant; leaf litter common; dense shrub / grass shelter common. |
| **Food Potential Over Entire Year** | Seeding grass scattered; scattered fleshy fruiting plants, including currant bush; nectar / pollen producing plant abundant; koala feed trees abundant. |
| **Species detected** | Species detected included two frogs, four reptiles, eight mammals and three birds (Appendix C). Only two nights trapping effort achieved, due to rising river. One EVNT species detected, being the Vulnerable (EPBC Act and NC Act) koala (*Phascolarctos cinereus*). |
| **Koala Feed Trees** | Forest red gum (*E. tereticornis*), coolabah (*E. coolabah*) and poplar box (*E. populnea*). |
| **Koala habitat score** | Koala occurrence: high (2); vegetation composition: high (2); habitat connectivity: high (2); key existing threats: medium (1); recovery value: high (2); overall score: 9 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>FAC5 | |
| **Location**<br>Seloh Nolem | |
| **Date**<br>7-11/11/2016 | |
| **Latitude**<br>-22.32590 | |
| **Longitude**<br>148.47960 | |
| **Slope:**<br>1° along reach; 30° down bank | |
| **Aspect:**<br>S along reach; W down bank | |

| **General Site Description** | |
|---|---|
| **Landform** | River bank |
| **Soil** | Yellow-brown sand |
| **Observed vegetation** | RE 11.3.25 (mapped as 11.3.25). Woodland to open forest dominated by forest red gum (*Eucalyptus tereticornis*), with frequent river she-oak (*Casuarina cunninghamiana*), and occasional carbeen (*Corymbia tessellaris*) and coolabah (*E. coolabah*). Sparse second stratum at 8 m of river she-oak, forest red gum and doolan (*Acacia salicina*). Sparse shrub layer of white bauhinia (*Lysiphyllum hookeri*) and lantana (*Lantana camara*) on the upper bank and snow-in-summer (*Melaleuca linariifolia*) on the lower bank. Ground layer dominated by green panic (*Megathyrsus maxima*), with occasional common couch *(Cynodon dactylon*), Queensland blue grass (*Dichanthium sericeum*) and Para grass (*Brachiaria mutica*). |
| **General Site Observations** | **BVG: Eucalypt open forests to woodlands on floodplains.** Trees form ecologically dominant stratum; healthy community within a large remnant patch; good recruitment; clearing for fence lines and tracks nearby; no dieback noted. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Small and large hollows abundant, mostly in living trees; large logs scattered; small logs common; leaf litter common; dense shrub / grass shelter common. |
| **Food Potential Over Entire Year** | Seeding grass cover common; scattered fleshy fruiting plants, including lantana and currant bush (*Carissa ovata*); nectar / pollen producing plant common; koala feed trees common. |
| **Species detected** | Species detected included two frogs, three reptiles, five mammals and 18 birds (Appendix C). No EVNT species detected. |
| **Koala Feed Trees** | Forest red gum (*E. tereticornis*) and coolabah (*E. coolabah*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: high (2); key existing threats: medium (1); recovery value: high (2); overall score: 7 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>FAC6 | |
| **Location**<br>Vermont Park | |
| **Date**<br>7-11/11/2016 | |
| **Latitude**<br>-22.29980 | |
| **Longitude**<br>148.46510 | |
| **Slope:**<br><1° | |
| **Aspect:**<br>S | |

| **General Site Description** | |
|---|---|
| **Landform** | Level plain |
| **Soil** | Brown loamy clay |
| **Observed vegetation** | RE 11.3.2 (mapped as 11.3.2 / 11.3.7 / 11.3.1). Poplar box (*Eucalyptus populnea*) woodland, with a sparse sub-canopy of boonaree (*Alectryon oleifolius*), whitewood (*Atalaya hemiglauca*), false sandalwood (*Eremophila mitchellii*), bean tree (*Cassia brewsteri*), emu apple (*Owenia acidula*), sally wattle (*Acacia salicina*) and poplar box. Very sparse shrub layer of whitewood, bean tree, yellowberry bush (*Denhamia cunninghamii*), currant bush (*Carissa ovata*) and nipan (*Capparis lasiantha*). Ground layer dominated by buffel grass (*Cenchrus ciliaris*), wiregrass (*Aristida sp.*), kangaroo grass (*Themeda triandra*) and black spear grass (*Heteropogon contortus*). |
| **General Site Observations** | **BVG: Eucalypt dry woodlands on inland depositional plains.** Trees form ecologically dominant stratum; healthy community within a large remnant patch; good recruitment; no dieback noted; range of canopy maturities with some larger hollows in old trees; no erosion noted; no fire scars. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered large hollows and abundant small hollows, in a mixture of dead and alive trees; large logs scattered; small logs common; leaf litter common; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Seeding grass cover common; scattered fleshy fruiting plants, including emu apple, currant bush and nipan; nectar / pollen producing plant common; koala feed trees common. |
| **Species detected** | Species detected included eight frogs, two reptiles, nine mammals and 15 birds (Appendix C). No EVNT species detected. |
| **Koala Feed Trees** | Poplar box (*E. populnea*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: medium (1); habitat connectivity: high (2); key existing threats: medium (1); recovery value: medium (1); overall score: 5 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>FAC7 | |
| **Location**<br>Vermont Park | |
| **Date**<br>7-11/11/2016 | |
| **Latitude**<br>-22.27760 | |
| **Longitude**<br>148.39190 | |
| **Slope:**<br><1° | |
| **Aspect:**<br>S | |

| **General Site Description** | |
|---|---|
| **Landform** | Palustrine wetland / swamp |
| **Soil** | Pale brown sandy clay |
| **Observed vegetation** | RE 11.5.17 (mapped as 11.3.27b). Woodland dominated by poplar gum (*Eucalyptus platyphylla*), with occasional coolabah (*E. coolabah*), forest red gum (*E. camaldulensis*) and carbeen (*Corymbia tessellaris*). A sub-canopy is not evident, nor is a shrub layer. Ground cover is *Cyperus sp.*, couch grass (*Cynodon dactylon*) and *Eleocharis* sp. |
| **General Site Observations** | **BVG: Eucalypt dry woodlands on inland depositional plains.** Trees form ecologically dominant stratum; medium to high stock impacts with pugging and grazing; no dieback evident; recruitment is poor and seedling regeneration likely suffering from grazing pressures; no erosion noted; no fire scars; ironstone nodules throughout wetlands with some areas of conglomerate formations. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered large hollows and small hollows common, mostly in alive trees; large logs scattered; small logs common; leaf litter common; dense shrub / grass shelter absent. |
| **Food Potential Over Entire Year** | Seeding grass / sedge cover common; fleshy fruiting plants absent; nectar / pollen producing plant common; koala feed trees scattered. |
| **Species detected** | Species detected included one frog, one reptile, 10 mammals and 18 birds (Appendix C). No EVNT species detected. |
| **Koala Feed Trees** | Forest red gum (*E. tereticornis*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: high (2); key existing threats: medium (1); recovery value: medium (1); overall score: 6 = **Critical habitat**. |
| **Fauna habitat value – general** | Average when dry. High when wet. |

| | |
|---|---|
| **Survey Code**<br>FAC8 | |
| **Location**<br>Vermont Park | |
| **Date**<br>7-11/11/2016 | |
| **Latitude**<br>-22.27380 | |
| **Longitude**<br>148.31430 | |
| **Slope:**<br><1° | |
| **Aspect:**<br>- | |

| **General Site Description** | |
|---|---|
| **Landform** | Gently undulating plain with large gilgai formations |
| **Soil** | Brown cracking clays |
| **Observed vegetation** | RE 11.4.9 (mapped as 11.4.9 / 11.4.8 / 11.5.3). Open woodland of brigalow (*Acacia harpophylla*) and Dawson gum (*Eucalyptus cambageana*), with a sparse sub-canopy of brigalow, yellowwood (*Terminalia oblongata*) and red bauhinia (*Lysiphyllum carronii*). Sparse shrub layer of currant bush (*Carissa ovata*), brigalow and false sandalwood (*Eremophila mitchellii*). Ground layer dominated by buffel grass (*Cenchrus ciliaris*), with occasional brigalow grass (*Paspalidium caespitosum*) and windmill grass (*Eragrostis sp.*). |
| **General Site Observations** | **BVG: Other acacia dominated open forests, woodlands and shrublands.** Trees form ecologically dominant stratum; mobile gilgai formation with many leaning brigalow trees, likely contributing to high level of timber on ground as well as relatively low canopy with no large trees; good recruitment; no erosion noted; no fire scars. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Small and large hollows absent; large logs absent; small logs common; leaf litter common; dense shrub / grass shelter common. |
| **Food Potential Over Entire Year** | Seeding grass cover scattered; scattered fleshy fruiting plants, including currant bush; nectar / pollen producing plant common; koala feed trees absent. |
| **Species detected** | Species detected included five reptiles, no frogs, five mammals and 11 birds (Appendix C). No EVNT species detected. |
| **Koala Feed Trees** | Not detected. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: low (0); habitat connectivity: high (2); key existing threats: medium (1); recovery value: low (0); overall score: 3 = **Not critical habitat.** |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>FAC9 | |
| **Location**<br>Willunga | |
| **Date**<br>24-28/04/2017 | |
| **Latitude**<br>-22.38003 | |
| **Longitude**<br>148.51611 | |
| **Slope:**<br><1° along reach; 30° bank | |
| **Aspect:**<br>S along reach; W down bank | |

| **General Site Description** | |
|---|---|
| **Landform** | River bank |
| **Soil** | Brown sand |
| **Observed vegetation** | RE 11.3.25 (mapped as 11.3.25). Open forest dominated by forest red gum (*Eucalyptus tereticornis*), with frequent weeping tea-tree (*Melaleuca fluviatilis*) and carbeen (*Corymbia tessellaris*), occasional river she-oak (*Casuarina cunninghammiana*) and coolabah (*E. coolabah*). Sub-canopy of snow in summer (*Melaleuca linariifolia*), sandpaper fig (*Ficus opposita*), white bauhinia (*Lysiphyllum hookeri*), poison peach (*Ehretia membranifolia*) and soap tree (*Alphitonia excelsa*). Ground layer dominated by green panic (*Megathyrsus maxima*) and sabi grass (*Urochloa mosambicensis*), abundant common couch (*Cynodon dactylon*) and frequent forest blue grass (*Bothriochloa bladhii*), giant sedge (*Cyperus exaltatus*) and buffel grass (*Cenchrus ciliaris*). |
| **General Site Observations** | **BVG: Eucalypt open forests to woodlands on floodplains.** Trees form ecologically dominant stratum; healthy community; moderate regeneration; vegetation unit part of the vegetated, but narrow, Isaac River riparian corridor; ground layer dominated by exotic grasses; scattered streambank erosion; light cattle grazing; fire scars absent. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered large hollows and abundant small hollows, in a mixture of dead and alive trees; large logs scattered; small logs common; scattered leaf litter; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Seeding grass cover common; scattered fleshy fruiting plants, including sandpaper fig; nectar / pollen producing plant abundant; koala feed trees abundant. |
| **Species detected** | Species detected included five amphibians, six reptiles, 10 mammals and 19 birds (Appendix C). |
| **Koala Feed Trees** | Forest red gum (*E. tereticornis*) and coolabah (*E. coolabah*). |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: medium (1); key existing threats: medium (1); recovery value: high (2); overall score: 6 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>FAC10 | |
| **Location**<br>Willunga | |
| **Date**<br>24-28/04/2017 | |
| **Latitude**<br>-22.37779 | |
| **Longitude**<br>148.54834 | |
| **Slope:**<br><1° | |
| **Aspect:**<br>SE | |

| **General Site Description** | |
|---|---|
| **Landform** | Level plain; deposited low rises – old floodplain |
| **Soil** | Red-brown sandy loam |
| **Observed vegetation** | RE 11.3.7 (mapped as 11.3.2 / 11.3.7 / 11.3.1). Grassy open woodland dominated by Clarkson's bloodwood (*Corymbia clarksoniana*) with frequent carbeen (*C. tessellaris*) and occasional poplar box (*E. populnea*). Very sparse sub-canopy of Clarkson's bloodwood, sally wattle (*Acacia salicina*), bean tree (*Cassia brewsteri*) and soap tree (*Alphitonia excelsa*). Sparse shrub layer dominated by currant bush (*Carissa ovata*) and scrub boonaree (*Alectryon diversifolius*), with occasional cocaine tree (*Erythroxylum australe*), sandalwood (*Santalum lanceolatum*) and bootlace oak (*Hakea lorea*). Ground layer dominated by buffel grass (*Cenchrus ciliaris*), with frequent pitted bluegrass (*Bothriochloa decipiens*), wiregrass (*Aristida* sp.) and *Sida* spp. |
| **General Site Observations** | **BVG: Eucalypt dry woodlands on inland depositional plains.** Trees form ecologically dominant stratum; healthy community with a range of ages; vegetation unit approximately 2.4 km long isolated by clearing; mostly exotic groundcover with scattered native grasses and exotic herbs; moderate recruitment; erosion absent; no dieback detected; fire scars absent. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered large hollows and common small hollows, in a mixture of dead and alive trees; small and large logs common; scattered leaf litter; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Seeding grass cover scattered; scattered fleshy fruiting plants, including currant bush and dysentery plant (*Grewia latifolia*); nectar / pollen producing plant common; koala feed trees absent. |
| **Species detected** | Species detected included five reptiles, 11 mammals and 14 birds (Appendix C). No EVNT species detected. |
| **Koala Feed Trees** | None detected. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: medium (1); habitat connectivity: medium (1); key existing threats: medium (1); recovery value: medium (1); overall score: 4 = Not critical habitat. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>FAC11 | |
| **Location**<br>Willunga | |
| **Date**<br>24-28/04/2017 | |
| **Latitude**<br>-22.34726 | |
| **Longitude**<br>148.60398 | |
| **Slope:**<br><1° | |
| **Aspect:**<br>- | |

| **General Site Description** | |
|---|---|
| **Landform** | Level plain, with gilgai |
| **Soil** | Brown medium clay |
| **Observed vegetation** | Non-remnant (mapped as non-remnant). Modified agricultural grassland dominated by sabi grass (*Urochloa mosambicensis*) and buffel grass (*Cenchrus ciliaris*). Scattered eucalypts. Shrub layer absent. |
| **General Site Observations** | **BVG: Agricultural grasslands**. Groundcover forms ecologically dominant stratum; standing water in adjoining gilgai as a result of recent rainfall; scattered trees; grazed by cattle; no recruitment evident. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered small hollows, mainly in living trees; large logs absent; small logs scattered; dense grass shelter abundant. |
| **Food Potential Over Entire Year** | Seeding grass cover abundant; fleshy fruiting plants absent; nectar / pollen producing plant scattered; koala feed trees absent. |
| **Species detected** | Species detected included five frogs, two reptiles, nine mammals (Appendix C). One EVNT species detected, being the Vulnerable (EPBC Act and NC Act) ornamental snake (*Denisonia maculata*). Most ornamental snakes were observed beneath scattered timber, likely due to the recent wet weather having swollen and closed most cracks in the clays. |
| **Koala Feed Trees** | None detected. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: low (0); habitat connectivity: low (0); key existing threats: high (2); recovery value: low (0); overall score: 2 = not critical habitat. |
| **Fauna habitat value – general** | Average. |

| | |
|---|---|
| **Survey Code**<br>FAC12 | |
| **Location**<br>Vermont Park | |
| **Date**<br>29/04/2017 – 3/05/2017 | |
| **Latitude**<br>-22.28952 | |
| **Longitude**<br>148.46427 | |
| **Slope:**<br><1° | |
| **Aspect:**<br>SE | |

| **General Site Description** | |
|---|---|
| **Landform** | Level plain with gilgai formation |
| **Soil** | Brown alluvial clay |
| **Observed vegetation** | RE 11.3.1 (mapped as 11.3.1). Woodland dominated by brigalow (*Acacia harpophylla*), with abundant yellowwood (*Terminalia oblongata*) and occasional coolabah (*Eucalyptus coolabah*). Sub-canopy of brigalow and yellowwood. Sparse shrub layer dominated by yellowwood and currant bush (*Carissa ovata*). Ground layer dominated by buffel grass (*Cenchrus ciliaris*), with frequent *Cyperus* sp., *Basilicum polystachion*, hairy nardoo (*Marsilea hirsuta*) and lesser joyweed (*Alternanthera denticulata*). |
| **General Site Observations** | **BVG: Other acacia dominated open forests, woodlands and shrublands.** No mature trees, but likely to be a low woodland variation of this RE which occurs in some situations with highly mobile gilgai formations; some very mature coolabah (*E. coolabah*) scattered throughout the patch; low native grass species cover is closely related to the dominance of buffel grass. Buffel grass is variable, but estimated at >50% of ground layer. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered large hollows and small hollows common, mostly in dead trees; large logs absent; small logs abundant; leaf litter common; dense shrub / grass shelter common. |
| **Food Potential Over Entire Year** | Seeding grass cover scattered; fleshy fruiting plants scattered, including currant bush; nectar / pollen producing plant common; koala feed trees scattered. |
| **Species detected** | Species detected included nine amphibians, three reptiles, eight mammals and 14 birds (Appendix C). One EVNT species detected, being the Vulnerable (EPBC Act and NC Act) ornamental snake (*Denisonia maculata*). |
| **Koala Feed Trees** | Coolabah (*E. coolabah*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: medium (1); habitat connectivity: medium (1); key existing threats: medium (1); recovery value: medium (1); overall score: 4 = Not critical habitat. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>FAC13 | |
| **Location**<br>Vermont Park | |
| **Date**<br>29/04/2017 – 3/05/2017 | |
| **Latitude**<br>-22.28323 | |
| **Longitude**<br>148.36495 | |
| **Slope:**<br>1° along reach | |
| **Aspect:**<br>SE | |

| **General Site Description** | |
|---|---|
| **Landform** | Creek bank / alluvium |
| **Soil** | Yellow-brown sand, with silty crust |
| **Observed vegetation** | RE 11.3.25 (mapped as 11.3.2 / 11.3.25 / 11.3.1). Open forest dominated by forest red gum (*Eucalyptus tereticornis*), with occasional poplar box (*E. populnea*) and paper barked tea-tree (*Melaleuca fluviatilis*). Sparse sub-canopy of brigalow (*Acacia harpophylla*), yellowwood (*Terminalia oblongata*), white bauhinia (*Lysiphyllum hookeri*), sally wattle (*Acacia salicina*) and black tea tree (*Melaleuca bracteata*). Sparse shrub layer of canopy species regrowth, false sandalwood (*Eremophila mitchellii*), currant bush (*Carissa ovata*), emu apple (*Owenia acidula*) and cocaine tree (*Erythroxylum australe*). Ground layer dominated by green panic (*Megathyrsus maxima*), with abundant sabi grass (*Urochloa mosambicensis*) and frequent bluegrass (*Bothriochloa* sp.). |
| **General Site Observations** | **BVG: Eucalypt open forest to woodland on floodplains**. Trees form ecologically dominant stratum; healthy riparian community; good recruitment; recent deposition of silt forming a thin crust on sandy banks; no fire scars; large mature trees with hollows; light grazing impacts. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered large hollows and abundant small hollows, in a mixture of dead and alive trees; large logs scattered; small logs abundant; scattered leaf litter; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Seeding grass cover scattered; fleshy fruiting plants scattered, including dysentery plant (*Grewia latifolia*), currant bush, emu apple and wombat berry (*Eustrephus latifolius*); nectar / pollen producing plant abundant; koala feed trees abundant. |
| **Species detected** | Species detected included 1 amphibian, 3 reptiles, 13 mammals and 15 birds (Appendix C). Two EVNT species detected, being the Vulnerable (EPBC Act and NC Act) koala (*Phascolarctos cinereus*) and the Vulnerable (EPBC Act and NC Act) greater glider (*Petauroides volans*). |
| **Koala Feed Trees** | Forest red gum (*E. tereticornis*) and poplar box (*E. populnea*). |
| **Koala habitat score** | Koala occurrence: high (2); vegetation composition: high (2); habitat connectivity: high (2); key existing threats: medium (1); recovery value: high (2); overall score: 9 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>FAC14 | |
| **Location**<br>Vermont Park | |
| **Date**<br>29/04/2017 – 3/05/2017 | |
| **Latitude**<br>-22.28475 | |
| **Longitude**<br>148.40706 | |
| **Slope:**<br>1° | |
| **Aspect:**<br>S | |

| **General Site Description** | |
|---|---|
| **Landform** | Gently undulating plain |
| **Soil** | Orange-brown sandy topped clay |
| **Observed vegetation** | RE 11.5.3 (mapped as 11.5.3 / 11.4.9). Poplar box (*Eucalyptus populnea*) woodland. Sparse sub-canopy of sandalwood (*Santalum lanceolatum*), quinine tree (*Petalostigma pubescens*) and sally wattle (*Acacia salicina*). Sparse shrub layer of cocaine tree (*Erythroxylum australe*), currant bush (*Carissa ovata*) and *Acacia* sp. Ground layer dominated by golden beard grass (*Chrysopogon fallax*), with abundant wiregrass (*Aristida* sp.) and *Sida* sp., with frequent red Natal grass (*Melinis repens*) and black spear grass (*Heteropogon contortus*). |
| **General Site Observations** | **BVG: Eucalypt dry woodlands on inland depositional plains.** Trees form ecologically dominant stratum; relatively young community, with no large hollows detected and scattered small hollows detected only in stags; some fire scars evident. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Large hollows absent; scattered small hollows, in dead trees; large logs absent; small logs scattered; leaf litter common; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Seeding grass cover common; scattered fleshy fruiting plants, including currant bush and dysentery plant (*Grewia latifolia*); nectar / pollen producing plant common; koala feed trees common. |
| **Species detected** | Species detected included two amphibians, two reptiles, five mammals and 10 birds (Appendix C). No EVNT species detected. |
| **Koala Feed Trees** | Poplar box (*E. populnea*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: medium (1); habitat connectivity: high (2); key existing threats: medium (1); recovery value: medium (1); overall score: 5 = **Critical habitat**. |
| **Fauna habitat value – general** | Average to good. |

| | |
|---|---|
| **Survey Code**<br>Q1 | |
| **Location**<br>Willunga | |
| **Date**<br>22/11/2016 | |
| **Latitude**<br>-22.40902 | |
| **Longitude**<br>148.56175 | |
| **Slope:**<br>1° | |
| **Aspect:**<br>NW | |

| **General Site Description** | |
|---|---|
| **Landform** | Gently undulating plain; deposited low rises – old floodplain |
| **Soil** | Red-brown sandy clay loam |
| **Observed vegetation** | RE 11.3.2 (mapped by DSITIA (2016) as 11.3.2 / 11.3.7 / 11.3.1). Woodland dominated by poplar box (*Eucalyptus populnea*), with occasional Clarkson's bloodwood (*Corymbia clarksoniana*). Sparse mid-stratum including cocaine tree (*Erythroxylum australe*), soap tree (*Alphitonia excelsa*), Leichhardt bean (*Cassia brewsteri*), quinine tree (*Petalostigma pubescens*) and currant bush (*Carissa ovata*). Ground layer dominated by buffel grass (*Cenchrus ciliaris*) and shrubby stylo (*Stylosanthes scabra*). |
| **General Site Observations** | **BVG: Eucalypt dry woodlands on inland depositional plains**. Trees form ecologically dominant stratum; young community with few old trees; connected through large isolated vegetation unit (over 5km long) with tenuous connection through to Isaac River corridor; mostly exotic groundcover with scattered native grasses and herbs; moderate recruitment; erosion absent; no dieback detected; fire scars absent. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered small hollows, mostly dead; scattered large logs; abundant small logs; leaf litter common; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Scattered seeding grass cover; scattered fleshy fruiting plants, including quinine tree, currant bush and pest pear (*Opuntia stricta*); nectar/pollen producing plants abundant; koala feed trees abundant. |
| **Signs** | Scattered macropod scats; birds detected at time of assessment comprised common native woodland species. |
| **Koala Feed Trees** | Poplar box (*E. populnea*) dominant. No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: medium (1); key existing threats: medium (1); recovery value: medium (1); overall score: 5 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>Q2 | |
| **Location**<br>Willunga | |
| **Date**<br>22/11/2016 | |
| **Latitude**<br>-22.41315 | |
| **Longitude**<br>148.55832 | |
| **Slope:**<br><1° | |
| **Aspect:**<br>NW | |

| **General Site Description** | |
|---|---|
| **Landform** | Gently undulating plain; deposited low rises – old floodplain |
| **Soil** | Orange-brown light sandy clay loam |
| **Observed vegetation** | RE 11.3.7 (mapped by DSITI (2016) as 11.3.2 / 11.3.7 / 11.3.1). Woodland dominated by carbeen (*Corymbia tessellaris*), Clarkson's bloodwood (*C. clarksoniana*), Dallachy's gum (*C. dallachiana*) and poplar gum (*Eucalyptus platyphylla*). Sparse mid-stratum including Leichhardt bean (*Cassia brewsteri*), soap tree (*Alphitonia excelsa*), juvenile Carbeen and *Melaleuca sp*. Ground layer dominated by buffel grass (*Cenchrus ciliaris*), with abundant black spear grass (*Heteropogon contortus*), *Sida* spp., kangaroo grass (*Themeda triandra*) and rattlepod (*Crotalaria* sp.). |
| **General Site Observations** | **BVG: Eucalypt dry woodlands on inland depositional plains**. Trees form ecologically dominant stratum; patchy young recovering community with few old trees; connected through large isolated vegetation unit (over 5km long) with tenuous connection through to Isaac River corridor; mostly exotic groundcover with scattered native grasses and herbs; good recruitment; erosion absent; old dieback evident; fire scars absent. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Small and large hollows common, mostly dead; scattered large logs; small logs common; scattered leaf litter; dense shrub / grass shelter common. |
| **Food Potential Over Entire Year** | Seeding grass cover common; scattered fleshy fruiting plants, including currant bush (*Carissa ovata*); nectar/pollen producing plants abundant. |
| **Signs** | Scattered macropod scats; scattered glider scratches; greater glider scats; birds detected at time of assessment comprised common native woodland species. |
| **Koala Feed Trees** | No primary or secondary koala feed trees detected. No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: low (0); habitat connectivity: medium (1); key existing threats: medium (1); recovery value: low (0); overall score: 2 = **not critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>Q4 | |
| **Location**<br>Old Bombandy | |
| **Date**<br>22/11/2016 | |
| **Latitude**<br>-22.40776 | |
| **Longitude**<br>148.57911 | |
| **Slope:**<br>0° | |
| **Aspect:**<br>N/A | |

| **General Site Description** | |
|---|---|
| **Landform** | Level plain; closed depression – old floodplain |
| **Soil** | Brown light clay |
| **Observed vegetation** | RE 11.3.27i (mapped by DSITIA (2016) as 11.3.27). Palustrine wetland / wooded swamp, dominated by mature forest red gum (*Eucalyptus tereticornis*) in the water, with fringing regrowth of the same species. Occasional Carbeen (*Corymbia tessellaris*). Mid-stratum absent. Ground layer dominated by milfoil (Myriophyllum sp.) and Indian heliotrope (*Heliotropium indicum*). |
| **General Site Observations** | **BVG: Wetlands (swamps and lakes).** Trees form ecologically dominant stratum with some mature trees; dense young regrowth above the high-water level; connected through large isolated vegetation unit (over 5km long) with tenuous connection through to Isaac River corridor; erosion absent; old and recent dieback evident; fire scars absent. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Large hollows common; small hollows abundant, mostly in dead trees; scattered large logs; abundant small logs; scattered leaf litter; dense shrub / grass shelter absent. |
| **Food Potential Over Entire Year** | Seeding grass cover scattered; fleshy fruiting plants absent; nectar/pollen producing plants abundant; koala feed trees abundant; provides seasonal water. |
| **Signs** | Scattered macropod scats; birds detected at time of assessment comprised common native woodland species. |
| **Koala Feed Trees** | Forest red gum (*E. tereticornis*) dominant. Targeted searches for signs of koala not undertaken. |
| **Koala habitat score** | Koala occurrence: medium (1; precautionary principle); vegetation composition: high (2); habitat connectivity: medium (1); key existing threats: medium (1); recovery value: medium (1); overall score: 6 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>Q5 | |
| **Location**<br>Old Bombandy | |
| **Date**<br>22/11/2016 | |
| **Latitude**<br>-22.40876 | |
| **Longitude**<br>148.57947 | |
| **Slope:**<br>1° | |
| **Aspect:**<br>N | |

| **General Site Description** | |
|---|---|
| **Landform** | Gently undulating plain; alluvial plain |
| **Soil** | Orange-brown sandy light clay |
| **Observed vegetation** | RE 11.3.2 (mapped by DSITIA (2016) as 11.4.9). Woodland on alluvial plain dominated by poplar box (*Eucalyptus populnea*) with white bauhinia (*Lysiphyllum hookerii*) abundant in the sub-canopy (T2). Mid-dense shrub layer dominated by currant bush (*Carissa ovata*), small-leaved ebony (*Diospyros humilis*), scrub boonaree (*Alectryon diversifolius*), cocaine tree (*Erythroxylum australe*), denhamia (*Denhamia oleaster*) and wallaby apple (*Pittosporum spinescens*). Ground layer dominated by buffel grass, with frequent shrubby stylo (*Stylosanthes scabra*) and occasional dark wiregrass (*Aristida calycina*). |
| **General Site Observations** | **BVG: Eucalypt dry woodlands on inland depositional plains.** Trees form ecologically dominant stratum with few old mature trees; moderate regeneration; connected through large isolated vegetation unit (over 5km long) with tenuous connection through to Isaac River corridor; erosion absent; light to moderate grazing stock impacts; no dieback evident; fire scars absent. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Small hollows common, mostly in dead trees; scattered large logs; abundant small logs; leaf litter common; dense shrub / grass shelter common. |
| **Food Potential Over Entire Year** | Seeding grass cover scattered; fleshy fruiting plants common, including currant bush and wallaby apple; nectar/pollen producing plant abundant; koala feed trees common. |
| **Signs** | Scattered macropod scats; birds and reptiles detected at time of assessment comprised common native woodland species. |
| **Koala Feed Trees** | Poplar box (*E. populnea*) dominant. No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: medium (1); key existing threats: medium (1); recovery value: medium (1); overall score: 5 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>Q6 | |
| **Location**<br>Old Bombandy | |
| **Date**<br>22/11/2016 | |
| **Latitude**<br>-22.41242 | |
| **Longitude**<br>148.58038 | |
| **Slope:**<br>1° | |
| **Aspect:**<br>NE | |

| **General Site Description** | |
|---|---|
| **Landform** | Gently undulating plain |
| **Soil** | Brown light clay |
| **Observed vegetation** | RE 11.4.8 (mapped by DSITIA (2016) as 11.4.9 / 11.4.8). Woodland on alluvial plain dominated by Dawson gum (*Eucalyptus cambageana*), with occasional poplar box (*E. populnea*). Sub-canopy (T2) species included yellowwood (*Terminalia oblongata*), brigalow (*Acacia harpophylla*) and belah (*Casuarina cristata*). Mid-dense shrub layer dominated by scrub boonaree (*Alectryon diversifolius*), soft acalypha (*Acalypha eremorum*), wilga (*Geijera parviflora*), Senna sp., denhamia (*Denhamia oleaster*), currant bush (*Carissa ovata*), jasmine (*Jasminum didymum*) and peach bush (*Ehretia membranifolia*). Ground layer dominated by buffel grass. |
| **General Site Observations** | **BVG: Eucalypt dry woodlands on inland depositional plains.** This patch is a thin fringe of clay plain (ecotonal) that was not cleared when the original clearing to the north occurred. It was likely uncleared due to the absence of Brigalow in this patch. Trees form ecologically dominant stratum; moderate regeneration; connected through large isolated vegetation unit (over 5km long) with tenuous connection through to Isaac River corridor; erosion absent; light to moderate grazing stock impacts; no dieback evident; fire scars absent. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered small hollows, mostly in dead trees; scattered large logs; abundant small logs; leaf litter common; dense shrub / grass shelter common. |
| **Food Potential Over Entire Year** | Seeding grass cover scattered; fleshy fruiting plants common, including currant bush and peach bush; nectar/pollen producing plant abundant; koala feed trees scattered. |
| **Signs** | Scattered macropod scats; common woodland birds including noisy friarbird, dollarbird, Torresian crow and pale-headed rosella. |
| **Koala Feed Trees** | Occasional poplar box (*E. populnea*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: medium (1); habitat connectivity: medium (1); key existing threats: medium (1); recovery value: medium (1); overall score: 4 = **not critical habitat**. |
| **Fauna habitat value – general** | Good |

| | |
|---|---|
| **Survey Code**<br>Q7 | |
| **Location**<br>Old Bombandy | |
| **Date**<br>22/11/2016 | |
| **Latitude**<br>-22.41566 | |
| **Longitude**<br>148.57885 | |
| **Slope:**<br>0° | |
| **Aspect:**<br>NA | |

| **General Site Description** | |
|---|---|
| **Landform** | Level plain; shallow closed depression |
| **Soil** | Brown sandy light clay |
| **Observed vegetation** | RE 11.5.17 (mapped by DSITIA (2016) as 11.5.17). Palustrine wetland (clay lined swamp) dominated by forest red gum (*Eucalyptus tereticornis*) with occasional carbeen (*Corymbia tessellaris*) and poplar gum (*E. platyphylla*). Sparse shrub layer of forest red gum regrowth. Ground layer dominated by hairy carpet weed (*Glinus lotoides*), with frequent *Eragrostis* sp., awnless barnyard grass (*Echinochloa colona*), *Cyperus* sp. and Indian heliotrope (*Heliotropium indicum*). |
| **General Site Observations** | **BVG: Eucalypt dry woodlands on inland depositional plains.** Trees form ecologically dominant stratum; few old mature trees; good regeneration cohort about 5 years old on high water line; connected through large isolated vegetation unit (over 5km long) with tenuous connection through to Isaac River corridor; erosion absent; moderate grazing stock impacts; no dieback evident; fire scars absent. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered large hollows and abundant small hollows, in a mixture of dead and alive trees; scattered large logs; abundant small logs; scattered leaf litter; dense shrub / grass shelter absent. |
| **Food Potential Over Entire Year** | Seeding grass cover common; fleshy fruiting plants absent; nectar / pollen producing plant common; koala feed trees common. |
| **Signs** | Scattered macropod scats; glider scratches; greater glider scats; common woodland birds including pied butcherbird, grey-crowned babbler, dollarbird, sulphur-crested cockatoo and pale-headed rosella. |
| **Koala Feed Trees** | Forest red gum (*E. tereticornis*) dominant. No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: medium (1); key existing threats: medium (1); recovery value: medium (1); overall score: 5 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>Q8 | |
| **Location**<br>Old Bombandy | |
| **Date**<br>22/11/2016 | |
| **Latitude**<br>-22.41721 | |
| **Longitude**<br>148.57977 | |
| **Slope:**<br><1° | |
| **Aspect:**<br>SW | |

| **General Site Description** | |
|---|---|
| **Landform** | Gently undulating plain; deposited low rises – old floodplain |
| **Soil** | Red brown sandy loam |
| **Observed vegetation** | RE 11.3.7 (mapped by DSITIA (2016) as 11.3.2 / 11.3.7 / 11.3.1). Woodland dominated by carbeen (*Corymbia tessellaris*), with abundant brown bloodwood (*C. trachyphloia*) and Clarkson's bloodwood (*C. clarksoniana*). Sparse sub-canopy (T2) of red ash (*Alphitonia excelsa*), quinine tree (*Petalostigma pubescens*) and *Corymbia* regrowth. Sparse shrub layer of bean tree (*Cassia brewsteri*). Ground layer dominated by buffel grass (*Cenchrus ciliaris*), with frequent shrubby stylo (*Stylosanthes scabra*), red Natal grass (*Melinis repens*), woolly glycine (*Glycine tomentella*) and rattlepod (*Crotalaria* sp.). |
| **General Site Observations** | **BVG: Eucalypt dry woodlands on inland depositional plains.** Trees form ecologically dominant stratum; good mix of older trees with hollows and regeneration across a range of maturities; connected through large isolated vegetation unit (over 5km long) with tenuous connection through to Isaac River corridor; mostly exotic groundcover; erosion absent; old dieback evident; fire scars absent. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered large hollows and abundant small hollows, in mostly alive trees; scattered large logs; small logs common; scattered leaf litter; dense shrub / grass shelter scattered. |
| **Food Potential Over Entire Year** | Seeding grass cover common; scattered fleshy fruiting plants, including quinine tree; nectar / pollen producing plant common; koala feed trees absent. |
| **Signs** | Scattered macropod scats; scattered glider scratches; greater glider scats; common woodland birds present. |
| **Koala Feed Trees** | None detected. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: low (0); habitat connectivity: medium (1); key existing threats: medium (1); recovery value: low (0); overall score: 2 = **not critical habitat**. |
| **Fauna habitat value – general** | Average |

| | |
|---|---|
| **Survey Code**<br>Q9 | |
| **Location**<br>Old Bombandy | |
| **Date**<br>22/11/2016 | |
| **Latitude**<br>-22.41957 | |
| **Longitude**<br>148.58670 | |
| **Slope:**<br>1° | |
| **Aspect:**<br>N | |

| **General Site Description** | |
|---|---|
| **Landform** | Gently undulating plain; deposited low rises – old floodplain |
| **Soil** | Red sandy loam |
| **Observed vegetation** | RE 11.3.7 (Mapped by DSITIA (2016) as 11.3.2 / 11.3.7 / 11.3.1). Grassy woodland co-dominated by Clarkson's bloodwood (*Corymbia clarksoniana*) and carbeen (*C. tessellaris*), with poplar box (*Eucalyptus populnea*) and poplar gum (*E. platyphylla*) associated. Clarkson's bloodwood and carbeen form a second stratum at 11 m, while a sparse third low tree stratum is made up of bean tree (*Cassia brewsteri*) and quinine tree (*Petalostigma pubescens*). There is a sparse shrub layer of bean tree and cocaine tree (*Erythroxylum australe*). Groundcover dominated by buffel grass (*Cenchrus ciliaris*), with frequent black speargrass (*Heteropogon contortus*) and wiregrass (*Aristida* sp.). |
| **General Site Observations** | **BVG: Eucalypt dry woodlands on inland depositional plains.** Trees form ecologically dominant stratum; a range of canopy maturities but mostly younger trees; connected through large isolated vegetation unit (over 5km long) with tenuous connection through to Isaac River corridor; mostly exotic groundcover; erosion absent; no dieback; fire scars absent. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered large hollows and abundant small hollows, in a mixture of dead and alive trees; scattered large logs; abundant small logs; scattered leaf litter; dense shrub / grass shelter common. |
| **Food Potential Over Entire Year** | Seeding grass cover scattered; fleshy fruiting plants not detected; nectar / pollen producing plant abundant; koala feed trees common. |
| **Signs** | Scattered macropod scats; scattered medium and large-sized bird nests; common woodland birds and raptors present, including pied butcherbird, dollarbird, Torresian crow, rainbow lorikeet, galah, magpie and Australian hobby. |
| **Koala Feed Trees** | Occasional poplar box (*E. populnea*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: medium (1); habitat connectivity: medium (1); key existing threats: medium (1); recovery value: medium (1); overall score: 4 = **not critical habitat**. |
| **Fauna habitat value – general** | Average. |

| | |
|---|---|
| **Survey Code**<br>Q10 | |
| **Location**<br>Old Bombandy | |
| **Date**<br>22/11/2016 | |
| **Latitude**<br>-22.42603 | |
| **Longitude**<br>148.60086 | |
| **Slope:**<br>1° | |
| **Aspect:**<br>S | |

| **General Site Description** | |
|---|---|
| **Landform** | Gently undulating plain; deposited low rises – old floodplain |
| **Soil** | Red brown sandy loam |
| **Observed vegetation** | RE 11.3.7 (mapped by DSITIA (2016) as 11.3.1). Woodland dominated by brown bloodwood (*Corymbia trachyphloia*), Clarkson's bloodwood (*C. clarksoniana*) and carbeen (*C. tessellaris*), with occasional poplar box (*Eucalyptus populnea*). Sparse sub-canopy (T2) of Carbeen, dead finish (*Archidendropsis basaltica*) and Leichardt bean (*Cassia brewsteri*). Sparse shrub layer of currant bush (*Carissa ovata*), scrub boonaree (*Alectryon diversifolius*) and denhamia (*Denhamia oleaster*). Ground layer dominated by buffel grass (*Cenchrus ciliaris*), with frequent wiregrasses (*Aristida* spp.), shrubby stylo (*Stylosanthes scabra*), glycine (*Glycine* sp.), flannel weed (*Sida cordifolia*) and rattlepod (*Crotalaria* sp.). |
| **General Site Observations** | **BVG: Eucalypt dry woodlands on inland depositional plains.** Trees form ecologically dominant stratum; healthy canopy, but mostly younger trees; connected through large isolated vegetation unit (over 5km long) with tenuous connection through to Isaac River corridor; mostly exotic groundcover; erosion absent; no dieback; fire scars absent. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered large hollows and abundant small hollows, mostly in dead trees; scattered large logs; abundant small logs; scattered leaf litter; dense shrub / grass shelter scattered. |
| **Food Potential Over Entire Year** | Seeding grass cover scattered; scattered fleshy fruiting plants, including currant bush; nectar / pollen producing plant common; koala feed trees scattered. |
| **Signs** | Scattered macropod scats; common woodland birds present, including noisy miner, pied butcherbird and rainbow lorikeet. |
| **Koala Feed Trees** | Occasional poplar box (*E. populnea*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: medium (1); habitat connectivity: medium (1); key existing threats: medium (1); recovery value: low (0); overall score: 3 = **not critical habitat**. |
| **Fauna habitat value – general** | Average |

| | |
|---|---|
| **Survey Code**<br>Q11 | |
| **Location**<br>Old Bombandy | |
| **Date**<br>22/11/2016 | |
| **Latitude**<br>-22.41684 | |
| **Longitude**<br>148.60455 | |
| **Slope:**<br>1° | |
| **Aspect:**<br>S | |

| **General Site Description** | |
|---|---|
| **Landform** | Gently undulating plain; deposited low rises – old floodplain |
| **Soil** | Brown sandy clay loam |
| **Observed vegetation** | RE 11.3.2 (mapped by DSITIA (2016) as 11.3.2 / 11.3.7 / 11.3.1). Woodland dominated by poplar box (*Eucalyptus populnea*), with abundant narrow-leaved ironbark (*E. crebra*), frequent Carbeen (Corymbia tessellaris), brown bloodwood (*C. trachyphloia*), Clarkson's bloodwood (*C. clarksoniana*) and buloke (*Allocasuarina luehmannii*). Sparse sub-canopy (T2) of white bauhinia (*Lysiphyllum hookerii*), quinine tree (*Petalostigma pubescens*), soap tree (*Alphitonia excelsa*), gnarled corkbark (*Hakea lorea*). Ground layer dominated by buffel grass (*Cenchrus ciliaris*), with occasional wiregrass (*Aristida* sp.). |
| **General Site Observations** | **BVG: Eucalypt dry woodlands on inland depositional plains.** Remnant vegetation; good health; trees form ecologically dominant stratum; foliage cover of T1 30%; overall patch size 20-50 ha; patch shape very irregular; connectivity not isolated; erosion absent; no dieback detected; frequent weeds, dominated by buffel grass; fire scars absent; moderate cattle grazing. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered large hollows and small hollows common, mostly in dead trees; large logs absent; small logs abundant; leaf litter common; dense shrub / grass shelter common. |
| **Food Potential Over Entire Year** | Seeding grass cover scattered; fleshy fruiting plants common, including currant bush (Carissa ovata), quinine tree (*P. pubescens*), Harissia cactus (*Harissia martinii*) and dysentery plant (*Grewia latifolia*); nectar / pollen producing plant abundant; koala feed trees common. |
| **Signs** | Scattered macropod scats. |
| **Koala Feed Trees** | Poplar box (*E. populnea*) and narrow-leaved ironbark (*E. crebra*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: low (0); key existing threats: medium (1); recovery value: medium (1); overall score: 4 = **not critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>Q12 | |
| **Location**<br>Old Bombandy | |
| **Date**<br>22/11/2016 | |
| **Latitude**<br>-22.41678 | |
| **Longitude**<br>148.59465 | |
| **Slope:**<br>1° | |
| **Aspect:**<br>W | |

| **General Site Description** | |
|---|---|
| **Landform** | Gently undulating plain; deposited low rises – old floodplain |
| **Soil** | Brown clay loam |
| **Observed vegetation** | RE 11.3.2 (mapped by DSITIA (2016) as 11.3.2 / 11.3.7 / 11.3.1). Grassy woodland dominated by poplar box (*Eucalyptus populnea*). Second stratum at 9 m comprised of poplar box, Clarkson's bloodwood (*Corymbia clarksoniana*) and bean tree (*Cassia brewsteri*). Scattered shrub layer of cocaine tree (*Erythroxylum australe*), bean tree, small-leaved ebony (*Diospyros humilis*) and currant bush (*Carissa ovata*). Groundcover dominated by buffel grass (*Cenchrus ciliaris*), with occasional black spear grass (*Heteropogon contortus*), wire grasses (*Aristida spp.*) and curly windmill grass (*Enteropogon acicularis*). |
| **General Site Observations** | **BVG: Eucalypt dry woodlands on inland depositional plains.** Trees form ecologically dominant stratum; healthy canopy with mostly younger trees; connected through large isolated vegetation unit (over 5km long) with tenuous connection through to Isaac River corridor; predominantly exotic groundcover; erosion absent; no dieback; fire scars absent. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Large hollows absent; small hollows common, mostly in living trees; large logs scattered; small logs common; leaf litter common; dense shrub / grass shelter common. |
| **Food Potential Over Entire Year** | Seeding grass cover scattered; scattered fleshy fruiting plants, including currant bush; nectar / pollen producing plant common; koala feed trees common. |
| **Signs** | Scattered macropod scats. |
| **Koala Feed Trees** | Poplar box (*E. populnea*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: medium (1); key existing threats: medium (1); recovery value: medium (1); overall score: 5 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>Q13 | |
| **Location**<br>Old Bombandy | |
| **Date**<br>22/11/2016 | |
| **Latitude**<br>-22.4176877 | |
| **Longitude**<br>148.5896194 | |
| **Slope:**<br>0° | |
| **Aspect:**<br>NA | |

| **General Site Description** | |
|---|---|
| **Landform** | Level plain; closed depression – old floodplain |
| **Soil** | Clay |
| **Observed vegetation** | RE 11.5.17 (mapped by DSITIA (2016) as 11.5.17). Scattered woodland dominated by forest red gum (*Eucalyptus tereticornis*) and abundant carbeen (*Corymbia tessellaris*), with frequent poplar gum (*E. platyphylla*) and occasional poplar box (*E. populnea*). Ground layer comprises an open sedgeland dominated by *Eleocharis* sp., and sneezeweed (*Centipeda minima*). |
| **General Site Observations** | **BVG: Eucalypt dry woodlands on inland depositional plains.** Trees form ecologically dominant stratum with mostly young trees; connected through large isolated vegetation unit (over 5km long) with tenuous connection through to Isaac River corridor; erosion absent; no dieback evident; fire scars absent; low level of recruitment evident and area likely to suffer stocking impacts; close to stock handling facility. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Large hollows absent; small hollows abundant, in a mixture of dead and alive trees; large logs scattered; small logs abundant; scattered leaf litter; dense shrub / grass shelter absent. |
| **Food Potential Over Entire Year** | Seeding grass cover scattered; fleshy fruiting plants absent; nectar / pollen producing plant abundant; koala feed trees common. |
| **Signs** | Scattered macropod scats; common woodland birds, including eastern koel, dollarbird and sulphur-crested cockatoo. |
| **Koala Feed Trees** | Forest red gum (*E. tereticornis*) and poplar box (*E. populnea*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: medium (1); key existing threats: medium (1); recovery value: medium (1); overall score: 5 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>Q14 | |
| **Location**<br>Willunga | |
| **Date**<br>22/11/2016 | |
| **Latitude**<br>-22.33622 | |
| **Longitude**<br>148.58287 | |
| **Slope:**<br>0° | |
| **Aspect:**<br>NA | |

| **General Site Description** | |
|---|---|
| **Landform** | Level plain with gilgai formation |
| **Soil** | Grey light to medium clay |
| **Observed vegetation** | Non-remnant (mapped by DSITIA (2016) as Non-remnant HVR 11.4.9). Regrowth of Brigalow (*Acacia harpophylla*) to 6 m tall. Buffel grass (*Cenchrus ciliaris*) dominates groundcover. High value regrowth assessed for condition thresholds for TEC status. Invasive restricted pest plant harrisia cactus (*Harrisia martinii*) present. |
| **General Site Observations** | **BVG: Other acacia dominated open forests, woodlands and shrublands.** Shrubs form ecologically dominant stratum; regrowth community estimated 15 years since last cleared; part of large patch of regrowth of similar age, isolated from other vegetation by clearing; exotic groundcover; deep gilgai clay soils, erosion absent. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Hollows absent; large logs absent; small logs scattered; leaf litter common; dense shrub / grass shelter common. |
| **Food Potential Over Entire Year** | Seeding grass cover scattered; fleshy fruiting plants absent; nectar / pollen producing plant common; koala feed trees absent. |
| **Signs** | None |
| **Koala Feed Trees** | None detected. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: low (0); habitat connectivity: low (0); key existing threats: medium (1); recovery value: low (0); overall score: 1 = **not critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>Q15 | |
| **Location**<br>Willunga | |
| **Date**<br>23/11/2016 | |
| **Latitude**<br>-22.37093 | |
| **Longitude**<br>148.55581 | |
| **Slope:**<br><1° | |
| **Aspect:**<br>SE | |
| **General Site Description** | |
| **Landform** | Gently undulating plain; deposited low rises – old floodplain |
| **Soil** | Red-brown sandy loam |
| **Observed vegetation** | RE 11.3.2 (mapped by DSITIA (2016) as 11.4.4 / 11.4.9). Woodland dominated by poplar box (*Eucalyptus populnea*), with frequent Clarkson's bloodwood (*Corymbia clarksoniana*). Second stratum at 9m of poplar box, white bauhinia (*Lysiphyllum hookeri*), sally wattle (*Acacia salicina*), ironwood (*Acacia excelsa*) and whitewood (*Atalaya hemiglauca*). Tall shrub layer of bean tree (*Cassia brewsteri*), poison peach (*Ehretia membranifolia*), stiff denhamia (*Denhamia oleaster*), native olive (*Notelaea microcarpa*), dead finish (*Archidendropsis basaltica*), and yellowberry bush (*Denhamia cunninghamii*). Low shrub layer of currant bush (*Carissa ovata*). Ground layer dominated by buffel grass (*Cenchrus ciliaris*), occasional wire grass (*Aristida calycina*), shrubby stylo (*Stylosanthes scabra*) and *Sida* sp. |
| **General Site Observations** | **BVG: Eucalypt dry woodlands on inland depositional plains.** Trees form ecologically dominant stratum; healthy community with mostly young trees; vegetation unit approximately 1.4 km long, isolated by clearing; mostly exotic groundcover with scattered native grasses and herbs; moderate recruitment; erosion absent; old dieback detected; fire scars absent. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Large hollows absent; small hollows scattered, mostly in dead trees; large logs absent; small logs common; leaf litter common; dense shrub / grass shelter common. |
| **Food Potential Over Entire Year** | Seeding grass cover scattered; fleshy fruiting plants common, including yellowberry bush and currant bush; nectar / pollen producing plant common; koala feed trees common. |
| **Signs** | Scattered macropod scats; bettong tracks in sand; dog prints also; common woodland birds, including Torresian crow, grey butcherbird, noisy minor, yellow-faced minor, red-winged parrot, galah, magpie, sulphur-crested cockatoo and dollarbird. |
| **Koala Feed Trees** | Poplar box (*E. populnea*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: low (0); key existing threats: medium (1); recovery value: medium (1); overall score: 4 = **not critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>Q16 | |
| **Location**<br>Willunga | |
| **Date**<br>23/11/2016 | |
| **Latitude**<br>-22.37204 | |
| **Longitude**<br>148.54876 | |
| **Slope:**<br>1-2° | |
| **Aspect:**<br>N | |
| **General Site Description** | |
| **Landform** | Gently undulating plain; deposited low rises – old floodplain |
| **Soil** | Red-brown sandy loam |
| **Observed vegetation** | RE 11.3.2 (mapped by DSITIA (2016) as 11.4.2 / 11.4.8). Grassy open woodland co-dominated by poplar box (*Eucalyptus populnea*) and Clarkson's bloodwood (*Corymbia clarksoniana*). Second stratum at 8m of Clarkson's bloodwood and poplar box. Tall scattered shrub layer of poison peach (*Ehretia membranifolia*), stiff denhamia (*Denhamia oleaster*), tea tree (*Melaleuca viridiflora*), ironwood (*Acacia excelsa*), quinine tree (*Petalostigma pubescens*), and whitewood (*Atalaya hemiglauca*). Low shrub layer of currant bush (*Carissa ovata*). Ground layer dominated by buffel grass (*Cenchrus ciliaris*), with associated wiregrass (*Aristida calycina*), shrubby stylo (*Stylosanthes scabra*) and flannel weed (*Sida cordifolia*). |
| **General Site Observations** | **BVG: Eucalypt dry woodlands on inland depositional plains.** Trees form ecologically dominant stratum; healthy community with a range of ages; vegetation unit approximately 1.4 km long isolated by clearing; mostly exotic groundcover with scattered native grasses and exotic herbs; moderate recruitment; erosion absent; no dieback detected; fire scars absent; ecotone between 11.3.2 and 11.3.7 to the south, shows greater affinity to RE 11.3.2. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Large hollows absent; small hollows common, in a mixture of dead and alive trees; large logs scattered; small logs abundant; leaf litter scattered; dense shrub / grass shelter common. |
| **Food Potential Over Entire Year** | Seeding grass cover scattered; fleshy fruiting plants common, including quinine tree and currant bush; nectar / pollen producing plant common; koala feed trees common. |
| **Signs** | Scattered macropod scats; Vulnerable (EPBC Act and NC Act) squatter pigeon (x5); common woodland birds, including blue-faced honeyeater, magpie-lark, Australian magpie and whistling kite. |
| **Koala Feed Trees** | Poplar box (*E. populnea*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: low (0); key existing threats: medium (1); recovery value: medium (1); overall score: 4 = **not critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>T1 | |
| **Location**<br>Willunga | |
| **Date**<br>23/11/2016 | |
| **Latitude**<br>-22.37309 | |
| **Longitude**<br>148.55003 | |
| **Slope:**<br>1° | |
| **Aspect:**<br>S | |

| **General Site Description** | |
|---|---|
| **Landform** | Gently undulating plain |
| **Soil** | Red sandy loam |
| **Observed vegetation** | RE 11.3.7 (mapped by DSITIA (2016) as 11.3.7). Woodland dominated by Clarkson's bloodwood (*Corymbia clarksoniana*) and Dallachy's gum (*C. dallachiana*), with occasional carbeen (C. tessellaris). Sub-canopy of Clarkson's bloodwood, bean tree (*Cassia brewsteri*), *Acacia* sp. and native olive (*Notelaea microcarpa*). Shrub layer of currant bush (Carissa ovata), dysentery plant (Grewia latifolia), wild orange (*Capparis mitchellii*), nipan (*Capparis lasiantha*), quinine tree (*Petalostigma pubescens*), peach bush (*Ehretia membranifolia*), hairy alectryon (*Alectryon conatus*), small-leaved ebony (*Diosyros humilis*) and ironwood (*Acacia excelsa*). Ground layer dominated by buffel grass (*Cenchrus ciliaris*), with a diversity of native grasses and forbs persisting. |
| **General Site Observations** | **BVG: Eucalypt dry woodlands on inland depositional plains.** Trees form ecologically dominant stratum; young community with occasional dead tree; evidence of old logging; vegetation unit approximately 1.4 km long isolated by clearing; mostly exotic groundcover with scattered native grasses and herbs; erosion absent; old fire scars. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Large hollows absent; scattered small hollows, in a mixture of dead and alive trees; small and large logs absent; leaf litter scattered; dense shrub / grass shelter common. |
| **Food Potential Over Entire Year** | Seeding grass cover scattered; fleshy fruiting plants common, including currant bush, dysentery plant, wild orange, nipan, quinine tree and hairy alectryon; nectar / pollen producing plant common; koala feed trees absent. |
| **Signs** | Scattered macropod scats; common woodland birds, including Australian magpie, brown honeyeater, rainbow lorikeet, pied butcherbird, Torresian crow and peaceful dove. |
| **Koala Feed Trees** | None detected. |
| **Koala habitat score** | Koala occurrence: medium (1 – precautionary principle); vegetation composition: low (0); habitat connectivity: low (0); key existing threats: medium (1); recovery value: low (0); overall score: 2 = **not critical habitat**. |
| **Fauna habitat value – general** | Good. |

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|---|---|
| **Survey Code**<br>Q17 | |
| **Location**<br>Willunga | |
| **Date**<br>23/11/2016 | |
| **Latitude**<br>-22.37996 | |
| **Longitude**<br>148.55129 | |
| **Slope:**<br><1° | |
| **Aspect:** | |

| **General Site Description** | |
|---|---|
| **Landform** | Level plain; deposited low rises – old floodplain |
| **Soil** | Red-brown sandy loam |
| **Observed vegetation** | RE 11.3.2 (mapped by DSITIA (2016) as 11.3.2 / 11.3.7 / 11.3.1). Grassy open woodland co-dominated by Clarkson's bloodwood (*Corymbia clarksoniana*), carbeen (*C. tessellaris*) and poplar box (*Eucalyptus populnea*). Very sparse second stratum at 10m of Clarkson's bloodwood, soap tree (*Alphitonia excelsa*) and ironwood (*Acacia salicina*). Very sparse shrub layer of Clarkson's bloodwood, stiff denhamia (*Denhamia oleaster*) and bootlace oak (*Hakea lorea*). Ground layer dominated by buffel grass (*Cenchrus ciliaris*), with abundant shrubby stylo (*Stylosanthes scabra*) and frequent black spear grass (*Heteropogon contortus*). |
| **General Site Observations** | **BVG: Eucalypt dry woodlands on inland depositional plains.** Trees form ecologically dominant stratum; healthy community with a range of ages; vegetation unit approximately 2.4 km long isolated by clearing; mostly exotic groundcover with scattered native grasses and exotic herbs; moderate recruitment; erosion absent; no dieback detected; fire scars absent. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered small and large hollows, in a mixture of dead an alive trees; scattered large logs; small logs abundant; scattered leaf litter; dense shrub / grass shelter common. |
| **Food Potential Over Entire Year** | Seeding grass cover scattered; fleshy fruiting plants absent; nectar / pollen producing plant common; koala feed trees scattered. |
| **Signs** | Scattered macropod scats; greater glider scats; common woodland birds, including eastern koel, pale-headed rosella and noisy minor. |
| **Koala Feed Trees** | Poplar box (*E. populnea*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: medium (1); habitat connectivity: low (0); key existing threats: medium (1); recovery value: medium (1); overall score: 3 = **not critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>Q18 | |
| **Location**<br>Willunga | |
| **Date**<br>23/11/2016 | |
| **Latitude**<br>-22.38176 | |
| **Longitude**<br>148.55646 | |
| **Slope:**<br>0° | |
| **Aspect:**<br>NA | |

| **General Site Description** | |
|---|---|
| **Landform** | Level plain; closed depression |
| **Soil** | Brown sandy clay with ironstone nodules and conglomerate masses |
| **Observed vegetation** | RE 11.5.17 (mapped by DSITIA (2016) as 11.5.17). Forest red gum (*Eucalyptus tereticornis*) woodland with sedge groundcover. Very sparse second stratum at 10m of forest red gum. Shrub layer absent. Ground layer dominated by *Cyperus trinervis*, with abundant awnless barnyard grass (*Echinochloa colona*) and sneezeweed (*Centipeda minima*) and occasional cup grass (*Eriochloa crebra*), purple lovegrass (*Eragrostis lacunaria*), *Dinebra ligulata* and *Panicum larcomianum*. Occasional parthenium (*Parthenium hysterophorus*). |
| **General Site Observations** | **BVG: Eucalypt dry woodlands on inland depositional plains.** Trees form ecologically dominant stratum; healthy community with good regeneration; vegetation unit approximately 2.4 km long, isolated by clearing; erosion absent; some dieback evident; fire scars absent. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered large hollows and small hollows abundant, mostly in dead trees; scattered large logs; small logs abundant; scattered leaf litter; dense shrub / grass shelter abundant. |
| **Food Potential Over Entire Year** | Seeding grass cover common; fleshy fruiting plants absent; nectar / pollen producing plant abundant; koala feed trees common. |
| **Signs** | Scattered macropod scats; medium-sized woodland bird nests; white-faced heron; common woodland birds, including pheasant coucal, laughing kookaburra, noisy miner, peaceful dove, crested pigeon and Torresian crow. |
| **Koala Feed Trees** | Forest red gum (*E. tereticornis*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: low (0); key existing threats: medium (1); recovery value: medium (1); overall score: 4 = **not critical habitat**. |
| **Fauna habitat value – general** | Good. |

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|---|---|
| **Survey Code**<br>Q19 | |
| **Location**<br>Willunga | |
| **Date**<br>23/11/2016 | |
| **Latitude**<br>-22.38447 | |
| **Longitude**<br>148.55042 | |
| **Slope:**<br>1° | |
| **Aspect:**<br>SW | |

| **General Site Description** | |
|---|---|
| **Landform** | Gently undulating plain; deposited low rises – old floodplain |
| **Soil** | Red sandy loam |
| **Observed vegetation** | RE 11.3.7 (mapped by DSITIA (2016) as 11.4.9 / 11.4.8). Open woodland dominated by Clarkson's bloodwood (*Corymbia clarksoniana*), with frequent carbeen (*Corymbia tessellaris*). Sparse second stratum at 7m of Clarkson's bloodwood, carbeen and sally wattle (*Acacia salicina*). Very sparse tall shrub layer of bean tree (*Cassia brewsteri*), stiff denhamia (*Denhamia oleaster*), soap tree (*Alphitonia excelsa*), sally wattle and small-leaved ebony (*Diospyros humilis*). Very sparse low shrub layer of currant bush (*Carissa ovata*). Ground layer is dominated by buffel grass (*Cenchrus ciliaris*), with frequent shrub sida (*Sida rohlenae*) and shrubby stylo (*Stylosanthes scabra*) and occasional wiregrass (*Aristida calycina*) and black speargrass (*Heteropogon contortus*). |
| **General Site Observations** | **BVG: Eucalypt dry woodlands on inland depositional plains.** Trees form ecologically dominant stratum; young community with moderate regeneration; vegetation unit approximately 2.4 km long, isolated by clearing; erosion absent; some dieback evident; fire scars absent; woody habitat on ground. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Large hollows absent; small hollows abundant, mostly in dead trees; large logs scattered; small logs abundant; scattered leaf litter; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Seeding grass cover scattered; scattered fleshy fruiting plants, including currant bush; nectar / pollen producing plant common; koala feed trees absent. |
| **Signs** | Scattered macropod scats. |
| **Koala Feed Trees** | Not detected. |
| **Koala habitat score** | Koala occurrence: medium (1; precautionary principle); vegetation composition: low (0); habitat connectivity: low (0); key existing threats: medium (1); recovery value: low (0); overall score: 2 = **not critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>Q20 | |
| **Location**<br>Willunga | |
| **Date**<br>23/11/2016 | |
| **Latitude**<br>-22.38752 | |
| **Longitude**<br>148.54337 | |
| **Slope:**<br>1° | |
| **Aspect:**<br>S | |

| **General Site Description** | |
|---|---|
| **Landform** | Gently undulating plain; deposited low rises – old floodplain |
| **Soil** | Red-brown sandy loam |
| **Observed vegetation** | RE 11.3.7 (mapped by DSITIA (2016) as 11.4.2 / 11.4.8). Woodland dominated by carbeen (*Corymbia tessellaris*), with frequent poplar box (*Eucalyptus populnea*), poplar gum (*E. platyphylla*), and occasional sally wattle (*Acacia salicina*). Sparse second stratum at 9m of carbeen, soap tree (*Alphitonia excelsa*) and quinine tree (*Petalostigma pubescens*). Mid-dense shrub layer of bean tree (*Cassia brewsteri*), stiff denhamia (*Denhamia oleaster*), soap tree, sally wattle, cocaine tree (*Erythroxylum australe*) and currant bush (*Carissa ovata*). Ground layer dominated by buffel grass (*Cenchrus ciliaris*), with abundant wiregrass (*Aristida calycina*) and occasional black speargrass (*Heteropogon contortus*), shrub sida (*Sida rohlenae*) and umbrella grass (*Digitaria divaricatissima*). |
| **General Site Observations** | **BVG: Eucalypt dry woodlands on inland depositional plains.** Trees form ecologically dominant stratum; healthy community with moderate regeneration; vegetation unit approximately 0.7 km long, isolated by clearing; ground layer dominated by exotic grass; erosion absent; some dieback evident; fire scars absent; ecotone between REs 11.3.2 and 11.3.7. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered large hollows and small hollows abundant, mostly in dead trees; large logs scattered; small logs abundant; leaf litter common; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Seeding grass cover common; scattered fleshy fruiting plants, including currant bush and quinine tree; nectar / pollen producing plant common; koala feed trees scattered. |
| **Signs** | Scattered macropod scats; brolgas; common woodland birds, including pied butcherbird, apostlebird, noisy miner, laughing kookaburra, Torresian crow and pale-headed rosella. |
| **Koala Feed Trees** | Poplar box (*E. populnea*) (not dominant). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: medium (1); habitat connectivity: low (0); key existing threats: medium (1); recovery value: medium (1); overall score: 3 = **not critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>Q21 | |
| **Location**<br>Willunga | |
| **Date**<br>23/11/2016 | |
| **Latitude**<br>-22.38600 | |
| **Longitude**<br>148.54095 | |
| **Slope:**<br>1° | |
| **Aspect:**<br>SW | |

| **General Site Description** | |
|---|---|
| **Landform** | Gently undulating plain |
| **Soil** | Orange-brown sandy clay loam |
| **Observed vegetation** | RE 11.3.2 (mapped by DSITIA (2016) as 11.4.9 / 11.4.8). Woodland dominated by poplar box (*Eucalyptus populnea*), with frequent Clarkson's bloodwood (*Corymbia clarksoniana*) and sally wattle (*Acacia salicina*), and occasional Dallachy's gum (*C. dallachiana*). Sparse second stratum at 8m of poplar box, bean tree (*Cassia brewsteri*), soap tree (*Alphitonia excelsa*) and quinine tree (*Petalostigma pubescens*). Mid-dense shrub layer of dysentery plant (*Grewia latifolia*), scrub boonaree (*Alectryon diversifolius*), sally wattle, whitewood (*Atalaya hemiglauca*), poison peach (*Ehretia membranifolia*), cocaine tree (*Erythroxylum australe*) and currant bush (*Carissa ovata*). Ground layer dominated by buffel grass *(Cenchrus ciliaris*), with frequent wiregrasses (*Aristida calycina* and *A. jerichoensis*) and *Sida* spp. |
| **General Site Observations** | **BVG: Eucalypt dry woodlands on inland depositional plains.** Trees form ecologically dominant stratum; healthy young community with moderate regeneration; vegetation unit approximately 0.7 km long, isolated by clearing; ground layer dominated by exotic grass; erosion absent; some dieback evident; fire scars absent; ecotone between REs 11.3.2 and 11.3.7. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered large hollows and small hollows abundant, mostly in dead trees; large logs scattered; small logs abundant; leaf litter common; dense shrub / grass shelter common. |
| **Food Potential Over Entire Year** | Seeding grass cover common; fleshy fruiting plants common, including quinine tree, dysentery plant and currant bush; nectar / pollen producing plant abundant; koala feed trees common. |
| **Signs** | Scattered macropod scats; brolgas; crow's nest; common woodland birds, including magpie-lark, Torresian crow and apostlebird. |
| **Koala Feed Trees** | Poplar box (*E. populnea*) (not dominant). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: low (0); key existing threats: medium (1); recovery value: medium (1); overall score: 4 = **not critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>Q22 | |
| **Location**<br>Willunga | |
| **Date**<br>23/11/2016 | |
| **Latitude**<br>-22.42510 | |
| **Longitude**<br>148.54825 | |
| **Slope:**<br><1° | |
| **Aspect:**<br>E | |

| **General Site Description** | |
|---|---|
| **Landform** | Level plain; deposited low rises – old floodplain |
| **Soil** | Brown sand |
| **Observed vegetation** | RE 11.3.2 (mapped by DSITIA (2016) as 11.3.2 / 11.3.7 / 11.3.1). Woodland dominated by poplar box (*Eucalyptus populnea*), with frequent carbeen (*Corymbia tessellaris*), and occasional silver-leaved ironbark (*E. melanophloia*) and coolabah (*E. coolabah*). Second stratum at 10m of poplar box and sally wattle (*Acacia salicina*). Very sparse shrub layer of scrub boonaree (*Alectryon diversifolius*), bean tree (*Cassia brewsteri*), poison peach (*Ehretia membranifolia*) and currant bush (*Carissa ovata*). Ground layer dominated by buffel grass *(Cenchrus ciliaris*), with frequent green panic (*Megathyrsus maxima*) and occasional wiregrass (*Aristida calycina*), spiked matt rush (*Lomandra longifolia*), black spear grass (*Heteropogon contortus*), parthenium (*Parthenium hysterophorus*) and malvastrum (*Malvastrum americanum*). |
| **General Site Observations** | **BVG: Eucalypt dry woodlands on inland depositional plains.** Trees form ecologically dominant stratum; healthy community with moderate regeneration; vegetation unit part of the vegetated but narrow Isaac River riparian corridor; ground layer dominated by exotic grass; erosion absent; some dieback evident; fire scars absent. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Large hollows common and small hollows abundant, in a mixture of dead and alive trees; scattered large logs; small logs common; scattered litter common; dense shrub / grass shelter abundant. |
| **Food Potential Over Entire Year** | Seeding grass cover scattered; scattered fleshy fruiting plants, including currant bush; nectar / pollen producing plant abundant; koala feed trees abundant. |
| **Signs** | Scattered macropod scats; greater glider scats; common woodland birds, including eastern koel, olive-backed oriel, rainbow lorikeet, Australian magpie and dollarbird. |
| **Koala Feed Trees** | Poplar box (*E. populnea*), coolabah (*E. coolabah*) and silver-leaved ironbark (*E. melanophloia*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: high (2); key existing threats: medium (1); recovery value: medium (1); overall score: 6 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

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|---|---|
| **Survey Code**<br>Q23 | |
| **Location**<br>Willunga | |
| **Date**<br>23/11/2016 | |
| **Latitude**<br>-22.40132 | |
| **Longitude**<br>148.53235 | |
| **Slope:**<br><1° | |
| **Aspect:**<br>SE | |

| **General Site Description** | |
|---|---|
| **Landform** | River bank |
| **Soil** | Brown sand |
| **Observed vegetation** | RE 11.3.25 (mapped by DSITIA (2016) as 11.3.25). Open forest dominated by forest red gum (*Eucalyptus tereticornis*), with frequent weeping tea-tree (*Melaleuca fluviatilis*), occasional river she-oak (*Casuarina cunninghamiana*) and coolabah (*Eucalyptus coolabah*). Second stratum at 12m of poplar box (*Eucalyptus populnea*), sally wattle (*Acacia salicina*), rough-barked apple (*Angophora floribunda*), flax leafed paperbark (*Melaleuca linariifolia*), black tea tree (*Melaleuca bracteata*) and white bauhinia (*Lysiphyllum hookeri*). Very sparse shrub layer of currant bush (*Carissa ovata*), stiff-leaved denhamia (*Denhamia oleaster*), bitter bark (*Alstonia constricta*) and sally wattle. Ground layer co-dominated by buffel grass *(Cenchrus ciliaris*) and green panic (*Megathyrsus maxima*). |
| **General Site Observations** | **BVG: Eucalypt open forests to woodlands on floodplains.** Trees form ecologically dominant stratum; healthy community which has been drastically narrowed by clearing; moderate regeneration; vegetation unit part of the vegetated, but narrow, Isaac River riparian corridor; ground layer dominated by exotic grass; erosion absent; fire scars absent. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered large hollows and small hollows abundant, in a mixture of dead and alive trees; large logs scattered; small logs abundant; leaf litter common; dense shrub / grass shelter common. |
| **Food Potential Over Entire Year** | Seeding grass cover scattered; scattered fleshy fruiting plants, including currant bush; nectar / pollen producing plant abundant; koala feed trees abundant. |
| **Signs** | Scattered macropod scats; glider scratches; greater glider scats. |
| **Koala Feed Trees** | Forest red gum (*E. tereticornis*), coolabah (*E. coolabah*) and poplar box (*E. populnea*). No koala scratches or pellets detected. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: high (2); key existing threats: medium (1); recovery value: high (2); overall score: 7 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

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|---|---|
| **Survey Code**<br>Q24 | |
| **Location**<br>Willunga | |
| **Date**<br>23/11/2016 | |
| **Latitude**<br>-22.40456 | |
| **Longitude**<br>148.53908 | |
| **Slope:**<br><1° | |
| **Aspect:** | |

| **General Site Description** | |
|---|---|
| **Landform** | Level plain; palustrine wetland |
| **Soil** | Brown light clay |
| **Observed vegetation** | RE 11.3.3c (mapped by DSITIA (2016) as 11.3.2 / 11.3.7 / 11.3.1). Coolabah (*Eucalyptus coolabah*) woodland, with a second sparser stratum at 9 m of Coolabah. Very sparse shrub layer of lignum (*Duma florulenta*), sally wattle (*Acacia salicina*) and bean tree (*Cassia brewsteri*). Ground layer dominated by spike rush (*Eleocharis plana*), nardoo (*Marsilea drummondii*) and parthenium (*Parthenium hysterophorus*). |
| **General Site Observations** | **BVG: Eucalypt dry woodlands on inland depositional plains.** Trees form ecologically dominant stratum; healthy ephemeral wetland community with moderate regeneration; vegetation unit part of the vegetated but narrow Isaac River riparian corridor; erosion absent; fire scars absent. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Large hollows common and small hollows abundant, mostly in alive trees; large logs scattered; small logs abundant; leaf litter common; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Seeding grass cover scattered; fleshy fruiting plants absent; nectar / pollen producing plant common; koala feed trees common. |
| **Signs** | Scattered macropod scats; brush-tailed possum scats; common woodland birds, including black-faced cuckoo shrike, peaceful dove, rainbow lorikeet and whistling kite. |
| **Koala Feed Trees** | Coolabah (*E. coolabah*) (dominant). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: high (2); key existing threats: medium (1); recovery value: high (2); overall score: 7 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>Q25 | |
| **Location**<br>Willunga | |
| **Date**<br>24/11/2016 | |
| **Latitude**<br>-22.38145 | |
| **Longitude**<br>148.52737 | |
| **Slope:**<br>1-2° | |
| **Aspect:**<br>S | |

| **General Site Description** | |
|---|---|
| **Landform** | Gently undulating plain; deposited low rises – old floodplain |
| **Soil** | Brown sandy loam |
| **Observed vegetation** | RE 11.3.7 (mapped by DSITIA (2016) as 11.3.2 / 11.3.7 / 11.3.1 / 11.3.1b). Woodland dominated by Clarkson's bloodwood (*Corymbia clarksoniana*), with frequent carbeen (*C. tessellaris*) and Dallachy's gum (*C. dallachyana*), and occasional poplar box (*E. populnea*). Sparse shrub layer of Clarkson's bloodwood, carbeen and Dallachy's gum. Ground layer dominated by buffel grass (*Cenchrus ciliaris*) with scattered forbs and grasses, including *Sida rohlenae*, wiregrass (*Aristida calycina*), red Natal grass (*Melinis repens*), sticky indigo (*Indigofera colutea*), ryncho (*Rhynchosia minima)*, four-leaved cassia (*Chamaecrista absus*) and trefoil rattlepod (*Crotalaria medicaginea*). |
| **General Site Observations** | **BVG: Eucalypt dry woodlands on inland depositional plains.** Trees form ecologically dominant stratum; sparse community with moderate regeneration; vegetation unit is intact remnant approximately 4.5 km long by 1.6 km wide and linked to the Isaac River corridor; ground layer dominated by exotic grass; erosion absent; minimal dieback evident with old logs on ground and evidence of old logging; fire scars absent; moderate grazing impacts. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered large hollows and small hollows common, mostly in dead trees; scattered large logs; small logs abundant; scattered leaf litter; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Seeding grass cover scattered; fleshy fruiting plants absent; nectar / pollen producing plant common; koala feed trees scattered. |
| **Signs** | Scattered macropod scats; common woodland birds, including pied butcherbird, eastern koel, noisy miner, dollarbird and noisy friarbird. |
| **Koala Feed Trees** | Poplar box (*E. populnea*) (not dominant). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: medium (1); habitat connectivity: high (2); key existing threats: medium (1); recovery value: medium (1); overall score: 5 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>Q26 | |
| **Location**<br>Willunga | |
| **Date**<br>24/11/2016 | |
| **Latitude**<br>-22.36682 | |
| **Longitude**<br>148.51587 | |
| **Slope:**<br>0° | |
| **Aspect:** | |

| **General Site Description** | |
|---|---|
| **Landform** | Level plain; closed depression |
| **Soil** | Brown sandy light clay |
| **Observed vegetation** | RE 11.5.17 (mapped by DSITIA (2016) as 11.5.17). Fringing woodland of forest red gum (*Eucalyptus tereticornis*), carbeen (*Corymbia tessellaris*) and poplar box (*E. populnea*). Sparse 2m shrub layer of forest red gum above the high-water mark. Ground cover in the wetland dominated by giant sedge (*Cyperus exaltatus*), Indian heliotrope (*Heliotropium indicum*), grey-leaved heliotrope (*Heliotropium ovalifolium*), small knotweed (*Polygonum plebeium*) and sneezeweed (*Centipeda minima*). |
| **General Site Observations** | **BVG: Eucalypt dry woodlands on inland depositional plains.** Trees form ecologically dominant stratum; healthy community with good regeneration; vegetation unit is intact remnant approximately 4.5 km long by 1.6 km wide and linked to the Isaac River corridor; ground layer dominated by native aquatic species; erosion absent; minimal dieback; fire scars absent; moderate grazing impacts. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered large hollows and small hollows common, mostly in dead trees; scattered large logs; small logs common; scattered leaf litter; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Seeding grass cover common; fleshy fruiting plants absent; nectar / pollen producing plant common; koala feed trees common. |
| **Signs** | Scattered macropod scats; galahs nesting in stags; eastern brown snake; common woodland birds, including pale-headed rosella, pied butcherbird, noisy miner, grey-crowned babbler and galah. |
| **Koala Feed Trees** | Forest red gum (*E. tereticornis*) and poplar box (*E. populnea*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: high (2); key existing threats: medium (1); recovery value: medium (1); overall score: 6 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>Q27 | |
| **Location**<br>Willunga | |
| **Date**<br>24/11/2016 | |
| **Latitude**<br>-22.36525 | |
| **Longitude**<br>148.50899 | |
| **Slope:**<br>0° | |
| **Aspect:** | |

| **General Site Description** | |
|---|---|
| **Landform** | Level plain; closed depression / swamp |
| **Soil** | Brown sandy light clay |
| **Observed vegetation** | RE 11.5.17 (mapped by DSITIA (2016) as 11.5.17). Fringing woodland dominated by coolabah (*Eucalyptus coolabah*), with abundant poplar box (*Eucalyptus populnea*) and occasional forest red gum (*Eucalyptus tereticornis*). Very sparse 10m second stratum of scattered sapling coolabah. Ground layer in the wetland is dominated by giant sedge (*Cyperus exaltatus*), para grass (*Brachiaria mutica*), white eclipta (*Eclipta prostrata*), willow primrose (*Ludwigia octovalvis*) and sneezeweed (*Centipeda minima*). |
| **General Site Observations** | **BVG: Eucalypt dry woodlands on inland depositional plains.** Trees form ecologically dominant stratum; healthy community with good regeneration; vegetation unit is intact remnant approximately 4.5 km long by 1.6 km wide and linked to the Isaac River corridor; ground layer a mix of native and exotic species; erosion absent; minimal dieback; fire scars absent; moderate grazing impacts. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered large hollows and small hollows abundant, mostly in living trees; scattered large logs; small logs common; scattered leaf litter; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Seeding grass cover scattered; fleshy fruiting plants absent; nectar / pollen producing plant common; koala feed trees common. |
| **Signs** | Scattered macropod scats; ruddy tree frog (*Litoria rubella*), eastern brown snake; common woodland birds, including Australian magpie, Torresian crow, dollarbird, eastern koel and little friarbird. |
| **Koala Feed Trees** | Coolabah (*E. coolabah*) and forest red gum (*E. tereticornis*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: high (2); key existing threats: medium (1); recovery value: high (2); overall score: 7 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>Q28 | |
| **Location**<br>Willunga | |
| **Date**<br>24/11/2016 | |
| **Latitude**<br>-22.36448 | |
| **Longitude**<br>148.51211 | |
| **Slope:**<br>1° | |
| **Aspect:**<br>S | |

| **General Site Description** | |
|---|---|
| **Landform** | Gently undulating plain, with gilgai formation |
| **Soil** | Brown light to medium cracking clay |
| **Observed vegetation** | RE 11.3.1 (mapped by DSITIA (2016) as 11.3.2 / 11.3.7 / 11.3.1 / 11.3.1b). Low open forest dominated by brigalow (*Acacia harpophylla*), with frequent yellowwood (*Terminalia oblongata*), emu apple (*Owenia acidula*), false sandalwood (*Eremophila mitchellii*) and red bauhinia (*Lysiphyllum carronii*). Tall shrub layer of scrub boonaree (*Alectryon diversifolius*), scrub wilga (*Geijera salicifolia*), peach bush (*Ehretia saligna*), currant bush (*Carissa ovata*), false sandalwood and wilga (*Geijera parviflora*). Ground cover restricted to high points on the gilgais and is dominated by buffel grass (*Cenchrus ciliaris*), with sparse areas of brigalow grass (*Paspalidium caespitosum*) and canegrass (*Walwhalleya subxerophila*). |
| **General Site Observations** | **BVG: Other acacia dominated open forests, woodlands and shrublands.** Trees form ecologically dominant stratum; healthy community with good regeneration; vegetation unit is an intact remnant approximately 4.5 km long by 1.6 km wide and linked to the Isaac River corridor; ground layer dominated by exotic species; erosion absent; minimal dieback; fire scars absent; moderate grazing impacts. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Hollows absent; large logs absent; small logs abundant; leaf litter common; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Seeding grass cover scattered; scattered fleshy fruiting plants, including emu apple, peach bush and currant bush; nectar / pollen producing plant common; koala feed trees absent. |
| **Signs** | Scattered macropod scats; possum scat; echidna scat; common woodland birds, including noisy friarbird, channel-billed cuckoo, little friarbird, dollarbird, whistling kits and pied butcherbird. |
| **Koala Feed Trees** | None detected. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: low (0); habitat connectivity: high (2); key existing threats: medium (1); recovery value: low (0); overall score: 3 = **not critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>T2 | |
| **Location**<br>Willunga | |
| **Date**<br>24/11/2016 | |
| **Latitude**<br>-22.35977 | |
| **Longitude**<br>148.51338 | |
| **Slope:**<br>1° | |
| **Aspect:**<br>W | |

| **General Site Description** | |
|---|---|
| **Landform** | Gently undulating plain |
| **Soil** | Red sandy loam |
| **Observed vegetation** | RE 11.3.2 (mapped by DSITIA (2016) as 11.3.2 / 11.3.7 / 11.3.1 / 11.3.1b). Woodland dominated by poplar box (*Eucalyptus populnea*), with occasional carbeen (*Corymbia tessellaris*), broad-leaved ironbark (*E. fibrosa*) and Clarkson's bloodwood (*C. clarksoniana*). Sparse shrub layer including sally wattle (*Acacia salicina*), whitewood (*Atalaya hemiglauca*), small-leaved ebony (*Diospyros humilis*) and currant bush (*Carissa ovata*). Ground layer dominated by buffel grass (*Cenchrus ciliaris*), with abundant shrubby stylo (Stylosanthes scabra) – both exotic. |
| **General Site Observations** | **BVG: Eucalypt dry woodlands on inland depositional plains.** Trees form ecologically dominant stratum; remnant vegetation; relatively young community; good health, although ground layer dominated by exotics; erosion absent; no dieback detected; fire scars absent; moderate cattle grazing. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Large hollows absent; small hollows common, in a mixture of dead and alive trees; large logs scattered; small logs common; leaf litter common; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Seeding grass cover scattered; fleshy fruiting plants scattered, including currant bush; nectar / pollen producing plant common; koala feed trees common. |
| **Signs** | Scattered macropod scats; common woodland birds, including Torresian crow, noisy friarbird, pied butcherbird and Australian magpie. |
| **Koala Feed Trees** | Poplar box (*E. populnea*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: high (2); key existing threats: medium (1); recovery value: medium (1); overall score: 6 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>Q29 | |
| **Location**<br>Willunga and Seloh Nolem | |
| **Date**<br>24/11/2016 | |
| **Latitude**<br>-22.34866 | |
| **Longitude**<br>148.51068 | |
| **Slope:**<br>0° | |
| **Aspect:** | |

| **General Site Description** | |
|---|---|
| **Landform** | Palustrine wetland on level plain |
| **Soil** | Brown light clay |
| **Observed vegetation** | RE 11.3.27b (mapped by DSITIA (2016) as 11.3.27b and Non-remnant). Wetland with fringing woodland dominated by coolabah (*Eucalyptus coolabah*) and forest red gum (*E. tereticornis*), with occasional belah (*Casuarina cristata*). Second stratum at 8 m of belah, forest red gum and yellowwood (*Terminalia oblongata*). Ground cover dominated by common couch (*Cynodon dactylon*), with giant sedge (*Cyperus exaltatus*), Indian heliotrope (*Heliotropium indicum*) and *Juncus* sp. |
| **General Site Observations** | **BVG: Wetlands (swamps and lakes).** Trees form ecologically dominant stratum; healthy community with good regeneration; vegetation unit is an intact remnant approximately 4.5 km long by 1.6 km wide and linked to the Isaac River corridor; ground layer restricted to drying fringes of the wetland; erosion absent; minimal dieback; fire scars absent; moderate grazing impacts. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Large hollows common and small hollows abundant, mostly in living trees; large logs scattered; small logs abundant; leaf litter scattered; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Seeding grass cover scattered; fleshy fruiting plants absent; nectar / pollen producing plant abundant; koala feed trees common. |
| **Signs** | Scattered macropod scats; possum / glider scratches; magpie-lark nest; common woodland birds, including magpie-lark, forest kingfisher and noisy miner. |
| **Koala Feed Trees** | Coolabah (*E. coolabah*) and forest red gum (*E. tereticornis*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: high (2); key existing threats: medium (1); recovery value: high (2); overall score: 7 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>Q30 | |
| **Location**<br>Seloh Nolem | |
| **Date**<br>24/11/2016 | |
| **Latitude**<br>-22.33668 | |
| **Longitude**<br>148.50658 | |
| **Slope:**<br>1° | |
| **Aspect:**<br>SE | |

| **General Site Description** | |
|---|---|
| **Landform** | Gently undulating plain; deposited low rises – old floodplain |
| **Soil** | Brown sandy loam |
| **Observed vegetation** | RE 11.3.7 (mapped by DSITIA (2016) as 11.3.2 / 11.3.7 / 11.3.1 / 11.3.1b). Woodland dominated by Clarkson's bloodwood (*Corymbia clarksoniana*), with abundant poplar box (*Eucalyptus populnea*) and frequent carbeen (*Corymbia tessellaris*). Second stratum at 7m of prickly pine (*Bursaria incana*), stiff-leaved denhamia (*Denhamia oleaster*), carbeen, Clarkson's bloodwood, bean tree (*Cassia brewsteri*) and scrub boonaree (*Alectryon diversifolius*). Shrub layer of brush hovea (*Hovea longipes*), peach (*Ehretia saligna*), cassinia (*Elaeodendron australe*), small-leaved ebony (*Diospyros humilis*), cocaine tree (*Erythroxylum australe*), large-fruited orange thorn (*Pittosporum spinescens*) and currant bush (*Carissa ovata*). Ground layer dominated by buffel grass (*Cenchrus ciliaris*). |
| **General Site Observations** | **BVG: Eucalypt dry woodlands on inland depositional plains.** Trees form ecologically dominant stratum; open community with moderate regeneration; vegetation unit is an isolated linear remnant approximately 2 km long by 0.25 km wide, surrounded by clearing; ground layer dominated by exotic grass; erosion absent; minimal dieback evident; fire scars absent; moderate grazing impacts. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Large hollows common and small hollows abundant, in a mixture of dead and alive trees; large logs absent; small logs scattered; leaf litter scattered; dense shrub / grass shelter common. |
| **Food Potential Over Entire Year** | Seeding grass cover absent, with the exception of buffel grass; scattered fleshy fruiting plants, including small-leaved ebony, large-fruited orange thorn and currant bush; nectar / pollen producing plant common; koala feed trees common. |
| **Signs** | Scattered macropod scats; medium-sized woodland bird nest; common woodland birds, including pied butcherbird, noisy miner and noisy friarbird. |
| **Koala Feed Trees** | Poplar box (*E. populnea*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: medium (1); habitat connectivity: low (0); key existing threats: medium (1); recovery value: medium (1); overall score: 3 = **not critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>Q31 | |
| **Location**<br>Seloh Nolem | |
| **Date**<br>24/11/2016 | |
| **Latitude**<br>-22.33750 | |
| **Longitude**<br>148.49354 | |
| **Slope:**<br>1° | |
| **Aspect:**<br>SE | |
| **General Site Description** | |
| **Landform** | Level plain with gilgai |
| **Soil** | Brown cracking clay |
| **Observed vegetation** | RE 11.3.1 (mapped as by DSITIA (2016) 11.3.2 / 11.3.7 / 11.3.1 / 11.3.1b). Open low woodland of yellowwood (*Terminalia oblongata*), brigalow (*Acacia harpophylla*), red bauhinia (*Lysiphyllum carronii*), and white bauhinia (*Lysiphyllum hookeri*). Denser shrub layer of brigalow, scrub boonaree (*Alectryon diversifolius*), warrior bush (*Apophyllum anomalum*), yellowwood, native lime (*Citrus glauca*), red bauhinia, whitewood (*Atalaya hemiglauca*), water bush (*Myoporum acuminatum*) and currant bush (*Carissa ovata*). Ground layer dominated by buffel grass (*Cenchrus ciliaris*), with scattered herbs such as red pigweed (*Portulaca oleracea*), soda bush (*Atriplex muelleri*), brigalow burr (*Sclerolaena tetracuspis*), soft rolypoly (*Salsola australis*) and *Maireana microphylla*. |
| **General Site Observations** | **BVG: Other acacia dominated open forests, woodlands and shrublands**. Trees form ecologically dominant stratum; highly disturbed community with poor regeneration, likely fire damaged when surrounding clearing was burned; vegetation unit is an isolated linear remnant approximately 3 km long with tenuous connection to Isaac River riparian corridor in the north; very similar cover to mapped non-remnant country to north east; ground layer dominated by exotic grass; erosion absent. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Large hollows absent; scattered small hollows, mostly in dead trees; large logs absent; small logs abundant; leaf litter scattered; dense shrub / grass shelter common. |
| **Food Potential Over Entire Year** | Seeding grass cover scattered; scattered fleshy fruiting plants, including native lime, water bush and currant bush; nectar / pollen producing plant scattered; koala feed trees absent. |
| **Signs** | Scattered macropod scats; common woodland birds, including grey-crowned babbler. |
| **Koala Feed Trees** | Not detected. |
| **Koala habitat score** | Koala occurrence: medium (1; precautionary principle); vegetation composition: low (0); habitat connectivity: high (2); key existing threats: medium (1); recovery value: low (0); overall score: 4 = **not critical habitat**. |
| **Fauna habitat value – general** | Average. |

| | |
|---|---|
| **Survey Code**<br>Q32 | |
| **Location**<br>Seloh Nolem | |
| **Date**<br>24/11/2016 | |
| **Latitude**<br>-22.34325 | |
| **Longitude**<br>148.48826 | |
| **Slope:**<br><1° | |
| **Aspect:**<br>S | |

| **General Site Description** | |
|---|---|
| **Landform** | Level plain; alluvial plain |
| **Soil** | Brown cracking clay |
| **Observed vegetation** | RE 11.3.27f (mapped by DSITIA (2016) as 11.3.27b). Woodland of coolabah (*Eucalyptus coolabah*). Very sparse second stratum at 9 m of coolabah and sally wattle (*Acacia salicina*). Very sparse shrub layer of coolabah and sally wattle seedlings. Ground layer is *Cyperus* sp., *Eleocharis* sp., cane grass (*Walwhalleya subxerophila*), native grasses, lesser joyweed (*Alternanthera denticulata*) and parthenium (*Parthenium hysterophorus*). |
| **General Site Observations** | **BVG: Wetlands (swamps and lakes).** Trees form ecologically dominant stratum; healthy wetland community with good regeneration; vegetation unit is part of the Isaac River riparian corridor where the vegetated corridor is approximately 1km wide at this point; erosion absent, no dieback. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Large hollows common and small hollows abundant, mostly in living trees; large logs scattered; small logs abundant; leaf litter common; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Seeding grass cover common; fleshy fruiting plants absent; nectar / pollen producing plant common; koala feed trees common. |
| **Signs** | Scattered macropod scats; greater glider scats; kingfisher nest in tree. |
| **Koala Feed Trees** | Coolabah (*E. coolabah*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: high (2); key existing threats: medium (1); recovery value: medium (1); overall score: 6 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>Q33 | |
| **Location**<br>Seloh Nolem | |
| **Date**<br>24/11/2016 | |
| **Latitude**<br>-22.35394 | |
| **Longitude**<br>148.49749 | |
| **Slope:**<br><1° | |
| **Aspect:** | |

| **General Site Description** | |
|---|---|
| **Landform** | Level plain; stream channel |
| **Soil** | Alluvial sands over clay substrate |
| **Observed vegetation** | RE 11.3.3 (mapped by DSITIA (2016) as 11.3.2 / 11.3.7 / 11.3.1 / 11.3.1b). Woodland dominated by coolabah (*Eucalyptus coolabah*), with occasional carbeen (*Corymbia tessellaris*). Slightly denser canopy second stratum at 10 m of white bauhinia (*Lysiphyllum hookeri*), bean tree (*Cassia brewsteri*), sandpaper fig (*Ficus opposita*), coolabah and sally wattle (*Acacia salicina*). Mid-density shrub layer of poison peach (Ehretia membranifolia), scrub boonaree (*Alectryon diversifolius*), bitterbark (*Alstonia constricta*), currant bush (*Carissa ovata*), coolabah and sally wattle. Ground layer dominated by buffel grass (*Cenchrus ciliaris*), with occasional parthenium (*Parthenium hysterophorus*), *Paspalidium sp.* and Queensland blue grass (*Dichanthium sericeum*). |
| **General Site Observations** | **BVG: Eucalypt dry woodlands on inland depositional plains.** Trees form ecologically dominant stratum; healthy community with moderate regeneration; vegetation unit is part of the Isaac River riparian corridor where the vegetated corridor is approximately 1km wide at this point; erosion absent; no dieback. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered large hollows and small hollows common, in a mixture of dead and alive trees; scattered large logs; small logs abundant; leaf litter common; dense shrub / grass shelter common. |
| **Food Potential Over Entire Year** | Seeding grass cover scattered; fleshy fruiting plants scattered, including sandpaper and currant bush; nectar / pollen producing plant common; koala feed trees common. |
| **Signs** | Scattered macropod scats; common woodland birds, including red-winged parrot, grey-crowned babbler, rainbow bee-eater, whistling kits and forest kingfisher. |
| **Koala Feed Trees** | Coolibah (*E. coolabah*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: high (2); key existing threats: medium (1); recovery value: medium (1); overall score: 6 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>Q34 | |
| **Location**<br>Seloh Nolem | |
| **Date**<br>24/11/2016 | |
| **Latitude**<br>-22.34563 | |
| **Longitude**<br>148.48637 | |
| **Slope:**<br><1° | |
| **Aspect:**<br>NE | |

| **General Site Description** | |
|---|---|
| **Landform** | Level plain; alluvial plain |
| **Soil** | Brown sandy clay loam |
| **Observed vegetation** | RE 11.3.2 (mapped by DSITIA (2016) as 11.3.2 / 11.3.7 / 11.3.1 / 11.3.1b). Poplar box (*Eucalyptus populnea*) woodland, with occasional coolabah (*Eucalyptus coolabah*) and Clarkson's bloodwood (*Corymbia clarksoniana*). Very sparse second stratum at 8 m of sally wattle (*Acacia salicina*). Sparse shrub layer of currant bush (*Carissa ovata*), bean tree (*Cassia brewsteri*), sally wattle, poplar box, and supplejack (*Ventilago viminalis*). Ground layer dominated by buffel grass, with occasional natives, including black spear grass (*Heteropogon contortus*), wiregrass (*Aristida calycina*), curly windmill grass (*Enteropogon acicularis*) and Darling lily (*Crinum flaccidum*). |
| **General Site Observations** | **BVG: Eucalypt dry woodlands on inland depositional plains.** Trees form ecologically dominant stratum; healthy community with good regeneration; vegetation unit is part of the Isaac River riparian corridor where the vegetated corridor is approximately 1km wide at this point; erosion absent, no dieback noted. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered large hollows and abundant small hollows, mostly in dead trees; large logs absent; small logs abundant; leaf litter common; dense shrub / grass shelter common. |
| **Food Potential Over Entire Year** | Seeding grass cover scattered; fleshy fruiting plants scattered, including currant bush; nectar / pollen producing plant common; koala feed trees common. |
| **Signs** | Scattered macropod scats; common woodland birds, including laughing kookaburra, pied butcherbird, Australian magpie and noisy friarbird. |
| **Koala Feed Trees** | Poplar box (*E. populnea*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: high (2); key existing threats: medium (1); recovery value: high (2); overall score: 7 = **not critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>Q35 | |
| **Location**<br>Seloh Nolem | |
| **Date**<br>25/11/2016 | |
| **Latitude**<br>-22.33314 | |
| **Longitude**<br>148.47250 | |
| **Slope:**<br><1° | |
| **Aspect:**<br>S | |

| **General Site Description** | |
|---|---|
| **Landform** | Level plain; alluvial plain |
| **Soil** | Brown sandy loam |
| **Observed vegetation** | RE 11.3.7 (mapped by DSITIA (2016) as 11.3.2 / 11.3.7 / 11.3.1 / 11.3.1b). Woodland dominated by carbeen (*Corymbia tessellaris*), with abundant Clarkson's bloodwood (*C. clarksoniana*) and poplar box (*Eucalyptus populnea*), and occasional Dallachy's gum (*Corymbia dallachiana*), forest red gum (*E. tereticornis*) and sally wattle (*Acacia salicina*). Sub-canopy at 8 m of poplar box, carbeen, bean tree (*Cassia brewsteri*), soap tree (*Alphitonia excelsa*) and sally wattle. Sparse shrub layer of lantana (*Lantana camara*), sandpaper fig (*Ficus opposita*), poplar box and bean tree. Ground layer is dominated by buffel grass, with frequent black spear grass *(Heteropogon contortus),* wiregrass *(Aristida jerichoensis*), shrubby stylo *(*Stylosanthes scabra) and red Natal grass *(Melinis repens).* |
| **General Site Observations** | **BVG: Eucalypt dry woodlands on inland depositional plains.** Trees form ecologically dominant stratum; healthy community with good regeneration; vegetation unit is part of the Isaac River riparian corridor; this site is located at the southern end of a large block of remnant vegetation approximately 6.5 km long by up to 4.5 km wide; erosion absent, no dieback noted. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Large hollows absent; small hollows scattered, mostly in dead trees; large logs scattered; small logs common; scattered leaf litter; dense grass shelter common – predominantly tall buffel grass. |
| **Food Potential Over Entire Year** | Seeding grass cover scattered; scattered fleshy fruiting plants, including lantana and sandpaper fig; nectar / pollen producing plant common; koala feed trees common. |
| **Signs** | Scattered macropod scats; pig diggings; medium-sized woodland bird nest; common woodland birds, including channel-billed cuckoo, Torresian crow and Australian magpie. |
| **Koala Feed Trees** | Forest red gum (*E. tereticornis*) and poplar box (*E. populnea*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: high (2); key existing threats: medium (1); recovery value: high (2); overall score: 7 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>Q36 | |
| **Location**<br>Seloh Nolem | |
| **Date**<br>25/11/2016 | |
| **Latitude**<br>-22.32805 | |
| **Longitude**<br>148.48349 | |
| **Slope:**<br><1° | |
| **Aspect:**<br>SSW | |

| **General Site Description** | |
|---|---|
| **Landform** | Level plain; alluvial plain |
| **Soil** | Orange-brown loamy clay |
| **Observed vegetation** | RE 11.3.2 (mapped by DSITIA (2016) as 11.3.2 / 11.3.7 / 11.3.1 / 11.3.1b). Woodland of poplar box (*Eucalyptus populnea*), with a sub-canopy at 6 m of poplar box, sally wattle (*Acacia salicina*), emu apple (*Owenia acidula*), white bauhinia (*Lysiphyllum hookeri*) and whitewood (*Atalaya hemiglauca*). Well-developed shrub layer of poplar box, white bauhinia, wilga (*Geijera parviflora*), cocaine tree (*Erythroxylum australe*), currant bush (*Carissa ovata*), supplejack (*Ventilago viminalis*) and sally wattle. The ground layer dominated by buffel grass (*Cenchrus ciliaris*), with occasional black spear grass (*Heteropogon contortus*), wire grass (*Aristida* sp.) and *Sida* spp. |
| **General Site Observations** | **BVG: Eucalypt dry woodlands on inland depositional plains.** Trees form ecologically dominant stratum; patchy community, but with good regeneration; this a small patch of vegetation that has been isolated by clearing; tunnel erosion evident with sinkhole action, some dieback noted. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered large hollows and small hollows common, mostly in dead trees; large logs common; small logs abundant; leaf litter common; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Seeding grass cover scattered; scattered fleshy fruiting plants, including emu apple and currant bush; nectar / pollen producing plant common; koala feed trees common. |
| **Signs** | Scattered macropod scats; common woodland birds, including black-faced cuckoo shrike, pale-headed rosella, red-winged parrot, Australian magpie and Torresian crow. |
| **Koala Feed Trees** | Poplar box (*E. populnea*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: low (0); key existing threats: medium (1); recovery value: medium (1); overall score: 4 = **not critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>Q37 | |
| **Location**<br>Seloh Nolem | |
| **Date**<br>25/11/2016 | |
| **Latitude**<br>-22.31433 | |
| **Longitude**<br>148.47243 | |
| **Slope:**<br>10-15° | |
| **Aspect:**<br>SW | |

| **General Site Description** | |
|---|---|
| **Landform** | River bank |
| **Soil** | Yellow-brown sand |
| **Observed vegetation** | RE 11.3.25 (mapped by DSITIA (2016) as 11.3.25). Woodland to open forest dominated by forest red gum (*Eucalyptus tereticornis*), with frequent river she-oak (*Casuarina cunninghamiana*), and occasional carbeen (*Corymbia tessellaris*) and coolabah (*E. coolabah*). Sparse second stratum at 8 m of river she-oak and forest red gum. Sparse shrub layer of white bauhinia (*Lysiphyllum hookeri*) and lantana (*Lantana camara*) on the upper bank and snow-in-summer (*Melaleuca linariifolia*) on the lower bank. Ground layer dominated by green panic (*Megathyrsus maxima*), with frequent common couch *(Cynodon dactylon*), Queensland blue grass (*Dichanthium sericeum*) and Para grass (*Brachiaria mutica*). |
| **General Site Observations** | **BVG: Eucalypt open forest to woodlands on floodplains.** Trees form ecologically dominant stratum; healthy community within a large remnant patch; good recruitment; clearing for fence lines and tracks on the river bank to north east of this point appears to be destabilising the river bank and the bank is being eaten away by flood events faster than normal erosive meander, no dieback noted. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Small and large hollows abundant, mostly in living trees; large logs scattered; small logs common; leaf litter common; dense shrub / grass shelter common. |
| **Food Potential Over Entire Year** | Seeding grass cover common; scattered fleshy fruiting plants, including lantana; nectar / pollen producing plant common; koala feed trees common. |
| **Signs** | Scattered macropod scats; greater glider scats. |
| **Koala Feed Trees** | Forest red gum (*E. tereticornis*) and coolabah (*E. coolabah*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: high (2); key existing threats: medium (1); recovery value: medium (1); overall score: 6 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>T3 | |
| **Location**<br>Vermont Park | |
| **Date**<br>25/11/2016 | |
| **Latitude**<br>-22.28968 | |
| **Longitude**<br>148.46448 | |
| **Slope:**<br><1° | |
| **Aspect:**<br>SE | |
| **General Site Description** | |
| **Landform** | Level plain with gilgai formation |
| **Soil** | Brown alluvial clay |
| **Observed vegetation** | RE 11.3.1 (mapped by DSITIA (2016) as 11.3.1). Woodland dominated by brigalow (*Acacia harpophylla*), with abundant yellowwood (*Terminalia oblongata*) and occasional coolabah (*Eucalyptus coolabah*). Sub-canopy of brigalow and yellowwood. Sparse shrub layer dominated by yellowwood and currant bush (*Carissa ovata*). Ground layer dominated by buffel grass (*Cenchrus ciliaris*), with frequent *Cyperus* sp., *Basilicum polystachion*, hariy nardoo (*Marsilea hirsuta*) and lesser joyweed (*Alternanthera denticulata*). |
| **General Site Observations** | **BVG: Other acacia dominated open forests, woodlands and shrublands**. Appears to be a young community, with no mature trees, but likely to be a low woodland variation of this RE which occurs in some situations; some very mature coolabah (*E. coolabah*) scattered throughout the patch; low native grass species cover is closely related to the dominance of buffel grass. Buffel grass is variable, but estimated at >50% of ground layer. Gilgai aquatic species are expected to dominate throughout the wetter months. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered large hollows and small hollows common, mostly in dead trees; large logs absent; small logs abundant; leaf litter common; dense shrub / grass shelter common. |
| **Food Potential Over Entire Year** | Seeding grass cover scattered; fleshy fruiting plants scattered, including currant bush; nectar / pollen producing plant common; koala feed trees scattered. |
| **Signs** | Scattered macropod scats; eastern snapping frog (*Cyclorana novaehollandiae*) tadpoles and metamorphs prevalent; common woodland birds, including little friarbird, noisy friarbird, apostlebird and dollarbird. |
| **Koala Feed Trees** | Coolabah (*E. coolabah*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: medium (1); habitat connectivity: high (2); key existing threats: medium (1); recovery value: medium (1); overall score: 5 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>Q38 | |
| **Location**<br>Vermont Park | |
| **Date**<br>25/11/2016 | |
| **Latitude**<br>-22.29103 | |
| **Longitude**<br>148.45897 | |
| **Slope:**<br><1° | |
| **Aspect:**<br>S | |

| **General Site Description** | |
|---|---|
| **Landform** | Level plain |
| **Soil** | Brown loamy clay |
| **Observed vegetation** | RE 11.3.2 (mapped by DSITIA (2016) as 11.3.2 / 11.3.7 / 11.3.1). Poplar box (*Eucalyptus populnea*) woodland, with a sparse second stratum at 6 m of whitewood (*Atalaya hemiglauca*), false sandalwood (*Eremophila mitchellii*), bean tree (*Cassia brewsteri*), emu apple (*Owenia acidula*) and poplar box. Very sparse shrub layer of whitewood, nelia (*Acacia oswaldii*), yellowberry bush (*Denhamia cunninghamii*), supplejack (*Ventilago viminalis*), sally wattle (*Acacia salicina*) currant bush (*Carissa ovata*) and nipan (*Capparis lasiantha*). Ground layer dominated by wiregrass (*Aristida sp.*) and kangaroo grass (*Themeda triandra*) and black spear grass (*Heteropogon contortus*), with occasional bearded watergrass (*Bulbostylis barbata*) and buffel grass (*Cenchrus ciliaris*). |
| **General Site Observations** | **BVG: Eucalypt dry woodlands on inland depositional plains.** Trees form ecologically dominant stratum; healthy community within a large remnant patch; good recruitment; no dieback noted; native ground cover species are dominant; no erosion noted, no weediness noted. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered large hollows and small hollows common, mostly in dead trees; large logs common; small logs abundant; leaf litter common; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Seeding grass cover common; scattered fleshy fruiting plants, including emu apple, yellowberry bush, currant bush and nipan; nectar / pollen producing plant common; koala feed trees common. |
| **Signs** | Scattered macropod scats; common woodland birds. |
| **Koala Feed Trees** | Poplar box (*E. populnea*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: high (2); key existing threats: medium (1); recovery value: medium (1); overall score: 6 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>Q39 | |
| **Location**<br>Vermont Park | |
| **Date**<br>25/11/2016 | |
| **Latitude**<br>-22.29414 | |
| **Longitude**<br>148.45418 | |
| **Slope:**<br><1° | |
| **Aspect:**<br>NE | |

| **General Site Description** | |
|---|---|
| **Landform** | Paleochannel on level plain |
| **Soil** | Brown sandy alluvial clay |
| **Observed vegetation** | RE 11.3.27b (mapped by DSITIA (2016) as 11.3.2 / 11.3.7 / 11.3.1). Woodland dominated by coolabah (*Eucalyptus coolabah*), with occasional carbeen (*Corymbia tessellaris*). Very sparse shrub layer of bean tree (*Cassia brewsteri*). The ground layer is almost bare, with scattered black spear grass (*Heteropogon contortus*), buffel grass (*Cenchrus ciliaris*) and forbs. |
| **General Site Observations** | **BVG: Wetlands (swamps and lakes).** Trees form ecologically dominant stratum; healthy community within a large remnant patch; good recruitment; no dieback noted; no erosion noted, no weediness noted; grazing livestock impacts evident with pugging and general grazing pressure. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Abundant small and large hollows, mostly in living trees; scattered large logs; abundant small logs; leaf litter common; dense shrub / grass shelter absent. |
| **Food Potential Over Entire Year** | Seeding grass cover scattered; fleshy fruiting plants absent; nectar / pollen producing plant common; koala feed trees common. |
| **Signs** | Frequent macropod scats; common woodland birds; Bynoe's gecko and *Gehyra dubia*; toads prevalent. |
| **Koala Feed Trees** | Coolabah (*E. coolabah*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: high (2); key existing threats: medium (1); recovery value: medium (2); overall score: 7 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>Q40 | |
| **Location**<br>Vermont Park | |
| **Date**<br>25/11/2016 | |
| **Latitude**<br>-22.30054 | |
| **Longitude**<br>148.45531 | |
| **Slope:**<br><1° | |
| **Aspect:** | |

| **General Site Description** | |
|---|---|
| **Landform** | Level plain |
| **Soil** | Brown loamy clay |
| **Observed vegetation** | RE 11.3.2 (mapped by DSITIA (2016) as 11.3.2 / 11.3.7 / 11.3.1). Woodland dominated by Poplar box (*Eucalyptus populnea*), with boonaree (*Alectryon oleifolius*). Sparse sub-canopy of poplar box, sally wattle (*Acacia salicina*) and emu apple (*Owenia acidula*). Very sparse shrub layer of bean tree (*Cassia brewsteri*), whitewood (*Atalaya hemiglauca*), currant bush (*Carissa ovata*) and native lime (*Citrus glauca*). Ground layer is approximately 50% buffel grass (*Cenchrus ciliaris*) and 50% native grasses, including kangaroo grass (*Themeda triandra*), black spear grass (*Heteropogon contortus*) and wiregrass (*Aristida jerichoensis*). |
| **General Site Observations** | **BVG: Eucalypt dry woodlands on inland depositional plains.** Trees form ecologically dominant stratum; healthy community within a large remnant patch; good recruitment; no dieback noted; range of canopy maturities with some larger hollows in old trees; no erosion noted; no fire scars. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered large hollows and abundant small hollows, in a mixture of dead and alive trees; large logs common; small logs abundant; leaf litter common; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Seeding grass cover common; scattered fleshy fruiting plants, including emu apple, currant bush and native lime; nectar / pollen producing plant common; koala feed trees common. |
| **Signs** | Scattered macropod scats. |
| **Koala Feed Trees** | Poplar box (*E. populnea*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: high (2); key existing threats: medium (1); recovery value: medium (1); overall score: 6 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

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|---|---|
| **Survey Code**<br>Q41 | |
| **Location**<br>Vermont Park | |
| **Date**<br>25/11/2016 | |
| **Latitude**<br>-22.30393 | |
| **Longitude**<br>148.45110 | |
| **Slope:**<br><1° | |
| **Aspect:**<br>E | |

| **General Site Description** | |
|---|---|
| **Landform** | Level plain |
| **Soil** | Brown sandy light clay |
| **Observed vegetation** | RE 11.4.8 (mapped by DSITIA (2016) as 11.4.9). Woodland co-dominated by brigalow (*Acacia harpophylla*) and Dawson gum (*Eucalyptus cambageana*), with a sparse sub-canopy (6m) of brigalow, scrub leopard ash (*Flindersia dissosperma*) and red bauhinia (*Lysiphyllum carronii*). Mid-dense shrub layer of currant bush (*Carissa ovata*), red bauhinia, wilga (*Geijera parviflora*) and whitewood (*Atalaya hemiglauca*). Ground layer dominated by wiregrass (*Aristida jerichoensis*), with abundant buffel grass (*Cenchrus ciliaris*) and frequent brigalow grass (*Paspalidium caespitosum*). |
| **General Site Observations** | **BVG: Other acacia dominated open forests, woodlands and shrublands.** Trees form ecologically dominant stratum; thin sliver of brigalow community that was not cleared when the original clearing to the south occurred; no dieback noted; no erosion noted; no fire scars. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Large hollows absent; small hollows scattered, mostly in dead trees; large logs absent; small logs abundant; leaf litter scattered; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Seeding grass cover common; scattered fleshy fruiting plants, including currant bush; nectar / pollen producing plant common; koala feed trees absent. |
| **Signs** | Scattered macropod scats. |
| **Koala Feed Trees** | None detected. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: low (0); habitat connectivity: high (2); key existing threats: medium (1); recovery value: low (0); overall score: 3 = **not critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>Q42 | |
| **Location**<br>Vermont Park | |
| **Date**<br>25/11/2016 | |
| **Latitude**<br>-22.31403 | |
| **Longitude**<br>148.46753 | |
| **Slope:**<br><1° | |
| **Aspect:**<br>ESE | |

| **General Site Description** | |
|---|---|
| **Landform** | Level plain |
| **Soil** | Brown sandy light clay |
| **Observed vegetation** | RE 11.3.2 (mapped by DSITIA (2016) as 11.3.2 / 11.3.7 / 11.3.1). Poplar box (*Eucalyptus populnea*) woodland, with a sparse sub-canopy (7m) of poplar box and bean tree (*Cassia brewsteri*). Sparse shrub layer containing dead finish (*Archidendropsis basaltica*), lantana (*Lantana camara*), supplejack (*Ventilago viminalis*), sally wattle (*Acacia salicina*), nelia (*Acacia oswaldii*), wild orange (*Capparis umbonata*), myrtle wood (*Psydrax oleifolius*), shiny-leaved canthium (*Psydrax odorata*) and currant bush (*Carissa ovata*). Ground layer dominated by wiregrasses (*Aristida spp.*) and curly windmill grass (*Enteropogon ramosus*), with abundant Buffel grass (*Cenchrus ciliaris*), frequent kangaroo grass (*Themeda triandra*) and forest blue grass (*Bothriochloa sp.*). |
| **General Site Observations** | **BVG: Eucalypt dry woodlands on inland depositional plains.** Trees form ecologically dominant stratum; a good mix of canopy maturities; good recruitment; no dieback noted; no erosion noted; no fire scars; good habitat timber on the ground; part of a significant remnant block adjacent to the Isaac River 7km long by up to 4km wide. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered large hollows and abundant small hollows, mostly in dead trees; small and large logs abundant; scattered leaf litter; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Seeding grass cover common; scattered fleshy fruiting plants, including lantana, wild orange and currant bush; nectar / pollen producing plant common; koala feed trees common. |
| **Signs** | Scattered macropod scats; eastern grey kangaroos; common woodland birds, including eastern koel. |
| **Koala Feed Trees** | Poplar box (*E. populnea*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: high (2); key existing threats: medium (1); recovery value: medium (1); overall score: 6 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>Q43 | |
| **Location**<br>Vermont Park (Lot 9 CNS98) | |
| **Date**<br>25/11/2016 | |
| **Latitude**<br>-22.32888 | |
| **Longitude**<br>148.47273 | |
| **Slope:**<br><1° | |
| **Aspect:** | |

| **General Site Description** | |
|---|---|
| **Landform** | Palustrine wetland; level plain |
| **Soil** | Brown sandy light clay |
| **Observed vegetation** | RE 11.3.27f (mapped by DSITIA (2016) as 11.3.27b). Woodland dominated by forest red gum (*Eucalyptus tereticornis*) and coolabah (*E. coolabah*), with occasional carbeen (*Corymbia tessellaris*). Similar density sub-canopy at 11m of young forest red gum, coolabah and carbeen, with a scattering of mature swamp mahogany (*Lophostemon suaveolens*). No shrub layer. Ground layer includes a mix of native grasses, small knotweed (*Polygonum plebeium*), indian heliotrope (*Heliotropium indicum*), *Heliotropium ovalifolium* and *Verbena* sp. |
| **General Site Observations** | **BVG: Wetlands (swamps and lakes).** Trees form ecologically dominant stratum; a healthy wetland community within a large remnant with intact linkages to larger remnants to the west; good recruitment; no dieback noted; no erosion noted; no fire scars; part of a remnant block adjacent to the Isaac River 7km long by up to 4km wide. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Small and large hollows abundant, mostly in living trees; small and large logs common; scattered leaf litter; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Seeding grass cover common; fleshy fruiting plants absent; nectar / pollen producing plant common; koala feed trees common. |
| **Signs** | Scattered macropod scats. |
| **Koala Feed Trees** | Forest red gum (*E. tereticornis*) and coolabah (*E. coolabah*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: high (2); key existing threats: medium (1); recovery value: medium (2); overall score: 7 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>Q44 | |
| **Location**<br>Vermont Park | |
| **Date**<br>25/11/2016 | |
| **Latitude**<br>-22.32872 | |
| **Longitude**<br>148.46386 | |
| **Slope:**<br><1° | |
| **Aspect:** | |

| **General Site Description** | |
|---|---|
| **Landform** | Level plain |
| **Soil** | Brown light to medium clay |
| **Observed vegetation** | RE 11.3.1 (mapped by DSITIA (2016) as 11.3.3 / 11.3.2 / 11.3.1 / 11.3.2b). Open forest dominated by brigalow (*Acacia harpophylla*), with abundant coolabah (*Eucalyptus coolabah*). Sub-canopy at 7m of white bauhinia (*Lysiphyllum hookeri*) and yellowwood (*Terminalia oblongata*). Sparse shrub layer of scrub boonaree (*Alectryon diversifolius*), poison peach (*Ehretia membranifolia*), shiny-leaved canthium (*Psydrax odorata*) and currant bush (*Carissa ovata*). Ground layer dominated by buffel grass (*Cenchrus ciliaris*). |
| **General Site Observations** | **BVG: Other acacia dominated open forests, woodlands and shrublands**. Trees form ecologically dominant stratum; a healthy but relatively small patch of brigalow that missed being cleared; good recruitment; no dieback noted; no erosion noted; no fire scars; highly infested with exotic grass and suffering edge effects from adjacent clearing. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered large hollows and abundant small hollows, mostly in dead trees; large logs scattered; small logs abundant; leaf litter common; dense shrub / grass shelter common. |
| **Food Potential Over Entire Year** | Seeding grass cover scattered; scattered fleshy fruiting plants, including currant bush; nectar / pollen producing plant common; koala feed trees common. |
| **Signs** | Scattered macropod scats; common woodland birds, including laughing kookaburra. |
| **Koala Feed Trees** | Coolabah (*E. coolabah*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: medium (1); habitat connectivity: high (2); key existing threats: medium (1); recovery value: medium (1); overall score: 5 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>Q45 | |
| **Location**<br>Vermont Park | |
| **Date**<br>26/11/2016 | |
| **Latitude**<br>-22.27440 | |
| **Longitude**<br>148.44267 | |
| **Slope:**<br>1° | |
| **Aspect:**<br>ESE | |

| **General Site Description** | |
|---|---|
| **Landform** | Level plain |
| **Soil** | Brown sandy clay loam |
| **Observed vegetation** | RE 11.3.7 (mapped by DSITIA (2016) as 11.3.2 / 11.3.7 / 11.3.1). Open woodland dominated by Clarkson's bloodwood (*Corymbia clarksoniana*) and Dallachy's gum (*C. dallachyana*), with abundant narrow-leaved iron-bark (*Eucalyptus crebra*) and occasional carbeen (*C. tessellaris*). Very sparse sub-canopy of carbeen, Clarkson's bloodwood and Bean tree (*Cassia brewsteri*). Very sparse shrub layer of bean tree, currant bush (*Carissa ovata*), dysentery plant *Grewia latifolia*) and lantana (*Lantana camara*). Ground layer includes a mix of wiregrass (*Aristida jerichoensis*), buffel grass (*Cenchrus ciliaris*), kangaroo grass (*Themeda triandra*) and black spear grass (*Heteropogon contortus*). |
| **General Site Observations** | **BVG: Eucalypt dry woodlands on inland depositional plains.** Trees form ecologically dominant stratum; healthy recovering community; good recruitment; old dead trees noted with large hollows; no erosion noted; old fire scars. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered large hollows and abundant small hollows, in a mixture of dead and alive trees; scattered large logs; small logs common; scattered leaf litter; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Seeding grass cover common; scattered fleshy fruiting plants, including currant bush, dysentery plant and lantana; nectar / pollen producing plant common; koala feed trees scattered. |
| **Signs** | Scattered macropod scats; common woodland birds, including brown quail, dollarbird, sulphur-crested cockatoo, pied butcherbird, noisy miner, Australian magpie, little friarbird and eastern koel. |
| **Koala Feed Trees** | Narrow-leaved ironbark (*E. crebra*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: medium (1); habitat connectivity: high (2); key existing threats: medium (1); recovery value: medium (1); overall score: 5 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>Q46 | |
| **Location**<br>Vermont Park | |
| **Date**<br>26/11/2016 | |
| **Latitude**<br>-22.28331 | |
| **Longitude**<br>148.41602 | |
| **Slope:**<br>1° | |
| **Aspect:**<br>N | |

| **General Site Description** | |
|---|---|
| **Landform** | Depression within gently undulating plain |
| **Soil** | Brown light to medium clay |
| **Observed vegetation** | RE 11.4.9 (mapped by DSITIA (2016) as 11.4.9). Open forest dominated by brigalow (*Acacia harpophylla*), with abundant yellowwood (*Terminalia oblongata*) and occasional coolabah (*Eucalyptus coolabah*). Very sparse sub-canopy of sandalwood (*Santalum lanceolatum*), bean tree (*Cassia brewsteri*), white bauhinia (*Lysiphyllum hookeri*) and yellowwood. Shrub layer of cocaine tree (*Erythroxylum australe*), poison peach (*Ehretia membranifolia*) and currant bush (*Carissa ovata*). Ground layer dominated by buffel grass (*Cenchrus ciliaris*), with frequent green panic (*Megathyrsus maxima*), brigalow grass (*Paspalidium caespitosum*), *Cyperus sp*. and smart weed (*Persicaria attenuata*). |
| **General Site Observations** | **BVG: Other acacia dominated open forests, woodlands and shrublands.** Trees form ecologically dominant stratum; healthy, mostly young community; good recruitment; no dieback noted; no significant erosion noted; old fire scars. Wetland areas along gully part of dam impoundment. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered small and large hollows, in a mixture of dead and alive trees; large logs absent; small logs abundant; leaf litter common; dense shrub / grass shelter common. |
| **Food Potential Over Entire Year** | Seeding grass cover common; scattered fleshy fruiting plants, including currant bush; nectar / pollen producing plant common; koala feed trees scattered. |
| **Signs** | Scattered macropod scats; black bittern and common woodland birds, including pied butcherbird, sulphur-crested cockatoo and whistling kite. |
| **Koala Feed Trees** | Coolabah (*E. coolabah*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: medium (1); habitat connectivity: high (2); key existing threats: medium (1); recovery value: low (0); overall score: 4 = **not critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>Q47 | |
| **Location**<br>Vermont Park | |
| **Date**<br>26/11/2016 | |
| **Latitude**<br>-22.27040 | |
| **Longitude**<br>148.41005 | |
| **Slope:**<br>1-2° | |
| **Aspect:**<br>SE | |

| **General Site Description** | |
|---|---|
| **Landform** | Gently undulating plain |
| **Soil** | Brown sandy clay loam |
| **Observed vegetation** | RE 11.5.3 (mapped by DSITIA (2016) as 11.5.3 / 11.4.9). Woodland dominated by poplar box (*Eucalyptus populnea*), with a sub-canopy of quinine tree (*Petalostigma pubescens*), emu apple (*Owenia acidula*), bean tree (*Cassia brewsteri*) and white bauhinia (*Lysiphyllum hookeri*). Shrub layer of currant bush (*Carissa ovata*), wombat berry (*Eustrephus latifolius*), cocaine tree (*Erythroxylum australe*), cassine (*Elaeodendron australe*), quinine tree, poison peach (*Ehretia membranifolia*), yellowberry bush (*Denhamia cunninghamii*) and bitterbark (*Alstonia constricta*). Ground layer includes a mix of wiregrass (*Aristida sp.*), buffel grass (*Cenchrus ciliaris*), kangaroo grass (*Themeda triandra*), shrubby stylo (*Stylosanthes scabra*), hooky grass (*Ancistrachne uncinulata*) and black spear grass (*Heteropogon contortus*). |
| **General Site Observations** | **BVG: Eucalypt dry woodlands on inland depositional plains.** Trees form ecologically dominant stratum; healthy community showing shrubbiness consistent with ecotone between REs 11.5.3 and 11.4.9; good recruitment; older trees noted with medium hollows; no erosion noted; no fire scars. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Large hollows absent; small hollows abundant, in a mixture of dead and alive trees; scattered large logs; small logs abundant; leaf litter common; dense shrub / grass shelter common. |
| **Food Potential Over Entire Year** | Seeding grass cover common; scattered fleshy fruiting plants, including quinine tree, emu apple, currant bush, wombat berry and yellowberry bush; nectar / pollen producing plant abundant; koala feed trees common. |
| **Signs** | Scattered macropod scats; common woodland birds, including peaceful dove and grey-crowned babbler. |
| **Koala Feed Trees** | Poplar box (*E. populnea*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: high (2); key existing threats: medium (1); recovery value: low (1); overall score: 6 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>Q48 | |
| **Location**<br>Vermont Park | |
| **Date**<br>26/11/2016 | |
| **Latitude**<br>-22.26591 | |
| **Longitude**<br>148.39170 | |
| **Slope:**<br>1-2° | |
| **Aspect:**<br>SE | |

| **General Site Description** | |
|---|---|
| **Landform** | Gently undulating plain |
| **Soil** | Orange-brown loamy sand |
| **Observed vegetation** | RE 11.5.9 (mapped by DSITIA (2016) as 11.5.3 / 11.4.9). Woodland dominated by Clarkson's bloodwood (*Corymbia clarksoniana*), with occasional carbeen (*C. tessellaris*). Sparse sub-canopy of Clarkson's bloodwood, prickly pine (*Bursaria incana*), soap tree (*Alphitonia excelsa*) and quinine tree (*Petalostigma pubescens*). Very sparse shrub layer, including currant bush (*Carissa ovata*) and velvety tree pear (*Opuntia tomentosa*). Ground layer dominated by native species, including wiregrass (*Aristida sp.*), kangaroo grass (*Themeda triandra*) and black spear grass (*Heteropogon contortus*). |
| **General Site Observations** | **BVG: Eucalypt dry woodlands on inland depositional plains.** Trees form ecologically dominant stratum; healthy but naturally sparse community; evidence of old logging; natural dieback evident; good recruitment; no erosion noted; no fire scars: deeply weathered sand capping (possibly ancient alluvium) over Cainozoic sand plains. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered large hollows and small hollows abundant, mostly in dead trees; large logs absent; small logs common; leaf litter common; shrub cover absent; grass shelter common. |
| **Food Potential Over Entire Year** | Seeding grass cover abundant; scattered fleshy fruiting plants, including including currant bush and quinine tree; nectar / pollen producing plant common; koala feed trees absent. |
| **Signs** | Scattered macropod scats; common woodland birds, including dollarbird, whistling kite, Australian magpie, grey-crowned babbler, peaceful dove, willy wagtail and weebill. |
| **Koala Feed Trees** | None detected. |
| **Koala habitat score** | Koala occurrence: medium (1; precautionary principle); vegetation composition: low (0); habitat connectivity: high (2); key existing threats: medium (1); recovery value: low (0); overall score: 4 = **not critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>Q49 | |
| **Location**<br>Vermont Park | |
| **Date**<br>26/11/2016 | |
| **Latitude**<br>-22.26532 | |
| **Longitude**<br>148.38541 | |
| **Slope:**<br>1-2° | |
| **Aspect:**<br>SE | |

| **General Site Description** | |
|---|---|
| **Landform** | Gently undulating plain |
| **Soil** | Brown light clay |
| **Observed vegetation** | RE 11.4.9 (mapped as by DSITIA (2016) 11.5.3 / 11.4.9). Woodland dominated by brigalow (*Acacia harpophylla*) with frequent yellowwood (*Terminalia oblongata*) and occasional poplar box (*Eucalyptus populnea*). Sparse sub-canopy of yellowwood, brigalow, scrub leopard ash (*Flindersia dissosperma*), false sandalwood (*Eremophila mitchellii*) and whitewood (*Atalaya hemiglauca*). Sparse shrub layer of currant bush (*Carissa ovata*), yellowwood and scrub leopard ash seedlings. Ground layer includes a mix of buffel grass (*Cenchrus ciliaris*), brigalow grass (*Paspalidium caespitosum*), comet grass (*Perotis rara*) and forest blue grass (*Bothriochloa bladhii*). |
| **General Site Observations** | **BVG: Other acacia dominated open forests, woodlands and shrublands.** Trees form ecologically dominant stratum; healthy small patch of brigalow community surrounded by poplar box community; naturally low brigalow canopy with low disturbance; good recruitment; no erosion noted; no fire scars. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Large hollows absent; scattered small hollows, mostly in dead trees; large logs absent; small logs abundant; leaf litter common; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Seeding grass cover scattered; fleshy fruiting plants scattered, including currant and velvety tree pear (*Opuntia tomentosa*); scattered nectar / pollen producing plant; koala feed trees scattered. |
| **Signs** | Scattered macropod scats; skink (*Morethia taeniopleura*); common woodland birds, including noisy friarbird and pale-headed rosella. |
| **Koala Feed Trees** | Poplar box (*E. populnea*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: medium (1); habitat connectivity: high (2); key existing threats: medium (1); recovery value: low (0); overall score: 4 = **not critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>Q50 | |
| **Location**<br>Vermont Park | |
| **Date**<br>26/11/2016 | |
| **Latitude**<br>-22.27507 | |
| **Longitude**<br>148.37189 | |
| **Slope:**<br>1-2° | |
| **Aspect:**<br>SE | |

| **General Site Description** | |
|---|---|
| **Landform** | Gently undulating plain, with light gilgai formation |
| **Soil** | Brown light clay |
| **Observed vegetation** | RE 11.4.9 (mapped as by DSITIA (2016) 11.5.3 / 11.4.9). Woodland dominated by brigalow (*Acacia harpophylla*), with frequent yellowwood (*Terminalia oblongata*). Mid-dense shrub layer of currant bush (*Carissa ovata*), yellowwood, wilga (*Geijera parviflora*) and whitewood (*Atalaya hemiglauca*). Ground layer dominated by buffel grass (*Cenchrus ciliaris*), with brigalow grass (*Paspalidium caespitosum*) and curly windmill grass (*Enteropogon acicularis*) more prevalent in barer areas. |
| **General Site Observations** | **BVG: Other acacia dominated open forests, woodlands and shrublands.** Trees form ecologically dominant stratum; healthy small patch of brigalow community surrounded by poplar box (*Eucalyptus populnea*) community; some internal disturbance with patchy colonisation by buffel grass; moderate recruitment; no erosion noted; no fire scars. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Hollows absent; large logs absent; small logs abundant; leaf litter common; dense shrub / grass shelter common. |
| **Food Potential Over Entire Year** | Seeding grass cover scattered; fleshy fruiting plants scattered, including currant bush; nectar / pollen producing plant scattered; koala feed trees absent. |
| **Signs** | Scattered macropod scats; common woodland birds, including noisy friarbird, apostlebird, noisy miner, dollarbird and willy wagtail. |
| **Koala Feed Trees** | None detected. |
| **Koala habitat score** | Koala occurrence: medium (1; precautionary principle); vegetation composition: low (0); habitat connectivity: high (2); key existing threats: medium (1); recovery value: low (0); overall score: 4 = **not critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>Q51 | |
| **Location**<br>Vermont Park | |
| **Date**<br>26/11/2016 | |
| **Latitude**<br>-22.28063 | |
| **Longitude**<br>148.39313 | |
| **Slope:**<br><1° | |
| **Aspect:**<br>S | |

| **General Site Description** | |
|---|---|
| **Landform** | Palustrine wetland / swamp |
| **Soil** | Pale brown sandy clay |
| **Observed vegetation** | RE 11.5.17 (mapped by DSITIA (2016) as 11.3.27b). Woodland of dominated by poplar gum (*Eucalyptus platyphylla*), with occasional forest red gum (*E. camaldulensis*) and carbeen (*Corymbia tessellaris*). A sub-canopy is not evident, nor is a shrub layer. Ground cover is *Cyperus sp.*, couch grass (*Cynodon dactylon*) and *Eleocharis* sp. |
| **General Site Observations** | **BVG: Eucalypt dry woodlands on inland depositional plains.** Trees form ecologically dominant stratum; healthy wetland community; medium to high stock impacts with pugging and grazing; close to water point; no dieback evident; recruitment is poor and seedling regeneration possibly suffering from grazing pressures; no erosion noted; no fire scars; ironstone nodules throughout wetlands with some areas of conglomerate formations. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered large hollows and small hollows common, mostly in alive trees; large logs scattered; small logs abundant; leaf litter common; dense shrub / grass shelter absent. |
| **Food Potential Over Entire Year** | Seeding grass / sedge cover common; fleshy fruiting plants absent; nectar / pollen producing plant common; koala feed trees scattered. |
| **Signs** | Scattered macropod scats; glider scratches; common woodland birds. |
| **Koala Feed Trees** | Forest red gum (*E. tereticornis*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: medium (1); habitat connectivity: high (2); key existing threats: medium (1); recovery value: medium (1); overall score: 5 = **Critical habitat**. |
| **Fauna habitat value – general** | Average. |

| | |
|---|---|
| **Survey Code**<br>Q52 | |
| **Location**<br>Vermont Park | |
| **Date**<br>26/11/2016 | |
| **Latitude**<br>-22.28190 | |
| **Longitude**<br>148.39678 | |
| **Slope:**<br><1° | |
| **Aspect:**<br>S | |

| **General Site Description** | |
|---|---|
| **Landform** | Gently undulating plain |
| **Soil** | Red-brown sandy loam |
| **Observed vegetation** | RE 11.5.9 (mapped by DSITIA (2016) as 11.5.3 / 11.4.9). Woodland of Clarkson's bloodwood (*Corymbia clarksoniana*), Dallachy's gum (*C. dallachyana*) and carbeen (*C. tessellaris*), with a sparse sub-canopy of Clarkson's bloodwood, prickly pine (*Bursaria incana*) and Dallachy's gum. Sparse shrub layer of cocaine tree (*Erythroxylum australe*), quinine tree (*Petalostigma pubescens*), currant bush (*Carissa ovata*) and dysentery plant (*Grewia latifolia*). Ground layer dominated by buffel grass (*Cenchrus ciliaris*), with abundant wiregrasses (*Aristida calycina* and *Aristida* sp.) and frequent black spear grass (*Heteropogon contortus*), velvet hibiscus (*Melhania oblongifolia*), yellow rattlepod (*Crotalaria mitchellii*), malvastrum (*Malvastrum americanum*) and *Sida* sp. |
| **General Site Observations** | **BVG: Eucalypt dry woodlands on inland depositional plains.** Trees form ecologically dominant stratum; healthy but naturally sparse community; natural dieback evident; moderate recruitment; no erosion noted; no fire scars; deeply weathered sand capping (possibly ancient alluvium) over Cainozoic sand plains. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered large hollows and abundant small hollows, in a mixture of dead and alive trees; large logs scattered; small logs abundant; leaf litter scattered; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Seeding grass cover scattered; scattered fleshy fruiting plants, including common, including quinine tree, currant bush and dysentery plant; nectar / pollen producing plant abundant; koala feed trees absent. |
| **Signs** | Scattered macropod scats; skinks (*Cryptoblepharus pulcher*); common woodland birds, including dollarbird, Australian magpie, striated pardalote, sulphur-crested cockatoo and peaceful dove. |
| **Koala Feed Trees** | None detected. |
| **Koala habitat score** | Koala occurrence: medium (1; precautionary principle); vegetation composition: low (0); habitat connectivity: high (2); key existing threats: medium (1); recovery value: low (0); overall score: 4 = **not critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>Q53 | |
| **Location**<br>Vermont Park | |
| **Date**<br>26/11/2016 | |
| **Latitude**<br>-22.28781 | |
| **Longitude**<br>148.40895 | |
| **Slope:**<br>1-2° | |
| **Aspect:**<br>E | |

| **General Site Description** | |
|---|---|
| **Landform** | Gently undulating plain |
| **Soil** | Orange-brown sandy topped clay |
| **Observed vegetation** | RE 11.5.3 (mapped by DSITIA (2016) as 11.5.3 / 11.4.9). Poplar box (*Eucalyptus populnea*) woodland, with occasional Clarkson's bloodwood (*Corymbia clarksoniana*) and Poplar gum (*E. platyphylla*). Sparse sub-canopy of bean tree (*Cassia brewsteri*), dead finish (*Archidendropsis basaltica*) and poplar box. Sparse shrub layer of dead finish, cocaine tree (*Erythroxylum australe*), currant bush (*Carissa ovata*) and yellowberry bush (*Denhamia cunninghamii*). Ground layer dominated by buffel grass (*Cenchrus ciliaris*), with abundant *Aristida spp*. and frequent shrubby stylo (*Stylosanthes scabra*). |
| **General Site Observations** | **BVG: Eucalypt dry woodlands on inland depositional plains.** Trees form ecologically dominant stratum; healthy woodland with older trees containing small hollows; no dieback; good recruitment; gully erosion noted on edge of plain with exposed ironstone nodulation at depth; no fire scars. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Large hollows absent; small hollows abundant, in a mixture of dead and alive trees; large logs scattered; small logs abundant; leaf litter common; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Seeding grass cover common; scattered fleshy fruiting plants, including currant bush and yellowberry bush; nectar / pollen producing plant abundant; koala feed trees common. |
| **Signs** | Scattered macropod scats; medium-sized woodland bird nest; common woodland birds, including noisy friarbird and pale-headed rosella. |
| **Koala Feed Trees** | Poplar box (*E. populnea*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: high (2); key existing threats: medium (1); recovery value: medium (1); overall score: 6 = **Critical habitat**. |
| **Fauna habitat value – general** | Average to good. |

| | |
|---|---|
| **Survey Code**<br>T4 | |
| **Location**<br>Vermont Park | |
| **Date**<br>26/11/2016 | |
| **Latitude**<br>-22.29734 | |
| **Longitude**<br>148.41519 | |
| **Slope:**<br>1° | |
| **Aspect:**<br>NNE | |

| **General Site Description** | |
|---|---|
| **Landform** | Gently undulating plain |
| **Soil** | Sandy duplex clay |
| **Observed vegetation** | RE 11.5.3 (mapped by DSITIA (2016) as 11.5.3 / 11.4.9). Woodland dominated by poplar box (*Eucalyptus populnea*). Sub-canopy of bean tree (*Cassia brewsteri*) and white bauhinia (*Lysiphyllum hookerii*). Sparse shrub layer including cocaine tree (*Erythroxylum australe*) and currant bush (*Carissa ovata*). Ground layer dominated by buffel grass (*Cenchrus ciliaris*), with frequent stylo (*Stylosanthes scabra* and *S. hamata*) and occasional native grasses. |
| **General Site Observations** | **BVG: Eucalypt dry woodlands on inland depositional plains.** Remnant vegetation; mature community; good health; trees form ecologically dominant stratum; erosion absent; no dieback detected; frequent weeds, dominated by buffel grass; fire scars absent; moderate cattle grazing. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered large hollows and small hollows abundant, mostly in living trees; large logs common; small logs abundant; leaf litter common; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Seeding grass cover scattered; fleshy fruiting plants scattered, including currant bush and velvety tree pear (*Opuntia tomentosa*); nectar / pollen producing plant common; koala feed trees common. |
| **Signs** | Scattered macropod scats; common woodland birds, including whistling kite, grey-crowned babbler and noisy miner. |
| **Koala Feed Trees** | Poplar box (*E. populnea*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: high (2); key existing threats: medium (1); recovery value: medium (1); overall score: 6 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>Q54 | |
| **Location**<br>Vermont Park | |
| **Date**<br>26/11/2016 | |
| **Latitude**<br>-22.29851 | |
| **Longitude**<br>148.41786 | |
| **Slope:**<br>1° | |
| **Aspect:**<br>NE | |

| **General Site Description** | |
|---|---|
| **Landform** | Gently undulating plain |
| **Soil** | Brown light clay |
| **Observed vegetation** | RE 11.4.8 (mapped by DSITIA (2016) as 11.3.3 / 11.3.2 / 11.3.1 / 11.3.2b). Woodland dominated by brigalow (*Acacia harpophylla*), with occasional Dawson gum (*Eucalyptus cambageana*) and Yellowwood (*Terminalia oblongata*). Sparse emergent of large Dawson gums to 17 m. Low shrub layer of currant bush (*Carissa ovata*), scrub boonaree (*Alectryon diversifolius*) and cocaine tree (*Erythroxylum australe*). Ground layer dominated by buffel grass (*Cenchrus ciliaris*), with frequent brigalow grass (*Paspalidium caespitosum),* curly windmill grass (*Enteropogon ramosa*), *Panicum larcomianum* and *Cyperus* sp. |
| **General Site Observations** | **BVG: Other acacia dominated open forests, woodlands and shrublands.** Trees form ecologically dominant stratum; untidy sliver of woodland on the edge of cleared brigalow country; some large Dawson gum with moderate hollows; no dieback; good recruitment; gully erosion noted from minor watercourse; edge of 11.5.3 community with some ecotonal aspects; no fire scars. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Large hollows absent; scattered small hollows, mostly in dead trees; large logs absent; small logs abundant; leaf litter scattered; dense shrub / grass shelter common. |
| **Food Potential Over Entire Year** | Seeding grass cover scattered; scattered fleshy fruiting plants, including currant bush and Harrissia cactus (*Harissia martinii*); nectar / pollen producing plant common; koala feed trees absent. |
| **Signs** | Scattered macropod scats; common woodland birds, including red-winged parrot, grey-crowned babbler, little friarbird and peaceful dove. |
| **Koala Feed Trees** | Not detected. |
| **Koala habitat score** | Koala occurrence: medium (1; precautionary principle); vegetation composition: low (0); habitat connectivity: high (2); key existing threats: medium (1); recovery value: low (0); overall score: 4 = not critical habitat. |
| **Fauna habitat value – general** | Average. |

| | |
|---|---|
| **Survey Code**<br>Q55 | |
| **Location**<br>Vermont Park | |
| **Date**<br>26/11/2016 | |
| **Latitude**<br>-22.30921 | |
| **Longitude**<br>148.38719 | |
| **Slope:**<br>1° | |
| **Aspect:**<br>SE | |

| **General Site Description** | |
|---|---|
| **Landform** | Gently undulating plain |
| **Soil** | Brown sandy light clay |
| **Observed vegetation** | RE 11.5.3 (mapped by DSITIA (2016) as 11.3.2 / 11.3.25 / 11.3.1). Woodland of poplar box (*Eucalyptus populnea*), with a sparse sub-canopy of poplar box, scrub leopard ash (*Flindersia dissosperma*), bean tree (*Cassia brewsteri*) and sally wattle (*Acacia salicina*). Mid-dense shrub layer of currant bush (*Carissa ovata*), scrub leopard ash, gumbi gumbi (*Pittosporum angustifolium*), beefwood (*Grevillea striata*) and emu apple (*Owenia acidula*). Ground layer dominated by buffel grass (*Cenchrus ciliaris*), with frequent kangaroo grass (*Themeda triandra*), forest blue grass (*Bothriochloa bladhii*), shrubby stylo (*Stylosanthes scabra*), *Aristida sp*. and red Natal grass (*Melinis repens*). |
| **General Site Observations** | **BVG: Eucalypt dry woodlands on inland depositional plains.** Trees form ecologically dominant stratum; healthy woodland with older trees containing with small hollows; natural dieback observed; moderate recruitment; no erosion noted; no fire scars; small patch. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Large hollows absent; small hollows abundant, in a mixture of dead and alive trees; large logs scattered; small logs abundant; leaf litter scattered; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Seeding grass cover scattered; fleshy fruiting plants scattered, including currant bush and emu apple; nectar / pollen producing plant common; koala feed trees common. |
| **Signs** | Scattered macropod scats; ruddy treefrog (*Litoria rubella*) – calling; common woodland birds, including noisy miner. |
| **Koala Feed Trees** | Poplar box (*E. populnea*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: high (2); key existing threats: recovery (1); recovery value: medium (1); overall score: 6 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>Q56 | |
| **Location**<br>Vermont Park | |
| **Date**<br>26/11/2016 | |
| **Latitude**<br>-22.31249 | |
| **Longitude**<br>148.39874 | |
| **Slope:**<br>1° | |
| **Aspect:**<br>SE | |

| **General Site Description** | |
|---|---|
| **Landform** | Gently undulating plain |
| **Soil** | Brown sandy alluvium |
| **Observed vegetation** | RE 11.3.25 (mapped by DSITIA (2016) as 11.3.2 / 11.3.25 / 11.3.1). Woodland dominated by forest red gum (*Eucalyptus tereticornis*), with frequent paper barked tea-tree (*Melaleuca fluviatilis*). Mid-dense sub-canopy of forest red gum, sally wattle (*Acacia salicina*), white bauhinia (*Lysiphyllum hookeri*), bean tree (*Cassia brewsteri*) and belmont siris (*Albizia canescens*). Sparse shrub layer of poison peach (*Ehretia membranifolia*), coffee bush (*Breynia oblongifolia*), wombat berry (*Eustrephus latifolius*), small-leaved ebony (*Diospyros humilis*), sandpaper fig (*Ficus opposita*), cocaine tree (*Erythroxylum australe*), currant bush (*Carissa ovata*) and bean tree. Ground layer dominated by exotics buffel grass (*Cenchrus ciliaris*) and green panic (*Megathyrsus maxima*). |
| **General Site Observations** | **BVG: Eucalypt open forests to woodlands on floodplains.** Trees form ecologically dominant stratum; healthy riparian woodland with mature trees containing large hollows; old logging observed; good recruitment; no erosion noted; no fire scars. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Large hollows common; small hollows abundant, in a mixture of dead and alive trees; large logs common; small logs abundant; leaf litter common; dense shrub / grass shelter abundant. |
| **Food Potential Over Entire Year** | Seeding grass cover scattered; scattered fleshy fruiting plants, including wombat berry, sandpaper fig and currant bush; nectar / pollen producing plant abundant; koala feed trees common. |
| **Signs** | Scattered macropod scats. |
| **Koala Feed Trees** | Forest red gum (*E. tereticornis*). No scratches or pellets detected. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: high (2); key existing threats: medium (1); recovery value: medium (2); overall score: 7 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>Q57 | |
| **Location**<br>Vermont Park | |
| **Date**<br>27/11/2016 | |
| **Latitude**<br>-22.29768 | |
| **Longitude**<br>148.31588 | |
| **Slope:**<br>1° | |
| **Aspect:** | |

| **General Site Description** | |
|---|---|
| **Landform** | Gently undulating plain |
| **Soil** | Yellow-brown sandy-topped clay |
| **Observed vegetation** | RE 11.4.8 (mapped by DSITIA (2016) as 11.4.9 / 11.4.8 / 11.5.3). Open woodland of Dawson gum (*Eucalyptus cambageana*), with a sub-canopy of Dawson gum, brigalow (*Acacia harpophylla*) and scrub leopard ash (*Flindersia dissosperma*) to 9m tall. Mid-dense shrub layer of currant bush (*Carissa ovata*), scrub leopard ash, wild orange (*Capparis canescens*), yellowwood (*Terminalia oblongata*), native lime (*Citrus glauca*), *Maireana microphylla*, false sandalwood (*Eremophila mitchellii*), poison peach (*Ehretia membranifolia*), boonaree (*Alectryon oleifolius*) and ruby saltbush (*Enchylaena tomentosa*). Ground layer dominated by Buffel grass (*Cenchrus ciliaris*), with abundant wiregrasses (*Aristida calycina and A.* sp) and kangaroo grass (*Themeda triandra*). |
| **General Site Observations** | **BVG: Other acacia dominated open forests, woodlands and shrublands.** Trees form ecologically dominant stratum; narrow tongue of woodland surrounded by cleared brigalow country; apparent damaged community which may have suffered burning when surrounding country originally cleared; moderate recruitment; no erosion noted; no fire scars. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered large hollows and small hollows abundant, in a mixture of dead and alive trees; large logs scattered; small logs common; leaf litter scattered; dense shrub / grass shelter abundant. |
| **Food Potential Over Entire Year** | Seeding grass cover scattered; scattered fleshy fruiting plants, including currant bush, wild orange, native lime and velvety tree pear (*Opuntia tomentosa*); nectar / pollen producing plant common; koala feed trees absent. |
| **Signs** | Scattered macropod scats; common woodland birds including black-faced cuckoo shrike, dollarbird, willy wagtail, Australian magpie, pied butcherbird, weebill, little friarbird, noisy miner, brown falcon and red-winged parrot. |
| **Koala Feed Trees** | Not detected. |
| **Koala habitat score** | Koala occurrence: medium (1; precautionary principle); vegetation composition: low (0); habitat connectivity: high (2); key existing threats: medium (1); recovery value: low (0); overall score: 4 = **not critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>Q58 | |
| **Location**<br>Vermont Park | |
| **Date**<br>27/11/2016 | |
| **Latitude**<br>-22.28084 | |
| **Longitude**<br>148.30548 | |
| **Slope:**<br>1-2° | |
| **Aspect:**<br>NE | |

| **General Site Description** | |
|---|---|
| **Landform** | Gently undulating plain, with large gilgai formation |
| **Soil** | Brown cracking clay |
| **Observed vegetation** | RE 11.4.9 (mapped by DSITIA (2016) as 11.4.9 / 11.4.8 / 11.5.3). Open woodland of brigalow (*Acacia harpophylla*) and red bauhinia (*Lysiphyllum carronii*) with a slightly denser sub-canopy of brigalow and yellowwood (*Terminalia oblongata*) to 7m height. Mid-dense shrub layer of currant bush (*Carissa ovata*), yellowwood, brigalow, large-fruited orange thorn (*Pittosporum spinescens*), dwarf lantern flower (*Abutilon fraseri*) and Dawson gum (*Eucalyptus cambageana*). Ground layer dominated by buffel grass (*Cenchrus ciliaris*), with frequent parthenium (*Parthenium hysterophorus*), cane grass (*Walwhalleya subxerophila*) and brigalow grass (*Paspalidium caespitosum*). |
| **General Site Observations** | **BVG: Other acacia dominated open forests, woodlands and shrublands**. Trees form ecologically dominant stratum; highly disturbed patch which may have suffered burning when surrounding country was cleared; moderate recruitment; no erosion noted; fire scars and charcoal noted. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Hollows absent; large logs absent; small logs abundant; scattered leaf litter; mid-dense shrub / grass shelter common. |
| **Food Potential Over Entire Year** | Seeding grass cover common; scattered fleshy fruiting plants, including currant bush, yellowwood, large-fruited orange thorn and velvety tree pear (*Opuntia tomentosa*); nectar / pollen producing plant common; koala feed trees absent. |
| **Signs** | Scattered macropod scats; common woodland birds, including noisy minor, pied butcherbird and magpie-lark. |
| **Koala Feed Trees** | None detected. |
| **Koala habitat score** | Koala occurrence: medium (1; precautionary principle); vegetation composition: low (0); habitat connectivity: high (2); key existing threats: medium (1); recovery value: low (0); overall score: 4 = **not critical habitat**. |
| **Fauna habitat value – general** | Average to good. |

| | |
|---|---|
| **Survey Code**<br>Q59 | |
| **Location**<br>Vermont Park | |
| **Date**<br>27/11/2016 | |
| **Latitude**<br>-22.27870 | |
| **Longitude**<br>148.31106 | |
| **Slope:**<br>1-2° | |
| **Aspect:**<br>SE | |

| **General Site Description** | |
|---|---|
| **Landform** | Gently undulating plain |
| **Soil** | Brown sandy light clay |
| **Observed vegetation** | RE 11.5.3 (mapped by DSITIA (2016) as 11.5.3). Open woodland of poplar box (*Eucalyptus populnea*), with a very sparse sub-canopy of poplar box, supplejack (*Ventilago viminalis*) and bootlace oak (*Hakea lorea*). Sparse shrub layer of currant bush (*Carissa ovata*), beefwood (*Grevillea striata*), sally wattle (*Acacia salicina*), bitterbark (*Alstonia constricta*), supplejack, bean tree (*Cassia brewsteri*) and cocaine tree (*Erythroxylum australe*). Ground layer is dominated by buffel grass (*Cenchrus ciliaris*), with abundant wiregrass (*Aristida calycina*), and frequent kangaroo grass (*Themeda triandra*) and black spear grass (*Heteropogon contortus*). |
| **General Site Observations** | **BVG: Eucalypt dry woodlands on inland depositional plains.** Trees form ecologically dominant stratum; disturbed woodland that has suffered a destructive fire event, probably from initial clearing of adjacent country; moderate recruitment; no erosion noted; fire scars evident; contiguous with large remnant to east and west, exposed to clearing to the south. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered large hollows and small hollows abundant, in a mixture of dead and alive trees; large logs absent; small logs abundant; scattered leaf litter; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Seeding grass cover common; fleshy fruiting plants scattered, including current bush and velvety tree pear (*Opuntia tomentosa*); nectar / pollen producing plant common; koala feed trees common. |
| **Signs** | Scattered macropod scats; common woodland birds, including noisy miner. |
| **Koala Feed Trees** | Poplar box (*E. populnea*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: high (2); key existing threats: medium (1); recovery value: medium (1); overall score: 6 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>Q60 | |
| **Location**<br>Vermont Park | |
| **Date**<br>27/11/2016 | |
| **Latitude**<br>-22.27367 | |
| **Longitude**<br>148.31543 | |
| **Slope:**<br>1° | |
| **Aspect:**<br>NE | |

| **General Site Description** | |
|---|---|
| **Landform** | Gently undulating plain with large gilgai formations |
| **Soil** | Brown cracking clays |
| **Observed vegetation** | RE 11.4.9 (mapped by DSITIA (2016) as 11.4.9 / 11.4.8 / 11.5.3). Open woodland of brigalow (*Acacia harpophylla*) and red bauhinia (*Lysiphyllum carronii*), with a very sparse sub-canopy of brigalow and yellowwood (*Terminalia oblongata*) to 6m height. Sparse shrub layer of currant bush (*Carissa ovata*), brigalow and false sandalwood (*Eremophila mitchellii*). Ground layer dominated by buffel grass (*Cenchrus ciliaris*), with frequent brigalow grass (*Paspalidium caespitosum*) and windmill grass (*Eragrostis sp.*). |
| **General Site Observations** | **BVG: Other acacia dominated open forests, woodlands and shrublands.** Trees form ecologically dominant stratum; highly mobile gilgai formation with many leaning brigalow trees, likely contributing to high level of timber on ground as well as relatively low canopy with no large trees; good recruitment; no erosion noted; no fire scars. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Small and large hollows absent; large logs absent; small logs abundant; leaf litter common; dense shrub / grass shelter common. |
| **Food Potential Over Entire Year** | Seeding grass cover scattered; scattered fleshy fruiting plants, including currant bush; nectar / pollen producing plant common; koala feed trees absent. |
| **Signs** | Scattered macropod scats; common woodland birds. FAC8 |
| **Koala Feed Trees** | Not detected. |
| **Koala habitat score** | Koala occurrence: medium (1; precautionary principle); vegetation composition: low (0); habitat connectivity: high (2); key existing threats: medium (1); recovery value: low (0); overall score: 4 = **not critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>Q61 | |
| **Location**<br>Vermont Park | |
| **Date**<br>27/11/2016 | |
| **Latitude**<br>-22.26632 | |
| **Longitude**<br>148.32005 | |
| **Slope:**<br>1° | |
| **Aspect:**<br>SW | |

| **General Site Description** | |
|---|---|
| **Landform** | Gently undulating plain |
| **Soil** | Brown sandy loam |
| **Observed vegetation** | RE 11.5.3 (mapped by DSITIA (2016) as 11.5.3). Woodland dominated by poplar box (*Eucalyptus populnea*) with occasional Clarkson's bloodwood (*Corymbia clarksoniana*) and supplejack (*Ventilago viminalis*). Very sparse sub-canopy of poplar box, supplejack, Dallachy's gum (*C. dallachyana*), bean tree (*Cassia brewsteri*) and sally wattle (*Acacia salicina*). Sparse shrub layer of yellowberry bush (*Denhamia cunninghamii*), dysentery plant (*Grewia retusifolia*), water bush (*Myoporum acuminatum*), sally wattle, bean tree and currant bush (*Carissa ovata*). Ground layer is dominated by buffel grass (*Cenchrus ciliaris*), with abundant kangaroo grass (*Themeda triandra*), wiregrasses (*Aristida sp*. and *Aristida calycina*) and umbrella cane grass (*Leptochloa digitata*). |
| **General Site Observations** | **BVG: Eucalypt dry woodlands on inland depositional plains.** Trees form ecologically dominant stratum; healthy woodland in a possible discharge area or swampy ground; good recruitment; no erosion noted; no fire scars; some mature trees with hollows; part of a large remnant to east 14km by 7km; moderate grazing impacts. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered large hollows and small hollows abundant, in a mixture of dead and alive trees; large logs scattered; small logs abundant; scattered leaf litter; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Seeding grass cover common; scattered fleshy fruiting plants, including yellowberry bush, dysentery plant, water bush and currant bush; nectar / pollen producing plant abundant; koala feed trees common. |
| **Signs** | Scattered macropod scats; common woodland birds, including rainbow bee-eater, red-winged parrot, pied butcherbird, noisy friarbird and forest kingfisher. |
| **Koala Feed Trees** | Poplar box (*E. populnea*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: high (2); key existing threats: medium (1); recovery value: medium (1); overall score: 6 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>Q62 | |
| **Location**<br>Vermont Park | |
| **Date**<br>27/11/2016 | |
| **Latitude**<br>-22.27178 | |
| **Longitude**<br>148.33179 | |
| **Slope:**<br>1-2° | |
| **Aspect:**<br>S | |

| **General Site Description** | |
|---|---|
| **Landform** | Stream bed |
| **Soil** | Yellow-brown sand |
| **Observed vegetation** | RE 11.3.25 (mapped by DSITIA (2016) as 11.3.2 / 11.3.25 / 11.3.1). Open forest dominated by forest red gum (*Eucalyptus tereticornis*), river red gum (*E. camaldulensis*), paper barked tea-tree (*Melaleuca fluviatilis*) and river she-oak (*Casuarina cunninghammiana*). Sparse sub-canopy of forest red gum, river she-oak, white bauhinia (*Lysiphyllum hookeri*) and quinine tree (*Petalostigma pubescens*). Very sparse shrub layer of sally wattle (*Acacia salicina*), river she-oak, currant bush (*Carissa ovata*), white bauhinia and Category 3 restricted plant Rubber vine (*Cryptostegia grandiflora*). Ground layer dominated by buffel grass (*Cenchrus ciliaris*) on the banks, with frequent spike rush (*Lomandra longifolia*) and *Cyperus* sp. |
| **General Site Observations** | **BVG: Eucalypt open forests to woodlands on floodplains.** Trees form ecologically dominant stratum; healthy narrow riparian community; good recruitment; noted clay outwash from upstream brigalow patch; no fire scars; large mature trees with hollows; part of a large remnant to east 14km by 7km; moderate grazing impacts. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered large hollows and small hollows common, mostly in dead trees; large logs scattered; small logs abundant; leaf litter common; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Seeding grass cover scattered; fleshy fruiting plants scattered, including currant bush and quinine tree; nectar / pollen producing plant abundant; koala feed trees common. |
| **Signs** | Scattered macropod scats; koala scratches (detectability of scats limited by recent flow event); possum / glider scratches; common woodland birds, including rainbow bee-eater, noisy friarbird and willy wagtail. |
| **Koala Feed Trees** | Forest red gum (*E. tereticornis*) and river red gum (*E. camaldulensis*). Koala scratches detected. |
| **Koala habitat score** | Koala occurrence: high (2); vegetation composition: high (2); habitat connectivity: high (2); key existing threats: medium (1); recovery value: high (2); overall score: 9 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>Q63 | |
| **Location**<br>Vermont Park | |
| **Date**<br>27/11/2016 | |
| **Latitude**<br>-22.26759 | |
| **Longitude**<br>148.33779 | |
| **Slope:**<br>1° | |
| **Aspect:**<br>SE | |

| **General Site Description** | |
|---|---|
| **Landform** | Gently undulating plain |
| **Soil** | Brown loamy sand |
| **Observed vegetation** | RE 11.3.2 (Mapped as by DSITIA (2016) 11.3.2 / 11.3.25 / 11.3.1). Poplar box (*Eucalyptus populnea*) woodland, with a very sparse sub-canopy of poplar box, bean tree (*Cassia brewsteri*) and white bauhinia (*Lysiphyllum hookeri*). Sparse shrub layer of currant bush (*Carissa ovata*), wombat berry (*Eustrephus latifolius*) and bean tree. Ground layer dominated by buffel grass (*Cenchrus ciliaris*), with associated black spear grass (*Heteropogon contortus*), wiregrass (*Aristida sp.*) and yellow rattlepod (*Crotalaria mitchellii*). |
| **General Site Observations** | **BVG: Eucalypt dry woodlands on inland depositional plains.** Trees form ecologically dominant stratum; moderately healthy woodland with apparent grazing impacts; minimal recruitment; no erosion noted; no fire scars; mature trees with hollows; part of a large remnant 14km by 7km, but patchily cleared in this area. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Large hollows common, small hollows abundant, in a mixture of dead and alive trees; large logs scattered; small logs abundant; scattered leaf litter; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Seeding grass cover scattered; scattered fleshy fruiting plants, including currant bush, wombat berry and velvety tree pear (*Opuntia tomentosa*); nectar / pollen producing plant common; koala feed trees common. |
| **Signs** | Scattered macropod scats; freckled monitor (*Varanus tristis*); common woodland birds, including common bronzewing, apostlebird and noisy miner. |
| **Koala Feed Trees** | Poplar box (*E. populnea*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: high (2); key existing threats: medium (1); recovery value: medium (1); overall score: 6 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>Q64 | |
| **Location**<br>Vermont Park | |
| **Date**<br>27/11/2016 | |
| **Latitude**<br>-22.25625 | |
| **Longitude**<br>148.32867 | |
| **Slope:**<br>1° | |
| **Aspect:**<br>SE | |
| **General Site Description** | |
| **Landform** | Gently undulating plain |
| **Soil** | Brown loamy sand |
| **Observed vegetation** | RE 11.3.2 (Mapped by DSITIA (2016) as 11.3.2 / 11.3.25 / 11.3.1). Woodland of dominated by poplar box (*Eucalyptus populnea*), with occasional brigalow (*Acacia harpophylla*), Clarkson's bloodwood (*Corymbia clarksoniana),* carbeen (*C. tessellaris*), silver-leaved ironbark (*E. melanophloia)* and crows ash (*Flindersia australis*). Very sparse sub-canopy of poplar box, false sandalwood (*Eremophila mitchellii*), scrub leopard ash (*Flindersia dissosperma*) and bean tree (*Cassia brewsteri*). Very sparse shrub layer of currant bush (*Carissa ovata*), nipan (*Capparis lasiantha*), dead finish (*Archidendropsis basaltica*), sally wattle (*Acacia salicina*), yellowberry bush (*Denhamia cunninghamii*), wombat berry (*Eustrephus latifolius*) and crows ash. Ground cover comprises mixed natives species, as well as buffel grass (*Cenchrus ciliaris*). |
| **General Site Observations** | **BVG: Eucalypt dry woodlands on inland depositional plains.** Trees form ecologically dominant stratum; healthy woodland with variable soils and some brigalow elements; good recruitment; no erosion noted; no fire scars; numerous mature trees with hollows; part of a large remnant 14km by 7km, but patchily cleared in this area. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered large hollows and small hollows abundant, in a mixture of dead and alive trees; scattered large logs; small logs abundant; leaf litter common; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Seeding grass cover common; fleshy fruiting plants scattered, including currant bush, yellowberry, wombat berry and velvety tree pear (*Opuntia tomentosa*); nectar / pollen producing plant abundant; koala feed trees common. |
| **Signs** | Scattered macropod scats; common woodland birds, including brown falcon, blue-faced honeyeater, noisy miner, pied butcherbird, eastern koel and zebra finch. |
| **Koala Feed Trees** | Poplar box (*E. populnea*) and silver-leaved ironbark (*E. melanophloia*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: high (2); key existing threats: medium (1); recovery value: medium (1); overall score: 6 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>Q65 | |
| **Location**<br>Vermont Park | |
| **Date**<br>27/11/2016 | |
| **Latitude**<br>-22.27819 | |
| **Longitude**<br>148.33455 | |
| **Slope:**<br>1° | |
| **Aspect:**<br>SW | |

| **General Site Description** | |
|---|---|
| **Landform** | Level plain |
| **Soil** | Brown sandy light clay |
| **Observed vegetation** | RE 11.5.3 (mapped by DSITIA (2016) as 11.5.3). Woodland dominated by poplar box (*Eucalyptus populnea*), with a very sparse sub-canopy of poplar box, supplejack (*Ventilago viminalis*), bean tree (*Cassia brewsteri*) and native pomegranate (*Capparis arborea*). Very sparse shrub layer of yellow berry bush (*Denhamia cunninghamii*), beefwood (*Grevillea striata*), bean tree, dead finish (*Archidendropsis basaltica*) and currant bush (*Carissa ovata*). Ground layer co-dominated by buffel grass (*Cenchrus ciliaris*), wiregrass (*Aristida calycina)* and black spear grass (*Heteropogon contortus*). |
| **General Site Observations** | **BVG: Eucalypt dry woodlands on inland depositional plains.** Trees form ecologically dominant stratum; healthy woodland with a range of maturities; moderate recruitment; no erosion noted; no fire scars; part of large remnant patch. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered large hollows and small hollows abundant, mostly in living trees; large logs scattered; small logs abundant; leaf litter common; dense shrub / grass shelter common; scattered termite mounds on ground. |
| **Food Potential Over Entire Year** | Seeding grass cover common; fleshy fruiting plants scattered, including yellow berry bush, currant bush and velvety tree pear (*Opuntia tomentosa*); nectar / pollen producing plant common; koala feed trees common. |
| **Signs** | Scattered macropod scats; common woodland birds, including little friarbird and whistling kite. |
| **Koala Feed Trees** | Poplar box (*E. populnea*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: high (2); key existing threats: medium (1); recovery value: medium (1); overall score: 6 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>Q67 | |
| **Location**<br>Vermont Park | |
| **Date**<br>27/11/2016 | |
| **Latitude**<br>-22.27795 | |
| **Longitude**<br>148.35803 | |
| **Slope:**<br><1° | |
| **Aspect:**<br>SE | |

| **General Site Description** | |
|---|---|
| **Landform** | Gently undulating plain |
| **Soil** | Brown light clay |
| **Observed vegetation** | RE 11.4.8 (mapped by DSITIA (2016) as 11.3.2 / 11.3.25 / 11.3.1). Woodland dominated by Dawson gum (*Eucalyptus cambageana*) and belah (*Casuarina cristata*), with a sparse sub-canopy of brigalow (*Acacia harpophylla*), white bauhinia (*Lysiphyllum hookeri*), false sandalwood (*Eremophila mitchellii*), emu apple (*Owenia acidula*) and scrub leopard ash (*Flindersia dissosperma*) to 10m height. Mid-dense shrub layer of currant bush (*Carissa ovata*), scrub leopard ash, false sandalwood, poison peach (*Ehretia membranifolia*), wilga (*Geijera parviflora*), cocaine tree (*Erythroxylum australe*), whitewood (*Atalaya hemiglauca*), warrior bush (*Apophyllum anomalum*) and small-leaved ebony (*Diospyros humilis*). Ground layer includes a mix of brigalow grass (*Paspalidium caespitosum*), black spear grass (*Heteropogon contortus*), harrisia cactus (*Harrisia martinii*) and buffel grass (*Cenchrus ciliaris*). |
| **General Site Observations** | **BVG: Other acacia dominated open forest, woodland and shrubland**. Trees form ecologically dominant stratum; healthy but small strip of woodland surrounded by cleared brigalow country; intergrades with RE 11.3.2 in places; good recruitment; no erosion noted; no fire scars. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered large hollows and small hollows common, in a mixture of dead and alive trees; scattered large logs; small logs abundant; scattered leaf litter; dense shrub / grass shelter common. |
| **Food Potential Over Entire Year** | Seeding grass cover common; scattered fleshy fruiting plants, including currant bush, emu apple and harrisia cactus; nectar / pollen producing plant common; koala feed trees not detected. |
| **Signs** | Scattered macropod scats; medium-sized woodland bird nests. |
| **Koala Feed Trees** | None detected. |
| **Koala habitat score** | Koala occurrence: medium (1; precautionary principle); vegetation composition: low (0); habitat connectivity: high (2); key existing threats: medium (1); recovery value: low (0); overall score: 4 = **not critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>Q69 | |
| **Location**<br>Vermont Park | |
| **Date**<br>27/11/2016 | |
| **Latitude**<br>-22.28131 | |
| **Longitude**<br>148.36267 | |
| **Slope:**<br>1° | |
| **Aspect:**<br>S | |

| **General Site Description** | |
|---|---|
| **Landform** | Palustrine wetland |
| **Soil** | Brown light clay |
| **Observed vegetation** | RE 11.3.27b (mapped by DSITIA (2016) as 11.3.27b). Fringing woodland dominated by river red gum (*Eucalyptus camaldulensis*), with frequent forest red gum (*E. tereticornis*), carbeen (*Corymbia tessellaris*) and poplar gum (*E. platyphylla*). Very sparse sub-canopy of white bauhinia (*Lysiphyllum hookeri*) and brigalow (*Acacia harpophylla*). Very sparse shrub layer of currant bush (*Carissa ovata*). Ground layer includes a range of wetland species including giant sedge (*Cyperus exaltatus*), common rush (*Juncus usitatus*), Indian heliotrope (*Heliotropium indicum*), Noogoora burr (*Xanthium orientalis*), damascisa (*Glinus lotoides*), sneezeweed (*Centipeda minima*), smart weed (*Persicaria attenuata*), awnless barnyard grass (*Echinochloa colona*), white eclipta (*Eclipta prostrata*), water primrose (*Ludwigia peploides*) and couch grass (*Cynodon dactylon*). |
| **General Site Observations** | **BVG: Wetlands (swamps and lakes)**. Trees form ecologically dominant stratum; wetland fringe with some older trees; good recruitment; no erosion noted; no fire scars; impoundment, banked to the south with excavations at both ends. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Large hollows common; small hollows abundant, mostly in alive trees; small and large logs common; scattered leaf litter; dense shrub / grass shelter common. |
| **Food Potential Over Entire Year** | Seeding grass / sedge cover common; fleshy fruiting plants scattered, including currant bush; nectar / pollen producing plant abundant; koala feed trees abundant. |
| **Signs** | Koala scratches and scats; possum / glider scratches; greater glider scats; scattered macropod scats; common woodland birds; common waterbirds and wader birds. |
| **Koala Feed Trees** | River red gum (*E. camaldulensis*) and forest red gum (*E. tereticornis*). Koala scratches and scats evident. |
| **Koala habitat score** | Koala occurrence: high (2); vegetation composition: high (2); habitat connectivity: high (2); key existing threats: medium (1); recovery value: high (2); overall score: 9 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>Q70 | |
| **Location**<br>Vermont Park | |
| **Date**<br>27/11/2016 | |
| **Latitude**<br>-22.29000 | |
| **Longitude**<br>148.35586 | |
| **Slope:**<br>1-2° | |
| **Aspect:**<br>NE | |

| **General Site Description** | |
|---|---|
| **Landform** | Gently undulating plain, with gilgai |
| **Soil** | Brown light to medium clay |
| **Observed vegetation** | RE 11.4.8 (mapped by DSITIA (2016) as 11.3.2 / 11.3.25 / 11.3.1). Woodland dominated by brigalow (*Acacia harpophylla*), with abundant Dawson gum (*Eucalyptus cambageana*), and occasional poplar box (*E. populnea*). Very sparse sub-canopy of brigalow, white bauhinia (*Lysiphyllum hookeri*) and emu apple (*Owenia acidula*). Sparse shrub layer of currant bush (*Carissa ovata*), wilga (*Geijera parviflora*), cocaine tree (*Erythroxylum australe*), wild orange (*Capparis mitchellii*), nipan (*Capparis lasiantha*), *Maireana microphylla* and brigalow. Ground layer includes brigalow grass (*Paspalidium caespitosum*), curly windmill grass (*Enteropogon acicularis*), hooky grass (*Ancistrachne uncinulata*), wiregrass (*Aristida sp.)* and buffel grass (*Cenchrus ciliaris*). |
| **General Site Observations** | **BVG: Other acacia dominated open forests, woodlands and shrublands**. Trees form ecologically dominant stratum; healthy patch adjacent to cleared Brigalow country; good recruitment; no erosion noted; no fire scars. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Large hollows absent; small hollows common, mostly in dead trees; scattered large logs; small logs abundant; leaf litter abundant; dense shrub / grass shelter common. |
| **Food Potential Over Entire Year** | Seeding grass cover common; scattered fleshy fruiting plants common, including emu apple, currant bush and wild orange; nectar / pollen producing plant common; koala feed trees scattered. |
| **Signs** | Scattered macropod scats; common woodland birds, including noisy miner and tawny frogmouth. |
| **Koala Feed Trees** | Poplar box (*E. populnea*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: medium (1); habitat connectivity: high (2); key existing threats: medium (1); recovery value: low (0); overall score: 4 = **not critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>Q71 | |
| **Location**<br>Vermont Park | |
| **Date**<br>27/11/2016 | |
| **Latitude**<br>-22.30458 | |
| **Longitude**<br>148.37300 | |
| **Elevation:**<br>160 mAHD | |
| **Slope:**<br>2° | |
| **Aspect:**<br>E | |

| **General Site Description** | |
|---|---|
| **Landform** | Gently undulating plain |
| **Soil** | Yellow-brown sandy clay |
| **Observed vegetation** | RE 11.5.3 (mapped by DSITIA (2016) as 11.5.3). Woodland dominated by poplar box (*Eucalyptus populnea*), with frequent Clarkson's bloodwood (*Corymbia clarksoniana*), poplar gum (*E. platyphylla*) and Bull oak (*Allocasuarina luehmannii*). Very sparse sub-canopy of poplar box, bean tree (*Cassia brewsteri*) and poplar gum. Very sparse shrub layer of bean tree, quinine tree (*Petalostigma pubescens*), myrtle wood (*Psydrax oleifolius*), supplejack (*Ventilago viminalis*) and currant bush (*Carissa ovata*). Ground layer dominated by wiregrass (*Aristida* sp.), *Sida* sp. and shrubby stylo (*Stylosanthes scabra*). |
| **General Site Observations** | **BVG: Eucalypt dry woodlands on inland depositional plains.** Trees form ecologically dominant stratum; good recruitment; no erosion noted; no fire scars; slightly scalded look about this site. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Large hollows absent; small hollows abundant, in a mixture of dead and alive trees; scattered large logs; small logs abundant; leaf litter common; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Seeding grass cover common; fleshy fruiting plants scattered, including currant bush, quinine tree and velvety tree pear (*Opuntia tomentosa*); nectar / pollen producing plant common; koala feed trees common. |
| **Signs** | Macropod scats frequent; five eastern grey kangaroos; medium-sized woodland bird nest. |
| **Koala Feed Trees** | Poplar box (*E. populnea*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: high (2); key existing threats: medium (1); recovery value: medium (1); overall score: 6 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>Q72 | |
| **Location**<br>Vermont Park | |
| **Date**<br>27/11/2016 | |
| **Latitude**<br>-22.27029 | |
| **Longitude**<br>148.36193 | |
| **Slope:**<br>1° | |
| **Aspect:**<br>SW | |

| **General Site Description** | |
|---|---|
| **Landform** | Gently undulating plain |
| **Soil** | Brown sandy clay, with ironstone nodules |
| **Observed vegetation** | RE 11.5.3 (mapped by DSITIA (2016) as 11.5.3 / 11.4.9). Woodland dominated by poplar box (*Eucalyptus populnea*), with occasional broad-leaved ironbark (*E. fibrosa*). Very sparse sub-canopy of poplar box, bean tree (*Cassia brewsteri*) and supplejack (*Ventilago viminalis*). Very sparse shrub layer of bean tree, currant bush (*Carissa ovata*), dead finish (*Archidendropsis basaltica*), cocaine tree (*Erythroxylum australe*), whitewood (*Atalaya hemiglauca*), yellowberry bush (*Denhamia cunninghamii*) and poison peach (*Ehretia membranifolia*). Ground layer dominated by wiregrass (*Aristida calycina*), with abundant cover is curly windmill grass (*Enteropogon acicularis*), black spear grass (*Heteropogon contortus*), buffel grass (*Cenchrus ciliaris*) and nine-awn grass (*Enneapogon robustissimus*). |
| **General Site Observations** | **BVG: Eucalypt dry woodlands on inland depositional plains.** Trees form ecologically dominant stratum; good recruitment; minor surface erosion noted on what appears to be an old track; healthy vegetation with older trees with good hollows; no dieback noted; no fire scars. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered large hollows and abundant small hollows, in a mixture of dead and alive trees; scattered large logs; abundant small logs; leaf litter common; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Seeding grass cover common; scattered fleshy fruiting plants, including currant bush (Carissa ovata); nectar / pollen producing plant common; koala feed trees common. |
| **Signs** | Scattered macropod scats. |
| **Koala Feed Trees** | Poplar box (*E. populnea*) and broad-leaved ironbark (*E. fibrosa*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: high (2); key existing threats: medium (1); recovery value: medium (1); overall score: 6 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>Q73 | |
| **Location**<br>Vermont Park | |
| **Date**<br>27/11/2016 | |
| **Latitude**<br>-22.25782 | |
| **Longitude**<br>148.35582 | |
| **Slope:**<br>1° | |
| **Aspect:**<br>S | |

| **General Site Description** | |
|---|---|
| **Landform** | Gently undulating plain |
| **Soil** | Brown sandy light clay |
| **Observed vegetation** | RE 11.5.9 (mapped by DSITIA (2016) as 11.5.3 / 11.4.9). Open woodland dominated by narrow-leaved ironbark (*Eucalyptus crebra*), with abundant Clarkson's bloodwood (*Corymbia clarksoniana*), carbeen (*C. tessellaris*) and Dallachy's gum (*C. dallachyana*). Very sparse sub-canopy of poplar box (*Eucalyptus populnea*), scrub leopard ash (*Flindersia dissosperma*) and Clarkson's bloodwood. Sparse shrub layer of currant bush (*Carissa ovata*), cocaine tree (*Erythroxylum australe*), quinine tree (*Petalostigma pubescens*), *Corymbia sp*. and scrub leopard ash. Ground layer dominated by buffel grass (*Cenchrus ciliaris*), with abundant black spear grass (*Heteropogon contortus*) and wiregrass (*Aristida* sp.). |
| **General Site Observations** | **BVG: Eucalypt dry woodlands on inland depositional plains.** Trees form ecologically dominant stratum; moderate recruitment; healthy and naturally sparse vegetation with some older trees; no dieback noted; no fire scars; ecotonal and on the edge of cleared brigalow (*Acacia harpophylla*) country to the north east. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Large hollows absent; small hollows abundant, mostly in dead trees; scattered large logs; small logs abundant; scattered leaf litter; dense shrub / grass shelter common. |
| **Food Potential Over Entire Year** | Seeding grass cover scattered; scattered fleshy fruiting plants, including currant bush, quinine tree and velvety tree pear (*Opuntia tomentosa*); nectar / pollen producing plant common; scattered koala feed trees. |
| **Signs** | Scattered macropod scats. |
| **Koala Feed Trees** | Narrow-leaved ironbark (*E. crebra*) and poplar box (*E. populnea*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: high (2); key existing threats: medium (1); recovery value: medium (1); overall score: 6 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>Q74 | |
| **Location**<br>Vermont Park | |
| **Date**<br>27/11/2016 | |
| **Latitude**<br>-22.26406 | |
| **Longitude**<br>148.35032 | |
| **Slope:**<br>1-2° | |
| **Aspect:**<br>E | |

| **General Site Description** | |
|---|---|
| **Landform** | Level plain |
| **Soil** | Brown sandy clay |
| **Observed vegetation** | RE 11.5.3 (mapped by DSITIA (2016) as 11.5.3 / 11.4.9). Woodland of Poplar box (*Eucalyptus populnea)* and broad-leaved ironbark (*E. fibrosa*), with a very sparse sub-canopy of poplar box, bean tree (*Cassia brewsteri*) and scrub leopard ash (*Flindersia dissosperma*). Very sparse shrub layer of bean tree, currant bush (*Carissa ovata*), ironwood (*Acacia excelsa*), quinine tree (*Petalostigma pubescens*), false sandalwood (*Eremophila mitchellii*) and myrtle wood (*Psydrax oleifolius*). Ground layer dominated by curly windmill grass (*Enteropogon acicularis),* black spear grass (*Heteropogon contortus*), buffel grass (*Cenchrus ciliaris*), shrubby stylo (*Stylosanthes scabra*) and wiregrass *(Aristida sp*.). |
| **General Site Observations** | **BVG: Eucalypt dry woodlands on inland depositional plains.** Trees form ecologically dominant stratum; good recruitment; no erosion; healthy vegetation; older trees with good hollows, no dieback noted, no fire scars. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered large hollows and abundant small hollows, in a mixture of dead and alive trees; scattered large logs; small logs abundant; leaf litter common; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Seeding grass cover scattered; scattered fleshy fruiting plants common, including currant bush and quinine tree; nectar / pollen producing plant common; koala feed trees common. |
| **Signs** | Scattered macropod scats; common woodland birds, including noisy miner, dollarbird, pied butcherbird and peaceful dove. |
| **Koala Feed Trees** | Poplar box (*E. populnea*) and broad-leaved ironbark (*E. fibrosa*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: high (2); key existing threats: medium (1); recovery value: medium (1); overall score: 6 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>Q75 | |
| **Location**<br>Vermont Park | |
| **Date**<br>27/11/2016 | |
| **Latitude**<br>-22.26016 | |
| **Longitude**<br>148.34124 | |
| **Slope:**<br>1° | |
| **Aspect:**<br>SE | |

| **General Site Description** | |
|---|---|
| **Landform** | Gently undulating plain |
| **Soil** | Brown sandy light clay |
| **Observed vegetation** | RE 11.5.3 (mapped by DSITIA (2016) as 11.3.2 / 11.3.25 / 11.3.1). Woodland dominated by poplar box (*Eucalyptus populnea*) with occasional carbeen (*Corymbia tessellaris*). Very sparse sub-canopy of poplar box, bean tree (*Cassia brewsteri*) and sally wattle (*Acacia salicina*). Sparse shrub layer of bean tree, currant bush (*Carissa ovata*), sally wattle, yellowwood (*Terminalia oblongata*) and cocaine tree (*Erythroxylum australe*). Ground layer dominated by buffel grass (*Cenchrus ciliaris*), with frequent black spear grass (*Heteropogon contortus*), shrubby stylo (*Stylosanthes scabra*) and wiregrass *(Aristida* sp.). |
| **General Site Observations** | **BVG: Eucalypt dry woodlands on inland depositional plains.** Trees form ecologically dominant stratum; good recruitment; no erosion; healthy vegetation with mostly young trees, no dieback noted, no fire scars. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Large hollows absent; small hollows abundant, in a mixture of dead and alive trees; large logs absent; small logs abundant; scattered leaf litter; dense shrub / grass shelter common. |
| **Food Potential Over Entire Year** | Seeding grass cover scattered; fleshy fruiting plants scattered, including currant bush and velvety tree pear (*Opuntia tomentosa*); koala feed trees common. |
| **Signs** | Scattered macropod scats. |
| **Koala Feed Trees** | Poplar box (*E. populnea*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: high (2); key existing threats: medium (1); recovery value: medium (1); overall score: 6 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>Q76 | |
| **Location**<br>Iffley | |
| **Date**<br>28/11/2016 | |
| **Latitude**<br>-22.24110 | |
| **Longitude**<br>148.42486 | |
| **Slope:**<br>1° | |
| **Aspect:**<br>S | |

| **General Site Description** | |
|---|---|
| **Landform** | Level plain; palustrine wetland |
| **Soil** | Brown light clay |
| **Observed vegetation** | RE 11.3.27b (mapped by DSITIA (2016) as 11.3.27b). Fringing woodland dominated by forest red gum (*Eucalyptus tereticornis*), with occasional sally wattle (*Acacia salicina*). Sparse sub-canopy of forest red gum and sally wattle. Very sparse shrub layer of bean tree (*Cassia brewsteri*) and parkinsonia (*Parkinsonia aculeata*). Ground layer includes a range of wetland species including giant sedge (*Cyperus exaltatus*), common rush (*Juncus usitatus*), Indian heliotrope (*Heliotropium indicum*), awnless barnyard grass (*Echinochloa colona*), spike rush (*Eleocharis plana*), shiny nardoo (*Marsilea mutica*), parthenium (*Parthenium hysterophorus*), and umbrella cane grass (*Leptochloa digitata*). |
| **General Site Observations** | **BVG: Wetlands (swamps and lakes).** Trees form ecologically dominant stratum; wetland fringe with mostly young regrowth trees; good recruitment; no erosion noted; no fire scars; parthenium and parkinsonia noted at this site, both are Restricted Category 3 species under the *Qld Biosecurity Act 2014* and Weeds of National Significance. Note: this community is palustrine in nature. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered small and large hollows, mostly in alive trees; large logs absent; small logs scattered; leaf litter common; dense shrub / grass shelter common. |
| **Food Potential Over Entire Year** | Seeding grass / sedge cover abundant; fleshy fruiting plants absent; nectar / pollen producing plant common; koala feed trees common. |
| **Signs** | Glider scratches; scattered macropod scats; common woodland birds, including willy wagtail, dollarbird, eastern koel, pied butcherbird, noisy miner, white-throated gerygone, little friarbird, Australian magpie and masked lapwing. |
| **Koala Feed Trees** | Forest red gum (*E. tereticornis*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: high (2); key existing threats: medium (1); recovery value: medium (2); overall score: 7 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>Q77 | |
| **Location**<br>Iffley | |
| **Date**<br>28/11/2016 | |
| **Latitude**<br>-22.23659 | |
| **Longitude**<br>148.42475 | |
| **Slope:**<br><1° | |
| **Aspect:**<br>S | |

| **General Site Description** | |
|---|---|
| **Landform** | Level plain; deposited low rises – old floodplain |
| **Soil** | Brown sandy loam |
| **Observed vegetation** | RE 11.3.7 (mapped by DSITIA (2016) as 11.3.2 / 11.3.7 / 11.3.1). Grassy open woodland dominated by sally wattle (*Acacia salicina*), with frequent Clarkson's bloodwood (*Corymbia clarksoniana*) and carbeen (*C. tessellaris*), and occasional Dallachy's gum (*C. dallachyana*) and silver-leaved ironbark (*Eucalyptus melanophloia*). Very sparse sub-canopy of Clarkson's bloodwood, carbeen and sally wattle. Very sparse shrub layer consisting of bean tree (*Cassia brewsteri*). Groundcover is dominated by buffel grass (*Cenchrus ciliaris*), with occasional green panic (*Megathyrsus maxima*) and sabi grass (*Urochloa mosambicensis*). |
| **General Site Observations** | **BVG: Eucalypt dry woodlands on inland depositional plains.** Trees form ecologically dominant stratum; regrowth community with no old trees; connected through the narrow Isaac River corridor; exotic groundcover with few native grasses and herbs; good recruitment; erosion absent; old dieback evident; fire scars absent; the dominant canopy of sally wattle – a pioneer species – suggests that this area was likely completely cleared at some point. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Too young to have hollows; large logs absent; small logs common; scattered leaf litter; dense shrub / grass shelter common, represented by relatively tall and dense stand of buffel grass, which, if grazed, would be reduced to only scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Seeding grass cover scattered; fleshy fruiting plants absent; nectar / pollen producing plant common; koala feed trees absent. |
| **Signs** | Scattered macropod scats; medium-sized woodland bird nest. |
| **Koala Feed Trees** | Silver-leaved ironbark. No scratches or scats detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: medium (1); habitat connectivity: high (2); key existing threats: medium (1); recovery value: medium (1); overall score: 5 = **Critical habitat**. |
| **Fauna habitat value – general** | Average. |

| | |
|---|---|
| **Survey Code**<br>Q78 | |
| **Location**<br>Iffley | |
| **Date**<br>28/11/2016 | |
| **Latitude**<br>-22.23910 | |
| **Longitude**<br>148.41858 | |
| **Slope:**<br><1° | |
| **Aspect:**<br>SE | |

| **General Site Description** | |
|---|---|
| **Landform** | Level plain; swamp |
| **Soil** | Brown light clay |
| **Observed vegetation** | RE 11.3.27c (mapped by DSITIA (2016) as 11.4.8). Very sparse fringing woodland of sally wattle (*Acacia salicina*) and occasional Dallachy's gum (*Corymbia dallachyana*). Mid-dense shrub layer of Parkinsonia (*Parkinsonia aculeata*) in parts. Ground layer dominated by spike rush (*Eleocharis plana*) with abundant umbrella cane grass (*Leptochloa digitata*) and frequent parthenium (*Parthenium hysterophorus*). |
| **General Site Observations** | **BVG: Wetlands (swamps and lakes**). The ground layer forms the ecologically dominant stratum; most likely a vegetated swamp, which has been cleared; no erosion noted; no fire scars; parthenium and parkinsonia noted at this site, both are Restricted Category 3 species under the Qld *Biosecurity Act 2014* and Weeds of National Significance. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Hollows absent; logs absent; leaf litter absent; dense shrub / grass shelter abundant; termite mounds absent. |
| **Food Potential Over Entire Year** | Seeding grass cover scattered; fleshy fruiting plants absent; nectar / pollen producing plant scattered; koala feed trees absent. |
| **Signs** | None detected. |
| **Koala Feed Trees** | None detected. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: low (0); habitat connectivity: low (0); key existing threats: medium (1); recovery value: low (0); overall score: 2 = not critical habitat. |
| **Fauna habitat value – general** | Degraded. |

| | |
|---|---|
| **Survey Code**<br>Q79 | |
| **Location**<br>Iffley | |
| **Date**<br>28/11/2016 | |
| **Latitude**<br>-22.23852 | |
| **Longitude**<br>148.41289 | |
| **Slope:**<br>1° | |
| **Aspect:**<br>S | |

| **General Site Description** | |
|---|---|
| **Landform** | Level plain |
| **Soil** | Brown sandy loam |
| **Observed vegetation** | RE 11.3.2 (mapped by DSITIA (2016) as 11.4.8). Woodland dominated by poplar box (*Eucalyptus populnea*), with frequent Dawson gum (*Eucalyptus cambageana*) and occasional brigalow (*Acacia harpophylla*). Very sparse sub-canopy of poplar box, bean tree (*Cassia brewsteri*) and whitewood (*Atalaya hemiglauca*). Very sparse shrub layer of scrub boonaree (*Alectryon diversifolius*), red bauhinia (*Lysiphyllum carronii*) and yellowwood (*Terminalia oblongata*). Ground cover dominated by sabi grass (*Urochloa mosambicensis*). |
| **General Site Observations** | **BVG: Eucalypt dry woodlands on inland depositional plains.** Trees form ecologically dominant stratum; regrowth vegetation that would meet the 50 / 70 rule for this community; good recruitment; no erosion noted; no fire scars; isolated patch; thin strip of highly disturbed 11.4.8 to the south of this point. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Too young to have hollows; large logs scattered; small logs common; leaf litter common; scattered shrub / grass shelter; termite mounds absent. |
| **Food Potential Over Entire Year** | Seeding grass cover scattered; fleshy fruiting plants scattered, including Harissia cactus (*Harissia martinii*); nectar / pollen producing plant abundant; koala feed trees common. |
| **Signs** | Scattered macropod scats; medium-sized woodland bird nest; common woodland birds, including noisy friarbird, magpie-lark and emu chick. |
| **Koala Feed Trees** | Poplar box (*E. populnea*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: high (2); key existing threats: medium (1); recovery value: medium (1); overall score: 6 = **Critical habitat**. |
| **Fauna habitat value – general** | Average. |

| | |
|---|---|
| **Survey Code**<br>Q80 | |
| **Location**<br>Iffley | |
| **Date**<br>28/11/2016 | |
| **Latitude**<br>-22.23998 | |
| **Longitude**<br>148.41062 | |
| **Slope:**<br>0° | |
| **Aspect:**<br>N/A | |

| **General Site Description** | |
|---|---|
| **Landform** | Level plain, with gilgai |
| **Soil** | Brown medium clay |
| **Observed vegetation** | Non-remnant (mapped by DSITIA (2016) as RE 11.4.8). Scattered regrowth brigalow (*Acacia harpophylla*) and yellowwood (*Terminalia oblongata*). Sparse shrub layer of parkinsonia (*Parkinsonia aculeata*), brigalow and lignum (*Duma florulenta*). Ground layer dominated by umbrella cane grass (*Leptochloa digitata*). |
| **General Site Observations** | **BVG: Agricultural grasslands**. Groundcover forms ecologically dominant stratum; regrowth vegetation with poor recovery; some gully erosion noted north of site; grazed by cattle. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Hollows absent; logs absent; leaf litter absent; dense shrub / grass shelter abundant. |
| **Food Potential Over Entire Year** | Seeding grass cover scattered; fleshy fruiting plants scattered, including blackberry nightshade (*Solanum nigrum*); nectar / pollen producing plant absent; koala feed trees absent. |
| **Signs** | No signs of fauna detected. |
| **Koala Feed Trees** | None detected. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: low (0); habitat connectivity: low (0); key existing threats: medium (1); recovery value: low (0); overall score: 1 = not critical habitat. |
| **Fauna habitat value – general** | Poor. |

| | |
|---|---|
| **Survey Code**<br>Q81 | |
| **Location**<br>Iffley | |
| **Date**<br>28/11/2016 | |
| **Latitude**<br>-22.23153 | |
| **Longitude**<br>148.40696 | |
| **Slope:**<br>1° | |
| **Aspect:**<br>SE | |

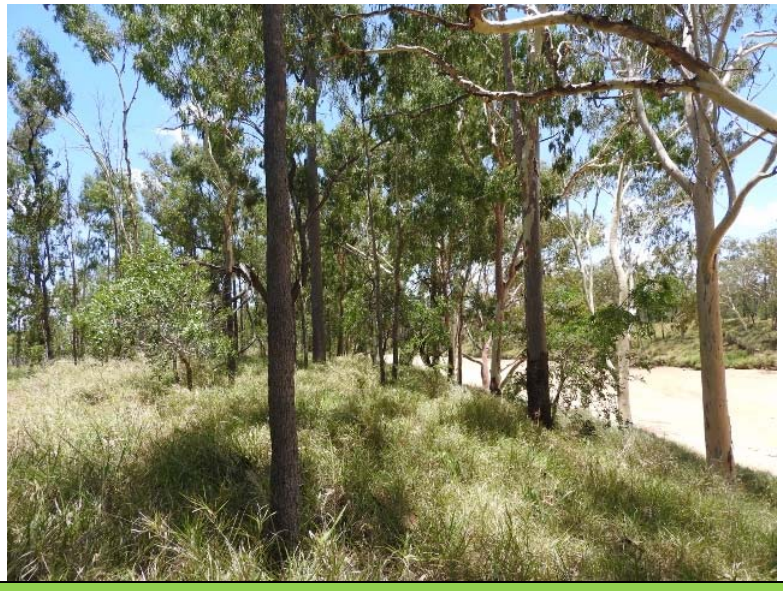
| **General Site Description** | |
|---|---|
| **Landform** | Level plain |
| **Soil** | Brown sandy loam |
| **Observed vegetation** | RE 11.3.2 (mapped by DSITIA (2016) as 11.4.8). Poplar box (*Eucalyptus populnea*) woodland, with a very sparse sub-canopy of poplar box and sally wattle (*Acacia salicina*). Sparse shrub layer of bean tree (*Cassia brewsteri*), currant bush (*Carissa ovata*), carbeen (*Corymbia tessellaris*), sally wattle and supplejack (*Ventilago viminalis*). Ground layer dominated by buffel grass (*Cenchrus ciliaris*), with frequent curly windmill grass (*Enteropogon ramosus*) and occasional sabi grass (*Urochloa mosambicensis*), red Natal grass (*Melinis repens*) and umbrella canegrass (*Leptochloa digitata*). |
| **General Site Observations** | **BVG: Eucalypt dry woodlands on inland depositional plains.** Trees form ecologically dominant stratum; healthy vegetation with a range of maturities; good recruitment; no erosion noted; no fire scars; Part of the Isaac River corridor, which is approximately 1km wide at this point; moderate to heavy grazing impacts; very dry. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Large hollows absent; small hollows abundant, in a mixture of dead and alive trees; scattered large logs; abundant small logs; leaf litter common; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Seeding grass cover scattered; scattered fleshy fruiting plants, including currant bush; nectar / pollen producing plant common; koala feed trees common. |
| **Signs** | Scattered macropod scats; common woodland birds, including pale-headed rosella, apostlebird, noisy miner and pied butcherbird. |
| **Koala Feed Trees** | Poplar box (*E. populnea*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: high (2); key existing threats: medium (1); recovery value: medium (1); overall score: 6 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>Q82 | |
| **Location**<br>Iffley | |
| **Date**<br>28/11/2016 | |
| **Latitude**<br>-22.22842 | |
| **Longitude**<br>148.40763 | |
| **Slope:**<br>1° | |
| **Aspect:**<br>S | |

| **General Site Description** | |
|---|---|
| **Landform** | Gently undulating plain; oxbow wetland |
| **Soil** | Brown light clay |
| **Observed vegetation** | RE 11.3.27f (mapped by DSITIA (2016) as 11.3.2 / 11.3.7 / 11.3.1). Fringing woodland dominated by coolabah (*Eucalyptus coolabah*), with occasional forest red gum (*E. tereticornis*) and carbeen (*Corymbia tessellaris*). Sub-canopy and shrub layer generally absent. Ground layer dominated by spike rush (*Eleocharis plana*), with occasional parthenium (*Parthenium hysterophorus*) and umbrella cane grass (*Leptochloa digitata*). |
| **General Site Observations** | **BVG: Wetlands (swamps and lakes).** Trees form ecologically dominant stratum; wetland fringe consists of mostly mature trees; low recruitment; no erosion noted; no fire scars; old river channel or flood out channel running roughly north to south; *Parthenium* and *Parkinsonia* noted at this site. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered large hollows and abundant small hollows, in mostly alive trees; scattered large logs; abundant small logs; scattered leaf litter; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Seeding grass / sedge cover abundant; fleshy fruiting plants absent; nectar / pollen producing plant common; koala feed trees common. |
| **Signs** | Scattered macropod scats; possum scats; common woodland birds, including pied butcherbird, Australian magpie, apostlebird and noisy friarbird. |
| **Koala Feed Trees** | Coolabah (*E. coolabah*) and forest red gum (*E. tereticornis*). No koala scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: high (2); key existing threats: medium (1); recovery value: high (2); overall score: 7 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>Q83 | |
| **Location**<br>Iffley | |
| **Date**<br>28/11/2016 | |
| **Latitude**<br>-22.22254 | |
| **Longitude**<br>148.41288 | |
| **Slope:**<br><1° | |
| **Aspect:**<br>S | |

| **General Site Description** | |
|---|---|
| **Landform** | Level plain |
| **Soil** | Brown sandy loam |
| **Observed vegetation** | RE 11.3.7 (mapped by DSITIA (2016) as 11.3.2 / 11.3.7 / 11.3.1). Grassy woodland dominated by coolabah (*Eucalyptus coolabah*), with frequent Dallachy's gum (*Corymbia dallachyana*) and carbeen (*Corymbia tessellaris*), occasional Clarkson's bloodwood (*Corymbia clarksoniana*) and sally wattle (*Acacia salicina*). Sparse sub-canopy of sally wattle, emu apple (*Owenia acidula*), white bauhinia (*Lysiphyllum hookeri*), scrub boonaree (*Alectryon oleifolius*), yellowberry bush (*Denhamia cunninghamii*) and bean tree (*Cassia brewsteri*). Sparse shrub layer of dead finish (*Archidendropsis basaltica*), poison peach (*Ehretia membranifolia*), scrub boonaree and bean tree. Groundcover is dominated by buffel grass (*Cenchrus ciliaris*). |
| **General Site Observations** | **BVG: Eucalypt dry woodlands on inland depositional plains.** Trees form ecologically dominant stratum; mature community with older trees; connected to the Isaac River corridor, 900 metres wide at this point; exotic groundcover with few native grasses and herbs; moderate recruitment; erosion absent; fire scars absent; heavy grazing evident. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Large hollows common and small hollows abundant, in a mixture of dead and alive trees; scattered large logs; small logs abundant; leaf litter common; dense shrub / grass shelter common. |
| **Food Potential Over Entire Year** | Seeding grass cover scattered; scattered fleshy fruiting plants common, including emu apple and yellowberry bush; nectar / pollen producing plant abundant; koala feed trees common. |
| **Signs** | Scattered macropod scats; koala scratches on Dallachy's gum (*C. dallachiana*), likely utilised as a shelter tree. |
| **Koala Feed Trees** | Coolabah (*E. coolabah*). Koala scratches detected; no pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: high (2); vegetation composition: high (2); habitat connectivity: high (2); key existing threats: medium (1); recovery value: high (2); overall score: 9 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>Q84 |  |
| **Location**<br>Iffley | |
| **Date**<br>28/11/2016 | |
| **Latitude**<br>-22.21612 | |
| **Longitude**<br>148.41676 | |
| **Slope:**<br>1° | |
| **Aspect:**<br>S | |

| **General Site Description** | |
|---|---|
| **Landform** | River bank |
| **Soil** | Brown sand |
| **Observed vegetation** | RE 11.3.25 (mapped by DSITIA (2016) as 11.3.25). Woodland dominated by forest red gum (*Eucalyptus tereticornis*), with occasional narrow-leaved ironbark (*E. crebra*), Clarkson's bloodwood (*C. clarksoniana*), carbeen (*Corymbia tessellaris*) and sally wattle (*Acacia salicina*). Sparse sub-canopy of forest red gum, sally wattle and carbeen. Sparse shrub layer of bean tree (*Cassia brewsteri*), white bauhinia (*Lysiphyllum hookeri*) and lantana (*Lantana camara*). Ground cover dominated green panic (*Megathyrsus maxima*), with frequent buffel grass (*Cenchrus ciliaris*). |
| **General Site Observations** | **BVG: Eucalypt open forests to woodlands on floodplains**. Trees form ecologically dominant stratum; healthy riparian woodland with mature trees and large hollows; good recruitment; no erosion noted; no fire scars; narrow riparian corridor; high fire fuel loading within the fenced river, primarily exotic grasses. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered large hollows and small hollows common, in a mixture of dead and alive trees; large logs absent; small logs scattered; leaf litter common; dense shrub / grass shelter common. |
| **Food Potential Over Entire Year** | Seeding grass cover common; scattered fleshy fruiting plants, including lantana; nectar / pollen producing plant abundant; koala feed trees abundant. |
| **Signs** | Scattered macropod scats; koala scratches; possum / glider scratches. |
| **Koala Feed Trees** | Forest red gum (*E. tereticornis*) and narrow-leaved ironbark (*E. crebra*); koala scratches evident; no pellets could be located, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: high (2); vegetation composition: high (2); habitat connectivity: high (2); key existing threats: medium (1); recovery value: high (2); overall score: 9 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>Q85 | |
| **Location**<br>Iffley | |
| **Date**<br>28/11/2016 | |
| **Latitude**<br>-22.19487 | |
| **Longitude**<br>148.39323 | |
| **Slope:**<br><1° | |
| **Aspect:**<br>SE | |

| **General Site Description** | |
|---|---|
| **Landform** | Level plain |
| **Soil** | Brown sandy light clay |
| **Observed vegetation** | RE 11.3.2 (mapped by DSITIA (2016) as 11.4.8). Woodland dominated by poplar box (*Eucalyptus populnea*) with occasional Dallachy's gum (*Corymbia dallachyana*). Very sparse sub-canopy of poplar box, Boonaree (*Alectryon oleifolius*), soap tree (*Alphitonia excelsa*), ironwood (*Acacia excelsa*), Dallachy's gum and white bauhinia (*Lysiphyllum hookeri*). Mid-dense shrub layer of bean tree (*Cassia brewsteri*), currant bush (*Carissa ovata*), white bauhinia, cocaine tree (*Erythroxylum australe*), ironwood, wilga (*Geijera parviflora*), lantana (*Lantana camara*), dysentery plant (*Grewia retusifolia*), Ellangowan poison bush (*Eremophila deserti*), wild orange (*Capparis canescens*) and dead finish (*Archidendropsis basaltica*). Ground cover dominated by buffel grass (*Cenchrus ciliaris*), with abundant windmill grass (*Enteropogon sp.*) and frequent kangaroo grass (*Themeda triandra*). |
| **General Site Observations** | **BVG: Eucalypt dry woodlands on inland depositional plains.** Trees form ecologically dominant stratum; healthy vegetation with a range of maturities; good recruitment; no erosion noted; no fire scars; Part of the Isaac River corridor which is approximately 600m wide at this point; moderate to heavy grazing impacts; very dry. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Large hollows absent; small hollows abundant, in a mixture of dead and alive trees; scattered large logs; small logs abundant; leaf litter common; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Seeding grass cover common; fleshy fruiting plants scattered, including currant bush, lantana, dysentery plant and wild orange; nectar / pollen producing plant common; koala feed trees common. |
| **Signs** | Scattered macropod scats; possum / glider scratches; common woodland birds; skinks, including *Cryptoblepharus* sp. and *Morethia* sp. |
| **Koala Feed Trees** | Poplar box (*E. populnea*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: high (2); key existing threats: medium (1); recovery value: medium (1); overall score: 6 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>Q86 | |
| **Location**<br>Iffley | |
| **Date**<br>28/11/2016 | |
| **Latitude**<br>-22.18399 | |
| **Longitude**<br>148.38416 | |
| **Slope:**<br><1° | |
| **Aspect:**<br>SE | |
| **General Site Description** | |
| **Landform** | Stream bank |
| **Soil** | Brown sandy loam |
| **Observed vegetation** | RE 11.3.3 (mapped by DSITIA (2016) as 11.3.25). Open woodland dominated by coolabah (*Eucalyptus coolabah*), with frequent carbeen (*Corymbia tessellaris*) and occasional forest red gum (*Eucalyptus tereticornis*). Very sparse sub-canopy of white bauhinia (*Lysiphyllum hookeri*), river she oak (*Casuarina cunninghamiana*), black tea tree (*Melaleuca bracteata*) and bean tree (*Cassia brewsteri*). Very sparse shrub layer of lantana (*Lantana camara*), scrub boonaree (*Alectryon diversifolius),* poison peach (*Ehretia membranifolia*), sandpaper fig (*Ficus opposita*), currant bush (*Carissa ovata*), forest red gum, castor oil weed (*Ricinus communis)* and river she oak. Groundcover dominated by green panic (*Megathyrsus maxima*) with frequent Mexican poppy (*Argemone ochroleuca*). |
| **General Site Observations** | **BVG: Eucalypt dry woodlands on inland depositional plains.** Trees form ecologically dominant stratum; disturbed vegetation with a poor structure; moderate recruitment; gully erosion noted; no fire scars; Part of the Isaac River corridor and junction of a minor gully; moderate to heavy grazing impacts; very dry; many dead canopy trees, possibly old ring barking. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered large hollows and abundant small hollows, mostly in dead trees; large logs absent; small logs common; scattered leaf litter; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Seeding grass cover scattered; fleshy fruiting plants scattered, including lantana, sandpaper fig and currant bush; nectar / pollen producing plant common; koala feed trees scattered. |
| **Signs** | Scattered macropod scats; koala scratches on forest red gums; common woodland birds, including noisy miner, black-faced cuckoo shrike, pied butcherbird and pale-headed rosella. |
| **Koala Feed Trees** | Forest red gum (*E. tereticornis*). Koala scratches evident. No pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: high (2; scratches); vegetation composition: high (2); habitat connectivity: high (2); key existing threats: medium (1); recovery value: high (2); overall score: 9 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>Q87 | |
| **Location**<br>Iffley | |
| **Date**<br>28/11/2016 | |
| **Latitude**<br>-22.16893 | |
| **Longitude**<br>148.38058 | |
| **Elevation:**<br>160 mAHD | |
| **Slope:**<br>1° | |
| **Aspect:**<br>SW | |

| **General Site Description** | |
|---|---|
| **Landform** | Deposited low rises – old floodplain; gently undulating plain |
| **Soil** | Brown sandy loam |
| **Observed vegetation** | RE 11.3.7 (mapped by DSITIA (2016) as 11.5.3 / 11.4.9). Woodland dominated by Clarkson's bloodwood (*Corymbia clarksoniana*) and Dallachy's gum (*C. dallachyana*), with frequent narrow-leaved ironbark (*Eucalyptus crebra*) and occasional carbeen (*Corymbia tessellaris*). Sparse sub-canopy of Clarkson's bloodwood, Dallachy's gum, carbeen, narrow-leaved ironbark and sally wattle (*Acacia salicina*). Mid-dense shrub layer of lantana (*Lantana camara*), bean tree (*Cassia brewsteri*) and sally wattle. Groundcover dominated by buffel grass (*Cenchrus ciliaris*), with frequent kangaroo grass (*Themeda triandra*) and occasional black spear grass (*Heteropogon contortus*), sabi grass (*Urochloa mosambicensis*) and green panic (*Megathyrsus maxima*). |
| **General Site Observations** | **BVG: Eucalypt dry woodlands on inland depositional plains.** Trees form ecologically dominant stratum; mature community, but mostly younger trees; connected to the Isaac River corridor, 450 m wide at this point; exotic groundcover with limited native grasses and herbs; moderate recruitment; erosion absent; fire scars absent; high fire fuel load; infested with lantana. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Large hollows absent; small hollows common, mostly in dead trees; large logs absent; small logs common; scattered leaf litter; dense shrub / grass shelter abundant, comprised largely of lantana. |
| **Food Potential Over Entire Year** | Seeding grass cover scattered; fleshy fruiting plants abundant, comprised of lantana; nectar / pollen producing plant abundant; koala feed trees not detected. |
| **Signs** | Scattered macropod scats. |
| **Koala Feed Trees** | Narrow-leaved ironbark (*E. crebra*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: medium (1); habitat connectivity: high (2); key existing threats: medium (1); recovery value: medium (1); overall score: 5 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

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|---|---|
| **Survey Code**<br>Q88 | |
| **Location**<br>Iffley | |
| **Date**<br>28/11/2016 | |
| **Latitude**<br>-22.17071 | |
| **Longitude**<br>148.37659 | |
| **Slope:**<br><1° | |
| **Aspect:**<br>SE | |

| **General Site Description** | |
|---|---|
| **Landform** | Level plain |
| **Soil** | Brown light clay |
| **Observed vegetation** | RE 11.5.3 (mapped by DSITIA (2016) as 11.5.3 / 11.4.9). Woodland dominated by poplar box (*Eucalyptus populnea*) with occasional Dallachy's gum (*Corymbia dallachyana*). Sparse sub-canopy of poplar box, ironwood (*Acacia excelsa*), sally wattle (*Acacia salicina*), supplejack (*Ventilago viminalis*), Dallachy's gum and boonaree (*Alectryon oleifolius*). Very sparse shrub layer of bean tree (*Cassia brewsteri*), wilga (*Geijera parviflora*), supplejack, lantana (*Lantana camara*), scrub boonaree (*Alectryon diversifolius*), scrub wilga (*Geijera salicifolia*) and currant bush (*Carissa ovata*). Ground cover co-dominated by buffel grass (*Cenchrus ciliaris*) and wiregrass (*Aristida sp.*), with abundant cotton panic (*Digitaria brownii*), frequent kangaroo grass (*Themeda triandra*) and native daisy (*Vittadinia sulcata*). |
| **General Site Observations** | **BVG: Eucalypt dry woodlands on inland depositional plains.** Trees form ecologically dominant stratum; healthy community with a range of maturities, including old dead trees; good recruitment; no erosion noted; no fire scars; reasonable connectivity despite vegetation having been cleared in strips in this area; moderate to heavy grazing pressure. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered large hollows and abundant small hollows, in a mixture of dead and alive trees; large logs common; small logs abundant; leaf litter common; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Seeding grass cover scattered; scattered fleshy fruiting plants, including lantana and currant bush; nectar / pollen producing plant common; koala feed trees common. |
| **Signs** | Scattered macropod scats. |
| **Koala Feed Trees** | Poplar box (*E. populnea*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: low (0); key existing threats: medium (1); recovery value: medium (1); overall score: 4 = **not critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>Q89 | |
| **Location**<br>Iffley | |
| **Date**<br>28/11/2016 | |
| **Latitude**<br>-22.17556 | |
| **Longitude**<br>148.37174 | |
| **Slope:**<br><1° | |
| **Aspect:**<br>SE | |

| **General Site Description** | |
|---|---|
| **Landform** | Level plain |
| **Soil** | Brown light clay |
| **Observed vegetation** | RE 11.5.3 (mapped by DSITIA (2016) as 11.5.3 / 11.4.9). Woodland dominated by poplar box (*Eucalyptus populnea*) with occasional Dallachy's gum (*Corymbia dallachyana*). Very sparse sub-canopy of poplar box and whitewood (*Atalaya hemiglauca*). Very sparse shrub layer of bean tree (*Cassia brewsteri*), sally wattle (*Acacia salicina*), Dallachy's gum and whitewood. Ground cover dominated by forest blue grass (*Bothriochloa bladhii*), with occasional *Cyperus sp*., kangaroo grass (*Themeda triandra*) and dysentery plant (*Grewia retusifolia*). |
| **General Site Observations** | **BVG: Eucalypt dry woodlands on inland depositional plains.** Trees form ecologically dominant stratum; healthy community with a range of maturities, including old trees with large hollows; good recruitment; no erosion noted; no fire scars; low point with swampy characteristics; very low exotic groundcover likely due to ephemeral wetland. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered large hollows and abundant small hollows, in mostly alive trees; scattered large logs; abundant small logs; scattered leaf litter; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Seeding grass cover scattered; scattered fleshy fruiting plants, including dysentery plant and lantana (*Lantana camara*); nectar / pollen producing plant abundant; koala feed trees common. |
| **Signs** | Scattered macropod scats. |
| **Koala Feed Trees** | Poplar box (*E. populnea*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: low (0); key existing threats: medium (1); recovery value: medium (1); overall score: 4 = **not critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>Q90 | |
| **Location**<br>Iffley | |
| **Date**<br>29/11/2016 | |
| **Latitude**<br>-22.23319 | |
| **Longitude**<br>148.37714 | |
| **Slope:**<br>1° | |
| **Aspect:**<br>S | |

| **General Site Description** | |
|---|---|
| **Landform** | Gently undulating plain |
| **Soil** | Sandy clay loam |
| **Observed vegetation** | RE 11.5.3 (mapped by DSITIA (2016) as 11.5.3 / 11.4.9). Woodland dominated by poplar box (*Eucalyptus populnea*), with rare occurrence of poplar box hybrid. Very sparse sub-canopy of poplar box, boonaree (*Alectryon oleifolius*), emu apple (*Owenia acidula*) and bean tree (*Cassia brewsteri*). Very sparse shrub layer of yellowberry bush (*Denhamia cunninghamii*), water bush (*Myoporum acuminatum*), currant bush (*Carissa ovata*), bean tree, nipan (*Capparis lasiantha*) and quinine tree (*Petalostigma pubescens*). Ground cover dominated by buffel grass (*Cenchrus ciliaris*), with abundant wiregrasses (*Aristida calycina* and *Aristida jerichoensis*), frequent black spear grass (Heteropogon contortus) and kangaroo grass (*Themeda triandra*). |
| **General Site Observations** | **BVG: Eucalypt dry woodlands on inland depositional plains.** Trees form ecologically dominant stratum; healthy community with a range of maturities including old trees with hollows; good recruitment; no erosion noted; no fire scars; patch size approx. 1km x 1km, isolated by clearing. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered large hollows and small hollows abundant, in mostly alive trees; scattered large logs; small logs common; leaf litter common; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Seeding grass cover common; fleshy fruiting plants scattered, including currant bush, emu apple, yellowberry, water bush, nipan and quinine tree; nectar / pollen producing plant common; koala feed trees common. |
| **Signs** | Scattered macropod scats; eastern grey kangaroos; medium sized woodland bird nests; common woodland birds, including rainbow bee-eater, pied butcherbird, noisy friarbird, Australian magpie, laughing kookaburra, Torresian crow and whistling kit. |
| **Koala Feed Trees** | Poplar box (*E. populnea*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: low (0); key existing threats: medium (1); recovery value: medium (1); overall score: 4 = **not critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>Q91 | |
| **Location**<br>Iffley | |
| **Date**<br>29/11/2016 | |
| **Latitude**<br>-22.22645 | |
| **Longitude**<br>148.38144 | |
| **Slope:**<br>1° | |
| **Aspect:**<br>SW | |

| **General Site Description** | |
|---|---|
| **Landform** | Gently undulating plain |
| **Soil** | Brown sandy clay loam |
| **Observed vegetation** | RE 11.5.3 (mapped by DSITIA (2016) as 11.4.9). Woodland of Poplar box (*Eucalyptus populnea)* and beefwood (*Grevillea striata*), with a very sparse sub-canopy of poplar box, ironwood (*Acacia excelsa*) and beefwood. Very sparse shrub layer of currant bush (*Carissa ovata*), bean tree (*Cassia brewsteri*), quinine tree (*Petalostigma pubescens*), dead finish (*Archidendropsis basaltica*), soap tree (*Alphitonia excelsa*), cocaine tree (*Erythroxylum australe*), beefwood, ironwood and supplejack (*Ventilago viminalis*). Ground cover dominated by buffel grass (Cenchrus ciliaris), with abundant wiregrasses (*Aristida calycina and Aristida* sp.) and frequent forest blue grass (*Bothriochloa bladhii*), kangaroo grass (*Themeda triandra*), shrubby stylo (*Stylosanthes scabra*) and dysentery plant (*Grewia retusifolia*). |
| **General Site Observations** | **BVG: Eucalypt dry woodlands on inland depositional plains.** Trees form ecologically dominant stratum; healthy community with a range of maturities including old trees with hollows; good recruitment; no erosion noted; no fire scars; patch size approx. 1km x 1km isolated by clearing; moderate to heavy grazing pressure; very dry. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered large hollows and small hollows common, in a mixture of dead and alive trees; scattered large logs; small logs abundant; leaf litter common; scattered shrub / grass shelter; scattered arboreal termite mounds. |
| **Food Potential Over Entire Year** | Seeding grass cover scattered; scattered fleshy fruiting plants, including currant bush, quinine tree and dysentery plant; nectar / pollen producing plant common; koala feed trees common. |
| **Signs** | Scattered macropod scats; kingfisher nest in arboreal termite mound; common woodland birds, including channel-billed cuckoo, zebra finch, Torresian crow, forest kingfisher, magpie and pale-headed rosella. |
| **Koala Feed Trees** | Poplar box (*E. populnea*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: low (0); key existing threats: medium (1); recovery value: medium (1); overall score: 4 = **not critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>Q92 | |
| **Location**<br>Iffley | |
| **Date**<br>29/11/2016 | |
| **Latitude**<br>-22.22180 | |
| **Longitude**<br>148.38164 | |
| **Slope:**<br>1° | |
| **Aspect:**<br>SE | |

| **General Site Description** | |
|---|---|
| **Landform** | Gently undulating plain |
| **Soil** | Loamy sand |
| **Observed vegetation** | RE 11.5.9 (mapped by DSITIA (2016) as 11.5.3 / 11.4.9). Woodland dominated by Clarkson's bloodwood (*C. clarksoniana*), with abundant carbeen (*Corymbia tessellaris*) and occasional poplar box (*Eucalyptus populnea*). Very sparse sub-canopy of carbeen, Clarkson's bloodwood, quinine tree (*Petalostigma pubescens*), soap tree (*Alphitonia excelsa*) and bean tree (*Cassia brewsteri*). Very sparse shrub layer of poplar box and cocaine tree (*Erythroxylum australe*). Ground cover dominated by buffel grass (*Cenchrus ciliaris*), frequent black spear grass (*Heteropogon contortus*), wiregrass (*Aristida calycina*) and red Natal grass (*Melinis repens*). |
| **General Site Observations** | **BVG: Eucalypt dry woodlands on inland depositional plains.** Trees form ecologically dominant stratum; naturally open, healthy community with a range of maturities including older trees; good recruitment; no erosion noted; no fire scars; patch size approx. 1km x 1km isolated by clearing; moderate to heavy grazing pressure; very dry; natural dieback noted with standing dead timber; deep sands. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered large hollows and small hollows common, mostly in dead trees; scattered large logs; small logs common; scattered leaf litter; dense shrub / grass shelter largely absent. |
| **Food Potential Over Entire Year** | Seeding grass cover scattered; fleshy fruiting plants scattered, including currant bush (*Carissa ovata*), velvety tree pear (*Opuntia tomentosa*), dysentery plant (*Grewia retusifolia*) and quinine tree; nectar / pollen producing plant common; koala feed trees scattered. |
| **Signs** | Scattered macropod scats; large nest – likely Torresian crow; common woodland birds including rainbow bee-eater, Australian magpie, pied butcherbird, crested pigeon, pale-headed rosella, laughing kookaburra and dollarbird. |
| **Koala Feed Trees** | Poplar box (*E. populnea*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: medium (1); habitat connectivity: low (0); key existing threats: medium (1); recovery value: medium (1); overall score: 3 = **not critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>Q93 | |
| **Location**<br>Iffley | |
| **Date**<br>29/11/2016 | |
| **Latitude**<br>-22.21133 | |
| **Longitude**<br>148.38036 | |
| **Slope:**<br>1° | |
| **Aspect:**<br>SE | |

| **General Site Description** | |
|---|---|
| **Landform** | Gently undulating plain |
| **Soil** | Red brown sand |
| **Observed vegetation** | RE 11.5.9 (mapped by DSITIA (2016) as 11.5.3 / 11.4.9). Open woodland of carbeen (*Corymbia tessellaris*), Clarkson's bloodwood (*C. clarksoniana*) and Dallachy's gum (*C. dallachyana*), with a sparse sub-canopy of Clarkson's bloodwood, quinine tree (*Petalostigma pubescens*), soap tree (*Alphitonia excelsa*), bootlace oak (*Hakea lorea*), yellowberry bush (*Denhamia cunninghamii*), sally wattle (*Acacia salicina*), white bauhinia (*Lysiphyllum hookeri*) and prickly pine (*Bursaria incana*). Very sparse shrub layer of quinine tree, white bauhinia, lolly bush (*Clerodendrum floribundum*), bootlace oak and cocaine tree (*Erythroxylum australe*). Ground cover dominated by buffel grass (*Cenchrus ciliaris*), with frequent wiregrass (*Aristida calycina*) and occasional black spear grass (*Heteropogon contortus*), kangaroo grass (*Themeda triandra*), bottle tree caustic (*Euphorbia tannensis*) and grey rattlepod (*Crotalaria dissitiflora*). |
| **General Site Observations** | **BVG: Eucalypt dry woodlands on inland depositional plains.** Trees form ecologically dominant stratum; extremely sparse community with many dead standing trees; moderate recruitment; no erosion noted; no fire scars; patch size small with strip clearing fragmenting the area; moderate grazing pressure; very dry; deep weathered sands; over 50% canopy dieback. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Large hollows absent; small hollows abundant, in a mixture of dead and alive trees; scattered large logs; small logs abundant; scattered leaf litter; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Seeding grass cover scattered; scattered fleshy fruiting plants, including quinine tree; nectar / pollen producing plant common; koala feed trees absent. |
| **Signs** | Scattered macropod scats; medium sized woodland bird nest; common woodland birds, including dollarbird, noisy miner, black-faced cuckoo shrike, pied butcherbird and pale-headed rosella. |
| **Koala Feed Trees** | None detected. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: low (0); habitat connectivity: low (0); key existing threats: medium (1); recovery value: low (1); overall score: 2 = **not critical habitat**. |
| **Fauna habitat value – general** | Average. |

| | |
|---|---|
| **Survey Code**<br>Q94 | |
| **Location**<br>Iffley | |
| **Date**<br>29/11/2016 | |
| **Latitude**<br>-22.21499 | |
| **Longitude**<br>148.37391 | |
| **Slope:**<br>1° | |
| **Aspect:**<br>SE | |

| **General Site Description** | |
|---|---|
| **Landform** | Gently undulating plain |
| **Soil** | Brown sandy light clay |
| **Observed vegetation** | RE 11.5.3 (mapped by DSITIA (2016) as 11.5.3 / 11.4.9). Poplar box (*Eucalyptus populnea*) woodland. Sparse sub-canopy of poplar box, bean tree (*Cassia brewsteri*), white bauhinia (*Lysiphyllum hookeri*), quinine tree (*Petalostigma pubescens*), ironwood (*Acacia excelsa*), poison peach (*Ehretia membranifolia*), clarkson's bloodwood (*Corymbia clarksoniana*) and bootlace oak (*Hakea lorea*). Sparse shrub layer of currant bush (*Carissa ovata*), quinine tree, dead finish (*Archidendropsis basaltica*), emu apple (*Owenia acidula*), scrub wilga (*Geijera salicifolia*), wombat berry (*Eustrephus latifolius*) and supplejack (*Ventilago viminalis*). Ground cover dominated by buffel grass (Cenchrus ciliaris), with abundant black spear grass (Heteropogon contortus) and wiregrass (*Aristida calycina*). |
| **General Site Observations** | **BVG: Eucalypt dry woodlands on inland depositional plains.** Trees form ecologically dominant stratum; healthy community with a range of maturities including old trees with hollows; good recruitment; no erosion noted; no fire scars; patch linear in an area fragmented by strip clearing; moderate to heavy grazing pressure; very dry. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Large hollows absent; small hollows abundant, in a mixture of dead and alive trees; scattered large logs; small logs common; scattered leaf litter; scattered shrub / grass shelter; scattered termite mounds. |
| **Food Potential Over Entire Year** | Seeding grass cover scattered; fleshy fruiting plants scattered, including currant bush, quinine tree, emu apple, wombat berry and dysentery plant; nectar / pollen producing plant common; koala feed trees common. |
| **Signs** | Scattered macropod scats; common woodland birds, including Australian magpie, pied butcherbird, pale-headed rosella and noisy miner. |
| **Koala Feed Trees** | Poplar box (*E. populnea*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: low (0); key existing threats: medium (1); recovery value: medium (1); overall score: 4 = **not critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>Q95 | |
| **Location**<br>Iffley | |
| **Date**<br>29/11/2016 | |
| **Latitude**<br>-22.22019 | |
| **Longitude**<br>148.37488 | |
| **Slope:**<br>1° | |
| **Aspect:**<br>SE | |

| **General Site Description** | |
|---|---|
| **Landform** | Gently undulating plain |
| **Soil** | Pale brown sandy light clay |
| **Observed vegetation** | RE 11.5.3 (mapped by DSITIA (2016) as 11.5.3 / 11.4.9). Woodland dominated by poplar box (*Eucalyptus populnea*) with occasional Clarkson's bloodwood (*Corymbia clarksoniana*). Sparse sub-canopy of poplar box, bean tree (*Cassia brewsteri*), ironwood (*Acacia excelsa*), Clarkson's bloodwood, dead finish (*Archidendropsis basaltica*) and emu apple (*Owenia acidula*). Very sparse shrub layer of quinine tree (*Petalostigma pubescens*), supplejack (*Ventilago viminalis*), yellowberry bush (*Denhamia cunninghamii*), wild orange (*Capparis mitchellii*), native pomegranate (*Capparis arborea*), and poplar box. Ground cover dominated by buffel grass (*Cenchrus ciliaris*) with abundant black spear grass (*Heteropogon contortus*), wiregrasses (*Aristida calycina and A. sp.*), shrubby stylo (*Stylosanthes scabra*) and kangaroo grass (*Themeda triandra*). |
| **General Site Observations** | **BVG: Eucalypt dry woodlands on inland depositional plains.** Trees form ecologically dominant stratum; healthy community with a range of maturities, including old trees with hollows; good recruitment; no erosion noted; no fire scars; patch linear in an area fragmented by strip clearing; moderate to heavy grazing pressure; very dry. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered large hollows and small hollows common, in mostly alive trees; large logs scattered; small logs common; leaf litter scattered; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Seeding grass cover common; fleshy fruiting plants scattered, including emu apple, quinine tree, yellowberry bush, wild orange, native pomegranate and dysentery plant (*Grewia latifolia*); nectar / pollen producing plant common; koala feed trees common. |
| **Signs** | Scattered macropod scats; common woodland birds, including Australian magpie, pied butcherbird, forest kingfisher, noisy friarbird and galah. |
| **Koala Feed Trees** | Poplar box (*E. populnea*). No koala scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: low (0); key existing threats: medium (1); recovery value: medium (1); overall score: 4 = **not critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>Q96 | |
| **Location**<br>Iffley | |
| **Date**<br>29/11/2016 | |
| **Latitude**<br>-22.22954 | |
| **Longitude**<br>148.37000 | |
| **Slope:**<br>1° | |
| **Aspect:**<br>SW | |

| **General Site Description** | |
|---|---|
| **Landform** | Gently undulating plain |
| **Soil** | Brown sandy light clay |
| **Observed vegetation** | RE 11.5.3 (mapped by DSITIA (2016) as 11.4.9). Woodland dominated by poplar box (*Eucalyptus populnea*), with occasional Clarkson's bloodwood (*Corymbia clarksoniana*); very sparse sub-canopy of poplar box, bean tree (*Cassia brewsteri*), Clarkson's bloodwood and sally wattle (*Acacia salicina*). Very sparse shrub layer of currant bush (*Carissa ovata*), quinine tree (*Petalostigma pubescens*), sally wattle, poplar box, water bush (*Myoporum acuminatum*), myrtle wood (*Psydrax oleifolius*) and soap tree (*Alphitonia excelsa*). Ground cover dominated by buffel grass (*Cenchrus ciliaris*), with silky oilgrass (*Cymbopogon bombycinus*), black spear grass (*Heteropogon contortus*), wiregrass (*Aristida calycina*), shrubby stylo (*Stylosanthes scabra*) and kangaroo grass (*Themeda triandra*). |
| **General Site Observations** | **BVG: Eucalypt dry woodlands on inland depositional plains.** Trees form ecologically dominant stratum; healthy community with a range of maturities, including old trees with hollows; good recruitment; no erosion noted; no fire scars; patch linear in an area fragmented by strip clearing; moderate to heavy grazing pressure; very dry. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered large hollows and small hollows common, in mostly alive trees; scattered large logs; small logs common; scattered leaf litter; scattered shrub / grass shelter; scattered termite mounds. |
| **Food Potential Over Entire Year** | Seeding grass cover scattered; fleshy fruiting plants scattered, including currant bush, quinine tree, dysentery bush, velvety tree pear (*Opuntia tomentosa*), lantana (*Lantana camara*), emu apple (*Owenia acidula*) and water bush; nectar / pollen producing plant common; mistletoe (*Dendrophthoe homoplastica*) scattered. |
| **Signs** | Scattered macropod scats; common woodland birds, including pale-headed rosella, noisy friarbird and black-faced cuckoo shrike. |
| **Koala Feed Trees** | Poplar box (*E. populnea*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: low (0); key existing threats: medium (1); recovery value: medium (1); overall score: 4 = **not critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>Q97 | |
| **Location**<br>Iffley | |
| **Date**<br>29/11/2016 | |
| **Latitude**<br>-22.22357 | |
| **Longitude**<br>148.36161 | |
| **Slope:**<br>1-2° | |
| **Aspect:**<br>SE | |

| **General Site Description** | |
|---|---|
| **Landform** | Gently undulating plain |
| **Soil** | Yellow-brown sand |
| **Observed vegetation** | RE 11.5.8c (mapped by DSITIA (2016) as 11.4.9). Low woodland of poplar gum (*E. platyphylla*), beefwood (*Grevillea striata*) and bean tree (*Cassia brewsteri*), with no discernible sub-canopy. Very sparse shrub layer of water bush (*Myoporum acuminatum*), silver oak (*Grevillea parallela*), beefwood, bean tree, dead finish (*Archidendropsis basaltica*) and yellowberry bush (*Denhamia cunninghamii*). Ground cover is dominated by kangaroo grass (*Themeda triandra*), with abundant wiregrass (*Aristida calycina*), frequent black spear grass (*Heteropogon contortus*) and shrubby stylo (*Stylosanthes scabra*). |
| **General Site Observations** | **BVG: Eucalypt dry woodlands on inland depositional plains.** Trees form ecologically dominant stratum; healthy community with a range of maturities, including dead trees with hollows; good recruitment; no erosion noted; no fire scars; patch 2km x 1km; moderate grazing pressure; very dry; multiple mistletoe (*Amyema miquelii*) observed on most poplar gum trees; high habitat quality for woodland birds. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Large hollows absent; scattered small hollows, mostly in dead trees; large logs absent; small logs common; leaf litter common; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Seeding grass cover common; fleshy fruiting plants scattered, including dysentery plant, water plant and mistletoe; nectar / pollen producing plant abundant. |
| **Signs** | Scattered macropod scats; glider scratches on poplar gums; common woodland birds including black-faced cuckoo shrike, dollarbird, rainbow bee-eater, pied butcherbird, noisy miner, pale-headed rosella, red-winged parrot, peaceful dover, double-barred finch, little friarbird, varied triller, dusky woodswallow, grey-crowned babbler and red-backed fairy wren; abundant mistletoe, suggesting mistletoe bird, but not observed. |
| **Koala Feed Trees** | Not detected. |
| **Koala habitat score** | Koala occurrence: medium (1; precautionary principle); vegetation composition: low (0); habitat connectivity: low (0); key existing threats: medium (1); recovery value: low (0); overall score: 2 = **not critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>Q98 | |
| **Location**<br>Iffley | |
| **Date**<br>29/11/2016 | |
| **Latitude**<br>-22.22298 | |
| **Longitude**<br>148.35360 | |
| **Slope:**<br><1° | |
| **Aspect:**<br>SW | |

| **General Site Description** | |
|---|---|
| **Landform** | Level plain; swamp / closed depression |
| **Soil** | Brown sandy clay |
| **Observed vegetation** | RE 11.5.17 (mapped by DSITIA (2016) as 11.5.17). Swamp with a fringing woodland of poplar box (*E. populnea*), with a very sparse sub-canopy of poplar box. No shrub layer. Wetland ground cover is aquatic species dominated by couch grass (*Cynodon dactylon*), with giant sedge (*Cyperus exaltatus*), willow primrose (*Ludwigia octovalvis*) and spike rush (*Eleocharis plana*). |
| **General Site Observations** | **BVG: Eucalypt dry woodlands on inland depositional plains.** Trees form ecologically dominant stratum; dead trees with hollows in wetland; good recruitment in fringe; no erosion noted; impoundment and excavation for stock water, rise in water level likely contributing to tree die back in centre of wetland; high grazing pressure. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Large hollows common; small hollows abundant, in a mixture of dead and alive trees; scattered small and large logs; scattered leaf litter; dense shrub / grass shelter common. |
| **Food Potential Over Entire Year** | Seeding groundcover species common; fleshy fruiting plants not detected; nectar / pollen producing plant scattered; koala feed trees common. |
| **Signs** | Scattered macropod scats. Medium and large (crow or raptor) nests. Common woodland birds including Torresian crow, grey-crowned babbler, noisy miner, dollarbird, willy wagtail, black kite, whistling kite and Nankeen kestrel. waterbirds on dam including grey teal, hardhead and black duck. |
| **Koala Feed Trees** | Poplar box (*E. populnea*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: low (0); key existing threats: medium (1); recovery value: medium (1); overall score: 4 = **not critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>Q99 | |
| **Location**<br>Iffley | |
| **Date**<br>29/11/2016 | |
| **Latitude**<br>-22.22308 | |
| **Longitude**<br>148.35198 | |
| **Slope:**<br>1° | |
| **Aspect:**<br>SE | |

| **General Site Description** | |
|---|---|
| **Landform** | Gently undulating plain |
| **Soil** | Brown sandy light clay |
| **Observed vegetation** | RE 11.5.3 (mapped by DSITIA (2016) as 11.5.3 / 11.4.9). Woodland dominated by poplar box (*Eucalyptus populnea*), with a very sparse sub-canopy of poplar box, bean tree (*Cassia brewsteri*), dead finish (*Archidendropsis basaltica*), whitewood (*Atalaya hemiglauca*) and Dallachy's gum (*C. dallachyana*). Very sparse shrub layer of currant bush (*Carissa ovata*), quinine tree (*Petalostigma pubescens*), sally wattle (*Acacia salicina*), poplar box, lantana (*Lantana camara*), water bush (*Myoporum acuminatum*), myrtle wood (*Psydrax oleifolius*) and soap tree (*Alphitonia excelsa*). Ground cover is dominated by buffel grass (*Cenchrus ciliaris*), with purpletop Chloris (*Chloris inflata*), dysentery plant (*Grewia retusifolia*), sabi grass (*Urochloa mosambicensis*) and wiregrass (*Aristida sp*.). |
| **General Site Observations** | **BVG: Eucalypt dry woodlands on inland depositional plains.** Trees form ecologically dominant stratum; healthy community with a range of maturities including old trees with hollows; good recruitment; no erosion noted; no fire scars; patch 2km x 1km in an area fragmented by strip clearing; moderate to heavy grazing pressure; very dry. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered large hollows; small hollows abundant, in mostly alive trees; scattered large logs; small logs common; scattered leaf litter; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Seeding grass cover scattered; fleshy fruiting plants scattered, including lantana, water bush, currant bush and quinine tree; nectar / pollen producing plant common; koala feed trees common. |
| **Signs** | Scattered macropod scats; echidna scat; common woodland birds, including apostlebird, whistling kite, black kite, Torresian crow, double-barred finch, grey-crowned babbler, noisy miner, dollarbird and Nankeen kestrel. |
| **Koala Feed Trees** | Poplar box (*E. populnea*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: low (0); key existing threats: medium (1); recovery value: medium (1); overall score: 4 = **not critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>Q100 | |
| **Location**<br>Iffley | |
| **Date**<br>29/11/2016 | |
| **Latitude**<br>-22.21690 | |
| **Longitude**<br>148.35558 | |
| **Slope:**<br>1° | |
| **Aspect:**<br>SE | |
| **General Site Description** | |
| **Landform** | Gently undulating plain |
| **Soil** | Brown sandy light clay |
| **Observed vegetation** | RE 11.5.3 (mapped by DSITIA (2016) as 11.5.3 / 11.4.9). Woodland of poplar box (*E. populnea*), with a very sparse sub-canopy of poplar box, bean tree (*Cassia brewsteri*), ironwood (*Acacia excelsa*), supplejack (*Ventilago viminalis*) and emu apple (*Owenia acidula*). Very sparse shrub layer of currant bush (*Carissa ovata*), bean tree, dead finish (*Archidendropsis basaltica*), emu apple, water bush (*Myoporum acuminatum*), native pomegranate (*Capparis arborea*) and false sandalwood (*Eremophila mitchellii*). Ground cover dominated by buffel grass (*Cenchrus ciliaris*), with wiregrass (*Aristida sp.*), kangaroo grass (*Themeda triandra*), curly windmill grass (*Enteropogon ramosus*), pink tongues (*Rostellularia adscendens*), velvety tree pear (*Opuntia tomentosa*), forest blue grass (*Bothriochloa bladhii*), shrubby stylo (*Stylosanthes scabra*), *Paspalidium sp*. and sabi grass (*Urochloa mosambicensis*). |
| **General Site Observations** | **BVG: Eucalypt dry woodlands on inland depositional plains.** Trees form ecologically dominant stratum; healthy community with a range of maturities including old trees with hollows; good recruitment; no erosion noted; no fire scars; small patch in an area fragmented by strip clearing; moderate to heavy grazing pressure; very dry. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Large hollows absent; small hollows abundant, in mostly alive trees; large logs scattered; small logs abundant; leaf litter common; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Seeding grass cover common; fleshy fruiting plants scattered, including water bush, currant bush, dysentery plant (*Grewia* sp.), emu apple, quinine tree (*Petalostigma pubescens*), velvety tree pear and native pomegranate; nectar / pollen producing plant common. |
| **Signs** | Scattered macropod scats; common woodland birds including Torresian crow and pied butcherbird. |
| **Koala Feed Trees** | Poplar box (*E. populnea*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: low (0); key existing threats: medium (1); recovery value: medium (1); overall score: 4 = **not critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>Q101 | |
| **Location**<br>Iffley | |
| **Date**<br>29/11/2016 | |
| **Latitude**<br>-22.21726 | |
| **Longitude**<br>148.36601 | |
| **Slope:**<br>1° | |
| **Aspect:**<br>SE | |

| **General Site Description** | |
|---|---|
| **Landform** | Gently undulating plain |
| **Soil** | Brown sandy clay |
| **Observed vegetation** | RE 11.5.3 (mapped by DSITIA (2016) as 11.4.9). Open woodland of poplar box (*Eucalyptus populnea*), with a very sparse sub-canopy of poplar box, ironwood (*Acacia excelsa*), whitewood (*Atalaya hemiglauca*) and beefwood (*Grevillea striata*). Mid-dense shrub layer of currant bush (*Carissa ovata*), bean tree (*Cassia brewsteri*), dead finish (*Archidendropsis basaltica*), emu apple (*Owenia acidula*), scrub boonaree (*Alectryon diversifolius*), wilga (*Geijera parviflora*), shiny-leaved canthium (*Psydrax odorata*), beefwood, whitewood and native lime (*Citrus glauca*). Ground cover dominated by buffel grass (*Cenchrus ciliaris*), with occasional wiregrass (*Aristida sp.*), red Natal grass (*Melinis repens*) and hooky grass (*Ancistrachne uncinulata*). |
| **General Site Observations** | **BVG: Eucalypt dry woodlands on inland depositional plains.** Trees form ecologically dominant stratum; scrappy ecotonal community of mostly young box trees; moderate recruitment; no erosion noted; no fire scars; small patch in an area fragmented by strip clearing; brigalow clearing close by, suggesting mapping error originally labelled this patch 11.4.9 instead of 11.5.3; exposed edge with edge effects. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Large hollows absent; scattered small hollows, in mostly alive trees; small and large logs scattered; scattered leaf litter; dense shrub / grass shelter abundant. |
| **Food Potential Over Entire Year** | Seeding grass cover scattered; fleshy fruiting plants common, including currant bush, emu apple and native lime; nectar / pollen producing plant common; koala feed trees common. |
| **Signs** | Scattered macropod scats; common woodland birds including Torresian crow, pied butcherbird and red-winged parrot. |
| **Koala Feed Trees** | Poplar box (*E. populnea*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: low (0); key existing threats: medium (1); recovery value: medium (1); overall score: 4 = **not critical habitat**. |
| **Fauna habitat value – general** | Average. |

| | |
|---|---|
| **Survey Code**<br>Q102 | |
| **Location**<br>Iffley | |
| **Date**<br>29/11/2016 | |
| **Latitude**<br>-22.20766 | |
| **Longitude**<br>148.37169 | |
| **Slope:**<br>1-2° | |
| **Aspect:**<br>SE | |

| **General Site Description** | |
|---|---|
| **Landform** | Gently undulating plain |
| **Soil** | Pale red-brown sand |
| **Observed vegetation** | RE 11.5.9 (mapped by DSITIA (2016) as 11.5.3 / 11.4.9). Woodland dominated by narrow-leaved ironbark (*E. crebra*), with abundant Clarkson's bloodwood (*Corymbia clarksoniana*) and occasional poplar box (*E. populnea*), and a sub-canopy of Clarkson's bloodwood, narrow-leaved ironbark and silver oak (*Grevillea parallela*). Sparse shrub layer of quinine tree (*Petalostigma pubescens*), white bauhinia (*Lysiphyllum hookeri*), lolly bush (*Clerodendrum floribundum*), bean tree (*Cassia brewsteri*), jasmine (*Jasminum didymum*) and cocaine tree (*Erythroxylum australe*). Ground cover dominated by buffel grass (*Cenchrus ciliaris*), with black spear grass (*Heteropogon contortus*), wiregrass (*Aristida sp.*), red Natal grass (*Melinis repens*), kangaroo grass (*Themeda triandra*), shrubby stylo (*Stylosanthes scabra*) and dysentery plant (*Grewia retusifolia*). |
| **General Site Observations** | **BVG: Eucalypt dry woodlands on inland depositional plains.** Trees form ecologically dominant stratum; healthy community with scattered dead standing trees; good recruitment; no erosion noted; no fire scars; patch size 1km x 1km but with strip clearing fragmenting the area; moderate grazing pressure; very dry; deeply weathered sands. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Large hollows absent; small hollows abundant, in a mixture of dead and alive trees; decorticating bark scattered; scattered large logs; small logs common; leaf litter common; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Seeding grass cover common; fleshy fruiting plants scattered, including quinine tree and dysentery plant; nectar / pollen producing plant common; koala feed trees scattered. |
| **Signs** | Scattered macropod scats. Common woodland birds including laughing kookaburra, noisy friarbird and pied butcherbird. |
| **Koala Feed Trees** | Poplar box (*E. populnea*) and narrow-leaved ironbark (*E. crebra*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: low (0); key existing threats: medium (1); recovery value: medium (1); overall score: 4 = **not critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>Q103 | |
| **Location**<br>Iffley | |
| **Date**<br>29/11/2016 | |
| **Latitude**<br>-22.20893 | |
| **Longitude**<br>148.36644 | |
| **Slope:**<br>1° | |
| **Aspect:**<br>E | |

| **General Site Description** | |
|---|---|
| **Landform** | Gently undulating plain, with gilgais |
| **Soil** | Brown light clay |
| **Observed vegetation** | RE 11.4.9 (mapped by DSITIA (2016) as 11.5.3 / 11.4.9). Low woodland of brigalow (*A. harpophylla*), yellow-wood (*T. oblongata*) and red bauhinia (*Lysiphyllum carronii*). Sparse shrub layer of currant bush (*Carissa ovata*). Ground cover dominated by buffel grass (*Cenchrus ciliaris*), with canegrass (*Walwhalleya subxerophila*), brigalow grass (*Paspalidium caespitosum*), fairy grass (*Sporobolus caroli*), awnless barnyard grass (*Echinochloa colona*), *Cyperus sp*., willow primrose (*Ludwigia octovalvis*), musk basil (*Basilicum polystachyon*), lesser joyweed (*Alternanthera denticulata*), ruby saltbush (*Enchylaena tomentella*) and nardoo (*Marsilea sp*.). |
| **General Site Observations** | **BVG: Other acacia dominated open forest, woodlands and shrublands**. Trees form ecologically dominant stratum; disturbed community with strip clearing at intervals running SW to NE through the woodland; good recruitment; no erosion noted; no fire scars; patch size 1km x 1km but with strip clearing fragmenting the area; high grazing pressure close to water point; gilgais with standing water; gilgais heavily trampled by stock. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Hollows absent; large logs absent; small logs abundant; leaf litter common; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Seeding grass cover scattered; fleshy fruiting plants scattered, including currant bush; nectar / pollen producing plant common. |
| **Signs** | Scattered macropod scats. Common woodland birds including peaceful dove and spotted bowerbird. |
| **Koala Feed Trees** | None detected. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: low (0); habitat connectivity: low (0); key existing threats: medium (1); recovery value: low (0); overall score: 1 = **not critical habitat**. |
| **Fauna habitat value – general** | Average. |

| | |
|---|---|
| **Survey Code**<br>Q104 | |
| **Location**<br>Iffley | |
| **Date**<br>29/11/2016 | |
| **Latitude**<br>-22.20312 | |
| **Longitude**<br>148.36622 | |
| **Slope:**<br>1-2° | |
| **Aspect:**<br>E | |

| **General Site Description** | |
|---|---|
| **Landform** | Gently undulating plain |
| **Soil** | Red sand |
| **Observed vegetation** | RE 11.5.9 (mapped by DSITIA (2016) as 11.5.3 / 11.4.9). Open woodland of narrow-leaved ironbark (*E. crebra*), Clarkson's bloodwood (*Corymbia clarksoniana*) and carbeen (*C. tessellaris*), with a very sparse sub-canopy of Dallachy's gum (*C. dallachyana*), narrow-leaved ironbark, quinine tree (*Petalostigma pubescens*), yellow berry bush (*Denhamia cunninghamii*), and bean tree (*Cassia brewsteri*). No shrub layer. Ground cover dominated by wiregrass (*Aristida calycina*), with abundant black spear grass (*Heteropogon contortus*) and occasional buffel grass (*Cenchrus ciliaris*), velvet hibiscus (*Melhania oblongifolia*), red Natal grass (*Melinis repens*), shrubby stylo (*Stylosanthes scabra*) and spike rush (*Lomandra longifolia*). |
| **General Site Observations** | **BVG: Eucalypt dry woodlands on inland depositional plains.** Trees form ecologically dominant stratum; healthy community with scattered dead standing trees; good recruitment; no erosion noted; no fire scars; patch linear with strip clearing fragmenting the area; moderate grazing pressure; very dry; deeply weathered sands. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered large hollows and small hollows common, mostly in dead trees; scattered small and large logs; leaf litter common; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Seeding grass cover common; fleshy fruiting plants scattered, including velvety tree pear (*Opuntia tomentosa*), dysentery plant (*Grewia* sp.) and quinine tree; nectar / pollen producing plant common. |
| **Signs** | Scattered macropod scats. Common woodland birds including pied butcherbird and Australian magpie. |
| **Koala Feed Trees** | Narrow-leaved ironbark (*E. crebra*). No scratches or scats detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: low (0); key existing threats: medium (1); recovery value: medium (1); overall score: 4 = **not critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>Q105 | |
| **Location**<br>Iffley | |
| **Date**<br>30/11/2016 | |
| **Latitude**<br>-22.19293 | |
| **Longitude**<br>148.36133 | |
| **Slope:**<br>1° | |
| **Aspect:**<br>E | |

| **General Site Description** | |
|---|---|
| **Landform** | Gently undulating plain |
| **Soil** | Red sand |
| **Observed vegetation** | RE 11.5.9 (mapped by DSITIA (2016) as 11.5.3 / 11.4.9). Woodland dominated by Clarkson's bloodwood (*Corymbia clarksoniana*), with abundant carbeen (*Corymbia tessellaris*), occasional narrow-leaved ironbark (*E. crebra*) and Dallachy's gum (*C. dallachiana*). Very sparse sub-canopy of Clarkson's bloodwood. Very sparse shrub layer of bean tree (*Cassia brewsteri*) and quinine tree (*Petalostigma pubescens*). Ground cover dominated by buffel grass (*Cenchrus ciliaris*), with black spear grass (*Heteropogon contortus*), wiregrass (*Aristida calycina*), velvet hibiscus (*Melhania oblongifolia*), golden beard grass (*Chrysopogon fallax*), curly windmill grass (*Enteropogon ramosus*), yellow rattlepod (*Crotalaria mitchellii*) and birdsville indigo (*Indigofera linnaei*). |
| **General Site Observations** | **BVG: Eucalypt dry woodlands on inland depositional plains.** Trees form ecologically dominant stratum; healthy community with scattered dead standing trees; moderate recruitment; no erosion noted; no fire scars; patch approx. 1.3km x 1.5 km; moderate grazing pressure; very dry; deeply weathered sands. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered large hollows and small hollows common, in mostly alive trees; scattered large logs; small logs abundant; leaf litter common; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Seeding grass cover scattered; fleshy fruiting plants scattered, including quinine tree and currant bush (*Carissa ovata*); nectar / pollen producing plant common; koala feed trees not detected. |
| **Signs** | Scattered macropod scats. Common woodland birds including rainbow bee-eater, pale-headed rosella, pied butcherbird, noisy miner and laughing kookaburra. |
| **Koala Feed Trees** | Narrow-leaved ironbark (*E. crebra*). No scratches or scats detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: medium (1); habitat connectivity: low (0); key existing threats: medium (1); recovery value: medium (1); overall score: 3 = **not critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>Q106 | |
| **Location**<br>Iffley | |
| **Date**<br>30/11/2016 | |
| **Latitude**<br>-22.18649 | |
| **Longitude**<br>148.35221 | |
| **Slope:**<br>1° | |
| **Aspect:**<br>N | |

| **General Site Description** | |
|---|---|
| **Landform** | Gently undulating plain |
| **Soil** | Brown sandy light clay |
| **Observed vegetation** | RE 11.5.3 (mapped by DSITIA (2016) as 11.5.3 / 11.4.9). Woodland of poplar box (*E. populnea*), with a very sparse sub-canopy of poplar box, bean tree (*Cassia brewsteri*) and quinine tree (*Petalostigma pubescens*). Very sparse shrub layer of bean tree, dead finish (*Archidendropsis basaltica*), nipan (*Capparis lasiantha*), poplar box and sally wattle (*Acacia salicina*). Ground cover dominated by buffel grass (*Cenchrus ciliaris*), with wiregrasses (*Aristida spp.*), kangaroo grass (*Themeda triandra*), pink tongues (*Rostellularia adscendens*), black spear grass (*Heteropogon contortus*), velvet hibiscus (*Melhania oblongifolia*), creeping phyllanthus (*Phyllanthus virgatus*), shrubby stylo (*Stylosanthes scabra*) and red Natal grass (*Melinis repens*). |
| **General Site Observations** | **BVG: Eucalypt dry woodlands on inland depositional plains.** Trees form ecologically dominant stratum; healthy community with a range of maturities but few old trees; good recruitment; no erosion noted; no fire scars; small patch in an area fragmented by strip clearing and tracks; moderate to heavy grazing pressure close to water; very dry. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered large hollows and small hollows common, in mostly alive trees; scattered large logs; abundant small logs; leaf litter common; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Seeding grass cover common; fleshy fruiting plants scattered, including quinine tree, emu apple (*Owenia acidula*), water bush (*Myoporum acuminatum*) and currant bush (Carissa ovata); nectar / pollen producing plant common; koala feed trees common. |
| **Signs** | Scattered macropod scats. Common woodland birds, including channel-billed cuckoo and blue-winged kookaburra and red-winged parrot. |
| **Koala Feed Trees** | Poplar box (*E. populnea*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: low (0); key existing threats: medium (1); recovery value: medium (1); overall score: 4 = **not critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>Q107 | |
| **Location**<br>Iffley | |
| **Date**<br>30/11/2016 | |
| **Latitude**<br>-22.18547 | |
| **Longitude**<br>148.35894 | |
| **Slope:**<br><1° | |
| **Aspect:**<br>E | |

| **General Site Description** | |
|---|---|
| **Landform** | Gently undulating plain |
| **Soil** | Brown sandy light clay |
| **Observed vegetation** | RE 11.5.3 (mapped by DSITIA (2016) as 11.5.3 / 11.4.9). Open woodland of poplar box (*E. populnea*) and beefwood (*Grevillea striata*), with a very sparse sub-canopy of bean tree (*Cassia brewsteri*), ironwood (*Acacia excelsa*), emu apple (*Owenia acidula*) and sally wattle (*Acacia salicina*). Sparse shrub layer containing nipan (*Capparis lasiantha*), bean tree, currant bush (*Carissa ovata*), native lime (*Citrus glauca)*, dead finish (*Archidendropsis basaltica*), emu apple (*Owenia acidula*), cocaine tree (*Erythroxylum australe*), scrub boonaree (*Alectryon diversifolius*), lantana (*Lantana camara*), and native pomegranate (*Capparis arborea*). Ground dominated by buffel grass (*Cenchrus ciliaris*), with wiregrass (*Aristida calycina*) and sabi grass (*Urochloa mosambicensis*). |
| **General Site Observations** | **BVG: Eucalypt dry woodlands on inland depositional plains.** Trees form ecologically dominant stratum; disturbed community with a range of maturities; moderate recruitment; no erosion noted; no fire scars; cleared to east, west and north; remnant connection to south even though RE mapping indicates otherwise; moderate to heavy grazing pressure; close to water; very dry. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Large hollows absent; small hollows abundant, mostly in dead trees; large logs common; small logs abundant; scattered leaf litter; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Seeding grass cover common; fleshy fruiting plants common, including, currant bush, emu apple, native lime, dysentery plant, nipan, native pomegranate and lantana; nectar / pollen producing plant common. |
| **Signs** | Scattered macropod scats. Common woodland birds including pied butcherbird, noisy miner, red-winged parrot and forest kingfisher. |
| **Koala Feed Trees** | Poplar box (*E. populnea*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: low (0); key existing threats: medium (1); recovery value: medium (1); overall score: 4 = **not critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>Q108 | |
| **Location**<br>Iffley | |
| **Date**<br>30/11/2016 | |
| **Latitude**<br>-22.18185 | |
| **Longitude**<br>148.35101 | |
| **Slope:**<br>1° | |
| **Aspect:**<br>S | |

| **General Site Description** | |
|---|---|
| **Landform** | Gently undulating plain |
| **Soil** | Brown sandy light clay |
| **Observed vegetation** | RE 11.5.3 (mapped by DSITIA (2016) as 11.5.3 / 11.4.9). Woodland dominated by poplar box (*E. populnea*), with a very sparse sub-canopy of bean tree (*Cassia brewsteri*), ironwood (*Acacia excelsa*), sally wattle (*A. salicina*), silver oak (*Grevillea parallela*), poplar box, whitewood (*Atalaya hemiglauca*) and scrub boonaree (*Alectryon diversifolius*). Sparse shrub layer containing nipan (*Capparis lasiantha*), currant bush (*Carissa ovata*), native lime (*Citrus glauca)*, dead finish (*Archidendropsis basaltica*), scrub boonaree (*Alectryon diversifolius*), wild orange *(Capparis umbonata*), quinine tree (*Petalostigma pubescens*), whitewood (*Atalaya hemiglauca*), water bush (*Myoporum acuminatum*), sally wattle and velvety tree pear (*Opuntia tomentosa*). Ground dominated by buffel grass (*Cenchrus ciliaris*). |
| **General Site Observations** | **BVG: Eucalypt dry woodlands on inland depositional plains.** Trees form ecologically dominant stratum; healthy community with a range of maturities; moderate recruitment; no erosion noted; no fire scars; part of relatively large block of intact remnant (over 4km long) although parts strip cleared; moderate to heavy grazing pressure close to water; very dry. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered large hollows and abundant small hollows, in a mixture of dead and alive trees; scattered large logs; small logs common; scattered leaf litter; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Seeding grass cover scattered; fleshy fruiting plants scattered, including water bush, currant bush, velvety tree pear, wild orange, nipan, lime bush and dysentery plant; nectar / pollen producing plant common. |
| **Signs** | Scattered macropod scats. Common woodland birds including pied butcherbird, Australian magpie, willy wagtail and noisy miner. |
| **Koala Feed Trees** | Poplar box (*E. populnea*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: medium (1); key existing threats: medium (1); recovery value: medium (1); overall: 5 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>Q110 | |
| **Location**<br>Lake Vermont | |
| **Date**<br>30/11/2016 | |
| **Latitude**<br>-22.17081 | |
| **Longitude**<br>148.34330 | |
| **Slope:**<br>1° | |
| **Aspect:**<br>E | |

| **General Site Description** | |
|---|---|
| **Landform** | Gently undulating plain |
| **Soil** | Red sand |
| **Observed vegetation** | RE 11.5.9 (mapped by DSITIA (2016) as 11.5.3 / 11.4.9). Open woodland dominated by Clarkson's bloodwood (*Corymbia clarksoniana*) and carbeen (*C. tessellaris*), with occasional poplar gum (*Eucalyptus platyphylla*), and rare occurrence of poplar box (*E. populnea*). Sparse sub-canopy of carbeen, Clarkson's bloodwood and quinine tree (*Petalostigma pubescens*). Very sparse shrub layer of quinine tree, *Corymbia* sp., prickly pine (*Bursaria incana*) and emu apple (*Owenia acidula*). Ground cover dominated by buffel grass (*Cenchrus ciliaris*), with black spear grass (*Heteropogon contortus*), wiregrass (*Aristida calycina*), velvet hibiscus (*Melhania oblongifolia*), yellow rattlepod (*Crotalaria mitchellii*), kangaroo grass (*Themeda triandra*), red Natal grass (*Melinis repens*), *Glycine sp*., dysentery plant (*Grewia retusifolia*), shrubby stylo (*Stylosanthes scabra*) and bottle tree caustic (*Euphorbia tannensis*). |
| **General Site Observations** | **BVG: Eucalypt dry woodlands on inland depositional plains.** Trees form ecologically dominant stratum; healthy community with good recruitment; no erosion noted; no fire scars; patch approx. 3 km x 2 km; low grazing pressure; dry; deeply weathered sands. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered small and large hollows, mostly in dead trees; scattered small and large logs; scattered leaf litter; dense shrub / grass shelter common. |
| **Food Potential Over Entire Year** | Seeding grass cover common; fleshy fruiting plants scattered, including quinine tree, dysentery plant, emu apple, and tree pear (*Opuntia tomentosa*); nectar / pollen producing plant abundant. |
| **Signs** | Scattered macropod scats. Possum / glider scratches on trees. Common woodland birds including noisy friarbird, Australian magpie and pale-headed rosella. |
| **Koala Feed Trees** | Rare occurrence of poplar box (*E. populnea*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: medium (1); habitat connectivity: medium (1); key existing threats: medium (1); recovery value: medium (1); overall score: 4 = **not critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>Q111 | |
| **Location**<br>Lake Vermont | |
| **Date**<br>30/11/2016 | |
| **Latitude**<br>-22.15759 | |
| **Longitude**<br>148.34466 | |
| **Slope:**<br><1° | |
| **Aspect:**<br>S | |

| **General Site Description** | |
|---|---|
| **Landform** | Gently undulating plain; floodchannel |
| **Soil** | Red sand |
| **Observed vegetation** | RE 11.3.27f (mapped by DSITIA (2016) as 11.3.27b). Open forest of forest red gum (*Eucalyptus tereticornis*) with a very sparse sub-canopy of carbeen (*Corymbia tessellaris*) and forest red gum. Sparse shrub layer of white bauhinia (*Lysiphyllum hookeri*), mimosa (*Vachellia farnesiana*), lantana (*Lantana camara*), stinking passionfruit (*Passiflora foetida*), dysentery plant (*Grewia latifolius*), sandpaper fig (*Ficus opposita*), bushweed (*Flueggea leucopyrus*), forest red gum saplings, sally wattle (*Acacia salicina*), soap tree (*Alphitonia excelsa*) and snow-in summer (*Melaleuca linariifolia*). Ground cover includes forest bluegrass (*Bothriochloa bladhii*), Queensland bluegrass (*Dichanthium sericeum*), umbrella canegrass (*Leptochloa digitata*), sedges (*Cyperus* spp.), couch grass (*Cynodon dactylon*), caustic spurge (*Euphorbia drummondii*), musk basil (*Basilicum polystachyon*) and blackberry nightshade (*Solanum nigrum*). |
| **General Site Observations** | **BVG: Wetlands (swamps and lakes).** Trees form ecologically dominant stratum; healthy community with good recruitment; no erosion noted; no fire scars; good linkage to Isaac River corridor through forest red gum forest; low grazing pressure. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Large hollows absent; small hollows common, mostly in dead trees; scattered large logs; small logs abundant; leaf litter common; scattered shrub / grass shelter; scattered arboreal termite mounds. |
| **Food Potential Over Entire Year** | Seeding grass cover common; scattered fleshy fruiting plants, including lantana, stinking passionfruit, dysentery plant, sandpaper fig and blackberry nightshade; nectar / pollen producing plant abundant; koala feed trees abundant. |
| **Signs** | Koala scratches, scats and individual male detected; scattered macropod scats; kingfisher nest in arboreal termite mound. |
| **Koala Feed Trees** | Forest red gum (*E. tereticornis*). Male koala observed; scratches and scats prevalent. |
| **Koala habitat score** | Koala occurrence: high (2); vegetation composition: high (2); habitat connectivity: medium (1); key existing threats: medium (1); recovery value: high (2); overall score: 8 = **Critical habitat**. |
| **Fauna habitat value – general** | Very good. |

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|---|---|
| **Survey Code**<br>Q112 | |
| **Location**<br>Lake Vermont | |
| **Date**<br>30/11/2016 | |
| **Latitude**<br>-22.16026 | |
| **Longitude**<br>148.34151 | |
| **Slope:**<br>1° | |
| **Aspect:**<br>E | |

| **General Site Description** | |
|---|---|
| **Landform** | Gently undulating plain |
| **Soil** | Brown sandy light clay |
| **Observed vegetation** | RE 11.5.3 (mapped by DSITIA (2016) as 11.5.3 / 11.4.9). Open woodland of poplar box (*Eucalyptus populnea*), with a very sparse sub-canopy of bean tree (*Cassia brewsteri*) and poplar box. Very sparse shrub layer of lantana (*Lantana camara*), bean tree, emu apple (*Owenia acidula*), currant bush (*Carissa ovata*) and nipan (*Capparis lasiantha*). Ground cover dominated by buffel grass (*Cenchrus ciliaris*), with wiregrass (*Aristida sp.*), dysentery plant (*Grewia retusifolia*), red Natal grass (*Melinis repens*), black spear grass (*Heteropogon contortus*), curly windmill grass (*Enteropogon ramosus*), oat grass (*Themeda avenacea*) and shrubby stylo (*Stylosanthes scabra*). |
| **General Site Observations** | **BVG: Eucalypt dry woodlands on inland depositional plains.** Trees form ecologically dominant stratum; healthy community with a range of maturities; good recruitment; no erosion noted; no fire scars; part of relatively large block of intact remnant (over 4km long), although parts strip cleared; low grazing pressure; very dry with moderate to high fire fuel load. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered large hollows and abundant small hollows, in mostly living trees; large logs absent; small logs scattered; scattered leaf litter; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Seeding grass cover scattered; scattered fleshy fruiting plants, including lantana, emu apple, currant bush and nipan; nectar / pollen producing plant common; koala feed trees common. |
| **Signs** | Scattered macropod scats. |
| **Koala Feed Trees** | Poplar box (*E. populnea*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: medium (1); key existing threats: medium (1); recovery value: medium (1); overall score: 5 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

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|---|---|
| **Survey Code**<br>Q113 | |
| **Location**<br>Lake Vermont | |
| **Date**<br>30/11/2016 | |
| **Latitude**<br>-22.15400 | |
| **Longitude**<br>148.33613 | |
| **Slope:**<br>1° | |
| **Aspect:**<br>SE | |

| **General Site Description** | |
|---|---|
| **Landform** | Gently undulating plain |
| **Soil** | Brown sandy loam |
| **Observed vegetation** | RE 11.3.2 (mapped by DSITIA (2016) as 11.3.2 / 11.3.7 / 11.3.1). Woodland of poplar box (*E. populnea*), Clarkson's bloodwood (*Corymbia clarksoniana*), carbeen (*C. tessellaris*) and sally wattle (*Acacia salicina*), with a very sparse sub-canopy of poplar box, Clarkson's bloodwood and sally wattle. Very sparse shrub layer of sally wattle, Lantana (*Lantana camara*), bean tree (*Cassia brewsteri*), currant bush (*Carissa ovata*), dead finish (*Archidendropsis basaltica*) and poplar box. Ground cover dominated by buffel grass (*Cenchrus ciliaris*), with wiregrass (*Aristida sp.*), red Natal grass (*Melinis repens*), black spear grass (*Heteropogon contortus*) and yellow rattlepod (*Crotalaria mitchellii*). |
| **General Site Observations** | **BVG: Eucalypt dry woodlands on inland depositional plains.** Trees form ecologically dominant stratum; patchy community with good recruitment; no erosion noted; no fire scars; part of relatively large block of intact remnant along Isaac River and to the SW; low grazing pressure; very dry with moderate to high fire fuel load. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Large hollow absent; small hollows common, in a mixture of dead and alive trees; large logs absent; small logs scattered; scattered leaf litter; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Seeding grass cover scattered; fleshy fruiting plants scattered, including lantana, currant bush and tree pear (*Opuntia tomentosa*); nectar / pollen producing plant common; koala feed trees common. |
| **Signs** | Scattered macropod scats; common woodland birds, including pied butcherbird, noisy miner and little friarbird. |
| **Koala Feed Trees** | Poplar box (*E. populnea*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: medium (1); key existing threats: medium (1); recovery value: medium (1); overall score: 5 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

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|---|---|
| **Survey Code**<br>Q114 | |
| **Location**<br>Lake Vermont | |
| **Date**<br>30/11/2016 | |
| **Latitude**<br>-22.15230 | |
| **Longitude**<br>148.34270 | |
| **Slope:**<br><1° | |
| **Aspect:**<br>SE | |

| **General Site Description** | |
|---|---|
| **Landform** | Gently undulating plain |
| **Soil** | Brown sandy loam |
| **Observed vegetation** | RE 11.3.4 (mapped by DSITIA (2016) as 11.3.2 / 11.3.7 / 11.3.1). Woodland of forest red gum (*E. tereticornis*), river red gum (*E. camaldulensis*), Clarkson's bloodwood (*Corymbia clarksoniana*), carbeen (*C. tessellaris*) and sally wattle (*Acacia salicina*), with a very sparse sub-canopy of younger forest red gum, carbeen, Clarkson's bloodwood and sally wattle. Mid-dense shrub layer dominated by lantana (*Lantana camara*). Other shrub species include bean tree (*Cassia brewsteri*) and sally wattle regrowth and forest red gum regrowth. Ground cover is dominated by buffel grass (*Cenchrus ciliaris*), with black spear grass (*Heteropogon contortus*) and dysentery plant (*Grewia retusifolia*). |
| **General Site Observations** | **BVG: Eucalypt open forests to woodlands on floodplains**. Trees form ecologically dominant stratum; weedy community with old trees with hollows; good recruitment; no erosion noted; no fire scars; part of relatively large block of intact remnant along Isaac River and to the SW; low grazing pressure; very dry with moderate to high fire fuel load; old logging area. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered large hollows and small hollows common, in a mixture of dead and alive trees; large logs absent; scattered small logs; leaf litter common; dense shrub / grass shelter abundant. |
| **Food Potential Over Entire Year** | Seeding grass cover scattered; fleshy fruiting plants abundant, including lantana and dysentery plant; nectar / pollen producing plant abundant; koala feed trees abundant. |
| **Signs** | Scattered macropod scats; koala scratches and scat; greater glider scratches. |
| **Koala Feed Trees** | Forest red gum (*E. tereticornis*) and river red gum (*E. camaldulensis*). Targeted searches identified koala scratches and scat. |
| **Koala habitat score** | Koala occurrence: high (2); vegetation composition: high (2); habitat connectivity: medium (1); key existing threats: medium (1); recovery value: high (2); overall score: 8 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

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|---|---|
| **Survey Code**<br>Q115 | |
| **Location**<br>Iffley | |
| **Date**<br>30/11/2016 | |
| **Latitude**<br>-22.17248 | |
| **Longitude**<br>148.35506 | |
| **Slope:**<br>1° | |
| **Aspect:**<br>SE | |

| **General Site Description** | |
|---|---|
| **Landform** | Gently undulating plain |
| **Soil** | Brown sandy light clay |
| **Observed vegetation** | RE 11.5.3 (mapped by DSITIA (2016) as 11.5.3 / 11.4.9). Open woodland of Poplar box (*E. populnea*), with a very sparse sub-canopy of emu apple (*Owenia acidula*), whitewood (*Atalaya hemiglauca*), Clarkson's bloodwood (*C. clarksoniana*), ironwood (*Acacia excelsa*), Dallachy's gum (*C. dallachyana*) and poplar box. Sparse shrub layer of lantana (*Lantana camara*), bean tree (*Cassia brewsteri*), currant bush (*Carissa ovata*), nipan (*Capparis lasiantha*), harrisia cactus (*Harrisia martinii*), poison peach (*Ehretia membranifolia*), yellow berry bush (*Denhamia cunninghamii*), dead finish (*Archidendropsis basaltica*), emu apple and poplar box. Ground layer dominated by buffel grass (*Cenchrus ciliaris*), wiregrass (*Aristida calycina*), red Natal grass (*Melinis repens*), velvet hibiscus (*Melhania oblongifolia*) and shrubby stylo (*Stylosanthes scabra*). |
| **General Site Observations** | **BVG: Eucalypt dry woodlands on inland depositional plains.** Trees form ecologically dominant stratum; healthy community with a range of maturities; good recruitment; no erosion noted; no fire scars; connected to relatively large block of intact remnant (over 4km long to west), although parts strip cleared; moderate grazing pressure; very dry. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered large hollows and abundant small hollows, in mostly alive trees; large logs common; small logs abundant; scattered leaf litter; shrub / grass shelter scattered. |
| **Food Potential Over Entire Year** | Seeding grass cover scattered; scattered fleshy fruiting plants, including emu apple, lantana, currant bush, harrisia cactus and yellow berry bush; nectar / pollen producing plant common; koala feed trees common. |
| **Signs** | Scattered macropod scats; common woodland birds, including red-winged parrot, little friarbird, Australian magpie and pied butcherbird. |
| **Koala Feed Trees** | Poplar box (*E. populnea*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: medium (1); key existing threats: medium (1); recovery value: medium (1); overall score: 5 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>Q116 | |
| **Location**<br>Iffley | |
| **Date**<br>30/11/2016 | |
| **Latitude**<br>-22.17652 | |
| **Longitude**<br>148.36459 | |
| **Slope:**<br>1° | |
| **Aspect:**<br>E | |

| **General Site Description** | |
|---|---|
| **Landform** | Gently undulating plain |
| **Soil** | Brown loamy sand |
| **Observed vegetation** | RE 11.3.7 (mapped by DSITIA (2016) as 11.5.3 / 11.4.9). Open woodland of carbeen (*Corymbia tessellaris*) and Clarkson's bloodwood (*C. clarksoniana*) with a very sparse sub-canopy of Clarkson's bloodwood, carbeen and quinine tree (*Petalostigma pubescens*). Very sparse shrub layer of currant bush (*Carissa ovata*). Ground cover dominated by buffel grass (*Cenchrus ciliaris*) with yellow rattlepod (*Crotalaria mitchellii*) and spike rush (*Lomandra longifolia*). |
| **General Site Observations** | **BVG: Eucalypt dry woodlands on inland depositional plains.** Trees form ecologically dominant stratum; sparse but healthy community with a range of maturities; moderate recruitment; no erosion noted; no fire scars; isolated patch some 1.3km x.3km; moderate grazing pressure. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered large hollows and abundant small hollows, mostly in dead trees; scattered small and large logs; scattered leaf litter; shrub / grass shelter very sparse. |
| **Food Potential Over Entire Year** | Seeding grass cover absent; fleshy fruiting plants scattered, including currant bush and quinine tree; nectar / pollen producing plant common; koala feed trees not detected. |
| **Signs** | Scattered macropod scats; common woodland birds, including pied butcherbird, noisy miner, channel-billed cuckoo and Torresian crow. |
| **Koala Feed Trees** | None detected. |
| **Koala habitat score** | Koala occurrence: medium (1; precautionary principle); vegetation composition: low (0); habitat connectivity: low (1); key existing threats: medium (1); recovery value: low (0); overall score: 3 = **not critical habitat**. |
| **Fauna habitat value – general** | Average. |

| | |
|---|---|
| **Survey Code**<br>Q117 | |
| **Location**<br>Iffley | |
| **Date**<br>30/11/2016 | |
| **Latitude**<br>-22.17826 | |
| **Longitude**<br>148.36646 | |
| **Slope:**<br><1° | |
| **Aspect:**<br>S | |

| **General Site Description** | |
|---|---|
| **Landform** | Gently undulating plain |
| **Soil** | Brown loamy sand |
| **Observed vegetation** | RE 11.3.2 (mapped by DSITIA (2016) as 11.4.9). Open woodland dominated by poplar box (*Eucalyptus populnea*) and Clarkson's bloodwood (*Corymbia clarksoniana*) with a very sparse sub-canopy of bean tree (*Cassia brewsteri*) and white bauhinia (*Lysiphyllum hookeri*). Very sparse shrub layer of poplar box, lolly bush (*Clerodendrum floribundum*) and sally wattle (*Acacia salicina*). Ground cover is dominated by buffel grass (*Cenchrus ciliaris*) with yellow rattlepod (*Crotalaria mitchellii*), shrubby stylo (*Stylosanthes scabra*) and red Natal grass (*Melinis repens*). |
| **General Site Observations** | **BVG: Eucalypt dry woodlands on inland depositional plains.** Trees form ecologically dominant stratum; sparse sliver on edge of 11.3.7 community against cleared country to south; poor recruitment; large number of standing hollow dead trees; no erosion noted; no fire scars; isolated patch some 1.3km x.3km; moderate grazing pressure. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered large hollows and abundant small hollows, mostly in dead trees; large logs absent; small logs abundant; scattered leaf litter; dense shrub / grass shelter absent. |
| **Food Potential Over Entire Year** | Seeding grass cover absent; fleshy fruiting plants absent; scattered nectar / pollen producing plant; koala feed trees scattered. |
| **Signs** | Scattered macropod scats; nest of medium to large sized woodland bird (likely magpie). |
| **Koala Feed Trees** | Poplar box (*E. populnea*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: low (0); key existing threats: medium (1); recovery value: low (0); overall score: 3 = **not critical habitat**. |
| **Fauna habitat value – general** | Average. |

| | |
|---|---|
| **Survey Code**<br>Q128 (Fauna) | |
| **Location**<br>Iffley | |
| **Date**<br>28/09/2017 | |
| **Latitude**<br>-22.22252 | |
| **Longitude**<br>148.41071 | |
| **Slope:**<br>1° | |
| **Aspect:**<br>SE | |

| **General Site Description** | |
|---|---|
| **Landform** | Level plain |
| **Soil** | Brown sandy light clay |
| **Observed vegetation** | 11.3.2 (mapped as 11.3.2 / 11.3.7 / 11.3.1). Poplar box (*Eucalyptus populnea*) woodland. Very sparse sub-canopy of poplar box. Very sparse shrub layer of bean tree (*Cassia brewsteri*), sally wattle (*Acacia salicina*), scrub boonaree (*Alectryon diversifolius*) and whitewood (*Atalaya hemiglauca*). Ground layer dominated by buffel grass (*Cenchrus ciliaris*), with frequent sabi grass (*Urochloa mosambicensis*), parthenium (*Parthenium hysterophorus*), wire grass (*Aristida* sp.), velvet hibiscus (*Melhania oblongifolia*) and *Dianella nervosa.* |
| **General Site Observations** | Trees form ecologically dominant stratum; healthy vegetation with a range of maturities; good recruitment; no erosion noted; no fire scars detected; part of the Isaac River corridor which is approximately 1 km wide at this point; moderate grazing impacts; very dry. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered small hollows; mostly in dead trees; scattered large logs; small logs common; scattered leaf litter. |
| **Food Potential Over Entire Year** | Scattered seeding grass cover; scattered fleshy fruiting plants, including dysentery plant (*Grewia latifolia*); scattered nectar / pollen producing plants; koala feed trees common. |
| **Signs** | Scattered macropod scats; common woodland birds, including willie wagtail, black-faced cuckoo shrike, Australian magpie and noisy miner. |
| **Koala Feed Trees** | Poplar box (*E. populnea*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: medium (1); vegetation composition: high (2); habitat connectivity: high (2); key existing threats: medium (1); recovery value: medium (1); overall score: 7 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>Q129 (Fauna) | |
| **Location**<br>Iffley | |
| **Date**<br>28/09/2017 | |
| **Latitude**<br>-22.21575 | |
| **Longitude**<br>148.41524 | |
| **Slope:**<br><1° | |
| **Aspect:**<br>S | |

| **General Site Description** | |
|---|---|
| **Landform** | Level plain; deposited old rises |
| **Soil** | Brown sandy loam; alluvium |
| **Observed vegetation** | RE 11.3.7 (mapped as 11.3.2 / 11.3.7 / 11.3.1). Grassy woodland with sparse canopy dominated by Dallachy's gum (*Corymbia dallachiana*), with frequent narrow-leaved ironbark (*Eucalyptus crebra*), Clarkson's bloodwood (*C. clarksoniana*) and carbeen (*C. tessellaris*), and occasional poplar box (*E. populnea*). Very sparse sub-canopy of poplar box, narrow-leaved ironbark, sally wattle (*Acacia salicina*) and bean tree (*Cassia brewsteri*). Sparse shrub layer, including dead finish (*Archidendropsis basaltica*), scrub boonaree (*Alectryon diversifolius*) and bean tree. Groundcover is a mix of native and exotic species, including buffel grass (*Cenchrus ciliaris*), kangaroo grass (*Themeda triandra*), wiregrass (*Aristida jerichoensis*), parthenium (*Parthenium hysterophorus*), green panic (*Megathyrsus maximus*) and sabi grass (*Urochloa mosambicensis*). |
| **General Site Observations** | Trees form the ecologically dominant stratum; mature community with older trees; connected to the Isaac River corridor; moderate recruitment; erosion not detected; fire scars not detected; moderate grazing evident. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Large hollows scattered and small hollows common, in a mixture of dead and alive trees; scattered large logs; small logs common; scattered leaf litter; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Seeding grass cover common; scattered fleshy fruiting plants, including wombat berry (*Eustrephus latifolius*); nectar / pollen producing plants common; scattered koala feed trees. |
| **Signs** | Scattered macropod scats; birds detected at time of assessment comprised common native woodland species. |
| **Koala Feed Trees** | Narrow-leaved ironbark (*E. crebra*) and poplar box (*E. populnea*). No koala scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: medium (1); vegetation composition: medium (1); habitat connectivity: high (2); key existing threats: medium (1); recovery value: medium (1); overall score: 6 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>Q130 (Fauna) | |
| **Location**<br>Iffley | |
| **Date**<br>28/09/2017 | |
| **Latitude**<br>-22.19688 | |
| **Longitude**<br>148.40029 | |
| **Slope:**<br><1° | |
| **Aspect:**<br>S | |

| **General Site Description** | |
|---|---|
| **Landform** | Level plain; deposited old rises |
| **Soil** | Brown sandy loam; alluvium |
| **Observed vegetation** | RE 11.3.7 (mapped as 11.3.2 / 11.3.7 / 11.3.1). Grassy woodland dominated by Clarkson's bloodwood (*Corymbia clarksoniana*), with occasional forest red gum (*Eucalyptus tereticornis*), carbeen (*Corymbia tessellaris*), Dallachy's gum (*C. dallachiana*), narrow-leaved ironbark (*Eucalyptus crebra*) and poplar box (*E. populnea*). Very sparse sub-canopy of sally wattle (*Acacia salicina*) and Clarkson's bloodwood. Sparse shrub layer of lantana (*Lantana camara*), bean tree (*Cassia brewsteri*), flannel weed (*Sida subspicata*), dysentery plant (*Grewia latifolia*) and juvenile Clarkson's bloodwood. Groundcover dominated by buffel grass (*Cenchrus ciliaris*), with frequent wiregrass (*Aristida* sp.), parthenium (*Parthenium hysterophorus*), sabi grass (*Urochloa mosambicensis*) and curly windmill grass (*Enteropogon ramosus*). |
| **General Site Observations** | Trees form the ecologically dominant stratum; mature community with older trees; connected to the Isaac River corridor; good recruitment; no erosion detected; no fire scars detected; light cattle grazing. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Large hollows scattered and small hollows common, in a mixture of dead and alive trees; scattered large logs; small logs common; scattered leaf litter; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Scattered seeding grass cover; scattered fleshy fruiting plants, including wombat berry (*Eustrephus latifolius*), dysentery plant and lantana; nectar / pollen producing plants common; scattered koala feed trees. |
| **Signs** | Scattered macropod scats; birds detected at time of assessment comprised common native woodland species. |
| **Koala Feed Trees** | Forest red gum (*E. tereticornis*), narrow-leaved ironbark (*E. crebra*) and poplar box (*E. populnea*). No koala scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: medium (1); vegetation composition: medium (1); habitat connectivity: high (2); key existing threats: medium (1); recovery value: medium (1); overall score: 6 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>CQ1 (Fauna) | |
| **Location**<br>Winchester Downs | |
| **Date**<br>30/05/2017 | |
| **Latitude**<br>-22.22527 | |
| **Longitude**<br>148.26139 | |
| **Slope:**<br>1° | |
| **Aspect:**<br>SSW | |
| **Infrastructure:**<br>Water pipeline | |

| **General Site Description** | |
|---|---|
| **Landform** | Gently undulating plain |
| **Soil** | Brown light clay |
| **Observed vegetation** | Non-remnant (mapped as 11.4.9). Scattered thicket species including scrub boonaree (*Alectryon diversifolius*), currant bush (*Carissa ovata*) and whitewood (*Atalaya hemiglauca*). Ground layer dominated by buffel grass (*Cenchrus ciliaris*), with abundant Indian couch (*Bothriochloa pertusa*) and occasional black spear grass (*Heteropogon contortus*), red Natal grass (*Melinis repens*), brigalow grass (*Paspalidium caespitosum*), sabi grass (*Urochloa mosambicensis*), curly windmill grass (*Enteropogon acicularis*) and parthenium weed (*Parthenium hysterophorus*). |
| **General Site Observations** | Complete dieback from likely historic herbicide pellet treatment; stags likely comprised Dawson gum (*Eucalyptus cambageana*). Scattered thicket species; mostly exotic groundcover with scattered native grasses and herbs; no erosion evident; no fire scars evident. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Small hollows common in stags; abundant small and large logs; scattered small rocks; scattered shrub / grass shelter; leaf litter largely absent. |
| **Food Potential Over Entire Year** | Scattered seeding grass cover; scattered fleshy fruiting plants, including currant bush and nipan (*Capparis lasiantha*) and dysentery plant (*Grewia latifolia*); scattered nectar / pollen producing plants; koala feed trees absent. |
| **Signs** | Common woodland birds, including willie wagtail and Torresian crow. |
| **Koala Feed Trees** | No primary or secondary koala feed trees detected. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: low (0); habitat connectivity: low (0); key existing threats: medium (1); recovery value: low (0); overall score: 1 = Not critical habitat. |
| **Fauna habitat value – general** | Degraded. |

| | |
|---|---|
| **Survey Code**<br>CQ2 (Fauna) | |
| **Location**<br>Winchester Downs | |
| **Date**<br>30/05/2017 | |
| **Latitude**<br>-22.22493 | |
| **Longitude**<br>148.25355 | |
| **Slope:**<br>1° | |
| **Aspect:**<br>SE | |
| **Infrastructure:**<br>Water pipeline | |

| **General Site Description** | |
|---|---|
| **Landform** | Gently undulating plain |
| **Soil** | Brown loamy sand |
| **Observed vegetation** | RE 11.3.2 (mapped 11.3.2/11.3.1/11.3.25). Open woodland dominated by poplar box (*Eucalyptus populnea*), forest blue gum (*E. tereticornis*) dominant on adjoining waterway; sub-canopy poplar box saplings. Sparse shrub layer dead finish (*Archidendropsis basaltica*), poplar box, sally wattle (*Acacia salicina*), bean tree (*Cassia brewsteri*) and ironwood (*A. excelsa*). Ground layer dominated buffel grass, abundant kangaroo grass (*Themeda triandra*), frequent black speargrass (*Heteropogon contortus*) and occasional Natal grass (*Melinis repens*), sabi grass (*Urochloa mosambicensis*), oat grass (*T. avenacea*), *Sida* sp., velvet hibiscus (*Melhania oblongifolia*) and golden beard grass (*Chrysopogon fallax*). |
| **General Site Observations** | Extensive dieback; patch has been chemically treated, evidenced by dead and unhealthy canopy trees; riparian vegetation along a minor watercourse providing moderate connectivity in an otherwise highly cleared landscape; scattered gully and rill erosion; fire scars absent. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Small hollows common, in a mixture of dead and alive trees; scattered large logs; small logs common; scattered small rocks; scattered leaf litter; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Seeding grass cover common; scattered fleshy fruiting plants, including currant bush (*Carissa ovata*), wild orange (*Capparis mitchellii*) and velvety tree pear (*Opuntia tomentosa*); nectar / pollen producing plants common; koala feed trees common. |
| **Signs** | Scattered macropod scats; birds detected at time of assessment comprised common native woodland species; koala scratches observed on forest blue gum (*E. tereticornis*) on watercourse. |
| **Koala Feed Trees** | Poplar box (*E. populnea*) and forest blue gum (*E. tereticornis*). Koala scratches detected. No pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: high (2); vegetation composition: high (2); habitat connectivity: low (0); key existing threats: medium (1); recovery value: medium (1); overall score: 6 = **Critical habitat**. |
| **Fauna habitat value – general** | Average. |

| | |
|---|---|
| **Survey Code**<br>CQ3 (Fauna) | |
| **Location**<br>Winchester Downs | |
| **Date**<br>30/05/2017 | |
| **Latitude**<br>-22.22459 | |
| **Longitude**<br>148.24590 | |
| **Slope:**<br>0° | |
| **Aspect:**<br>- | |
| **Infrastructure:**<br>Water pipeline | |

| **General Site Description** | |
|---|---|
| **Landform** | Level plain |
| **Soil** | Brown clay with low gilgai |
| **Observed vegetation** | RE 11.4.8 (mapped as 11.4.9 / 11.4.8 / 11.5.3). Woodland with sparse canopy dominated by Dawson gum (*Eucalyptus cambageana*), with occasional poplar box (*E. populnea*). Very sparse sub-canopy of Dawson gum, poplar box and scrub leopardwood (*Flindersia dissosperma*). Sparse to mid-dense shrub layer of currant bush (*Carissa ovata*), poison peach (*Ehretia membranifolia*), bean tree (*Cassia brewsteri*), shiny-leaved canthium (*Psydrax odorata* subsp. *buxifolia*), scrub boonaree (*Alectryon diversifolius*) and small-leaved ebony (*Diospyros humilis*). Ground layer dominated by buffel grass (*Cenchrus ciliaris*), with occasional green panic (*Megathyrsus maximus*), hairy panic (*Panicum effusum*), *Aristida* sp., fairy grass (*Sporobolus caroli*), forest bluegrass (*Bothriochloa decipiens*), shot grass (*Paspalidium distans*) and golden beard grass (*Chrysopogon fallax*). |
| **General Site Observations** | Trees form the ecologically dominant stratum; a mature community, but suffering edge effects due to small patch size; isolated within the landscape; mostly non-native groundcover; moderate recruitment; erosion absent; no dieback detected; fire scars absent. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Small hollows abundant, in a mixture of dead and alive trees; scattered small and large logs; scattered leaf litter; dense shrub / grass shelter common; arboreal termite mounds. |
| **Food Potential Over Entire Year** | Scattered seeding grass cover; fleshy fruiting plants common, including currant bush, nipan (*Capparis lasiantha*) and harrisia cactus (*Harrisia martinii*); nectar / pollen producing plants common. |
| **Signs** | Scattered macropod scats; large woodland bird nest – likely Torresian crow; birds detected comprised common native woodland species. |
| **Koala Feed Trees** | Occasional poplar box. No scratches/pellets detected, despite searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: medium (1); habitat connectivity: low (0); key existing threats: medium (1); recovery value: low (0); overall score: 2 = Not critical habitat. |
| **Fauna habitat value – general** | Average. |

| | |
|---|---|
| **Survey Code**<br>CQ4 (Fauna) | |
| **Location**<br>Wynette | |
| **Date**<br>31/05/2017 | |
| **Latitude**<br>-22.22702 | |
| **Longitude**<br>148.30059 | |
| **Slope:**<br>0° | |
| **Aspect:**<br>- | |
| **Infrastructure:**<br>Water pipeline | |

| **General Site Description** | |
|---|---|
| **Landform** | Level plain |
| **Soil** | Brown light-medium clay; cracking soils with gilgai relief |
| **Observed vegetation** | Non-remnant (mapped as Non-remnant). Shrubland dominated by brigalow (*Acacia harpophylla*) regrowth. Ground layer dominated by buffel grass (*Cenchrus ciliaris*). |
| **General Site Observations** | Shrubs form ecologically dominant stratum; regrowth brigalow, estimated age 5-10 years, with improved pasture; gilgai relief with ephemeral aquatic values; crab holes in gilgai; erosion absent; fire scars absent; no obvious signs of recent cattle use – may be winter paddock. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | No hollows, logs or rocks detected; scattered leaf litter; dense shrub / grass shelter abundant. |
| **Food Potential Over Entire Year** | Seeding grass cover scattered; fleshy fruiting plants scattered; nectar / pollen producing plants common; koala feed trees absent. |
| **Signs** | Scattered macropod scats; large bird prints in gilgai – likely brolga, which was heard calling at the time of the site visit. Torresian crow, black duck and white-faced heron also detected. |
| **Koala Feed Trees** | None detected. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: low (0); habitat connectivity: low (0); key existing threats: medium (1); recovery value: low (0); overall score: 1 = Not critical habitat. |
| **Fauna habitat value – general** | Poor (recovering from clearing). |

| | |
|---|---|
| **Survey Code**<br>CQ5 (Fauna) | |
| **Location**<br>Winchester Downs | |
| **Date**<br>31/05/2017 | |
| **Latitude**<br>-22.22619 | |
| **Longitude**<br>148.23903 | |
| **Slope:**<br>0° | |
| **Aspect:**<br>- | |
| **Infrastructure:**<br>Water pipeline | |

| **General Site Description** | |
|---|---|
| **Landform** | Level plain |
| **Soil** | Brown clay loam |
| **Observed vegetation** | RE 11.5.3 (mapped as 11.5.3). Woodland dominated by poplar box (*Eucalyptus populnea*), with frequent narrow-leaved ironbark (*E. crebra*), occasional sally wattle (*Acacia salicina*), Clarkson's bloodwood (*Corymbia clarksoniana*) and Dallachy's gum (*C. dallachiana*). Sparse shrub layer of currant bush (*Carissa ovata*), poison peach (*Ehretia membranifolia*), bean tree (*Cassia brewsteri*), scrub boonaree (*Alectryon diversifolius*), beefwood (*Grevillea striata*), red bauhinia (*Lysiphyllum carronii*), lolly bush (*Clerodendron floribunda*), dysentery plant (*Grewia retusifolia*), nipan (*Capparis lasiantha*), water bush (*Myoporum acuminatum*) and coffee bush (*Breynia oblongifolia*). Ground layer includes a mix of *Aristida* sp., golden beard grass (*Chrysopogon fallax*), kangaroo grass (*Themeda triandra*) and brown silky top (*Eulalia aurea*). |
| **General Site Observations** | Trees form ecologically dominant stratum; mature community of younger trees; areas dominated by *E. crebra*, patch isolated approx. 1 km x 0.4 km; mostly native groundcover; no dieback, fire scars or erosion. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Large hollows scattered; small hollows abundant, in a mixture of dead and alive trees; scattered large logs; abundant small logs; leaf litter common; scattered shrub / grass shelter; scattered termite mounds. |
| **Food Potential Over Entire Year** | Seeding grass cover common; fleshy fruiting plants scattered, including currant bush, dysentery plant, nipan, water bush, emu apple (*Owenia acidula*) and quinine tree (*Petalostigma pubescens*); nectar / pollen producing plant abundant; koala feed trees common. |
| **Signs** | Scattered macropod scats; possum / glider scratches on poplar box with large hollow; birds detected comprised common native woodland spp. |
| **Koala Feed Trees** | Poplar box (*E. populnea*) and narrow-leaved ironbark (*E. crebra*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: low (0); key existing threats: medium (1); recovery value: medium (1); overall score: 4 = Not critical habitat. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>CQ6 (Fauna) | |
| **Location**<br>Winchester Downs | |
| **Date**<br>1/06/2017 | |
| **Latitude**<br>-22.12503 | |
| **Longitude**<br>148.27063 | |
| **Slope:**<br><1° | |
| **Aspect:**<br>S | |
| **Infrastructure:**<br>Rail corridor | |

| **General Site Description** | |
|---|---|
| **Landform** | Drainage line transecting level plain |
| **Soil** | Brown sandy clay |
| **Observed vegetation** | RE 11.3.25 (mapped as 11.3.2 / 11.3.7 / 11.3.1). Woodland with sparse canopy of forest red gum (*Eucalyptus tereticornis*) and coolabah (*E. coolabah*), with a very sparse sub-canopy of Sally wattle (*Acacia salicina*) and white bauhinia (*Lysiphyllum hookeri*). Very sparse shrub layer of Sally wattle. Ground layer dominated by exotic species, consisting primarily of Indian couch (*Bothriochloa pertusa*), green panic (*Megathyrsus maximus*) and paddy's lucerne (*Sida rhombifolia*). |
| **General Site Observations** | Trees form the ecologically dominant stratum; a mature community with some hollows; a narrow riparian strip approx. 50 metres wide but on the edge of a significant area of intact remnant vegetation which includes the Isaac River corridor; moderate recruitment; normal watercourse erosion, siltation in places; no dieback detected; fire scars absent. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered large hollows and small hollows common, in a mixture of dead and alive trees; scattered small logs; scattered leaf litter; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Seeding grass cover common; scattered fleshy fruiting plants, including harrisia cactus (*Harrisia martinii*); nectar/pollen producing plant abundant; koala feed trees common. |
| **Signs** | Scattered macropod scats; common woodland birds including peaceful dove, willie wagtail, Torresian crow and striated pardalote. |
| **Koala Feed Trees** | Forest red gum (*Eucalyptus tereticornis*) and coolabah (*E. coolabah*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: high (2); key existing threats: medium (1); recovery value: medium (1); overall score: 5 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>CQ7 (Fauna) | |
| **Location**<br>Winchester Downs | |
| **Date**<br>1/06/2017 | |
| **Latitude**<br>-22.13870 | |
| **Longitude**<br>148.29280 | |
| **Slope:**<br>0° | |
| **Aspect:**<br>- | |
| **Infrastructure:**<br>Rail corridor | |

| **General Site Description** | |
|---|---|
| **Landform** | Palustrine wetland on level plain |
| **Soil** | Brown light clay |
| **Observed vegetation** | RE 11.3.27f (mapped as 11.3.2 / 11.3.7). Woodland dominated by forest blue gum (*Eucalyptus tereticornis*), with abundant coolabah (*E. coolabah*). No distinguishable sub-canopy. Very sparse shrub layer of Sally wattle (*Acacia salicina*). Ephemeral native wetland species dominate the ground layer with Spike rush (*Eleocharis philippinensis*) the dominant species. Southern cut grass (*Leersia hexandra*) is common in patches while willow primrose (*Ludwigia octovalvis*), giant flat sedge (*Cyperus exaltatus*), white eclipta (*Eclipta prostrata*) and hairy nardoo (*Marsilea drummondii*) are scattered throughout. |
| **General Site Observations** | Trees form ecologically dominant stratum; a mature community with some hollows; part of a significant area of intact remnant vegetation which includes the Isaac River corridor; low to moderate recruitment; low erosion; no dieback detected; fire scars absent. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Small and large hollows abundant, in a mixture of dead and alive trees; scattered large logs; small logs common; scattered leaf litter; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Seeding grass cover common; fleshy fruiting plants scattered, including dysentery plant (*Grewia latifolia*) and lantana (*Lantana camara*); nectar / pollen producing plant common; koala feed trees common. |
| **Signs** | Scattered macropod scats; possum / glider scratches on trees; greater glider scats; common woodland birds including peaceful dove, white-throated gerygone, red-backed fairy wren moorhen and black duck. |
| **Koala Feed Trees** | Forest blue gum (*Eucalyptus tereticornis*) and coolabah (*E. coolabah*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: high (2); key existing threats: medium (1); recovery value: high (2); overall score: 6 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>CQ8 (Fauna) | |
| **Location**<br>Winchester Downs | |
| **Date**<br>1/06/2017 | |
| **Latitude**<br>-22.13952 | |
| **Longitude**<br>148.29348 | |
| **Slope:**<br><1° | |
| **Aspect:**<br>SW | |
| **Infrastructure:**<br>Rail corridor | |

| **General Site Description** | |
|---|---|
| **Landform** | Level plain |
| **Soil** | Brown loam |
| **Observed vegetation** | RE 11.3.2 (mapped as 11.3.2 / 11.3.7). Woodland dominated by poplar box (*Eucalyptus populnea*), with frequent Dallachy's gum (*Corymbia dallachyana*). Very sparse sub canopy of poplar box and Sally wattle (*Acacia salicina*). Very sparse shrub layer of bean tree (*Cassia brewsteri),* dysentery plants (*Grewia retusifolia* and *G. latifolius*), sandpaper fig (*Ficus opposita*), whitewood (*Atalaya hemiglauca*), lantana (*Lantana camara*) and wombat berry (*Eustrephus latifolius*). Ground layer is a mix of buffel grass (*Cenchrus ciliaris*), black speargrass (*Heteropogon contortus*), kangaroo grass (*Themeda triandra*), brown silky top (*Eulalia aurea*), hairy panic (*Panicum effusum*), curly windmill grass (*Enteropogon acicularis*) and hairy panic (*Digitaria brownii*). |
| **General Site Observations** | Trees form ecologically dominant stratum; a mature community but mostly younger trees with few hollows; part of a significant area of intact remnant vegetation which includes the Isaac River corridor; good recruitment; low erosion; no dieback detected; fire scars absent. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered large hollows and abundant small hollows, in a mixture of dead and alive trees; scattered small and large logs; leaf litter common; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Seeding grass common; scattered fruiting plants: dysentery plants, winter apple (*Eremophila debilis*), sandpaper fig, lantana and wombat berry; nectar / pollen producing plants abundant; koala feed trees common. |
| **Signs** | Scattered macropod scats; possum / glider scratches; common woodland birds present, including sulphur-crested cockatoo, white-throated gerygone, pale-headed rosella, whistling kite, striated pardalote, willie wagtail, peaceful dove and laughing kookaburra. |
| **Koala Feed Trees** | Poplar box (*Eucalyptus populnea*). No scratches/pellets, despite searches |
| **Koala habitat score** | Koala occurrence: low (0); veg. composition: medium (1); habitat connectivity: high (2); key existing threats: medium (1); recovery value: medium (1); overall score: 5 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>CQ9 (Fauna) | |
| **Location**<br>Wynette | |
| **Date**<br>1/06/2017 | |
| **Latitude**<br>-22.14615 | |
| **Longitude**<br>148.30033 | |
| **Slope:**<br><1° | |
| **Aspect:**<br>S | |
| **Infrastructure:**<br>Rail corridor | |

| **General Site Description** | |
|---|---|
| **Landform** | River bank on level plain |
| **Soil** | Brown alluvial sand |
| **Observed vegetation** | RE 11.3.25 (Mapped as 11.3.25). Woodland dominated by forest red gum (*Eucalyptus tereticornis*), with frequent river she oak (*Casuarina cunninghamiana*), occasional Clarkson's bloodwood (*Corymbia clarksoniana*) and carbeen (*C. tessellaris*). Very sparse sub-canopy of white bauhinia (*Lysiphyllum hookeri*) and sally wattle (*Acacia salicina*). Sparse shrub layer of bean tree (*Cassia brewsteri*), sandpaper fig (*Ficus opposita*), lantana (*Lantana camara*) and flax-leaved paperbark (*Melaleuca linariifolia*). Ground layer dominated by introduced green panic (*Megathyrsus maximus*) and butterfly pea (*Clitoria ternatea*), with occasional kangaroo grass (*Themeda triandra*). |
| **General Site Observations** | Trees form ecologically dominant stratum; an immature community with mostly younger trees with occasional hollows in older trees; part of a significant area of intact remnant vegetation which includes the Isaac River corridor; moderate recruitment, likely to be affected by dense exotic groundcover; moderate erosion and slumping in parts from recent flooding; no dieback detected; fire scars absent. |

| **Fauna Habitat Observations** | |
|---|---|
| **Shelter / Cover** | Scattered small hollows, in a mixture of dead and alive trees; scattered small logs; leaf litter common; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Seeding grass cover common; fleshy fruiting plants scattered, including lantana and dysentery plant (*Grewia latifolius*); nectar / pollen producing plant abundant; koala feed trees common. |
| **Signs** | Scattered macropod scats; koala scratches; common woodland and water birds. |
| **Koala Feed Trees** | Forest red gum (*E. tereticornis*). Targeted searches identified koala scratches; Detection of pellets made difficult by prevalence of green panic. |
| **Koala habitat score** | Koala occurrence: high (2); vegetation composition: high (2); habitat connectivity: high (2); key existing threats: medium (1); recovery value: high (2); overall score: 9 = **Critical habitat**. |
| **Fauna habitat value – general** | Average. |

| | |
|---|---|
| **Survey Code**<br>CQ10 (Fauna) | |
| **Location**<br>Wynette | |
| **Date**<br>1/06/2017 | |
| **Latitude**<br>-22.14910 | |
| **Longitude**<br>148.30247 | |
| **Slope:**<br><1° | |
| **Aspect:**<br>ESE | |
| **Infrastructure:**<br>Rail corridor | |

| **General Site Description** | |
|---|---|
| **Landform** | Closed depression on level plain |
| **Soil** | Brown light clay |
| **Observed vegetation** | RE 11.3.27f (mapped as 11.3.27b). Woodland with a sparse canopy dominated by coolabah (*Eucalyptus coolabah*), with frequent forest red gum (*E. tereticornis*). Very sparse sub-canopy of coolabah and sally wattle (*Acacia salicina*). Shrub layer absent. Ground layer is composed of native wetland species including southern cut grass (*Leersia hexandra*), spiny mudgrass (*Pseudoraphis spinescens*), brown beetle grass (*Diplachne fusca*), spike rushes (*Eleocharis philippinensis* and *E. plana*) and dwarf cassia (*Chamaecrista mimosoides*). |
| **General Site Observations** | Trees form the ecologically dominant stratum; ephemeral wetland currently full after recent rainfall and runoff events; part of a significant area of intact remnant vegetation which includes the Isaac River corridor; moderate recruitment; no erosion; no dieback detected; fire scars absent. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Small hollows common, in a mixture of dead and alive trees; scattered small logs; scattered leaf litter; dense shrub / grass shelter common. |
| **Food Potential Over Entire Year** | Seeding grass cover abundant; fleshy fruiting plants not detected; nectar / pollen producing plant abundant; koala feed trees common. |
| **Signs** | Scattered macropod scats; medium sized woodland bird nests; common woodland birds present, including noisy miner, Torresian crow, laughing kookaburra, Australian magpie and pale-headed rosella. |
| **Koala Feed Trees** | Coolabah (*E. coolabah*) and forest red gum (*E. tereticornis*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: high (2); key existing threats: medium (1); recovery value: medium (1); overall score: 6 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>CQ11 (Fauna) | |
| **Location**<br>Wynette | |
| **Date**<br>1/06/2017 | |
| **Latitude**<br>-22.15170 | |
| **Longitude**<br>148.30618 | |
| **Slope:**<br>1° | |
| **Aspect:**<br>SE | |
| **Infrastructure:**<br>Rail corridor | |

| **General Site Description** | |
|---|---|
| **Landform** | Gently undulating plain |
| **Soil** | Brown light clay |
| **Observed vegetation** | Agricultural grassland dominated by buffel grass (*Cenchrus ciliaris*), with adjacent vegetation consistent with RE 11.4.8 (*Eucalyptus cambageana* woodland to open forest with *Acacia harpophylla* or *A. argyrodendron* on Cainozoic clay plains). |
| **General Site Observations** | Non-remnant (cleared). Blade ploughed. |

| **Fauna Habitat Observations** | |
|---|---|
| **Shelter / Cover** | Grass shelter. |
| **Food Potential Over Entire Year** | Forage for herbivores. |
| **Signs** | Scattered macropod scats. |
| **Koala Feed Trees** | Absent. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: low (0); habitat connectivity: low (0); key existing threats: medium (1); recovery value: low (0); overall score: 1 = Not critical habitat. |
| **Fauna habitat value – general** | Degraded. |

| | |
|---|---|
| **Survey Code**<br>CQ12 (Fauna) | |
| **Location**<br>Wynette | |
| **Date**<br>1/06/2017 | |
| **Latitude**<br>-22.15286 | |
| **Longitude**<br>148.30689 | |
| **Slope:**<br><1° | |
| **Aspect:**<br>SE | |
| **Infrastructure:**<br>Rail corridor | |

| **General Site Description** | |
|---|---|
| **Landform** | Level plain |
| **Soil** | Brown light clay |
| **Observed vegetation** | RE 11.4.8 (mapped as 11.4.9). Sparse woodland dominated by Dawson gum (*Eucalyptus cambageana*), with a sparse sub-canopy of Brigalow (*Acacia harpophylla*), scrub leopardwood (*Flindersia dissosperma*) and ironwood (*Acacia excelsa*). Very sparse shrub layer containing currant bush (*Carissa ovata*), scrub boonaree (*Alectryon diversifolius*), dysentery plants (*Grewia retusifolia* and *G. latifolius*), whitewood (*Atalaya hemiglauca*), shiny-leaved canthium (*Psydrax buxifolia*), red bauhinia (*Lysiphyllum carronii*), poison peach (*Ehretia membranifolia*) and scrub leopardwood. Ground layer dominated by a mix of curly windmill grass (*Enteropogon acicularis*), wiregrass (*Aristida sp.*) and buffel grass (*Cenchrus ciliaris*). |
| **General Site Observations** | Trees form the ecologically dominant stratum; a sparse community that has suffered some disturbance, possibly fire; cleared vegetation to the west, but forms part of a significant area of intact remnant vegetation extending to the east, including the Isaac River corridor; moderate cattle grazing, yet moderate recruitment; no erosion; no dieback detected; fire scars absent. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Small hollows common, mostly in dead trees; large logs common; small logs abundant; scattered leaf litter; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Seeding grass cover common; scattered fleshy fruiting plants, including currant bush and dysentery plants (*Grewia retusifolia* and *G. latifolius*); nectar / pollen producing plant common. |
| **Signs** | Scattered macropod scats; common woodland birds, including willie wagtail and Australian magpie. |
| **Koala Feed Trees** | None detected. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: low (0); habitat connectivity: low (0); key existing threats: medium (1); recovery value: low (0); overall score: 1 = Not critical habitat. |
| **Fauna habitat value – general** | Average. |

| | |
|---|---|
| **Survey Code**<br>CQ13 (Fauna) | |
| **Location**<br>Wynette | |
| **Date**<br>1/06/2017 | |
| **Latitude**<br>-22.15908 | |
| **Longitude**<br>148.31327 | |
| **Slope:**<br><1° | |
| **Aspect:**<br>E | |
| **Infrastructure:**<br>Rail corridor | |
| **General Site Description** | |
| **Landform** | Drainage feature on level plain |
| **Soil** | Brown light clay |
| **Observed vegetation** | RE 11.4.8 (mapped as 11.4.9). Woodland with a sparse canopy of Dawson gum (*Eucalyptus cambageana*) and sparse sub-canopy of Brigalow (*Acacia harpophylla*) and red bauhinia (*Lysiphyllum carronii*). Very sparse shrub layer including yellowwood (*Terminalia oblongata*), red bauhinia, wilga (*Geijera parviflora*) and brigalow. Ground layer dominated by buffel grass (*Cenchrus ciliaris*). Other exotic species include harrisia cactus (*Harrisia martinii*), parthenium (*Parthenium hysterophorus*) and sabi grass (*Urochloa mosambicensis*). Native grasses represented in low numbers by forest bluegrass (*Bothriochloa bladhii*) and Queensland bluegrass (*Dichanthium sericeum*). |
| **General Site Observations** | Trees form the ecologically dominant stratum; a narrow and sparse community that has suffered edge effect disturbance from fire; tenuous linkage to the Isaac River corridor; moderate recruitment; significant erosion in adjacent cleared paddocks; siltation; dieback detected; fire scarring present. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered small hollows, mostly in dead trees; scattered small logs; scattered leaf litter; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Seeding grass cover common; scattered fleshy fruiting plants, including dysentery plant (*Grewia latifolius*); nectar / pollen producing plant scattered. |
| **Signs** | Scattered macropod scats; common woodland birds, including willie wagtail and striated pardalote. |
| **Koala Feed Trees** | None detected. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: low (0); habitat connectivity: low (0); key existing threats: medium (1); recovery value: low (0); overall score: 1 = Not critical habitat. |
| **Fauna habitat value – general** | Average. |

| | |
|---|---|
| **Survey Code**<br>CQ14 (Fauna) | |
| **Location**<br>Wynette | |
| **Date**<br>2/06/2017 | |
| **Latitude**<br>-22.15769 | |
| **Longitude**<br>148.29784 | |
| **Slope:**<br>1° | |
| **Aspect:**<br>E | |
| **Infrastructure:**<br>Rail corridor | |

| **General Site Description** | |
|---|---|
| **Landform** | Level plain |
| **Soil** | Brown light clay |
| **Observed vegetation** | RE 11.4.8 (mapped as 11.3.1). Woodland with sparse canopy of Dawson gum (*Eucalyptus cambageana*) and very sparse sub-canopy of brigalow (*Acacia harpophylla*) and red bauhinia (*Lysiphyllum carronii*). Very sparse shrub layer containing yellowwood (*Terminalia oblongata*), red bauhinia, brigalow, sandalwood (*Santalum lanceolatum*), scrub boonaree (*Alectryon diversifolius*), brigalow senna (*Senna coronilloides*) and poison peach (*Ehretia membranifolia*). Ground layer dominated by canegrass (*Leptochloa digitata*) in drainage line and by buffel grass (*Cenchrus ciliaris*) on plain, with frequent musk basil (*Basilicum polystachion*), parthenium (*Parthenium hysterophorus*), forest bluegrass (*Bothriochloa bladhii*) and Queensland bluegrass (*Dichanthium sericeum*). |
| **General Site Observations** | Trees form the ecologically dominant stratum; a sparse community that has possibly suffered edge effect disturbance from fire; tenuous linkage to the Isaac River corridor; moderate recruitment; no erosion; dieback detected; fire scarring low; broad drainage area. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered small hollows, mostly in dead trees; small logs abundant; scattered leaf litter; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Seeding grass cover scattered; fleshy fruiting plants not detected; scattered nectar / pollen producing plant; koala feed trees not detected. |
| **Signs** | Scattered macropod scats; common woodland birds, including striated pardalote, willie wagtail and wedge-tailed eagle. |
| **Koala Feed Trees** | None detected. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: low (0); habitat connectivity: low (0); key existing threats: high (2); recovery value: low (0); overall score: 2 = not critical habitat. |
| **Fauna habitat value – general** | Poor to average. |

| | |
|---|---|
| **Survey Code**<br>CQ15 (Fauna) | |
| **Location**<br>Wynette | |
| **Date**<br>2/06/2017 | |
| **Latitude**<br>-22.17320 | |
| **Longitude**<br>148.32074 | |
| **Slope:**<br>1° | |
| **Aspect:**<br>NNW | |
| **Infrastructure:**<br>Rail corridor | |

| **General Site Description** | |
|---|---|
| **Landform** | Gently undulating plain |
| **Soil** | Orange-brown loam |
| **Observed vegetation** | RE 11.5.3 (mapped as 11.5.3). Open woodland with a very sparse canopy of poplar box (*Eucalyptus populnea*). Very sparse sub-canopy of poplar box and white bauhinia (*Lysiphyllum hookeri*). Sparse shrub layer containing scrub boonaree (*Alectryon diversifolius*), small-leaved ebony (*Diospyros humilis*) and poison peach (*Ehretia membranifolia*). Ground layer dominated by buffel grass (*Cenchrus ciliaris*). |
| **General Site Observations** | Trees form the ecologically dominant stratum; a sparse community that has suffered edge effect disturbance from fire; part of a large block of contiguous vegetation (4.5km x 2.5km), connecting with the Isaac River corridor; moderate recruitment; no erosion; no dieback detected; fire scarring present. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | No hollows or logs detected; scattered leaf litter; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Seeding grass cover scattered; fleshy fruiting plants scattered, including small-leaved ebony; scattered nectar / pollen producing plant; koala feed trees scattered. |
| **Signs** | Scattered macropod scats; common woodland birds, including Torresian crow and red-backed fairy wren. |
| **Koala Feed Trees** | Poplar box (*E. populnea*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: medium (1); habitat connectivity: high (2); key existing threats: medium (1); recovery value: medium (1); overall score: 5 = **Critical habitat**. |
| **Fauna habitat value – general** | Poor to average. |

| | |
|---|---|
| **Survey Code**<br>CQ16 (Fauna) | |
| **Location**<br>Wynette | |
| **Date**<br>2/06/2017 | |
| **Latitude**<br>-22.18744 | |
| **Longitude**<br>148.34176 | |
| **Slope:**<br><1° | |
| **Aspect:**<br>NW | |
| **Infrastructure:**<br>Rail corridor | |

| **General Site Description** | |
|---|---|
| **Landform** | Level plain |
| **Soil** | Brown sandy loam |
| **Observed vegetation** | Woodland with sparse canopy dominated by poplar box (*Eucalyptus populnea*), with occasional Clarkson's bloodwood (*Corymbia clarksoniana*). Sparse sub-canopy of ironwood (*Acacia excelsa*), bootlace oak (*Hakea lorea*) and bean tree (*Cassia brewsteri*). Sparse shrub layer of quinine tree (*Petalostigma pubescens*), yellowberry bush (*Denhamia cunninghamii*), scrub wilga (*Geijera salicifolia*), vine tree (*Ventilago viminalis*), ironwood, dead finish (*Archidendropsis basaltica*) and poison peach (*Ehretia membranifolia*). Ground layer dominated by buffel grass (*Cenchrus ciliaris*), with occasional golden beard grass (*Chrysopogon fallax*), black spear grass (*Heteropogon contortus*), wiregrass (*Aristida sp.*), wiry nineawn (*Enneapogon lindleyanus*), velvet hibiscus (*Melhania oblongifolia*), bottletree caustic (*Euphorbia tannensis*) and shotgrass (*Paspalidium distans*). |
| **General Site Observations** | Trees form the ecologically dominant stratum; a healthy community with a range of maturities; part of a large block of contiguous vegetation (4.5km x 2.5km) including the Isaac River corridor; good recruitment; no erosion; no dieback detected; no fire scarring. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered large hollows; small hollows common, in a mixture of dead and alive trees; large logs scattered; small logs common; scattered leaf litter; scattered shrub / grass shelter; scattered termite mounds. |
| **Food Potential Over Entire Year** | Seeding grass common; scattered fruiting plants: quinine tree, native pomegranate (*Capparis arborea*) and dysentery plant (*Grewia retusifolia*), nectar / pollen producing plant common; koala feed trees common. |
| **Signs** | Scattered macropod scats; common woodland birds. |
| **Koala Feed Trees** | Poplar box (*E. populnea*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: high (2); key existing threats: medium (1); recovery value: medium (1); overall score: 6 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>CQ17 (Fauna) | |
| **Location**<br>Wynette | |
| **Date**<br>2/06/2017 | |
| **Latitude**<br>-22.16978 | |
| **Longitude**<br>148.32429 | |
| **Slope:**<br>0° | |
| **Aspect:**<br>- | |
| **Infrastructure:**<br>Rail corridor | |

| **General Site Description** | |
|---|---|
| **Landform** | Closed depression on level plain |
| **Soil** | Brown clay loam with weathered ironstone nodules |
| **Observed vegetation** | RE 11.5.17 (mapped as 11.5.17). Woodland with sparse canopy comprised of forest red gum (*Eucalyptus tereticornis*). No discernible sub-canopy. Very sparse shrub layer of young forest red gum. Ground layer inundated at the time of survey and consisted of *Juncus sp*., brown beetle grass (*Diplachne fusca*), willow primrose (*Ludwigia octovalvis*), white eclipta (*Eclipta prostrata*) and clustered lovegrass (*Eragrostis elongata*). |
| **General Site Observations** | Trees form the ecologically dominant stratum; a healthy community on what appears to be a short-term ephemeral wetland; part of a large block of contiguous vegetation (4.5km x 2.5km) adjoining the Isaac River corridor; good recruitment; no erosion; numerous dead trees; no fire scarring. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered large hollows; small hollows abundant, in mostly dead trees; large logs scattered; small logs common; leaf litter common; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Seeding grass cover common; fleshy fruiting plants scattered, including creeping lantana (*Lantana montevidensis*); nectar / pollen producing plant common; koala feed trees common. |
| **Signs** | Scattered macropod scats; medium and large bird nests; common woodland and water birds, including noisy miner, pied currawong, pale-headed rosella, whistling kite, masked lapwing, white-necked heron, grey teal and pacific black duck; recent koala scratches and pellets. |
| **Koala Feed Trees** | Forest red gum (*E. tereticornis*). |
| **Koala habitat score** | Koala occurrence: high (2); vegetation composition: high (2); habitat connectivity: high (2); key existing threats: medium (1); recovery value: medium (1); overall score: 8 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>CQ18 (Fauna) | |
| **Location**<br>Wynette | |
| **Date**<br>2/06/2017 | |
| **Latitude**<br>-22.16728 | |
| **Longitude**<br>148.32146 | |
| **Slope:**<br><1° | |
| **Aspect:**<br>S | |
| **Infrastructure:**<br>Rail corridor | |

| **General Site Description** | |
|---|---|
| **Landform** | Level plain |
| **Soil** | Orange-brown loam |
| **Observed vegetation** | RE 11.5.15 (mapped as 11.5.15). Woodland dominated by poplar box (*Eucalyptus populnea*), occasional Clarkson's bloodwood (*Corymbia clarksoniana*), Dallachy gum (*C. dallachiana*) and poplar box hybrid. Very sparse sub-canopy of white bauhinia (*Lysiphyllum hookeri*), crows ash (*Flindersia australis*) and shiny-leaved canthium (*Psydrax odorata*). Mid-dense shrub layer of purple pea bush (*Hovea longipes*), acalypha (*Acalypha eremorum*), wilga (*Geijera parviflora*), scrub wilga (*G. salicifolia*), shiny-leaved canthium, cocaine tree (*Erythroxylum australe*), quinine tree (*Petalostigma pubescens*) and dysentery plant (*Grewia latifolia*). Ground layer dominated by buffel grass (*Cenchrus ciliaris*), associated wiregrass (*Aristida sp.*), golden beard grass (*Chrysopogon fallax*), red natal grass (*Melinis repens*), black spear grass (*Heteropogon contortus*), kangaroo grass (*Themeda triandra*) and wiry nineawn (*Enneapogon lindleyanus*). |
| **General Site Observations** | Trees form the ecologically dominant stratum; a mixed community comprising a canopy of 11.5.3 species with sub-canopy and shrub layer consistent with SEVT 11.5.15 community; part of a large block of contiguous vegetation (4.5km x 2.5km) adjoining the Isaac River corridor; good recruitment; no erosion; no dieback detected; no fire scarring. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Small hollows common, mostly in dead trees; small logs common; leaf litter common; dense shrub / grass shelter common. |
| **Food Potential Over Entire Year** | Seeding grass cover scattered; scattered fleshy fruiting plants, including quinine tree and dysentery plant; nectar / pollen producing plant common; koala feed trees common. |
| **Signs** | Scattered macropod scats; common woodland birds, including pale-headed rosella and noisy miner. |
| **Koala Trees** | Poplar box (*E. populnea*). No scratches / pellets, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); veg. composition: high (2); habitat connectivity: high (2); key existing threats: medium (1); recovery value: medium (1); overall score: 6 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>CQ19 (Fauna) | |
| **Location**<br>Wynette | |
| **Date**<br>2/06/2017 | |
| **Latitude**<br>-22.16570 | |
| **Longitude**<br>148.31992 | |
| **Slope:**<br>1° | |
| **Aspect:**<br>W | |
| **Infrastructure:**<br>Rail corridor | |

| **General Site Description** | |
|---|---|
| **Landform** | Gently undulating plain |
| **Soil** | Brown sandy loam |
| **Observed vegetation** | RE 11.5.3 (mapped as 11.5.3). Woodland dominated by narrow-leaved ironbark (*Eucalyptus crebra*), with frequent poplar box (*E. populnea*), *E. populnea* x *E. crebra* hybrid and Dallachy's gum (*Corymbia dallachiana*). Very sparse sub-canopy of narrow-leaved ironbark, Dallachy's gum and emu apple (*Owenia acidula*). Very sparse shrub layer of narrow-leaved ironbark, bean tree (*Cassia brewsteri*) and quinine tree (*Petalostigma pubescens*). Ground layer dominated by buffel grass (*Cenchrus ciliaris*), with frequent golden beard grass (*Chrysopogon fallax*), red Natal grass (*Melinis repens*), black spear grass (*Heteropogon contortus*), wiregrass (*Aristida sp.*), velvet hibiscus (*Melhania oblongifolia*), *Digitaria* sp., shrubby stylo (*Stylosanthes scabra*) and shrub sida (*Sida rohlenae*). |
| **General Site Observations** | Trees form the ecologically dominant stratum; a mostly young community with the occasional hollow-bearing older tree; ironbark dominates the canopy in this component of the 11.5.3 polygon. Part of a large block of contiguous vegetation (4.5km x 2.5km) adjoining the Isaac River corridor; good recruitment; no erosion; no dieback detected; no fire scarring. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Small hollows common; scattered small logs; scattered leaf litter; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Seeding grass cover scattered; scattered fleshy fruiting plants, including emu apple and quinine tree; nectar / pollen producing plant common; koala feed trees common. |
| **Signs** | Scattered macropod scats. Common woodland birds, including noisy miner, willie wagtail and striated pardalote. |
| **Koala Feed Trees** | Narrow-leaved ironbark (*E. crebra*) and poplar box (*E. populnea*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: high (2); key existing threats: medium (1); recovery value: medium (1); overall score: 6 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>CQ20 (Fauna) | |
| **Location**<br>Winchester Downs | |
| **Date**<br>3/06/2017 | |
| **Latitude**<br>-22.14796 | |
| **Longitude**<br>148.27804 | |
| **Slope:**<br>1° | |
| **Aspect:**<br>W | |
| **Infrastructure:**<br>Rail corridor | |

| **General Site Description** | |
|---|---|
| **Landform** | Gently undulating plain |
| **Soil** | Brown light clay (cracking) |
| **Observed vegetation** | RE 11.9.5 (mapped as 11.9.3 / 11.9.2). Woodland with sparse canopy of brigalow (*Acacia harpophylla*) and mountain coolabah (*Eucalyptus orgadophila*). Very sparse sub-canopy of brigalow, whitewood (*Atalaya hemiglauca*), white bauhinia (*Lysiphyllum hookeri*) and yellowwood (*Terminalia oblongata*). Sparse shrub layer containing yellowwood, brigalow, currant bush (*Carissa ovata*), white bauhinia and vine tree (*Ventilago viminalis*). Ground layer dominated by buffel grass (*Cenchrus ciliaris*), with occasional parthenium (*Parthenium hysterophorus*) and forest bluegrass (*Bothriochloa bladhii*). |
| **General Site Observations** | Trees form the ecologically dominant stratum; a disturbed community that has possibly suffered edge effect disturbance from fire; isolated patch in the landscape; moderate recruitment; no erosion; dieback common; large amount of coarse woody debris; fire scarring not obvious, 11.9.5 community extends to the SW within the mapped 11.9.3 / 11.9.2 polygon. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | No hollows detected; small logs abundant; scattered leaf litter; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Scattered seeding grass cover; scattered fleshy fruiting plants, including currant bush; nectar / pollen producing plant scattered; scattered koala feed trees. |
| **Signs** | Common woodland birds, including magpie-lark, noisy miner, grey-crowned babbler and grey butcherbird. |
| **Koala Feed Trees** | Mountain coolibah (*Eucalyptus orgadophila*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: medium (1); habitat connectivity: low (0); key existing threats: medium (1); recovery value: low (0); overall score: 2 = Not critical habitat. |
| **Fauna habitat value – general** | Poor to average. |

| | |
|---|---|
| **Survey Code**<br>CQ21 (Fauna) | |
| **Location**<br>Winchester Downs | |
| **Date**<br>3/06/2017 | |
| **Latitude**<br>-22.14861 | |
| **Longitude**<br>148.27941 | |
| **Slope:**<br><1° | |
| **Aspect:**<br>SE | |
| **Infrastructure:**<br>Rail corridor | |

| **General Site Description** | |
|---|---|
| **Landform** | Level plain |
| **Soil** | Red-brown light clay |
| **Observed vegetation** | RE 11.9.2 (mapped as Non-remnant). Woodland with very sparse canopy of mountain coolabah (*Eucalyptus orgadophila*), with no discernible sub-canopy. Very sparse shrub layer containing currant bush (*Carissa ovata*), red bauhinia (*Lysiphyllum carronii*), vine tree (*Ventilago viminalis*), boonaree (*Alectryon oleifolius*), scrub boonaree (*A. diversifolius*), bean tree (*Cassia brewsteri*), whitewood (*Atalaya hemiglauca*) and limebush (*Citrus glauca*). Ground layer dominated by forest bluegrass (*Bothriochloa bladhii*), with abundant buffel grass (*Cenchrus ciliaris*) and kangaroo grass (*Themeda triandra*), frequent black spear grass (*Heteropogon contortus*) and occasional parthenium (*Parthenium hysterophorus*) and wiregrass (*Aristida* sp.). |
| **General Site Observations** | Trees form the ecologically dominant stratum; a naturally sparse community that has possibly been overlooked during mapping due to its open grassland nature; low recruitment; no erosion; some dieback; fire scarring not obvious; aerial imagery indicates no historical clearing. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Small hollows abundant, in a mixture of dead and alive trees; small logs scattered; leaf litter scattered; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Seeding grass cover common; scattered fleshy fruiting plants, including currant bush, limebush and wombat berry (*Eustrephus latifolius*); nectar / pollen producing plant common; Very sparse canopy comprised of koala feed trees, although woodland likely too open to be favoured by koala. |
| **Signs** | Scattered macropod scats; common woodland birds, including noisy miner, pale-headed rosella and Australian magpie. |
| **Koala Feed Trees** | Mountain coolibah (*E. orgadophila*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: low (0); key existing threats: medium (1); recovery value: medium (1); overall score: 4 = Not critical habitat. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>CQ22 (Fauna) | |
| **Location**<br>Winchester Downs | |
| **Date**<br>3/06/2017 | |
| **Latitude**<br>-22.15685 | |
| **Longitude**<br>148.28737 | |
| **Slope:**<br><1° | |
| **Aspect:**<br>SE | |
| **Infrastructure:**<br>Rail corridor | |

| **General Site Description** | |
|---|---|
| **Landform** | Level plain |
| **Soil** | Brown light clay (cracking) |
| **Observed vegetation** | RE 11.4.8 (mapped as 11.9.3 / 11.9.2). Woodland comprising sparse canopy of Dawson gum (*Eucalyptus cambageana*). Very sparse to sparse sub-canopy of red bauhinia (*Lysiphyllum carronii*), yellowwood (*Terminalia oblongata*) and brigalow (*Acacia harpophylla*). Sparse shrub layer containing yellowwood, brigalow, emu apple (*Owenia acidula*), brigalow senna (*Senna coronilloides*), red bauhinia, scrub boonaree (*Alectryon diversifolius*), wild orange (*Capparis mitchellii*), currant bush (*Carissa ovata*) and fuchsia bush (*Eremophila maculata*). Ground layer a mix of Queensland bluegrass (*Dichanthium sericeum*), Mitchell grass (*Astrebla lappacea*), slender rat's tail grass (*Sporobolus creber*), windmill grass (*Enteropogon acicularis*), *Malvastrum* sp., *Aristida* sp., shot grass (*Paspalidium distans*) and forest bluegrass (*Bothriochloa bladhii*). |
| **General Site Observations** | Trees form the ecologically dominant stratum; a disturbed and patchy community that has likely suffered edge effects, including disturbance from fire; isolated patch with tenuous linkage to the east along a minor watercourse; moderate recruitment; no erosion; dieback detected; fire scarring not obvious. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Small hollows abundant, dead and alive; scattered large logs; small logs common; scattered leaf litter; dense shrub / grass shelter common. |
| **Food Potential Over Entire Year** | Seeding grass cover common; scattered fleshy fruiting plants, including emu apple, wild orange, currant bush, tree pear (*Opuntia tomentosa*) and wombat berry (*Eustrephus latifolius*); nectar / pollen prod. plant common. |
| **Signs** | Scattered macropod scats; common woodland birds, including Torresian crow, whistling kite, black-faced cuckoo shrike, black-faced woodswallow, noisy miner and willie wagtail. |
| **Koala Feed Trees** | None detected. No scratches / pellets, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: low (0); habitat connectivity: low (0); key existing threats: medium (1); recovery value: low (0); overall score: 1 = Not critical habitat. |
| **Fauna habitat value – general** | Average. |

| | |
|---|---|
| **Survey Code**<br>CQ23 (Fauna) | |
| **Location**<br>Winchester Downs | |
| **Date**<br>3/06/2017 | |
| **Latitude**<br>-22.15899 | |
| **Longitude**<br>148.29041 | |
| **Slope:**<br>1° | |
| **Aspect:**<br>E | |
| **Infrastructure:**<br>Rail corridor | |

| **General Site Description** | |
|---|---|
| **Landform** | Drainage depression on gently undulating plain |
| **Soil** | Brown light clay (cracking) |
| **Observed vegetation** | RE 11.4.8 (mapped as 11.4.9). Woodland with sparse canopy dominated by brigalow (*Acacia harpophylla*), with frequent Dawson gum (*Eucalyptus cambageana*) and red bauhinia (*Lysiphyllum carronii*). Very sparse sub-canopy of brigalow, red bauhinia and false sandalwood (*Eremophila mitchellii*). Sparse shrub layer containing yellowwood (*Terminalia oblongata*), brigalow, white bauhinia (*Lysiphyllum hookeri*), scrub boonaree (*Alectryon diversifolius*), limebush (*Citrus glauca*), currant bush (*Carissa ovata*) and poison peach (*Ehretia membranifolia*). Ground layer contains buffel grass (*Cenchrus ciliaris*), fairy grass (*Sporobolus caroli*), parthenium (*Parthenium hysterophorus*), cumbungi (*Typha sp.*,), *Juncus sp.*, forest blue grass (*Bothriochloa bladhii*), canegrass (*Leptochloa digitata*), *Cyperus isabellinus*, trim flat sedge (*Cyperus concinnus*), nardoo (*Marsilea drummondii*) and musk basil (*Basilicum polystachion*). |
| **General Site Observations** | Trees form the ecologically dominant stratum; high level disturbance from grazing cattle; tenuous linkage to the east along a minor watercourse; moderate recruitment; low erosion; within a watercourse and tail end of impoundment; large component of patch is semi-permanent water; fire scarring not obvious. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered small hollows, mostly in living trees; small logs abundant; small logs abundant; scattered leaf litter; dense shrub / grass shelter common. |
| **Food Potential Over Entire Year** | Seeding grass cover common; scattered fleshy fruiting plants, including limebush and currant bush; nectar / pollen producing plant common. |
| **Signs** | Scattered macropod scats; common woodland birds, including willie wagtail, pale-headed rosella, whistling kite, double-barred finch, mistletoe bird, singing honeyeater, rufous whistler and grey fantail. |
| **Koala Feed Trees** | None detected. No koala scratches or pellets detected. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: low (0); habitat connectivity: low (0); key existing threats: medium (1); recovery value: low (0); overall score: 1 = Not critical habitat. |
| **Fauna habitat value – general** | Good. |

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|---|---|
| **Survey Code**<br>CQ24 (Fauna) | |
| **Location**<br>Iffley | |
| **Date**<br>4/06/2017 | |
| **Latitude**<br>-22.19259 | |
| **Longitude**<br>148.34695 | |
| **Slope:**<br>1° | |
| **Aspect:**<br>NE | |
| **Infrastructure:**<br>Rail corridor | |

| **General Site Description** | |
|---|---|
| **Landform** | Gently undulating plain |
| **Soil** | Brown light clay to sandy loam |
| **Observed vegetation** | RE 11.4.9 (mapped as 11.5.3 / 11.4.9). Woodland with sparse canopy dominated by brigalow (*Acacia harpophylla*), with occasional poplar box (*Eucalyptus populnea*). Sparse to very sparse sub-canopy of sandalwood (*Santalum lanceolatum*), white bauhinia (*Lysiphyllum hookeri*), brigalow and emu apple (*Owenia acidula*). Very sparse shrub layer containing shiny-leaved canthium (*Psydrax odorata* subsp. *buxifolia*), sandalwood, currant bush (*Carissa ovata*), poison peach (*Ehretia membranifolia*), water vine (*Clematicissus opaca*) and northern silk pod (*Parsonsia lanceolata*). Ground layer dominated by buffel grass (*Cenchrus ciliaris*) and green panic (*Megathyrsus maximus*), with occasional sabi grass (*Urochloa mosambicensis*) and native grasses windmill grass (*Enteropogon acicularis*), fairy grass (*Sporobolus caroli*), wiregrass (*Aristida calycina*), shot grass (*Paspalidium distans*), brigalow grass (*P. caespitosum*) and *P. rarum*. |
| **General Site Observations** | Trees form the ecologically dominant stratum; significant block of intact remnant vegetation with reduced connectivity due to strip clearing; good recruitment; low erosion; within a minor drainage depression with isolated pool; downstream of dam; fire scarring not obvious. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered small hollows, mostly in dead trees; large logs scattered; small logs abundant; scattered leaf litter; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Seeding grass cover common; fleshy fruiting plants scattered; nectar / pollen producing plant common. |
| **Signs** | Scattered macropod scats and tracks; common woodland birds, including willie wagtail, pied currawong, white-throated honeyeater, red-winged parrot, noisy friarbird, pied butcherbird and striated pardalote. |
| **Koala Feed Trees** | Poplar box (*E. populnea*). No scratches / pellets, despite searches. |
| **Koala habitat score** | Koala occurrence: low (0); veg. composition: medium (1); habitat connectivity: medium (1); key existing threats: medium (1); recovery value: med. (1); overall score: 4 = Not critical habitat. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>CQ25 (Fauna) | |
| **Location**<br>Iffley | |
| **Date**<br>4/06/2016 | |
| **Latitude**<br>-22.19544 | |
| **Longitude**<br>148.34967 | |
| **Slope:**<br>1° | |
| **Aspect:**<br>NW | |
| **Infrastructure:**<br>Rail corridor | |

| **General Site Description** | |
|---|---|
| **Landform** | Gently undulating plain |
| **Soil** | Brown sandy loam |
| **Observed vegetation** | RE 11.5.3 (mapped as 11.5.3). Woodland dominated by poplar box (*E. populnea*), occasional narrow-leaved ironbark (*Eucalyptus crebra*). Sparse sub-canopy of sally wattle (*Acacia salicina*), ironwood (*A. excelsa*), poplar box, vine tree (*Ventilago viminalis*), bean tree (*Cassia brewsteri*) and emu apple (*Owenia acidula*). Sparse shrub layer of currant bush (*Carissa ovata*), sally wattle, poplar box and quinine tree (*Petalostigma pubescens*). Ground layer dominated by buffel grass (*Cenchrus ciliaris*) and wiregrasses (*Aristida calycina* and *A. jericoensis*), with frequent golden beard grass (*Chrysopogon fallax*), wiry nineawn (*Enneapogon lindleyanus*), shotgrass (*Paspalidium distans*), kangaroo grass (*Themeda triandra*), curly windmill grass (*Enteropogon acicularis*), velvet hibiscus (*Melhania oblongifolia*), shrubby stylo (*Stylosanthes scabra*) and shrub sida (*Sida rohlenae*). |
| **General Site Observations** | Trees form ecologically dominant stratum; mature community; part of a large irregularly shaped block of contiguous vegetation (6km x 4km); moderate fragmentation from clearing corridors throughout; good recruitment; no erosion, dieback or fire scarring detected. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered large hollows and abundant small hollows, mostly in living trees; scattered large logs; small logs common; scattered leaf litter; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Seeding grass common; scattered fleshy fruiting plants, including emu apple, currant bush, quinine tree and dysentery plant (*Grewia retusifolia*); nectar / pollen producing plant common; koala feed trees common. |
| **Signs** | Scattered macropod scats; rabbit pellets; common woodland birds, including white-throated gerygone and willie wagtail. |
| **Koala Feed Trees** | Poplar box (*E. populnea*) and narrow-leaved ironbark (*E. crebra*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); veg. composition: high (2); habitat connectivity: medium (1); key existing threats: medium (1); recovery value: medium (1); overall score: 5 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>CQ26 (Fauna) | |
| **Location**<br>Olive Downs | |
| **Date**<br>8/06/2017 | |
| **Latitude**<br>-22.15137 | |
| **Longitude**<br>148.33544 | |
| **Slope:**<br><1° | |
| **Aspect:**<br>E | |
| **Infrastructure:**<br>ETL | |

| **General Site Description** | |
|---|---|
| **Landform** | River bank on level plain |
| **Soil** | Brown alluvial sand |
| **Observed vegetation** | RE 11.3.25 (mapped as 11.3.25). Woodland to open forest with sparse to mid-dense canopy dominated by forest red gum (*Eucalyptus tereticornis*), with occasional carbeen (*Corymbia tessellaris*). Very sparse sub-canopy of sally wattle (*Acacia salicina*), forest red gum and bean tree (*Cassia brewsteri*). Mid-dense shrub layer dominated by lantana (*Lantana camara*), with occasional bean tree (*Cassia brewsteri),* sandpaper fig *(Ficus opposita),* sally wattle and birdflower (*Crotalaria laburnifolia* subsp. *laburnifolia).* Ground layer dominated by introduced green panic (*Megathyrsus maximus*) and buffel grass (*Cenchrus ciliaris*), with occasional natives including forest blue grass (*Bothriochloa bladhii*) and pitted blue grass (*B. decipiens*). |
| **General Site Observations** | Trees form the ecologically dominant stratum; an immature community with mostly younger trees, with occasional hollows in older trees; part of a significant area of intact remnant vegetation along the Isaac River corridor; moderate recruitment likely to be affected by dense exotic groundcover; moderate erosion and slumping in parts from recent flooding; no dieback detected; fire scars absent. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered large and small hollows common, dead and alive trees; scattered small and large logs; scattered leaf litter; dense shrub / grass common. |
| **Food Potential Over Entire Year** | Seeding grass common; fruiting plants abundant, including lantana and sandpaper fig; nectar / pollen plant abundant; koala feed trees common. |
| **Signs** | Scattered macropod scats; possum / glider scratches; common woodland birds, including willie wagtail, grey fantail, double-barred finch, pied butcherbird and striated pardalote. |
| **Koala Feed Trees** | Forest red gum (*E. tereticornis*). Koala scratches recorded during fauna survey May 2017. |
| **Koala habitat score** | Koala occurrence: high (2); vegetation composition: high (2); habitat connectivity: high (2); key existing threats: medium (1); recovery value: high (2); overall score: 9 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>CQ27 (Fauna) | |
| **Location**<br>Olive Downs | |
| **Date**<br>8/06/2017 | |
| **Latitude**<br>-22.14731 | |
| **Longitude**<br>148.33450 | |
| **Slope:**<br>1° | |
| **Aspect:**<br>NE | |
| **Infrastructure:**<br>ETL and access | |

| **General Site Description** | |
|---|---|
| **Landform** | Gently undulating plain |
| **Soil** | Brown sandy loam |
| **Observed vegetation** | RE 11.3.2 (mapped as 11.3.2 / 11.3.7 / 11.3.1). Woodland with sparse canopy dominated by poplar box (*Eucalyptus populnea*), with occasional Dallachy's gum (*Corymbia dallachiana*). Very sparse sub-canopy of sally wattle (*Acacia salicina*) and poplar box. Very sparse shrub layer containing lantana (*Lantana camara*), whitewood *(Atalaya hemiglauca*), sally wattle and bean tree (*Cassia brewsteri*). Ground layer dominated by buffel grass (*Cenchrus ciliaris*), with occasional sabi grass (*Urochloa mosambicensis*), shrubby stylo (*Stylosanthes scabra*) and golden beard grass (*Chrysopogon fallax*). |
| **General Site Observations** | Trees form the ecologically dominant stratum; a healthy community with mostly younger trees with occasional older trees; part of a significant area of intact remnant vegetation along the Isaac River corridor; good recruitment; erosion NE of this site with some subsoil exposure; no dieback detected; fire scars absent. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Small hollows common, mostly in dead trees; scattered small and large logs; leaf litter common; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Seeding grass cover scattered; scattered fleshy fruiting plants, including lantana velvety tree pear (*Opuntia tomentosa*); nectar / pollen producing plant common; koala feed trees common. |
| **Signs** | Scattered macropod scats; common woodland birds, including weebill, noisy miner, striated pardalote, pied currawong, willie wagtail, grey fantail, pied butcherbird, rufous whistler and double-barred finch. |
| **Koala Feed Trees** | Poplar box (*E. populnea*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: high (2); key existing threats: medium (1); recovery value: high (2); overall score: 8 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>CQ28 (Fauna) | |
| **Location**<br>Olive Downs | |
| **Date**<br>8/06/2017 | |
| **Latitude**<br>-22.14460 | |
| **Longitude**<br>148.33392 | |
| **Slope:**<br><1° | |
| **Aspect:**<br>SW | |
| **Infrastructure:**<br>ETL and access | |

| **General Site Description** | |
|---|---|
| **Landform** | Drainage line on level plain |
| **Soil** | Brown sandy light clay with sandy stream bed |
| **Observed vegetation** | Boundary of RE 11.3.25 and 11.4.8 (mapped as 11.4.8). Woodland with sparse canopy dominated by coolabah (*Eucalyptus coolabah*), with occasional brigalow (*Acacia harpophylla*), poplar box (*Eucalyptus populnea*) and narrow-leaved ironbark (*E. crebra*). Very sparse sub-canopy of sally wattle (*Acacia salicina*), coolabah, Dallachy's gum (*Corymbia dallachiana*) and white bauhinia (*Lysiphyllum hookeri*). Very sparse shrub layer of sally wattle and mimosa (*Vachellia farnesiana*). Ground layer dominated by introduced green panic (*Megathyrsus maximus*) and Indian couch (*Bothriochloa pertusa*). |
| **General Site Observations** | Trees form the ecologically dominant stratum; a mixed community with influence from land zone 4 clays along the northern extent; part of a significant area of intact remnant vegetation along the Isaac River corridor; good recruitment and good health; low erosion but some gullying in banks from cattle pads; no dieback detected; fire scars absent. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered small hollows; small logs common; scattered leaf litter; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Scattered seeding grass cover; scattered fleshy fruiting plants, including harrisia cactus (*Harrisia martinii*), dysentery plant (*Grewia retusifolia*), winter apple (*Eremophila debilis*) and lantana (*Lantara camara*); nectar / pollen producing plant common; koala feed trees scattered. |
| **Signs** | Scattered macropod scats; common woodland birds, including noisy friarbird, white-chinned honeyeater, striated pardalote and willie wagtail. |
| **Koala Feed Trees** | Coolabah (*Eucalyptus coolabah*), poplar box (E. populnea) and narrow-leaved ironbark (*E. crebra*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: high (2); key existing threats: medium (1); recovery value: medium (1); overall score: 6 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>CQ29 (Fauna) | |
| **Location**<br>Olive Downs | |
| **Date**<br>8/06/2017 | |
| **Latitude**<br>-22.14321 | |
| **Longitude**<br>148.33383 | |
| **Slope:**<br>1° | |
| **Aspect:**<br>SW | |
| **Infrastructure:**<br>ETL and access | |

| **General Site Description** | |
|---|---|
| **Landform** | Gently undulating plain |
| **Soil** | Brown light clay |
| **Observed vegetation** | RE 11.4.8 (mapped as Non-remnant). Woodland with very sparse canopy of Dawson gum (*Eucalyptus cambageana*). Very sparse sub-canopy of Dawson gum, brigalow (*Acacia harpophylla*) and ironwood (*Acacia excelsa*). Sparse shrub layer of scrub boonaree (*Alectryon diversifolius*), yellowwood (*Terminalia oblongata*), warrior bush (*Apophyllum anomalum*), currant bush (*Carissa ovata*), narrow-leaved bumbil (*Capparis loranthifolia*), limebush (*Citrus glauca*), whitewood (*Atalaya hemiglauca*) and poison peach (*Ehretia membranifolia*). Ground layer dominated by buffel grass (*Cenchrus ciliaris*), with frequent Indian couch (*Bothriochloa pertusa*) and occasional fairy grass (*Sporobolus caroli*), Queensland blue grass (*Dichanthium sericeum*) and cup grass (*Eriochloa pseudoacrotricha*). |
| **General Site Observations** | Trees form the ecologically dominant stratum; likely fire damaged; part of a significant area of intact remnant vegetation along the Isaac River corridor; recruitment is low; scattered rill erosion; no dieback detected; fire scars absent. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered small hollows, mostly in dead trees; scattered small logs; scattered leaf litter; shrub / grass shelter common. |
| **Food Potential Over Entire Year** | Seeding grass cover scattered; scattered fleshy fruiting plants, including currant bush, narrow-leaved bumbil and limebush; scattered nectar / pollen producing plant. |
| **Signs** | Common woodland birds, including grey fantail and white-throated honeyeater. |
| **Koala Feed Trees** | None detected. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: low (0); habitat connectivity: high (2); key existing threats: medium (1); recovery value: low (0); overall score: 3 = Not critical habitat. |
| **Fauna habitat value – general** | Average. |

| | |
|---|---|
| **Survey Code**<br>CQ30 (Fauna) | |
| **Location**<br>Olive Downs | |
| **Date**<br>8/06/2017 | |
| **Latitude**<br>-22.09724 | |
| **Longitude**<br>148.33364 | |
| **Slope:**<br>1° | |
| **Aspect:**<br>SE | |
| **Infrastructure:**<br>ETL and Access | |

| **General Site Description** | |
|---|---|
| **Landform** | Gently undulating plain |
| **Soil** | Brown light clay |
| **Observed vegetation** | Non-remnant (mapped as Non-remnant). Shrubland with sparse canopy of brigalow (*Acacia harpophylla*), with frequent yellowwood (*Terminalia oblongata*) and occasional scrub boonaree (*Alectryon diversifolius*) and currant bush (*Carissa ovata*). Ground layer dominated by buffel grass (*Cenchrus ciliaris*), with frequent cup grass (*Eriochloa crebra*), *Cyperus sp*., musk basil (*Basilicum polystachion*), dirty dora (*Cyperus difformis*), canegrass (*Leptochloa digitata*), parthenium (*Parthenium hysterophorus*), common rush (*Juncus usitatus*), white Eclipta (*Eclipta prostrata*) and dwarf lantern flower (*Abutilon fraseri*). |
| **General Site Observations** | Brigalow regrowth; estimated 3-5 years since last treated; gilgai, varying from small to medium water holes; wet at time of survey with ephemeral wetland species estimated at 15-25% of ground cover depending on density of gilgai; good habitat for reptiles, amphibians and water birds. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered small rocks; scattered leaf litter; dense shrub / grass shelter common. |
| **Food Potential Over Entire Year** | Seeding grass cover scattered; scattered fleshy fruiting plants, including currant bush and harrisia cactus (*Harissia martinii*); scattered nectar / pollen producing plant. |
| **Signs** | Scattered macropod scats; common birds of cleared land, including Australasian pipit, Horsfield's bushlark and wedge-tailed eagle. |
| **Koala Feed Trees** | None detected. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: low (0); habitat connectivity: low (0); key existing threats: medium (1); recovery value: low (0); overall score: 1 = Not critical habitat. |
| **Fauna habitat value – general** | Poor to average. |

| | |
|---|---|
| **Survey Code**<br>CQ31 (Fauna) | |
| **Location**<br>Moorvale | |
| **Date**<br>9/06/2017 | |
| **Latitude**<br>-22.08308 | |
| **Longitude**<br>148.35991 | |
| **Slope:**<br>1° | |
| **Aspect:**<br>SW | |
| **Infrastructure:**<br>ETL and Access | |

| **General Site Description** | |
|---|---|
| **Landform** | Gently undulating plain |
| **Soil** | Orange-brown sandy loam |
| **Observed vegetation** | RE 11.3.2 (mapped as 11.3.2 / 11.3.1). Woodland with sparse canopy of poplar box (*Eucalyptus populnea*). Very sparse sub-canopy of poplar box, sally wattle (*Acacia salicina*) and carbeen (*Corymbia tessellaris*). Sparse shrub layer of bean tree (*Cassia brewsteri*), currant bush (*Carissa ovata*), dead finish (*Archidendropsis basaltica*), poplar box, boonaree (*Alectryon oleifolius*) and scrub boonaree (*A. diversifolius*). Ground layer dominated by buffel grass (*Cenchrus ciliaris*), with abundant sabi grass (*Urochloa mosambicensis*), frequent shrub sida (*Sida rhombifolia*) and wiregrasses (*Aristida calycina* and *Aristida* sp.), occasional golden beard grass (*Chrysopogon fallax*), hooky grass (*Ancistrachne uncinulata*), burr daisy (*Calotis cuneifolia*), cockatoo grass (*Alloteropsis semialata*), pitted blue grass (*Bothriochloa decipiens*) and tropical speedwell (*Evolvulus alsinoides*). |
| **General Site Observations** | Trees form the ecologically dominant stratum; mostly young community with scattered older trees; part of a riparian corridor approx. 0.5km wide with linkage to the Isaac River; recruitment is good; scattered rill erosion; fire scars absent. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Small hollows abundant, mostly in dead trees; scattered large logs; small logs common; scattered leaf litter; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Seeding grass cover scattered; scattered fleshy fruiting plants, including currant bush, nipan (*Capparis lasiantha*) and dysentery bush (*Grewia retusifolia*); nectar / pollen plant common; koala feed trees common. |
| **Signs** | Scattered macropod scats; common woodland birds, including noisy miner, pied butcherbird, pale-headed rosella, willie wagtail and striated pardalote. |
| **Koala Feed Trees** | Poplar box (E. populnea). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); veg. composition: high (2); habitat connectivity: medium (1); key existing threats: medium (1); recovery value: medium (1); overall score: 5 = **Critical habitat**. |
| **Fauna habitat value – general** | Average. |

| | |
|---|---|
| **Survey Code**<br>CQ32 (Fauna) | |
| **Location**<br>North Ck, Moorvale | |
| **Date**<br>9/06/2017 | |
| **Latitude**<br>-22.08335 | |
| **Longitude**<br>148.35862 | |
| **Slope:**<br>1° reach; 30° bank | |
| **Aspect:**<br>S | |
| **Infrastructure:**<br>ETL and access | |

| **General Site Description** | |
|---|---|
| **Landform** | Bank of watercourse transecting gently undulating plain |
| **Soil** | Brown sand |
| **Observed vegetation** | RE 11.3.25 (mapped as 11.3.25). Woodland with sparse canopy dominated by forest red gum (*Eucalyptus tereticornis*), with abundant river she-oak (*Casuarina cunninghamiana*), frequent carbeen (*Corymbia tessellaris*), and occasional Clarkson's bloodwood (*C. clarksoniana*). Very sparse sub-canopy of forest red gum, carbeen and ironwood (*Acacia excelsa*). Very sparse shrub layer of white bauhinia (*Lysiphyllum hookeri*), lantana (*Lantana camara*), sandpaper fig (*Ficus opposita*) and bean tree (*Cassia brewsteri*). Ground layer dominated by Green panic (*Megathyrsus maximus*), with frequent long-leaved matrush (*Lomandra longifolia*). |
| **General Site Observations** | Trees form the ecologically dominant stratum; a mature community with a range of canopy maturities; part of a riparian corridor approx. 0.5km wide with linkage to the Isaac River; good recruitment and good health; low erosion, but a mobile creek on alluvial sands with evidence of regular movement; no dieback detected; fire scars absent. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Small hollows common, in a mixture of dead and alive trees; large logs scattered; small logs common; scattered leaf litter; dense shrub / grass shelter common. |
| **Food Potential Over Entire Year** | Seeding grass cover common; scattered fleshy fruiting plants, including lantana, sandpaper fig, wombat berry (*Eustrephus latifolius*) and pest pear (*Opuntia stricta*); nectar / pollen producing plant common; koala feed trees common. |
| **Signs** | Scattered macropod scats; possum / glider scratches; koala scratches; common woodland birds, including galah, red-winged parrot, pied butcherbird, Australian magpie and striated pardalote. |
| **Koala Feed Trees** | Forest red gum (*E. tereticornis*). Koala scratches detected. |
| **Koala habitat score** | Koala occurrence: high (2); vegetation composition: high (2); habitat connectivity: medium (1); key existing threats: medium (1); recovery value: high (2); overall score: 8 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>CQ33 (Fauna) | |
| **Location**<br>Moorvale | |
| **Date**<br>9/06/2017 | |
| **Latitude**<br>-22.08366 | |
| **Longitude**<br>148.35711 | |
| **Slope:**<br>1° | |
| **Aspect:**<br>S | |
| **Infrastructure:**<br>ETL and access | |

| **General Site Description** | |
|---|---|
| **Landform** | Gently undulating plain |
| **Soil** | Orange-brown sandy loam |
| **Observed vegetation** | RE 11.3.2 (mapped as 11.9.5 / 11.9.1 / 11.9.2). Woodland with very sparse canopy of poplar box (*Eucalyptus populnea*). Very sparse sub-canopy of poplar box and carbeen (*Corymbia tessellaris*). Very sparse shrub layer of bean tree (*Cassia brewsteri*), sally wattle (*Acacia salicina*), boonaree (*Alectryon oleifolius*), white bauhinia (*Lysiphyllum hookeri*), and ironwood (*Acacia excelsa*). Ground layer dominated by buffel grass (*Cenchrus ciliaris*), with abundant wiregrass (*Aristida calycina*) and frequent golden beard grass (*Chrysopogon fallax*), pineapple daisy (*Pterocaulon redolens*), shrubby stylo (*Stylosanthes scabra*), *Waltheria indica* and flannel weed (*Sida cordifolia*). |
| **General Site Observations** | Trees form the ecologically dominant stratum; sparse community with numerous dead trees, possibly old treated country; part of a riparian corridor approx. 0.5km wide with linkage to the Isaac River; recruitment is poor; low erosion; large stags present; fire scars absent. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered large hollows and abundant small hollows, in mostly dead trees; scattered large logs; small logs abundant; leaf litter scattered; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Scattered seeding grass cover; scattered fleshy fruiting plants, including dysentery plant (*Grewia retusifolia*); scattered nectar / pollen producing common; koala feed trees common. |
| **Signs** | Common woodland birds, including Torresian crow. |
| **Koala Feed Trees** | Poplar box (*E. populnea*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: medium (1); key existing threats: medium (1); recovery value: medium (1); overall score: 5 = **Critical habitat**. |
| **Fauna habitat value – general** | Average. |

| | |
|---|---|
| **Survey Code**<br>CQ34 (Fauna) | |
| **Location**<br>Moorvale | |
| **Date**<br>9/06/2017 | |
| **Latitude**<br>-22.06348 | |
| **Longitude**<br>148.36022 | |
| **Slope:**<br>1° reach | |
| **Aspect:**<br>SW | |
| **Infrastructure:**<br>ETL and access | |
| **General Site Description** | |
| **Landform** | Creek bank on gently undulating plain |
| **Soil** | Brown alluvial sands and light clays |
| **Observed vegetation** | RE 11.3.25 (mapped as 11.4.9 / 11.5.3). Sparse canopy dominated by forest red gum (*Eucalyptus tereticornis*), with occasional carbeen (*Corymbia tessellaris*) and brigalow (*Acacia harpophylla*). Very sparse sub-canopy of white bauhinia (*Lysiphyllum hookeri*), yellowwood (*Terminalia oblongata*) and brigalow. Sparse to very sparse shrub layer of yellowwood, cassinia (*Elaeodendron australe*), cocaine tree (*Erythroxylum australe*), scrub boonaree (*Alectryon diversifolius*), narrow-leaved bumbil (*Capparis loranthifolia*), wild orange (*C. mitchellii*), currant bush (*Carissa ovata*) and whitewood (*Atalaya hemiglauca*). Ground layer dominated by Indian couch (*Bothriochloa pertusa*) and green panic (*Megathyrsus maximus*). |
| **General Site Observations** | Trees form ecologically dominant stratum; a complex community with clay soil elements (land zone 4) as the southern boundary of riparian movement; a range of canopy tree maturities; part of a riparian corridor approx. 150 m wide with linkage to the Isaac River; moderate recruitment and good health; active tunnel erosion in highly dispersible subsoils to west of creek line; no dieback detected; fire scars absent. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Large hollows common and small hollows abundant, in a mixture of dead and alive trees; scattered large logs; small logs common; scattered leaf litter; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Seeding grass scattered; scattered fruiting plants, including wild orange, narrow-leaved bumbil, currant bush and harissia cactus (*Harrisia martinii*); nectar / pollen producing plant common; koala feed trees common. |
| **Signs** | Scattered macropod scats; koala scratches; possum / glider scratches; common bird species, including sulphur-crested cockatoo, white-throated honeyeater, apostlebird, Torresian crow and white-faced heron. |
| **Koala Feed Trees** | Forest red gum (*E. tereticornis*). Koala scratches detected. |
| **Koala habitat score** | Koala occurrence: high (2); vegetation composition: high (2); habitat connectivity: high (2); key existing threats: medium (1); recovery value: medium (1); overall score: 8 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>CQ35 (Fauna) | |
| **Location**<br>Moorvale | |
| **Date**<br>9/06/2017 | |
| **Latitude**<br>-22.05498 | |
| **Longitude**<br>148.34910 | |
| **Slope:**<br><1° | |
| **Aspect:**<br>NW | |
| **Infrastructure:**<br>ETL and Access | |

| **General Site Description** | |
|---|---|
| **Landform** | Level plain |
| **Soil** | Brown sandy loam |
| **Observed vegetation** | RE 11.3.2 (mapped as 11.3.2 / 11.3.1). Woodland with very sparse canopy of poplar box (*Eucalyptus populnea*). Very sparse sub-canopy of poplar box and vine tree (*Ventilago viminalis*). Very sparse shrub layer of white bauhinia (*Lysiphyllum hookeri*), currant bush (*Carissa ovata*), false sandalwood (*Eremophila mitchellii*), nipan (*Capparis lasiantha*), scrub boonaree (*Alectryon diversifolius*) and lantana (*Lantana camara*). Ground layer dominated by Buffel grass (*Cenchrus ciliaris*), Indian couch (*Bothriochloa pertusa*) and sabi grass (*Urochloa mosambicensis*). |
| **General Site Observations** | Trees form the ecologically dominant stratum; sparse community with old fire damage; part of a riparian corridor approx. 0.5 km wide with linkage to the Isaac River and a local block of remnant vegetation 2.5 km x 2.5 km; poor recruitment; eroding edges of the plain in this locality; small to medium stags present; fire scars evident. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Small hollows common, mostly in dead trees; scattered small logs; scattered leaf litter; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Scattered seeding grass cover; scattered fleshy fruiting plants, including currant bush, nipan and lantana; nectar / pollen producing plant common; koala feed trees common. |
| **Signs** | Scattered macropod scats; common woodland birds, including double-barred finch, Torresian crow, pied currawong, striated pardalote and white-winged chough. |
| **Koala Feed Trees** | Poplar box (*E. populnea*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: high (2); key existing threats: medium (1); recovery value: medium (1); overall score: 6 = **Critical habitat**. |
| **Fauna habitat value – general** | Average. |

| | |
|---|---|
| **Survey Code**<br>CQ36 (Fauna) | |
| **Location**<br>North Ck, Moorvale | |
| **Date**<br>9/06/2017 | |
| **Latitude**<br>-22.05260 | |
| **Longitude**<br>148.35101 | |
| **Slope:**<br>1° reach; 40° bank | |
| **Aspect:**<br>SW | |
| **Infrastructure:**<br>ETL and Access | |

| **General Site Description** | |
|---|---|
| **Landform** | Bank of watercourse transecting gently undulating plain |
| **Soil** | Brown sand |
| **Observed vegetation** | RE 11.3.25 (mapped as 11.3.25). Woodland with sparse canopy dominated by forest red gum (*Eucalyptus tereticornis*), with abundant river she-oak (*Casuarina cunninghamiana*), occasional carbeen (*Corymbia tessellaris*) and poplar box (*E. populnea*). Very sparse sub-canopy of white bauhinia (*Lysiphyllum hookeri*). Very sparse shrub layer of white bauhinia, bean tree (*Cassia brewsteri*), lantana (*Lantana camara*) and sandpaper fig (*Ficus opposita*). Ground layer dominated by green panic (*Megathyrsus maximus*) and sabi grass (*Urochloa mosambicensis*). |
| **General Site Observations** | Trees form the ecologically dominant stratum; a mature community with a range of canopy tree maturities, with good hollows; part of a riparian corridor approx. 0.5 km wide, with linkage to the Isaac River and a local block of remnant vegetation 2.5 km x 2.5 km; moderate recruitment and good health; semi-permanent waterbody with downstream sandstone bar; upstream barrier comprising granite boulder crossing with small flume pipes, being the road crossing to Daunia granite quarry; lantana prominent within the shrub layer; no dieback detected; fire scars absent. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Large hollows common and small hollows abundant, living trees; scattered small and large logs; scattered leaf litter; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Seeding grass cover common; scattered fleshy fruiting plants, including lantana and sandpaper fig; nectar / pollen producing plant abundant; koala feed trees common. |
| **Signs** | Scattered macropod scats; possum / glider scratches; greater glider scats; koala scratches; common woodland birds, including striated pardalote, grey fantail, Australian magpie, galah, white-winged chough, white-throated honeyeater and Torresian crow. |
| **Koala Feed Trees** | Forest red gum (*E. tereticornis*) and poplar box (*E. populnea*). |
| **Koala habitat score** | Koala occurrence: high (2); vegetation composition: high (2); habitat connectivity: high (2); key existing threats: medium (1); recovery value: medium (1); overall score: 8 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>CQ37 (Fauna) | |
| **Location**<br>Moorvale | |
| **Date**<br>10/06/2017 | |
| **Latitude**<br>-22.00054 | |
| **Longitude**<br>148.31614 | |
| **Slope:**<br>1° | |
| **Aspect:**<br>W | |
| **Infrastructure:**<br>ETL | |

| **General Site Description** | |
|---|---|
| **Landform** | Level plain |
| **Soil** | Brown clay |
| **Observed vegetation** | RE 11.3.1 (mapped 11.3.2/11.3.1). Sparse canopy of Dawson gum (*Eucalyptus cambageana*) and sub-canopy dominated by brigalow (*Acacia harpophylla*), with yellowwood (*Terminalia oblongata*). Sparse shrub layer of currant bush (*Carissa ovata),* scrub boonaree (*Alectryon diversifolius),* nipan (*Capparis lasiantha),* vine tree (*Ventilago viminalis)* and yellowwood. Ground layer dominated by buffel grass (*Cenchrus ciliaris*), frequent Wiregrass (*Aristida jerichoensis*), and occasional sabi grass (*Urochloa mosambicensis*), hooky grass (*Ancistrachne uncinulata*), windmill grass (*Enteropogon acicularis*), spiked sida (*Sida hackettiana*), brigalow grass (*Paspalidium caespitosum*), flannel weed (*Abutilon oxycarpum*), fairy grass (*Sporobolus caroli*) and *Maireana microphylla*. |
| **General Site Observations** | Trees form the ecologically dominant stratum; a patchy community with grassy open areas; part of a riparian corridor approx. 1.5 km wide with linkage to the Isaac River; moderate recruitment and good health; no dieback detected; fire scars absent. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered small hollows, mostly in dead trees; small logs abundant; leaf litter common; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Scattered seeding grass cover; scattered fleshy fruiting plants, including currant bush, nipan, dysentery plant (*Grewia retusifolia*) and harrisia cactus (*Harrisia martinii*); nectar / pollen producing plant common. |
| **Signs** | Scattered macropod scats; common woodland birds: Torresian crow, striated pardalote, grey fantail, willie wagtail, Australian magpie, magpie lark, noisy miner, pied butcherbird, pale-headed rosella, weebill and blue-faced honeyeater. |
| **Koala Feed Trees** | None detected. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: low (0); habitat connectivity: medium (1); key existing threats: medium (1); recovery value: medium (1); overall score: 3 = Not critical habitat. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>CQ38 (Fauna) | |
| **Location**<br>Moorvale | |
| **Date**<br>10/06/2017 | |
| **Latitude**<br>-21.99964 | |
| **Longitude**<br>148.30980 | |
| **Slope:**<br><1° | |
| **Aspect:**<br>W | |
| **Infrastructure:**<br>ETL | |

| **General Site Description** | |
|---|---|
| **Landform** | Level plain |
| **Soil** | Brown sandy loam |
| **Observed vegetation** | RE 11.3.7 (mapped as 11.3.2 / 11.3.1). Woodland with a sparse canopy dominated by carbeen (*Corymbia tessellaris*) and Clarkson's bloodwood (*C. clarksoniana*), with abundant narrow-leaved ironbark (*Eucalyptus crebra*). Very sparse sub-canopy of carbeen, narrow-leaved ironbark and Clarkson's bloodwood. Very sparse shrub layer of carbeen and narrow-leaved ironbark. Ground layer dominated by buffel grass (*Cenchrus ciliaris*), with occasional wiregrass (*Aristida calycina*), curly windmill grass (*Enteropogon ramosus*), Paddy's Lucerne (*Sida rhombifolia*), yellow buttons (*Chrysocephalum apiculatum*), golden beard grass (*Chrysopogon fallax*) and yellow rattlepod (*Crotalaria mitchellii*). |
| **General Site Observations** | Trees form the ecologically dominant stratum; a young community with some mature larger trees; part of a riparian corridor approx. 1.5 km wide, with linkage to the Isaac River; good recruitment; no dieback detected; fire scars absent. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered small hollows, mostly in dead trees; scattered large logs; small logs common; scattered leaf litter. |
| **Food Potential Over Entire Year** | Scattered seeding grass cover; scattered fleshy fruiting plants, including dysentery plant (*Grewia retusifolia*); nectar / pollen producing plant common; koala feed trees scattered. |
| **Signs** | Scattered macropod scats; common woodland birds, including blue-faced honeyeater, crested pigeon, pied butcherbird, magpie lark, pale-headed rosella, noisy friarbird and Australian magpie. |
| **Koala Feed Trees** | Narrow-leaved ironbark (*E. crebra*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: medium (1); habitat connectivity: high (2); key existing threats: medium (1); recovery value: medium (1); overall score: 5 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>CQ39 (Fauna) | |
| **Location**<br>Moorvale | |
| **Date**<br>10/06/2017 | |
| **Latitude**<br>-21.99931 | |
| **Longitude**<br>148.30542 | |
| **Slope:**<br><1° | |
| **Aspect:**<br>S | |
| **Infrastructure:**<br>ETL | |

| **General Site Description** | |
|---|---|
| **Landform** | Level plain |
| **Soil** | Brown sandy loam |
| **Observed vegetation** | RE 11.3.2 (mapped as 11.3.2 / 11.3.1 / 11.3.25). Woodland with sparse canopy of poplar box (*Eucalyptus populnea*). Very sparse sub-canopy of poplar box, ironwood (*Acacia excelsa*) and bean tree (*Cassia brewsteri*). Very sparse shrub layer of currant bush (*Carissa ovata*), scrub boonaree (*Alectryon diversifolius*) and bean tree. Ground layer dominated by buffel grass (*Cenchrus ciliaris*), with occasional black spear grass (*Heteropogon contortus*), wiregrass (*Aristida* sp.), shrub sida (*Sida rohlenae*) and dysentery plant (*Grewia retusifolia*). |
| **General Site Observations** | Trees form the ecologically dominant stratum; a mature community with numerous mature larger trees; part of a riparian corridor approx. 1.5km wide with linkage to the Isaac River; good recruitment; no dieback detected; fire scars absent. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered large hollows and abundant small hollows, mostly in living trees; scattered large logs; small logs common; leaf litter common; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Scattered seeding grass cover; scattered fleshy fruiting plants, including currant bush, dysentery plant and harrisia cactus (*Harrisia martinii*); nectar / pollen producing plant common; koala feed trees common. |
| **Signs** | Scattered macropod scats; common woodland birds, including noisy miner, sulphur-crested cockatoo, blue-faced honeyeater, Australian magpie and Torresian crow. |
| **Koala Feed Trees** | Poplar box (*E. populnea*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: high (2); key existing threats: medium (1); recovery value: medium (1); overall score: 6 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>CQ40 (Fauna) | |
| **Location**<br>Moorvale | |
| **Date**<br>10/06/2017 | |
| **Latitude**<br>-21.98639 | |
| **Longitude**<br>148.28738 | |
| **Slope:**<br>2° | |
| **Aspect:**<br>SE | |
| **Infrastructure:**<br>ETL | |

| **General Site Description** | |
|---|---|
| **Landform** | Gently undulating plain |
| **Soil** | Brown sandy loam |
| **Observed vegetation** | RE 11.5.3 (mapped as 11.4.2). Woodland with sparse to mid-dense canopy of poplar box (*Eucalyptus populnea*), with a very sparse sub-canopy of poplar box, ironwood (*Acacia excelsa*), bean tree (*Cassia brewsteri*), scrub leopardwood (*Flindersia dissosperma*) and false sandalwood (*Eremophila mitchellii*). Very sparse shrub layer of dead finish (*Archidendropsis basaltica*), vine tree (*Ventilago viminalis*), bean tree and currant bush (*Carissa ovata*). Ground layer dominated by buffel grass (*Cenchrus ciliaris*), with abundant Paddy's lucerne (*Sida rhombifolia*), frequent curly windmill grass (*Enteropogon ramosus*), occasional cockatoo grass (*Alloteropsis semialata*), shrubby stylo (*Stylosanthes scabra*), velvet hibiscus (*Melhania oblongifolia*), *Waltheria indica*, golden beard grass (*Chrysopogon fallax*), chaff weed (*Achyranthes aspera*) and hairy panic (*Panicum effusum*). |
| **General Site Observations** | Trees form the ecologically dominant stratum; a mature community with scattered larger, mature trees; a disconnected patch 0.6 km wide with narrow linkage to riparian corridor to the east; good recruitment; no dieback detected; fire scars absent. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Large hollows scattered and small hollows common, mostly in dead trees; scattered large logs; small logs abundant; leaf litter common; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Scattered seeding grass; scattered fruiting plants: dysentery plant (*Grewia retusifolia*), currant bush and tree pear (*Opuntia tomentosa*); nectar / pollen producing plant common; koala feed trees common. |
| **Signs** | Scattered macropod scats. Common woodland birds, including striated pardalote, pale-headed rosella and willie wagtail. |
| **Koala Feed Trees** | Poplar box (*E. populnea*). No scratches / pellets, despite searches. |
| **Koala habitat score** | Koala occurrence: low (0); veg. composition: high (2); habitat connectivity: medium (1); key existing threats: medium (1); recovery value: medium (1); overall score: 5 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>CQ41 (Fauna) | |
| **Location**<br>Wynette | |
| **Date**<br>26/09/2017 | |
| **Latitude**<br>-22.15982 | |
| **Longitude**<br>148.31131 | |
| **Slope:**<br>1-2° | |
| **Aspect:**<br>E | |
| **Infrastructure:**<br>Rail corridor | |

| **General Site Description** | |
|---|---|
| **Landform** | Gently undulating plain |
| **Soil** | Brown light clay |
| **Observed vegetation** | 11.4.9 (mapped as 11.3.1). Open forest with a sparse canopy of Brigalow (*Acacia harpophylla*), coolabah (*Eucalyptus coolabah*), yellowwood (*Terminalia oblongata*) and red bauhinia (*Lysiphyllum carronii*). Very sparse shrub layer containing yellowwood, scrub boonaree (*Alectryon diversifolius*), wilga (*Geijera parviflora*) and sandalwood (*Santalum lanceolatum*). Ground layer dominated by buffel grass (*Cenchrus ciliaris*), with frequent canegrass (*Leptochloa digitata*) and curly windmill grass (*Enteropogon acicularis*). |
| **General Site Observations** | Trees form the ecologically dominant stratum; sparse community that has suffered edge effect disturbance from fire and exotic species incursion; tenuous linkage to the Isaac River corridor; moderate recruitment; some gully and bank erosion; fire scarring low. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered small hollows; scattered large logs; small logs common; leaf litter largely absent. |
| **Food Potential Over Entire Year** | Scattered seeding grass cover; scattered fleshy fruiting plants, including nipan (*Capparis lasiantha*); scattered nectar / pollen producing plants; scattered koala feed trees. |
| **Signs** | Scattered macropod scats; common woodland birds, including pied butcherbird, striated pardalote and Australian magpie. |
| **Koala Feed Trees** | Coolabah (*E. coolibah*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: medium (1); habitat connectivity: low (0); key existing threats: medium (1); recovery value: low (0); overall score: 2 = Not critical habitat. |
| **Fauna habitat value – general** | Average. |

| | |
|---|---|
| **Survey Code**<br>CQ42 (Fauna) | |
| **Location**<br>Winchester Downs | |
| **Date**<br>26/09/2017 | |
| **Latitude**<br>-22.14381 | |
| **Longitude**<br>148.29625 | |
| **Slope:**<br><1° | |
| **Aspect:**<br>S | |
| **Infrastructure:**<br>Rail corridor | |

| **General Site Description** | |
|---|---|
| **Landform** | Level plain |
| **Soil** | Brown light clay; alluvium |
| **Observed vegetation** | RE 11.3.27f (mapped as 11.3.2 / 11.3.7 / 11.3.1). Woodland dominated by coolabah (*Eucalyptus coolabah*), with frequent forest red gum (*E. tereticornis*), carbeen (*Corymbia tessellaris*) and Dallachy's gum (*C. dallachiana*). Very sparse sub-canopy at 12 m, reflective of the canopy species. Sparse shrub layer of bean tree (*Cassia brewsteri*) and sally wattle (*Acacia salicina*), with occasional lantana (*Lantana camara*). Ground layer dominated by forest bluegrass *(Bothriochloa bladhii)*, common rush (*Juncus usitatus*), clustered lovegrass (*Eragrostis elongata*) and white eclipta (*Eclipta prostrata*). |
| **General Site Observations** | Flood channel that periodically floods; trees form the ecologically dominant stratum; healthy wetland community with good recruitment; vegetation unit is part of the Isaac River riparian corridor, where the vegetated corridor is approximately 2 km wide at this point; no erosion detected; some old dieback evident. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Large hollows common; small hollows abundant, in a mixture of dead and alive trees; large logs common; scattered small logs; scattered leaf litter; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Seeding grass common; scattered fruiting plants, including lantana; nectar / pollen producing plants common; koala feed trees common. |
| **Signs** | Scattered macropod scats; birds detected at time of assessment comprised common native woodland species; koala scratches observed within same RE polygon approx. 260 m north-west. |
| **Koala Feed Trees** | Coolabah (*E. coolabah*) and forest blue gum (*E. tereticornis*). No koala scratches or pellets detected, despite targeted searches. However, koala scratches observed within same RE on the rail corridor alignment approx. 260 m north-west, as well as on the banks of the Isaac River. |
| **Koala habitat score** | Koala occurrence: high (2); vegetation composition: high (2); habitat connectivity: medium (2); key existing threats: medium (1); recovery value: medium (1); overall score: 8 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>CQ43 (Fauna) | |
| **Location**<br>Winchester Downs | |
| **Date**<br>26/09/2017 | |
| **Latitude**<br>-22.14418 | |
| **Longitude**<br>148.29590 | |
| **Slope:**<br><1° | |
| **Aspect:**<br>S | |
| **Infrastructure:**<br>Rail corridor | |

| **General Site Description** | |
|---|---|
| **Landform** | Level plain |
| **Soil** | Brown sandy loam; alluvium |
| **Observed vegetation** | RE 11.3.2 (mapped as 11.3.2 / 11.3.7 / 11.3.1). Woodland with sparse canopy dominated by poplar box (*Eucalyptus populnea*), with occasional carbeen (*Corymbia tessellaris*), Dallachy's gum (*C. dallachiana*) and Clarkson's bloodwood (*C. clarksoniana*). Sparse sub-canopy of sally wattle (*Acacia salicina*), boonaree (*Alectryon oleifolius*), Dallachy's gum and bean tree (*Cassia brewsteri*). Very sparse shrub layer of dysentery plant (*Grewia retusifolia*), lantana (*Lantana camara*) and bean tree. Ground layer dominated by buffel grass (*Cenchrus ciliaris*), with frequent black speargrass (*Heteropogon contortus*), wiregrass (*Aristida sp.*), Paddy's Lucerne (*Sida rhombifolia*), barbed wire grass (*Cymbopogon refractus*) and forest blue grass (*Bothriochloa bladhii*). |
| **General Site Observations** | Trees form the ecologically dominant stratum; part of the Isaac River riparian corridor approx. 2 km wide; good recruitment; no dieback detected; no fire scars evident. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered large hollows; small hollows common, in a mixture of dead and alive trees; scattered small and large logs; scattered leaf litter; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Scattered seeding grass cover; scattered fleshy fruiting plants, including dysentery plant and lantana; nectar / pollen producing plant common; koala feed trees common. |
| **Signs** | Scattered macropod scats; common woodland birds detected, including willie wagtail, pale-headed rosella, pied butcherbird and Torresian crow. |
| **Koala Feed Trees** | Poplar box (*E. populnea*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: medium (1); vegetation composition: high (2); habitat connectivity: high (2); key existing threats: medium (1); recovery value: medium (1); overall score: 7 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>CQ44 (Fauna) | |
| **Location**<br>Winchester Downs | |
| **Date**<br>26/09/2017 | |
| **Latitude**<br>-22.14123 | |
| **Longitude**<br>148.29309 | |
| **Slope:**<br><1° | |
| **Aspect:**<br>SE | |
| **Infrastructure:**<br>Rail corridor | |

| **General Site Description** | |
|---|---|
| **Landform** | Level plain |
| **Soil** | Brown light clay; alluvium |
| **Observed vegetation** | RE 11.3.1 (mapped as 11.3.27b). Open forest dominated by sparse canopy of brigalow (*Acacia harpophylla*) with occasional coolabah (*Eucalyptus coolabah*). Very sparse sub-canopy of brigalow. Shrub layer non-existent. Ground layer contains mostly aquatic species, dominated by brown beetle grass (*Diplachne fusca* var. *fusca*), with occasional rigid panic (*Walwhalleya proluta*), musk basil (*Basilicum polystachion*), spike rushes (*Eleocharis plana* and *Eleocharis* sp.) and wavy marshwort (*Nymphoides crenata*). |
| **General Site Observations** | Trees form the ecologically dominant stratum; a healthy community that is periodically inundated, being located on the edge of a palustrine wetland; part of the Isaac River corridor approx. 2km wide at this point; moderate recruitment; low exotic species. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered small hollows, in a mixture of dead and alive trees; small logs common; scattered lead litter. |
| **Food Potential Over Entire Year** | Scattered seeding grass cover; no fleshy fruiting plants detected; scattered koala feed trees. |
| **Signs** | Common woodland birds detected, including brown honeyeater, noisy friarbird and pied currawong. |
| **Koala Feed Trees** | Coolibah (*E. coolibah*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: medium (1); vegetation composition: medium (1); habitat connectivity: high (2); key existing threats: medium (1); recovery value: low (0); overall score: 5 = **Critical habitat**. |
| **Fauna habitat value – general** | Average. |

| | |
|---|---|
| **Survey Code**<br>CQ45 (Fauna) | |
| **Location**<br>Winchester Downs | |
| **Date**<br>26/09/2017 | |
| **Latitude**<br>-22.12471 | |
| **Longitude**<br>148.27298 | |
| **Slope:**<br>1-2° | |
| **Aspect:**<br>E | |
| **Infrastructure:**<br>Rail corridor | |

| **General Site Description** | |
|---|---|
| **Landform** | Drainage line transecting gently undulating plain |
| **Soil** | Brown light clay |
| **Observed vegetation** | RE 11.3.1 (mapped as 11.3.2 / 11.3.7 / 11.3.1). Open forest with a sparse canopy dominated by brigalow (*Acacia harpophylla*), with occasional coolabah (*Eucalyptus coolabah*), yellowwood (*Terminalia oblongata*) and Dallachy's gum (*Corymbia dallachiana*). Very sparse sub-canopy of yellowwood and red bauhinia (*Lysiphyllum carronii*). Sparse shrub layer of red bauhinia and bean tree (*Cassia brewsteri*). Ground layer contains dominated by green panic (*Megathyrsus maximus*), with frequent parthenium (*Parthenium hysterophorus*), sabi grass (*Urochloa mosambicensis*), Noogoora burr (*Xanthium occidentale*) and curly bluegrass (*Dichanthium fecundum*). |
| **General Site Observations** | Trees form the ecologically dominant stratum; a patchy linear community which is suffering from edge effects; part of the Isaac River corridor over 2 km wide at this point; moderate recruitment; high abundance of exotic species, likely ecotone with elements of 11.3.1 and 11.3.7. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Small hollows common, mainly in dead trees; small logs common; scattered large logs; scattered leaf litter; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Seeding grass cover common; scattered fleshy fruiting plants, including lantana and dysentery plant (*Grewia latifolia*); scattered nectar / pollen producing plant; occasional koala feed trees. |
| **Signs** | Scattered macropod scats; common native woodland birds detected, including noisy friarbird and pied butcherbird. |
| **Koala Feed Trees** | Coolabah (*E. coolabah*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: medium (1); habitat connectivity: high (2); key existing threats: medium (1); recovery value: low (0); overall score: 4 = Not critical habitat. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>CQ46 (Fauna) | |
| **Location**<br>Winchester Downs | |
| **Date**<br>26/09/2017 | |
| **Latitude**<br>-22.12398 | |
| **Longitude**<br>148.27299 | |
| **Slope:**<br>1-2° | |
| **Aspect:**<br>SE | |
| **Infrastructure:**<br>Rail corridor | |

| **General Site Description** | |
|---|---|
| **Landform** | Gently undulating plain |
| **Soil** | Brown light clay |
| **Observed vegetation** | Non-remnant (mapped as 11.3.2 / 11.3.7 / 11.3.1). Cleared recently, with brigalow (*Acacia harpophylla*), yellowwood (*Terminalia oblongata*) and red bauhinia (*Lysiphyllum carronii*) small trees (suckers) evident in the debris. |
| **General Site Observations** | Likely regrowth of previous clearing that has been re-treated. |

| **Fauna Habitat Observations** | |
|---|---|
| **Shelter / Cover** | No standing vegetation; ground debris included recently felled vegetation. |
| **Food Potential Over Entire Year** | Limited. |
| **Signs** | No signs of fauna usage. |
| **Koala Feed Trees** | None detected. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: low (0); habitat connectivity: low (0); key existing threats: medium (1); recovery value: low (0); overall score: 1 = Not critical habitat. |
| **Fauna habitat value – general** | Degraded. |

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|---|---|
| **Survey Code**<br>CQ47 (Fauna) | |
| **Location**<br>Winchester Downs | |
| **Date**<br>26/09/2017 | |
| **Latitude**<br>-22.12054 | |
| **Longitude**<br>148.27409 | |
| **Slope:**<br>1° | |
| **Aspect:**<br>E | |
| **Infrastructure:**<br>Rail corridor | |

| **General Site Description** | |
|---|---|
| **Landform** | Level plain |
| **Soil** | Brown sandy loam |
| **Observed vegetation** | RE 11.3.2 (mapped as 11.3.2 / 11.3.7 / 11.3.1). Woodland with sparse canopy dominated by poplar box (*Eucalyptus populnea*), with occasional sally wattle (*Acacia salicina*) and ironwood (*A. excelsa*). Very sparse sub-canopy of sally wattle, poplar box and ironwood. Very sparse shrub layer of sally wattle, poplar box, bean tree (*Cassia brewsteri*) and lolly bush (*Clerodendrum* sp.). Ground layer dominated by buffel grass (*Cenchrus ciliaris*), with occasional red Natal grass (*Melinis repens*), shrubby stylo (*Stylosanthes scabra*) and velvety tree pear (*Opuntia tomentosa*). |
| **General Site Observations** | Trees form the ecologically dominant stratum; healthy mature community; part of the Isaac River riparian corridor approx. 2 km wide; good recruitment; no dieback detected; no fire scars detected; high exotic ground cover. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered small and large hollows, mostly in dead trees; scattered small and large logs; scattered leaf litter; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Scattered seeding grass cover; scattered fleshy fruiting plants, including tree pear and lantana; nectar / pollen producing plant common; koala feed trees common. |
| **Signs** | Scattered macropod scats; common woodland birds, including little friarbird, pied butcherbird and willie wagtail. |
| **Koala Feed Trees** | Poplar box (*E. populnea*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: high (2); key existing threats: medium (1); recovery value: medium (1); overall score: 6 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

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|---|---|
| **Survey Code**<br>CQ48 (Fauna) | |
| **Location**<br>Moorvale Mine Rd | |
| **Date**<br>27/09/2017 | |
| **Latitude**<br>-22.00384 | |
| **Longitude**<br>148.33431 | |
| **Slope:**<br>1-2° | |
| **Aspect:**<br>S | |
| **Infrastructure:**<br>Access road option | |

| **General Site Description** | |
|---|---|
| **Landform** | Gently undulating plain |
| **Soil** | Brown sandy loam |
| **Observed vegetation** | RE 11.3.2 (mapped as 11.3.2 / 11.3.1). Woodland with sparse canopy of poplar box (*Eucalyptus populnea*). Sparse sub-canopy of poplar box, vine tree (*Ventilago viminalis*), bean tree (*Cassia brewsteri*) and belah (*Casuarina cristata*). Very sparse shrub layer of sally wattle (*Acacia salicina*), ironwood (*A. excelsa*), false sandalwood (*Eremophila mitchellii*), nipan (*Capparis lasiantha*) and lime bush (*Citrus glauca*). |
| **General Site Observations** | Trees form the ecologically dominant stratum; healthy mature community; small patch approx. 1.3 km x 0.5 km in a fragmented area; moderate recruitment; no dieback detected; no fire scars detected, mostly native grasses. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered large hollows and small hollows common, in a mixture of dead and alive trees; scattered large logs; small logs common; leaf litter common; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Seeding grass cover common; scattered fleshy fruiting plants, including nipan (*Capparis lasiantha*), currant bush and limebush; nectar / pollen producing plant common; koala feed trees common. |
| **Signs** | Scattered macropod scats; common woodland birds present, including grey-crowned babbler, white-throated gerygone, crested pigeon, Torresian crow, Australian magpie and pied butcherbird. |
| **Koala Feed Trees** | Poplar box (*Eucalyptus populnea*). No scratches or pellets detected. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: low (0); key existing threats: medium (1); recovery value: medium (1); overall score: 4 = Not critical habitat. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>CQ49 (Fauna) | |
| **Location**<br>Moorvale Mine Rd | |
| **Date**<br>27/09/2017 | |
| **Latitude**<br>-22.00543 | |
| **Longitude**<br>148.34906 | |
| **Slope:**<br>1-2° | |
| **Aspect:**<br>S | |
| **Infrastructure:**<br>Access road option | |

| **General Site Description** | |
|---|---|
| **Landform** | Drainage depression on gently undulating plain |
| **Soil** | Brown light clay |
| **Observed vegetation** | RE 11.3.1 (Mapped as 11.3.2 / 11.3.1). Open forest with very sparse canopy of poplar box (*Eucalyptus populnea*), brigalow (*Acacia harpophylla*), Dallachy's gum (*Corymbia dallachiana*), carbeen (*C. tessellaris*) and yellowwood (*Terminalia oblongata*). Sparse sub-canopy of white bauhinia (*Lysiphyllum hookeri*) and native olive (*Notelaea microcarpa*). Very sparse shrub layer of currant bush (*Carissa ovata*), brigalow, mimosa (*Vachellia farnesiana*) and acalypha (*Acalypha eremorum*). Ground layer dominated by buffel grass (*Cenchrus ciliaris*) and sabi grass (*Urochloa mosambicensis*). |
| **General Site Observations** | Trees form the ecologically dominant stratum; a patchy linear community which is suffering from edge effects; moderate recruitment; high abundance of exotic species. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | No hollows or large logs detected; scattered small logs; scattered leaf litter; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Scattered seeding grass cover; scattered fleshy fruiting plants, including currant bush and *Capparis* sp.; scattered nectar / pollen producing plant; scattered koala feed trees. |
| **Signs** | Common woodland birds, including white-throated honeyeater, pale-headed rosella, noisy miner and galah. |
| **Koala Feed Trees** | Poplar box (*E. populnea*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: medium (1); habitat connectivity: low (0); key existing threats: medium (1); recovery value: low (0); overall score: 2 = Not critical habitat. |
| **Fauna habitat value – general** | Poor. |

| | |
|---|---|
| **Survey Code**<br>CQ50 (Fauna) | |
| **Location**<br>Daunia Rd | |
| **Date**<br>27/09/2017 | |
| **Latitude**<br>-22.02058 | |
| **Longitude**<br>148.33673 | |
| **Slope:**<br>1-2° | |
| **Aspect:**<br>SE | |
| **Infrastructure:**<br>Access road option | |

| **General Site Description** | |
|---|---|
| **Landform** | Gently undulating plain |
| **Soil** | Brown sandy loam; alluvium |
| **Observed vegetation** | RE 11.3.2 (mapped as 11.3.2 / 11.3.1). Woodland with sparse canopy of poplar box (*Eucalyptus populnea*). Very sparse sub-canopy of poplar box and bean tree (*Cassia brewsteri*). Very sparse shrub layer of currant bush (*Carissa ovata*) and bean tree. Ground layer species include wiregrass (*Aristida calycina*), Paddy's lucerne (*Sida rhombifolia*), *Enneapogon* sp., black speargrass (*Heteropogon contortus*), buffel grass (*Cenchrus ciliaris*) and shrubby stylo (*Stylosanthes scabra*). |
| **General Site Observations** | Trees form the ecologically dominant stratum; healthy community of mostly mid age trees; narrow linear patch which links to the riparian corridor but is fragmented by roads and other farming, moderate recruitment; no dieback detected; no fire scars detected; groundcover mostly native grasses. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Small hollows common, mainly in dead trees; scattered large logs; small logs abundant; scattered leaf litter; limited shrub / grass shelter. |
| **Food Potential Over Entire Year** | Scattered seeding grass cover; scattered fleshy fruiting plants, including tree pear and currant bush; scattered nectar / pollen producing plant abundant; koala feed trees common. |
| **Signs** | Scattered macropod scats; common woodland birds present, including apostlebird, Torresian crow, pied butcherbird and pale-headed rosella. |
| **Koala Feed Trees** | Poplar box (*E. populnea*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: low (0); key existing threats: medium (1); recovery value: low (0); overall score: 3 = Not critical habitat. |
| **Fauna habitat value – general** | Average. |

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|---|---|
| **Survey Code**<br>CQ51 (Fauna) | |
| **Location**<br>Daunia Rd | |
| **Date**<br>27/09/2017 | |
| **Latitude**<br>-22.02735 | |
| **Longitude**<br>148.34384 | |
| **Slope:**<br>1-2° | |
| **Aspect:**<br>SW | |
| **Infrastructure:**<br>Access road option | |

| **General Site Description** | |
|---|---|
| **Landform** | Gently undulating plain |
| **Soil** | Brown light clay |
| **Observed vegetation** | RE 11.3.1 (Mapped as 11.3.2 / 11.3.1). Open forest with sparse canopy dominated by brigalow (*Acacia harpophylla*), with occasional Dawson gum (*Eucalyptus cambageana*) and yellowwood (*Terminalia oblongata*). Very sparse sub-canopy of brigalow, yellowwood, sandalwood (*Santalum lanceolatum*) and false sandalwood (*Eremophila mitchellii*). Very sparse shrub layer of currant bush (*Carissa ovata*), brigalow, warrior bush (*Apophyllum anomalum*) and desert jasmine (*Jasminum didymum* subsp. *lineare*). Ground layer dominated by buffel grass (*Cenchrus ciliaris*) and sabi grass (*Urochloa mosambicensis*). |
| **General Site Observations** | Trees form the ecologically dominant stratum; a patchy linear community which is suffering from edge effects; confined to a minor watercourse; low / moderate recruitment; high abundance of exotic species. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | No hollows detected; small logs common; scattered leaf litter; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Scattered seeding grass cover; scattered fleshy fruiting plants, including currant bush (Carissa ovata) and nipan (*Capparis lasiantha*); scattered nectar / pollen producing plant. |
| **Signs** | Apostlebird nest; common woodland birds present, including apostlebird, willie wagtail and varied triller. |
| **Koala Feed Trees** | Absent. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: low (0); habitat connectivity: low (0); key existing threats: medium (1); recovery value: low (0); overall score: 1 = Not critical habitat. |
| **Fauna habitat value – general** | Average. |

| | |
|---|---|
| **Survey Code**<br>CQ52 (Fauna) | |
| **Location**<br>Daunia Rd | |
| **Date**<br>27/09/2017 | |
| **Latitude**<br>-22.03152 | |
| **Longitude**<br>148.34883 | |
| **Slope:**<br>1-2° | |
| **Aspect:**<br>SW | |
| **Infrastructure:**<br>Access road option | |

| **General Site Description** | |
|---|---|
| **Landform** | Gently undulating plain |
| **Soil** | Brown light clay |
| **Observed vegetation** | RE 11.3.1 (mapped as 11.3.2 / 11.3.1). Open forest with sparse canopy dominated by brigalow (*Acacia harpophylla*), with occasional poplar box (*Eucalyptus populnea*). Sparse sub-canopy of white bauhinia (*Lysiphyllum hookeri*), false sandalwood (*Eremophila mitchellii*) and narrow-leaf bumbil (*Capparis loranthifolia*). Sparse shrub layer of currant bush (*Carissa ovata*), wombat berry (*Eustrephus latifolius*), whitewood (*Atalaya hemiglauca*), white bauhinia, bean tree (*Cassia brewsteri*) and shiny-leaved canthium (*Psydrax odorata* subsp. *buxifolia*). Ground layer dominated by buffel grass (*Cenchrus ciliaris*), with frequent hooky grass (*Ancistrachne uncinulata*), wiregrass (*Aristida* sp.), windmill grasses (*Enteropogon acicularis* and *E. ramosus*) and sabi grass (*Urochloa mosambicensis*). |
| **General Site Observations** | Trees form the ecologically dominant stratum; a patchy linear community which is suffering from edge effects; the vegetation is only a small patch of 11.3.1 sandwiched in between 11.3.2 and confined to roadside vegetation; poor recruitment; moderate to high exotic species. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered small hollows, mostly in dead trees; scattered large logs; small logs common; scattered leaf litter; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Scattered seeding grass cover; scattered fleshy fruiting plants, including currant bush and tree pear; scattered nectar / pollen producing plant; occasional koala feed tree. |
| **Signs** | Scattered macropod scats; common woodland birds, including Torresian crow, Australian magpie, pied butcherbird, white-throated honeyeater, crested pigeon and black-faced cuckoo shrike. |
| **Koala Feed Trees** | Poplar box (*E. populnea*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: medium (1); habitat connectivity: low (0); key existing threats: medium (1); recovery value: low (0); overall score: 2 = Not critical habitat. |
| **Fauna habitat value – general** | Average. |

| | |
|---|---|
| **Survey Code**<br>CQ53 (Fauna) | |
| **Location**<br>Daunia Rd | |
| **Date**<br>27/09/2017 | |
| **Latitude**<br>-22.03282 | |
| **Longitude**<br>148.34915 | |
| **Slope:**<br>1-2° | |
| **Aspect:**<br>S | |
| **Infrastructure:**<br>Access road option | |

| **General Site Description** | |
|---|---|
| **Landform** | Gently undulating plain |
| **Soil** | Brown sandy loam |
| **Observed vegetation** | RE 11.3.2 (mapped as 11.3.2 / 11.3.1). Woodland with sparse canopy of poplar box (*Eucalyptus populnea*). Very sparse sub-canopy of poplar box and white bauhinia (*Lysiphyllum hookeri*). Very sparse shrub layer including cocaine tree (*Erythroxylum australe*), bean tree (*Cassia brewsteri*), currant bush (*Carissa ovata*), dead finish (*Archidendropsis basaltica*) and wilga (*Geijera parviflora*). Ground layer dominated by wiregrass (*Aristida calycina*), with frequent Paddy's lucerne (*Sida rhombifolia*), buffel grass (*Cenchrus ciliaris*), windmill grass (*Enteropogon ramosus*) and sabi grass (*Urochloa mosambicensis*). |
| **General Site Observations** | Trees form the ecologically dominant stratum; healthy community at this point, though progressively deteriorates to the south; narrow linear patch which links to the riparian corridor but has been damaged by fire, moderate recruitment; fire scars evident on dead trees. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered small hollows, mostly in dead trees; scattered large logs; small logs common; scattered leaf litter; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Seeding grass cover scattered; scattered fleshy fruiting plants, including nipan (*Capparis lasiantha*), currant bush (*Carissa ovata*) and tree pear (*Opuntia tomentosa*); scattered nectar / pollen producing plant; koala feed trees common. |
| **Signs** | Scattered macropod scats; common woodland birds, including grey butcherbird, Torresian crow, Australian magpie, pied butcherbird, white-throated honeyeater, crested pigeon and black-faced cuckoo shrike. |
| **Koala Feed Trees** | Poplar box (*E. populnea*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: low (0); key existing threats: medium (1); recovery value: low (0); overall score: 3 = Not critical habitat. |
| **Fauna habitat value – general** | Average. |

| | |
|---|---|
| **Survey Code**<br>CQ54 (Fauna) | |
| **Location**<br>Iffley | |
| **Date**<br>28/09/2017 | |
| **Latitude**<br>-22.22038 | |
| **Longitude**<br>148.35094 | |
| **Slope:**<br>1° | |
| **Aspect:**<br>SE | |
| **Infrastructure:**<br>Rail corridor | |

| **General Site Description** | |
|---|---|
| **Landform** | Level plain |
| **Soil** | Brown sand |
| **Observed vegetation** | RE 11.5.9 (mapped as 11.5.3 / 11.4.9). Woodland with sparse canopy dominated by narrow-leaved ironbark (*Eucalyptus crebra*), with occasional Clarkson's bloodwood (*Corymbia clarksoniana*) and poplar box (*Eucalyptus populnea*). Sparse sub-canopy of prickly pine (*Bursaria incana*), red ash (*Alphitonia excelsa*) and quinine tree (*Petalostigma pubescens*). Very sparse shrub layer of currant bush (*Carissa ovata*), bean tree (*Cassia brewsteri*) and lolly bush (*Clerodendrum* sp.). Ground layer includes wiregrass (*Aristida calycina*), velvet hibiscus (*Melhania oblongifolia*), forest bluegrass (*Bothriochloa bladhii*), black speargrass (*Heteropogon contortus*) and golden beard grass (*Chrysopogon fallax*). |
| **General Site Observations** | Trees form the ecologically dominant stratum; healthy patch but the area has been fragmented by strip clearing; good recruitment; no fire scars evident; some natural dieback; native grasses. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered small and large hollows, mostly in dead trees; scattered large logs; small logs common; scattered leaf litter; limited shrub / grass shelter. |
| **Food Potential Over Entire Year** | Seeding grass cover common; scattered fleshy fruiting plants, including currant bush and quinine tree; scattered nectar / pollen producing plant; koala feed trees common. |
| **Signs** | Scattered macropod scats; common woodland birds, including white-throated gerygone, double-barred finch, Torresian crow, willie wagtail and grey-crowned babbler. |
| **Koala Feed Trees** | Narrow-leaved ironbark (*E. crebra*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: low (0); key existing threats: medium (1); recovery value: medium (1); overall score: 4 = Not critical habitat. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>CQ55 (Fauna) | |
| **Location**<br>Iffley | |
| **Date**<br>28/09/2017 | |
| **Latitude**<br>-22.21983 | |
| **Longitude**<br>148.35263 | |
| **Slope:**<br>1° | |
| **Aspect:**<br>SE | |
| **Infrastructure:**<br>Rail corridor | |

| **General Site Description** | |
|---|---|
| **Landform** | Level plain |
| **Soil** | Brown sandy light clay |
| **Observed vegetation** | RE 11.5.3 (mapped as 11.5.3). Woodland with sparse canopy dominated by poplar box (*Eucalyptus populnea*), occasional narrow-leaved ironbark (*Eucalyptus crebra*). Very sparse sub-canopy of poplar box, red ash (*Alphitonia excelsa*), quinine (*Petalostigma pubescens*), vine tree (*Ventilago viminalis*), bean tree (*Cassia brewsteri*), silver oak (*Grevillea parallela*) and emu apple (*Owenia acidula*). Sparse shrub layer of bean tree, dead finish (*Archidendropsis basaltica*), native pomegranate (*Capparis arborea*), water bush (*Myoporum acuminatum*), boonaree (*Alectryon oleifolius*), scrub boonaree (*A. diversifolius*) and lolly bush (*Clerodendrum* sp.). Ground cover dominated by buffel grass (*Cenchrus ciliaris*), with some wiregrass (*Aristida calycina*), velvet hibiscus (*Melhania oblongifolia*), black speargrass (*Heteropogon contortus*), barbed wire grass (*Cymbopogon refractus*) and red Natal grass (*Melinis repens*). |
| **General Site Observations** | Trees form the ecologically dominant stratum; healthy patch but the area has been fragmented by strip clearing; good recruitment; no fire scars evident; mostly exotic grasses. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered small hollows, mostly in dead trees; scattered large logs; small logs common; scattered lead littler; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Seeding grass cover scattered; fleshy fruiting plants scattered, including quinine tree, emu apple, winter apple (*Eremophila debilis*), native pomegranate (*Capparis arborea*) and water bush (*Myoporum acuminatum*); koala feed trees abundant. |
| **Signs** | Scattered macropod scats; common woodland birds, including black-faced cuckoo shrike and pied butcherbird. |
| **Koala Feed Trees** | Poplar box (*E. populnea*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: low (0); key existing threats: medium (1); recovery value: low (1); overall score: 4 = Not critical habitat. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>RCQ1 (Fauna) | |
| **Location**<br>Winchester Downs | |
| **Date**<br>14/11/2017 | |
| **Latitude**<br>-22.12372 | |
| **Longitude**<br>148.16667 | |
| **Slope:**<br>1° | |
| **Aspect:**<br>SE | |
| **Infrastructure:**<br>Water pipeline | |

| **General Site Description** | |
|---|---|
| **Landform** | Level plain |
| **Soil** | Brown sandy light clay |
| **Observed vegetation** | 11.5.3 (mapped as 11.4.8). Woodland with sparse canopy dominated by poplar box (*Eucalyptus populnea*), with occasional carbeen (*Corymbia tessellaris*). Very sparse sub-canopy of poplar box and sally wattle (*Acacia salicina*). Sparse shrub layer of dead finish (*Archidendropsis basaltica*), currant bush (*Carissa ovata*), broad-leaved wilga (*Geijera salicifolia*), cocaine tree (*Erythroxylum australe*), sally wattle and northern silk pod (*Parsonsia lanceolata*). Ground cover dominated by buffel grass (*Cenchrus ciliaris*), with occasional velvet hibiscus (*Melhania oblongifolia*), climbing saltbush (*Einadia nutans*), flaxleaf fleabane (*Conyza bonariensis*), parthenium (*Parthenium hysterophorus*), golden beard grass (*Chrysopogon fallax*), blue spade flower (*Hybanthus enneaspermus*), bluebells (*Wahlenbergia* sp.), *Spermacoce brachystema*, *Cyperus* sp. and *Sida* spp. |
| **General Site Observations** | Trees form the ecologically dominant stratum; healthy patch, despite the area having been fragmented by clearing; good recruitment; no fire scars evident; mostly exotic grasses. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered large hollows and smalls hollows common, in a mixture of dead and alive trees; scattered large logs; small logs common; scattered leaf litter; shrub / grass shelter common. |
| **Food Potential Over Entire Year** | Scattered seeding grass cover; scattered fleshy fruiting plants, including currant bush and tree pear (*Opuntia tomentosa*); nectar / pollen producing plants common; koala feed trees common. |
| **Signs** | Scattered macropod scats; common woodland birds, including rainbow bee-eater, pheasant coucal, pied currawong, noisy friarbird, willie wagtail, Australian magpie, dollarbird, pied butcherbird, Torresian crow and white-winged chough. |
| **Koala Feed Trees** | Poplar box (*E. populnea*). No scratches or pellets detected in the immediate vicinity, but scratches detected only 120 m away. |
| **Koala habitat score** | Koala occurrence: high (2); vegetation composition: high (2); habitat connectivity: high (2); key existing threats: medium (1); recovery value: medium (1); overall score: 8 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>RCQ2 (Fauna) | |
| **Location**<br>Winchester Downs | |
| **Date**<br>14/11/2017 | |
| **Latitude**<br>-22.12387 | |
| **Longitude**<br>148.16759 | |
| **Slope:**<br>1° | |
| **Aspect:**<br>S | |
| **Infrastructure:**<br>Water pipeline | |
| **General Site Description** | |
| **Landform** | Level plain |
| **Soil** | Brown sandy light clay |
| **Observed vegetation** | RE 11.5.3 (mapped as 11.5.3). Woodland with sparse canopy dominated by poplar box (*Eucalyptus populnea*), with occasional carbeen (*Corymbia tessellaris*) and forest red gum (*Eucalyptus tereticornis*). Very sparse sub-canopy of poplar box, carbeen, forest red gum and sally wattle (*Acacia salicina*). Sparse shrub layer of dead finish (*Archidendropsis basaltica*), wilga (*Geijera parviflora*), bean tree (*Cassia brewsteri*) and sally wattle. Ground cover dominated by Buffel grass (*Cenchrus ciliaris*), with occasional flaxleaf fleabane (*Conyza bonariensis*), blue spade flower (*Hybanthus enneaspermus*), *Cyperus conicus*, Paddy's lucerne (*Sida rhombifolia*), green panic (*Megathyrsus maximus*), flannel weed (*Sida cordifolia*), sleepy morning (*Waltheria indica*), black speargrass (*Heteropogon contortus*), coat buttons (*Tridax procumbens*), rattlepod (*Crotalaria mitchellii*) and milk thistle (*Sonchus oleraceus*). |
| **General Site Observations** | Trees form the ecologically dominant stratum; healthy patch, but adjacent to a clearing; good recruitment; no fire scars evident; mostly exotic grasses, shallow drainage linking to nearby Cherwell Creek. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered small and large hollows, mostly in living trees; scattered large logs; small logs common; leaf litter common; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Scattered seeding grass cover; scattered fleshy fruiting plants, including currant bush and tree pear (*Opuntia tomentosa*); nectar / pollen producing plants common; koala feed trees common. |
| **Signs** | Scattered macropod scats; possum / glider scratches, koala scratches and pellets (fresh) beneath forest red gum; birds detected at time of assessment comprised common native woodland species. |
| **Koala Feed Trees** | Poplar box Coolabah (*E. coolabah*) and forest blue gum (*E. tereticornis*). Koala scratches and pellets. |
| **Koala habitat score** | Koala occurrence: high (2); vegetation composition: high (2); habitat connectivity: medium (2); key existing threats: medium (1); recovery value: medium (1); overall score: 8 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>RCQ3 (Fauna) | |
| **Location**<br>Winchester Downs | |
| **Date**<br>14/11/2017 | |
| **Latitude**<br>-22.12178 | |
| **Longitude**<br>148.17227 | |
| **Slope:**<br>1-2° | |
| **Aspect:**<br>SE | |
| **Infrastructure:**<br>Water pipeline | |

| **General Site Description** | |
|---|---|
| **Landform** | Gently undulating plain |
| **Soil** | Brown sandy light clay |
| **Observed vegetation** | Non-remnant (mapped as RE 11.5.3). No canopy or sub-canopy present. Sparse shrub layer of dead finish (*Archidendropsis basaltica*), currant bush (*Carissa ovata*), stiff denhamia (*Denhamia oleaster*), whitewood (*Atalaya hemiglauca*), boonaree (*Alectryon oleifolius*) and desert jasmine (*Jasminum didymum* subsp. *lineare*). Ground cover dominated by buffel grass (*Cenchrus ciliaris*), with occasional red Natal grass (*Melinis repens*), sabi grass (*Urochloa mosambicensis*), velvet hibiscus (*Melhania oblongifolia*), yellow burr daisy (*Calotis lappulacea*), kangaroo grass (*Themeda triandra*), curly bluegrass (*Dichanthium fecundum),* rough fuzzweed (*Vittadinia pustula*), hairy panic (*Panicum effusum*) and rhynco *(Rhynchosia minima*). |
| **General Site Observations** | Trees have all been killed; no obvious fire scars evident; mostly exotic grasses. |

| **Fauna Habitat Observations** | |
|---|---|
| **Shelter / Cover** | Scattered small hollows, mostly in dead trees / stags; scattered large logs; small logs abundant; scattered leaf litter; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Scattered seeding grass cover; scattered fleshy fruiting plants, including currant bush, tree pear (*Opuntia tomentosa*) and harrisia (*Harrisia martinii*); nectar / pollen producing plant scattered. |
| **Signs** | Common woodland birds detected, including grey butcherbird, Torresian crow, double-barred finch, black-faced cuckoo shrike, rainbow bee-eater, pale-headed rosella and laughing kookaburra. |
| **Koala Feed Trees** | No koala feed trees detected. |
| **Koala habitat score** | Koala occurrence: medium (1); vegetation composition: low (0); habitat connectivity: low (0); key existing threats: low (0); recovery value: low (0); overall score: 1 = Not critical habitat. |
| **Fauna habitat value – general** | Average. |

| | |
|---|---|
| **Survey Code**<br>RCQ4 (Fauna) | |
| **Location**<br>Winchester Downs | |
| **Date**<br>14/11/2017 | |
| **Latitude**<br>-22.12157 | |
| **Longitude**<br>148.173926 | |
| **Slope:**<br><1° | |
| **Aspect:**<br>NNE | |
| **Infrastructure:**<br>Water pipeline | |

| **General Site Description** | |
|---|---|
| **Landform** | Watercourse; creek |
| **Soil** | Sand; alluvium |
| **Observed vegetation** | RE 11.3.25 (mapped as 11.3.25). Riparian woodland with sparse canopy of forest red gum (*Eucalyptus tereticornis*), river she-oak (*Casuarina cunninghamiana*), river tea tree (*Melaleuca fluviatilis*), carbeen (*Corymbia tessellaris*) and Dallachy's gum (*Corymbia dallachiana*). Very sparse sub-canopy of river she-oak, black tea tree (*Melaleuca bracteata*) and white bauhinia (*Lysiphyllum hookeri*). Sparse shrub layer of sandpaper fig (*Ficus opposita*), black tea tree and white bauhinia. Ground layer dominated by exotic species and consists of green panic (*Megathyrsus maximus*), Paddy's lucerne (*Sida rhombifolia*), buffel grass (*Cenchrus ciliaris*), flannel weed (*Sida cordifolia*), parthenium (*Parthenium hysterophorus*), flaxleaf fleabane (*Conyza bonariensis)*, tropical girdlepod (*Mitracarpus hirtus*) and grey crown-beard (*Verbesina encelioides*). |
| **General Site Observations** | Trees form the ecologically dominant stratum; a mature community with some hollows; the narrow riparian strip is within a larger mapped area of remnant vegetation, but significant historical disturbance has occurred and parts adjacent would be considered non-remnant; moderate recruitment; normal watercourse erosion, no dieback detected; fire scars not detected. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered large hollows and small hollows common, mostly in dead trees; scattered smalls and large logs; scattered large rocks; scattered leaf litter; dense shrub / grass shelter common. |
| **Food Potential Over Entire Year** | Seeding grass cover common; scattered fleshy fruiting plants, including sandpaper fig; scattered koala feed trees. |
| **Signs** | Greater glider scratches and pellets on forest red gums; koala scratches on forest red gums; scattered macropod scats; common woodland birds detected. |
| **Koala Feed Trees** | Forest red gum (*E. tereticornis*). Koala scratches evident. |
| **Koala habitat score** | Koala occurrence: medium (1); vegetation composition: high (2); habitat connectivity: high (2); key existing threats: medium (1); recovery value: medium (1); overall score: 7 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>RCQ5 (Fauna) | |
| **Location**<br>Winchester Downs | |
| **Date**<br>14/11/2017 | |
| **Latitude**<br>-22.12046 | |
| **Longitude**<br>148.17633 | |
| **Slope:**<br><1° | |
| **Aspect:**<br>S | |
| **Infrastructure:**<br>Water pipeline | |
| **General Site Description** | |
| **Landform** | Level plain |
| **Soil** | Brown sandy loam |
| **Observed vegetation** | Non-remnant (mapped as RE 11.3.4 / 11.3.7). Primarily cleared, with a very sparse canopy of carbeen (*Corymbia tessellaris*), Clarkson's bloodwood (*Corymbia clarksoniana*) and poplar box (*Eucalyptus populnea*). No sub-canopy or shrub layer. Ground layer dominated by buffel grass (*Cenchrus ciliaris*), with abundant bluebells (*Wahlenbergia* sp.) and frequent yellow rattlepod (*Crotalaria mitchellii*), woolly glycine (*Glycine tomentosa*) and purple burr daisy (*Calotis cuneifolia*). |
| **General Site Observations** | This area has been largely cleared with extremely sparse canopy retained or regrown; roughly only 20% of the benchmark canopy cover for this community; poor recruitment; old pushed tree trunks on the ground; high exotic ground cover. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered small and large logs; scattered leaf litter. |
| **Food Potential Over Entire Year** | Scattered nectar / pollen producing plant; occasional koala feed tree. |
| **Signs** | Common native woodland birds detected, including dollarbird and willie wagtail. |
| **Koala Feed Trees** | Poplar box (*E. populnea*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: medium (1); vegetation composition: low (0); habitat connectivity: low (0); key existing threats: low (0); recovery value: low (0); overall score: 1 = Not critical habitat. |
| **Fauna habitat value – general** | Poor. |

| | |
|---|---|
| **Survey Code**<br>RCQ6 (Fauna) | |
| **Location**<br>Winchester Downs | |
| **Date**<br>14/11/2017 | |
| **Latitude**<br>-22.11933 | |
| **Longitude**<br>148.17969 | |
| **Slope:**<br><1° | |
| **Aspect:** | |
| **Infrastructure:**<br>Water pipeline | |

| **General Site Description** | |
|---|---|
| **Landform** | Level plain |
| **Soil** | Brown sandy loam; alluvium |
| **Observed vegetation** | RE 11.3.2 (mapped as 11.5.3 / 11.3.2). Woodland with sparse canopy dominated by poplar box (*Eucalyptus populnea*), with occasional carbeen (*Corymbia tessellaris*). Very sparse sub canopy of poplar box and sally wattle (*Acacia salicina*). Very sparse shrub layer of poplar box, sally wattle and red bauhinia (*Lysiphyllum carronii*). Ground layer dominated by buffel grass (*Cenchrus ciliaris*), with frequent Paddy's lucerne (*Sida rhombifolia*) and occasional velvet hibiscus (*Melhania oblongifolia*), sleepy morning (*Waltheria indica*), blue burr daisy (*Calotis cuneifolia*) and tropical sensitive pea (*Chamaecrista absus*). |
| **General Site Observations** | Trees form the ecologically dominant stratum; mostly younger trees with few hollows; part of a relatively narrow vegetated corridor following Cherwell Creek of which parts have been cleared but not reflected in the vegetation mapping; moderate level of historical disturbance; close to Winchester Downs homestead; moderate recruitment; low erosion; no dieback detected; no fire scars detected. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered small and large hollows, mostly in dead trees; scattered small and large logs; scattered leaf litter; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Scattered fleshy fruiting plants, including harrisia (*Harrisia martinii*). |
| **Signs** | Scattered macropod scats; common woodland birds detected, including dollarbird, Torresian crow and rainbow bee-eater. |
| **Koala Feed Trees** | Poplar box (*E. populnea*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: medium (1); vegetation composition: high (2); habitat connectivity: high (2); key existing threats: medium (1); recovery value: medium (1); overall score: 7 = **Critical habitat**. |
| **Fauna habitat value – general** | Average. |

| | |
|---|---|
| **Survey Code**<br>RCQ7 (Fauna) | |
| **Location**<br>Winchester Downs | |
| **Date**<br>14/11/2017 | |
| **Latitude**<br>-22.117811 | |
| **Longitude**<br>148.192413 | |
| **Slope:**<br>1-2° | |
| **Aspect:**<br>S | |
| **Infrastructure:**<br>Water pipeline | |

| **General Site Description** | |
|---|---|
| **Landform** | Gently undulating plain |
| **Soil** | Brown sandy loam |
| **Observed vegetation** | RE 11.5.3 (mapped as 11.5.3 / 11.3.2). Woodland with sparse canopy dominated by poplar box (*Eucalyptus populnea*), with frequent carbeen (*Corymbia tessellaris*), and occasional Clarkson's bloodwood (*Corymbia clarksoniana*) and sally wattle (*Acacia salicina*). Very sparse sub-canopy of false sandalwood (*Eremophila mitchellii*), wilga (*Geijera parviflora*) and whitewood (*Atalaya hemiglauca*). Very sparse shrub layer of currant bush (*Carissa ovata*), cocaine tree (*Erythroxylum australe*) and white bauhinia (*Lysiphyllum hookeri*). Ground cover dominated by buffel grass (*Cenchrus ciliaris*), with frequent rattlepod (*Crotalaria medicaginea*), shrub sida (*Sida rohlenae*), spermacoce (*Spermacoce brachystema*) and lilac tasselflower (*Emilia sonchifolia*). |
| **General Site Observations** | Trees form the ecologically dominant stratum; healthy patch and part of linear intact vegetation corridor of Cherwell Creek; good recruitment; mostly exotic grasses; very narrow tip of a larger geological component running to the south west; Deep gully erosion (natural process) to the south of this point. |

| **Fauna Habitat Observations** | |
|---|---|
| **Shelter / Cover** | Scattered small hollows, mostly in living trees; scattered small and large logs; scattered leaf litter; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Scattered fleshy fruiting plants, including currant bush and tree pear (*Opuntia tomentosa*); nectar / pollen producing plant common; koala feed trees common. |
| **Signs** | Scattered macropod scats; common woodland birds, including Torresian crow, channel-billed cuckoo, dollarbird, black-faced cuckoo shrike, sulphur-crested cockatoo and laughing kookaburra. |
| **Koala Feed Trees** | Poplar box (*E. populnea*). No scratches or pellets detected in immediate vicinity, but scratches detected approx. 50 n north in the riparian corridor. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: high (2); key existing threats: medium (1); recovery value: medium (1); overall score: 6 = **Critical habitat**. |
| **Fauna habitat value – general** | Average. |

| | |
|---|---|
| **Survey Code**<br>RCQ8 (Fauna) | |
| **Location**<br>Winchester Downs | |
| **Date**<br>14/11/2017 | |
| **Latitude**<br>-22.11776 | |
| **Longitude**<br>148.19356 | |
| **Slope:**<br>1° | |
| **Aspect:**<br>W | |
| **Infrastructure:**<br>Water pipeline | |

| **General Site Description** | |
|---|---|
| **Landform** | Flood out closed depression |
| **Soil** | Sand |
| **Observed vegetation** | RE 11.3.25 (mapped as 11.3.25). Riparian woodland with sparse canopy dominated by forest red gum (*Eucalyptus tereticornis*), with occasional carbeen (*Corymbia tessellaris*) and poplar box (*Eucalyptus populnea*). Very sparse sub-canopy of sally wattle (*Acacia salicina*) and white bauhinia (*Lysiphyllum hookeri*). Very sparse shrub layer of sally wattle, white bauhinia, bean tree (*Cassia brewsteri*), currant bush (*Carissa ovata*) and sandpaper fig (*Ficus opposita*). Ground layer contains Juncus (*Juncus usitatus*), Indian couch (*Bothriochloa pertusa*), western nut grass (*Cyperus bifax*) and silky browntop (*Eulalia aurea*). |
| **General Site Observations** | Trees form the ecologically dominant stratum; a mature community with some hollows, but mostly young trees; part of a flood out closed depression that likely fills when Cherwell Creek floods; dieback observed; moderate recruitment; no fire scars detected. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Small hollows abundant, in a mixture of dead and alive trees; scattered large logs; small logs common; leaf litter common; shrub / grass shelter common. |
| **Food Potential Over Entire Year** | Seeding grass cover common; scattered fleshy fruiting plants, including currant bush, sandpaper fig, harrisia (*Harrisia martinii*), tree pear (*Opuntia tomentosa*) and dysentery plant (*Grewia latifolia*); nectar / pollen producing plant common; koala feed trees abundant. |
| **Signs** | Eastern grey kangaroo and swamp wallaby observed; feral pig diggings; small glider (sugar or squirrel glider) scratches; common woodland birds present, including weebill, dollarbird, Torresian crow, channel-billed cuckoo, rainbow bee-eater, crested pigeon, black-faced cuckoo shrike and noisy friarbird. |
| **Koala Feed Trees** | Forest red gum (*Eucalyptus tereticornis*) and poplar box (*E. populnea*). No scratches or pellets detected, despite targeted searches. Koala scratches detected approx. 110 m north in the riparian corridor. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: high (2); key existing threats: medium (1); recovery value: high (2); overall score: 7 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>RCQ9 (Fauna) | |
| **Location**<br>Winchester Downs | |
| **Date**<br>15/11/2017 | |
| **Latitude**<br>-22.11775 | |
| **Longitude**<br>148.19742 | |
| **Slope:**<br>1° | |
| **Aspect:**<br>NW | |
| **Infrastructure:**<br>Water pipeline | |

| **General Site Description** | |
|---|---|
| **Landform** | Level plain |
| **Soil** | Brown sandy loam |
| **Observed vegetation** | RE 11.5.3 (Mapped as 11.5.3 / 11.4.9). Woodland with sparse canopy of poplar box (*Eucalyptus populnea*). Very sparse sub-canopy of poplar box, white bauhinia (*Lysiphyllum hookeri*), sally wattle (*Acacia salicina*) and native peach (*Ehretia membranifolia*). Very sparse shrub layer of sally wattle, native peach, cocaine tree (*Erythroxylum australe*), dead finish (*Archidendropsis basaltica*) and currant bush (*Carissa ovata*). Ground layer dominated by buffel grass (*Cenchrus ciliaris*) with frequent rattlepod (*Crotalaria medicaginea*) and shrub sida (*Sida rohlenae*) and occasional spermacoce (*Spermacoce brachystema*), velvet hibiscus (*Melhania oblongifolia*), snail flower (*Galactia tenuiflora*), purple wiregrass (*Aristida ramosa*), shrubby stylo (*Stylosanthes scabra*) and rough fuzzweed (*Vittadinia pustula*). |
| **General Site Observations** | Trees form the ecologically dominant stratum; healthy patch and part of linear intact vegetation corridor adjacent to Cherwell Creek, that runs through to the Isaac River; moderate recruitment; mostly exotic grasses; no dieback detected; no fire scars detected. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered large hollows and small hollows abundant, in a mixture of dead and alive tree; abundant small and large logs; scattered leaf litter; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Scattered seeding grass cover; scattered fleshy fruiting plants, including currant bush and tree pear (*Opuntia tomentosa*); nectar / pollen producing plant common; koala feed trees common. |
| **Signs** | Scattered macropod scats; common woodland birds, including black-faced cuckoo shrike, noisy miner, dollarbird and pied butcherbird. |
| **Koala Feed Trees** | Poplar box (*E. populnea*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: high (2); key existing threats: medium (1); recovery value: medium (1); overall score: 6 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>RCQ10 (Fauna) | |
| **Location**<br>Winchester Downs | |
| **Date**<br>15/11/2017 | |
| **Latitude**<br>-22.11822 | |
| **Longitude**<br>148.20564 | |
| **Slope:**<br>1° | |
| **Aspect:**<br>NW | |
| **Infrastructure:**<br>Water pipeline | |

| **General Site Description** | |
|---|---|
| **Landform** | Level plain |
| **Soil** | Brown sandy loam |
| **Observed vegetation** | RE 11.5.3 (mapped as 11.5.3 / 11.4.9). Woodland with sparse canopy of poplar box (*Eucalyptus populnea*), carbeen (*Corymbia tessellaris*) and Clarkson's bloodwood (*Corymbia clarksoniana*). Very sparse sub-canopy of poplar box. Sparse shrub layer of currant bush (*Carissa ovata*), sally wattle (*Acacia salicina*) and dead finish (*Archidendropsis basaltica*). Ground cover dominated by buffel grass (*Cenchrus ciliaris*), with frequent shrub sida (*Sida rohlenae*) and parthenium (*Parthenium hysterophorus*) and occasional *Glycine* sp., bluebell (*Wahlenbergia gracilis*), austral bugle (*Ajuga australis*), woolly glycine (*Glycine tomentella*), vernonia (*Cyanthillium cinereum*), harrisia cactus (*Harrisia martinii*) and pineapple daisy (*Pterocaulon redolens*). |
| **General Site Observations** | Trees form the ecologically dominant stratum; small patch surrounded by clearing; moderate recruitment; mostly exotic grasses, significant dieback evidenced by more dead trunks than live trunks; no fire scars observed, but it's possible these trees might have been killed by fires from adjacent clearing; if there had been evidence of chemical treatment, this patch would have been mapped as non-remnant. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Small hollows common, mainly in dead trees; scattered large logs; small logs abundant; scattered leaf litter; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Scattered seeding grass cover; scattered fleshy fruiting plants, including currant bush and harrisia; scattered nectar / pollen producing plant abundant; scattered koala feed trees. |
| **Signs** | Scattered macropod scats; common woodland birds detected, including white-throated honeyeater, rainbow bee-eater, white-browed woodswallow and grey-crowned babbler. |
| **Koala Feed Trees** | Poplar box (*E. populnea*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: medium (1); habitat connectivity: low (0); key existing threats: medium (1); recovery value: medium (1); overall score: 3 = Not critical habitat. |
| **Fauna habitat value – general** | Average. |

| | |
|---|---|
| **Survey Code**<br>RCQ11 (Fauna) | |
| **Location**<br>Winchester Downs | |
| **Date**<br>16/11/2017 | |
| **Latitude**<br>-22.11950 | |
| **Longitude**<br>148.22017 | |
| **Slope:**<br><1° | |
| **Aspect:**<br>E | |
| **Infrastructure:**<br>Water pipeline | |

| **General Site Description** | |
|---|---|
| **Landform** | Level plain |
| **Soil** | Brown light clay with moderate gilgai |
| **Observed vegetation** | RE 11.4.9 (Mapped as 11.4.9). Woodland with sparse canopy dominated by brigalow (*Acacia harpophylla*) and belah (*Casuarina cristata*), with occasional yellowwood (*Terminalia oblongata*) and poplar box (*E. populnea*). Sparse to very sparse sub-canopy of brigalow, red bauhinia (*Lysiphyllum carronii*) and belah. Sparse shrub layer containing currant bush (*Carissa ovata*), poison peach (*Ehretia membranifolia*) and red bauhinia. Ground layer dominated by buffel grass (*Cenchrus ciliaris*), with frequent Paddy's lucerne (*Sida rhombifolia*), sabi grass (*Urochloa mosambicensis*), shrub sida (*Sida rohlenae*), harrisia (*Harrisia martinii*) and parthenium (*Parthenium hysterophorus*). |
| **General Site Observations** | Trees form the ecologically dominant stratum; a very narrow strip of remnant vegetation which was not cleared with adjacent brigalow; low recruitment; fire scarring not obvious. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Small hollows common, mostly in dead trees; scattered large logs; small logs abundant; scattered leaf litter; scattered shrub / grass shelter; cracking clays suitable for amphibians and reptiles. |
| **Food Potential Over Entire Year** | Scattered seeding grass cover; scattered fleshy fruiting plants, including currant bush and harrisia; scattered koala feed trees. |
| **Signs** | Scattered macropod scats; common woodland birds, including Australian magpie, Apostlebird, willie wagtail, rainbow bee-eater, striated pardalote and Torresian crow. |
| **Koala Feed Trees** | Poplar box (*E. populnea*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: medium (1); habitat connectivity: high (2); key existing threats: medium (1); recovery value: low (0); overall score: 4 = Not critical habitat. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>RCQ12 (Fauna) | |
| **Location**<br>Winchester Downs | |
| **Date**<br>16/11/2017 | |
| **Latitude**<br>-22.11839 | |
| **Longitude**<br>148.22416 | |
| **Slope:**<br><1° | |
| **Aspect:**<br>E | |
| **Infrastructure:**<br>Water pipeline | |

| **General Site Description** | |
|---|---|
| **Landform** | Level plain |
| **Soil** | Brown sandy loam |
| **Observed vegetation** | RE 11.3.4 (mapped as 11.5.3 / 11.4.9). Woodland with sparse canopy dominated by forest red gum (*Eucalyptus tereticornis*), with abundant carbeen (*Corymbia tessellaris*) and occasional Clarkson's bloodwood (*Corymbia clarksoniana*) and poplar box (*Eucalyptus populnea*). Very sparse sub-canopy of carbeen and sally wattle (*Acacia salicina*). Very sparse shrub layer containing currant bush (*Carissa ovata*), carbeen, sally wattle and scrub boonaree (*Alectryon diversifolius*). Ground layer dominated by buffel grass (*Cenchrus ciliaris*), with abundant Paddy's lucerne (*Sida rhombifolia*) and parthenium (*Parthenium hysterophorus*) and occasional shrub sida (*Sida rohlenae*), austral bugle (*Ajuga australis*), rattlepod (*Crotalaria mitchellii*), black speargrass (*Heteropogon contortus*), vernonia (*Cyanthillium cinereum*), snail flower (*Galactia tenuiflorum*) and white eyes (*Richardia brasiliensis*). |
| **General Site Observations** | Trees form the ecologically dominant stratum; a low point in the plain combined with deposited sands to form a relatively small patch of this community; good recruitment; fire scarring not obvious; little erosion. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Small hollows abundant, in a mixture of dead and alive trees; scattered large logs; abundant small logs; leaf litter common; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Scattered seeding grass cover; scattered fleshy fruiting plants, including currant bush, dysentery plant (*Grewia latifolia*), harrisia (*Harissia martinii*) and tree pear (*Opuntia tomentosa*); nectar / pollen producing plant common; koala feed trees common. |
| **Signs** | Scattered macropod scats; common woodland birds, including noisy miner, Australian magpie, pale-headed rosella, pied butcherbird, red-winged parrot, Apostlebird, olive-backed oriole and nankeen kestrel. |
| **Koala Feed Trees** | Forest red gum (*E. tereticornis*) and poplar box (*E. populnea*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: high (2); key existing threats: medium (1); recovery value: medium (1); overall score: 6 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>RCQ13 (Fauna) | |
| **Location**<br>Winchester Downs | |
| **Date**<br>16/11/2017 | |
| **Latitude**<br>-22.117321 | |
| **Longitude**<br>148.227484 | |
| **Slope:**<br><1° | |
| **Aspect:**<br>E | |
| **Infrastructure:**<br>Water pipeline | |
| **General Site Description** | |
| **Landform** | Level plain |
| **Soil** | Brown sandy light clay |
| **Observed vegetation** | RE 11.5.3 (mapped as 11.5.3 / 11.4.9). Woodland with very sparse canopy of poplar box (*Eucalyptus populnea*) and boonaree (*Alectryon oleifolius*), with no discernible sub-canopy. Sparse to mid-dense shrub layer of dead finish (*Archidendropsis basaltica*), currant bush (*Carissa ovata*), beefwood (*Grevillea striata*), bean tree (*Cassia brewsteri*) and scrub boonaree (*Alectryon diversifolius*). Ground cover dominated by buffel grass (*Cenchrus ciliaris*), with occasional blue burr daisy (*Calotis cuneifolia*), Paddy's lucerne (*Sida rhombifolia*), golden beard grass (*Chrysopogon fallax*), chaff weed (*Achyranthes aspera*), winter apple (*Eremophila debilis*) and pineapple daisy (*Pterocaulon redolens*). |
| **General Site Observations** | Trees form the ecologically dominant stratum; extreme dieback, possibly associated with fire in neighbouring cleared brigalow country moving into the retained remnant; no fire scars evident; mostly exotic grasses. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Small hollows abundant, mostly in dead trees; scattered large logs; small logs abundant; shrub / grass shelter common. |
| **Food Potential Over Entire Year** | Scattered seeding grass cover; scattered fleshy fruiting plants, including currant bush, winter apple, tree pear (*Opuntia tomentosa*) and emu apple (*Owenia acidula*); scattered nectar / pollen producing plant; scattered koala feed trees. |
| **Signs** | Scattered macropod scats; common woodland birds, including pied butcherbird, willie wagtail and pheasant coucal. |
| **Koala Feed Trees** | Poplar box (*E. populnea*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: medium (1); habitat connectivity: medium (1); key existing threats: medium (1); recovery value: medium (1); overall score: 4 = Not critical habitat. |
| **Fauna habitat value – general** | Average. |

| | |
|---|---|
| **Survey Code**<br>RCQ14 (Fauna) | |
| **Location**<br>Winchester Downs | |
| **Date**<br>16/11/2017 | |
| **Latitude**<br>-22.11646 | |
| **Longitude**<br>148.23124 | |
| **Slope:**<br><1° | |
| **Aspect:**<br>SE | |
| **Infrastructure:**<br>Water pipe | |

| **General Site Description** | |
|---|---|
| **Landform** | Level plain |
| **Soil** | Brown light clay with gilgai formation |
| **Observed vegetation** | RE 11.4.8 (mapped as 11.5.3 / 11.4.9). Open woodland to woodland with very sparse canopy dominated by Dawson gum (*Eucalyptus cambageana*) and brigalow (*Acacia harpophylla*). Sparse sub-canopy of brigalow, red bauhinia (*Lysiphyllum carronii*) and yellowwood (*Terminalia oblongata*). Very sparse shrub layer of currant bush (*Carissa ovata*), scrub boonaree (*Alectryon diversifolius*) and warrior bush (*Apophyllum anomalum*). Ground layer dominated by buffel grass (*Cenchrus ciliaris*), with occasional harrisia (*Harrisia martinii*), parthenium (*Parthenium hysterophorus*), brown beetle grass (*Diplachne fusca* var. *fusca*), musk basil (*Basilicum polystachion*), hooky grass (*Ancistrachne uncinulata*) and flannel weed (*Abutilon oxycarpum*). |
| **General Site Observations** | Trees form the ecologically dominant stratum; a small but mature pocket of this community bounded to the north by sparse remnant 11.5.3 and cleared country to the south; mostly exotic groundcover; moderate recruitment; no erosion detected; dieback detected with low to nil canopy cover across melon holes; no fire scars detected. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | No hollows detected; small logs abundant; scattered leaf litter; shrub / grass shelter common; cracking clays suitable for a diversity of amphibians and reptiles. |
| **Food Potential Over Entire Year** | Scattered seeding grass cover; scattered fleshy fruiting plants, including currant bush, harrisia, winter apple (*Eremophila debilis*) and dysentery plant (*Grewia latifolia*); scattered nectar / pollen producing plant. |
| **Signs** | Medium-sized woodland bird nests; common woodland birds, including white-throated honeyeater, striated pardalote, magpie-lark, Australian magpie, noisy friarbird, pied butcherbird and pale-headed rosella. |
| **Koala Feed Trees** | None detected. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: low (0); habitat connectivity: high (2); key existing threats: medium (1); recovery value: low (0); overall score: 3 = Not critical habitat. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>RCQ15 (Fauna) | |
| **Location**<br>Winchester Downs | |
| **Date**<br>16/11/2017 | |
| **Latitude**<br>-22.11635 | |
| **Longitude**<br>148.23838 | |
| **Slope:**<br><1° | |
| **Aspect:**<br>SW | |
| **Infrastructure:**<br>Water pipeline | |

| **General Site Description** | |
|---|---|
| **Landform** | Level plain |
| **Soil** | Brown sandy light clay |
| **Observed vegetation** | RE 11.5.3 (mapped as 11.4.9). Woodland with sparse canopy dominated by poplar box (*Eucalyptus populnea*), with occasional brigalow (*Acacia harpophylla*) (on western edge). Very sparse sub-canopy of ironwood (*Acacia excelsa*), poplar box, red bauhinia (*Lysiphyllum carronii*) and emu apple (*Owenia acidula*). Very sparse shrub layer of currant bush (*Carissa ovata*), cocaine tree (*Erythroxylum australe*), red bauhinia (*Lysiphyllum carronii*), bean tree (*Cassia brewsteri*), sweet canthium (*Psydrax oleifolius*) and dysentery plant (*Grewia latifolia*). Ground cover dominated by buffel grass (*Cenchrus ciliaris*), with occasional velvet hibiscus (*Melhania oblongifolia*). |
| **General Site Observations** | Trees form the ecologically dominant stratum; there is a very thin sliver of what would be 11.4.9 consisting of a single canopy width of brigalow and belah (*Casuarina cristata*) on the western edge (abutting the non-remnant vegetation) that is too narrow for mapping and should be removed from the mapping; no fire scars evident; mostly exotic grasses. |

| **Fauna Habitat Observations** | |
|---|---|
| **Shelter / Cover** | Scattered small hollows, mostly in dead trees; scattered large logs; small logs common; leaf litter common; shrub / grass shelter common. |
| **Food Potential Over Entire Year** | Scattered seeding grass cover; scattered fleshy fruiting plants, including currant bush, dysentery plant, harrisia (*Harrisia martinii*) and nipan (*Capparis lasiantha*); koala feed trees common. |
| **Signs** | Scattered macropod scats; common woodland birds, including pied butcherbird, noisy friarbird and magpie-lark. |
| **Koala Feed Trees** | Poplar box (*E. populnea*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: high (2); key existing threats: medium (1); recovery value: low (1); overall score: 6 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>RCQ16 (Fauna) | |
| **Location**<br>Winchester Downs | |
| **Date**<br>16/11/2017 | |
| **Latitude**<br>-22.11724 | |
| **Longitude**<br>148.26012 | |
| **Slope:**<br><1° | |
| **Aspect:**<br>S | |
| **Infrastructure:**<br>Water pipeline | |

| **General Site Description** | |
|---|---|
| **Landform** | Level plain |
| **Soil** | Brown sandy light clay |
| **Observed vegetation** | RE 11.5.3 (mapped as 11.5.3 / 11.4.9). Woodland dominated by poplar box (*Eucalyptus populnea*), with occasional carbeen (*Corymbia tessellaris*) and Clarkson's bloodwood (*Corymbia clarksoniana*). Very sparse sub-canopy of red bauhinia (*Lysiphyllum carronii*), sally wattle (*Acacia salicina*) and poplar box. Very sparse shrub layer of dead finish (*Archidendropsis basaltica*), bean tree (*Cassia brewsteri*), sally wattle and quinine tree (*Petalostigma pubescens*). Ground cover dominated by buffel grass (*Cenchrus ciliaris*), with occasional *Oxalis* sp., chaff flower (*Achyranthes aspera*) and shrub sida (*Sida rohlenae*). |
| **General Site Observations** | Trees form the ecologically dominant stratum; this community is part of a larger remnant adjacent to the Isaac River and is approximately 3 km wide and over 10 km long; recruitment good, young trees with occasional older hollow trees; no fire scars evident; mostly exotic grasses. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered small hollows, in a mixture of dead and alive trees; scattered large logs; scattered small logs; scattered leaf litter; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Scattered seeding grass cover; scattered fleshy fruiting plants, including harrisia (*Harrisia martinii*), tree pear (*Opuntia tomentosa*) and coffee bush (*Breynia oblongifolia*); koala feed trees common. |
| **Signs** | Scattered macropod scats; common woodland birds, including black-faced cuckoo shrike, noisy miner and pied butcherbird. |
| **Koala Feed Trees** | Poplar box (*E. populnea*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: high (2); key existing threats: medium (1); recovery value: low (1); overall score: 6 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>RCQ17 (Fauna) | |
| **Location**<br>Winchester Downs | |
| **Date**<br>16/11/2017 | |
| **Latitude**<br>-22.11946 | |
| **Longitude**<br>148.26915 | |
| **Slope:**<br>1-2° | |
| **Aspect:**<br>S | |
| **Infrastructure:**<br>Water pipeline | |

| **General Site Description** | |
|---|---|
| **Landform** | Gently undulating plain |
| **Soil** | Brown light clay |
| **Observed vegetation** | RE 11.4.9 (mapped as 11.5.3 / 11.4.9). Woodland with sparse canopy dominated by brigalow (*Acacia harpophylla*), with occasional red bauhinia (*Lysiphyllum carronii*) and poplar box (*Eucalyptus populnea*). Very sparse sub-canopy of brigalow and red bauhinia. Mid-dense shrub layer containing currant bush (*Carissa ovata*), scrub boonaree (*Alectryon diversifolius*), northern silk pod (*Parsonsia lanceolata*), scrub leopardwood (*Flindersia dissosperma*), red bauhinia, yellowwood (*Terminalia oblongata*), warrior bush (*Apophyllum anomalum*), whitewood (*Atalaya hemiglauca*), nipan (*Capparis lasiantha*) and harrisia (*Harrisia martinii*). Ground layer dominated by buffel grass (*Cenchrus ciliaris*), with occasional soft roly-poly (*Salsola australis*), green panic (*Megathyrsus maximus*), chaff flower (*Achyranthes aspera*) and brigalow grass (*Paspalidium caespitosum*). |
| **General Site Observations** | Trees form the ecologically dominant stratum; small patch of brigalow dominated vegetation linked to another patch of brigalow (11.3.1) to the east; moderate recruitment; fire scarring not obvious; high level of exotic ground cover; subjected to light stock grazing; part of a larger remnant adjacent to the Isaac River. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | No hollows detected; small logs common; scattered leaf litter; dense shrub / grass shelter common. |
| **Food Potential Over Entire Year** | Scattered seeding grass cover; scattered fleshy fruiting plants, including currant bush, nipan, harrisia, nipan and small-leaved water vine; scattered koala feed trees. |
| **Signs** | Scattered macropod scats; common woodland birds, including noisy friarbird, pied butcherbird and Torresian crow. |
| **Koala Feed Trees** | Poplar box (*E. populnea*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: medium (1); habitat connectivity: high (2); key existing threats: medium (1); recovery value: low (1); overall score: 5 = **Critical habitat**. |
| **Fauna habitat value – general** | Average. |

| | |
|---|---|
| **Survey Code**<br>RCQ18 (Fauna) | |
| **Location**<br>Winchester Downs | |
| **Date**<br>16/11/2017 | |
| **Latitude**<br>-22.12010 | |
| **Longitude**<br>148.27108 | |
| **Slope:**<br><1° | |
| **Aspect:**<br>NE | |
| **Infrastructure:**<br>Water pipeline | |

| **General Site Description** | |
|---|---|
| **Landform** | Level plain |
| **Soil** | Brown loam |
| **Observed vegetation** | RE 11.3.2 (mapped as 11.3.2 / 11.3.7 / 11.3.1). Woodland with sparse canopy of poplar box (*Eucalyptus populnea*). Sparse sub-canopy of red bauhinia (*Lysiphyllum carronii*), white bauhinia (*L. hookeri*) and ironwood (*Acacia excelsa*). Sparse shrub layer of poplar box, red bauhinia, bean tree (*Cassia brewsteri*), currant bush (*Carissa ovata*), harrisia (*Harrisia martinii*) and lantana (*Lantana camara*). Ground layer contains wiregrass (*Aristida calycina*), buffel grass (*Cenchrus ciliaris*), purple wiregrass (*Aristida ramosa*) and shrubby stylo (*Stylosanthes scabra*). |
| **General Site Observations** | Trees form the ecologically dominant stratum; a good spread of ages in the upper canopy; part of a significant block of remnant vegetation through to the Isaac River, but bisected by the Peak Downs rail spur; good recruitment; little erosion; no dieback detected; no fire scars evident. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Large hollows scattered and small hollows abundant, in a mixture of dead and alive trees; scattered small and large logs; leaf litter common; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Scattered seeding grass cover; scattered fleshy fruiting plants, including currant bush, harrisia and lantana; koala feed trees common. |
| **Signs** | Scattered macropod scats; common woodland birds, including black-faced cuckoo shrike and pied butcherbird. |
| **Koala Feed Trees** | Poplar box (*E. populnea*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: high (2); key existing threats: medium (1); recovery value: low (1); overall score: 6 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>RCQ19 (Fauna) | |
| **Location**<br>Winchester Downs | |
| **Date**<br>16/11/2017 | |
| **Latitude**<br>-22.12054 | |
| **Longitude**<br>148.27232 | |
| **Slope:**<br>1° | |
| **Aspect:**<br>N | |
| **Infrastructure:**<br>Water pipeline | |

| **General Site Description** | |
|---|---|
| **Landform** | Level plain |
| **Soil** | Light to medium clay |
| **Observed vegetation** | RE 11.3.1 (mapped as 11.3.2 / 11.3.7 / 11.3.1). Woodland of Dawson gum (*Eucalyptus cambageana*) with a sparse sub-canopy of brigalow (*Acacia harpophylla*), boonaree (*Alectryon oleifolius*) and yellowwood (*Terminalia oblongata*). Mid-dense shrub layer of currant bush (*Carissa ovata*), scrub boonaree (*Alectryon diversifolius*), cocaine tree (*Erythroxylum australe*), water vine (*Clematicissus opaca*), yellowwood, poison peach (*Ehretia membranifolia*), boonaree, warrior bush (*Apophyllum anomalum*) and red bauhinia (*Lysiphyllum carronii*). Ground layer dominated by buffel grass (*Cenchrus ciliaris*), with frequent hooky grass (*Ancistrachne uncinulata*), purple wiregrass (*Aristida ramosus*), barbed wire grass (*Cymbopogon refractus*), shot grass (*Paspalidium distans*) and sabi grass (*Urochloa mosambicensis*). |
| **General Site Observations** | Trees form the ecologically dominant stratum; healthy community with moderate regeneration; vegetation unit is part of an intact remnant linked to the Isaac River corridor but bisected by the Peak Downs spur line; patch is suffering weedy edge effects adjacent to the rail corridor; ground layer dominated by exotic species; clay soils; no erosion detected; minimal dieback; no fire scars detected; light grazing impacts. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Large hollows scattered and small hollows abundant, mostly in dead trees; scattered large logs; small logs abundant; leaf litter common; dense shrub / grass shelter common. |
| **Food Potential Over Entire Year** | Scattered seeding grass cover; scattered fleshy fruiting plants, including currant bush, water vine, harrisia (*Harrisia martinii*) and nipan (*Capparis lasiantha*); no koala feed tree detected. |
| **Signs** | Scattered macropod scats; common woodland birds, including noisy friarbird, welcome swallow (nesting in culverts nearby) and willie wagtail. |
| **Koala Feed Trees** | None detected. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: low (0); habitat connectivity: high (2); key existing threats: medium (1); recovery value: low (0); overall score: 3 = Not critical habitat. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>RCQ20 (Fauna) | |
| **Location**<br>Winchester Downs | |
| **Date**<br>16/11/2017 | |
| **Latitude**<br>-22.12975 | |
| **Longitude**<br>148.27557 | |
| **Slope:**<br>1° | |
| **Aspect:**<br>N | |
| **Infrastructure:**<br>Rail corridor | |

| **General Site Description** | |
|---|---|
| **Landform** | Level plain |
| **Soil** | Brown light to medium clay with shallow gilgai |
| **Observed vegetation** | Non-remnant – regrowth of 11.4.9 (mapped as 11.9.3 / 11.9.2). Open woodland of brigalow (*Acacia harpophylla*) and poplar box (*Eucalyptus populnea*). Sparse sub-canopy of brigalow, scrub leopard ash (*Flindersia dissosperma*), yellowwood (*Terminalia oblongata*) and red bauhinia (*Lysiphyllum carronii*). Sparse shrub layer including limebush (*Citrus glauca*), currant bush (*Carissa ovata*), scrub boonaree (*Alectryon diversifolius*), cocaine tree (*Erythroxylum australe*), narrow-leaved bumbil (*Capparis loranthifolia*), whitewood (*Atalaya hemiglauca*), peach bush (*Ehretia membranifolia*), harrisia (*Harrisia martinii*) and brigalow. Ground layer dominated by buffel grass (*Cenchrus ciliaris*). |
| **General Site Observations** | Trees form the ecologically dominant stratum; a partly cleared community (possibly from clearing fires) with moderate regeneration; within a cleared paddock but with slightly higher canopy cover than surrounding regrowth vegetation; ground layer dominated by exotic species; clay soils; erosion absent; dieback evidenced by dead standing trees (possibly from original clearing); fire scars not detected; moderate grazing impacts. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Small hollows common, mostly in dead trees; scattered large logs; small logs abundant; scattered leaf litter; shrub / grass shelter common; cracking clays suitable for a diversity of amphibians and reptiles |
| **Food Potential Over Entire Year** | Scattered seeding grass cover; scattered fleshy fruiting plants, including limebush, currant bush, peach bush, harrisia, narrow-leaved bumbil and slender grape (*Clematicissus opaca*); koala feed trees scattered. |
| **Signs** | Scattered macropod scats; common woodland birds, including black-faced cuckoo shrike, willie wagtail, rainbow bee-eater, dollarbird and little friarbird. |
| **Koala Feed Trees** | Poplar box (*E. populnea*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: medium (1); habitat connectivity: low (0); key existing threats: medium (1); recovery value: low (0); overall score: 2 = Not critical habitat. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>RCQ21 (Fauna) | |
| **Location**<br>Winchester Downs | |
| **Date**<br>16/11/2017 | |
| **Latitude**<br>-22.13228 | |
| **Longitude**<br>148.28504 | |
| **Slope:**<br>1° | |
| **Aspect:**<br>NE | |
| **Infrastructure:**<br>Rail corridor | |

| **General Site Description** | |
|---|---|
| **Landform** | Level plain |
| **Soil** | Brown light clay |
| **Observed vegetation** | RE 11.9.2 (mapped as 11.9.3 / 11.9.2). Woodland of mountain coolibah (*Eucalyptus orgadophila*) and Dawson gum (*E. cambageana*). Very sparse sub-canopy of brigalow (*Acacia harpophylla*) and sally wattle (*A. salicina*). Sparse shrub layer of dead finish (*Archidendropsis basaltica*), currant bush (*Carissa ovata*), boonaree (*Alectryon oleifolius*), bean tree (*Cassia brewsteri*), stiff canthium (*Psydrax odorata forma buxifolia*), sally wattle, peach bush (*Ehretia membranifolia*), false sandalwood (*Eremophila mitchellii*), mountain coolibah and nipan (*Capparis lasiantha*). Ground layer dominated by buffel grass (*Cenchrus ciliaris*). |
| **General Site Observations** | Trees form the ecologically dominant stratum; possibly ecotonal with elements of RE 11.4.8 evident; cleared to the south with possible edge effects or clearing fire impacts; ground layer dominated by exotic species; light clay soils; no erosion detected; dieback evidenced by dead standing trees (possibly from original clearing); no fire scars detected; moderate grazing impacts. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Large hollows scattered and small hollows common, mostly in dead trees; scattered large logs; small logs common; scattered leaf litter; shrub / grass shelter common. |
| **Food Potential Over Entire Year** | Seeding grass cover scattered; fleshy fruiting plants scattered, including currant bush, peach bush, nipan, limebush (*Citrus glauca*) and ruby saltbush (*Enchylaena tomentosa*); scattered koala feed trees. |
| **Signs** | Eastern grey kangaroos camping; common woodland birds, including pheasant coucal, black-faced cuckoo shrike, Australian magpie and red-backed fairy-wren. |
| **Koala Feed Trees** | Mountain coolibah (*E. orgadophila*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: medium (1); habitat connectivity: high (2); key existing threats: medium (1); recovery value: low (0); overall score: 4 = Not critical habitat. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>RCQ22 (Fauna) | |
| **Location**<br>Daunia Rd | |
| **Date**<br>17/11/2017 | |
| **Latitude**<br>-22.02417 | |
| **Longitude**<br>148.33796 | |
| **Slope:**<br>2-5° | |
| **Aspect:**<br>S | |
| **Infrastructure:**<br>Access road | |

| **General Site Description** | |
|---|---|
| **Landform** | Undulating plain |
| **Soil** | Orange-brown sandy light clay |
| **Observed vegetation** | RE 11.5.3 (mapped as 11.3.25). Woodland with sparse canopy dominated by poplar box (*Eucalyptus populnea*), with occasional brigalow (*Acacia harpophylla*). Sparse sub-canopy of red bauhinia (*Lysiphyllum carronii*), white bauhinia (*L. hookeri*), boonaree (*Alectryon oleifolius*), sally wattle (*Acacia salicina*) and poplar box. Very sparse shrub layer of currant bush (*Carissa ovata*), cocaine tree (*Erythroxylum australe*), bean tree (*Cassia brewsteri*), scrub boonaree (*Alectryon diversifolius*) and red bauhinia. Ground layer dominated by buffel grass (*Cenchrus ciliaris*), with abundant *Vittadinia dissecta* var. *dissecta*, frequent parthenium (*Parthenium hysterophorus*), and occasional red Natal grass (*Melinis repens*) and woolly glycine (*Glycine tomentella*). |
| **General Site Observations** | Trees form the ecologically dominant stratum; this site sits on an exposed and eroding edge of older sediments with active alluvium to the south associated with a watercourse and alluvia to the north and east, likely associated with flood flows; heavy grazing impacts contributing to erosive forces; active erosion areas with deeper gullying in parts; mostly exotic grasses; significant dieback. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Large hollows scattered and small hollows common, in a mixture of dead and alive trees; scattered large logs; small logs abundant; scattered leaf litter; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Seeding grass cover scattered; fleshy fruiting plants scattered, including currant bush and harrisia (*Harrisia martinii*); koala feed trees common. |
| **Signs** | Scattered macropod scats; common woodland birds, including pale-headed rosella, Torresian crow and black-faced cuckoo shrike; two young emaciated dingos passing by. |
| **Koala Feed Trees** | Poplar box (*E. populnea*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: high (2); key existing threats: medium (1); recovery value: medium (1); overall score: 6 = **Critical habitat**. |
| **Fauna habitat value – general** | Average. |

| | |
|---|---|
| **Survey Code**<br>RCQ23 (Fauna) | |
| **Location**<br>Daunia Rd | |
| **Date**<br>17/11/2017 | |
| **Latitude**<br>-22.023383 | |
| **Longitude**<br>148.337375 | |
| **Slope:**<br>1-3° | |
| **Aspect:**<br>S | |
| **Infrastructure:**<br>Access road | |

| **General Site Description** | |
|---|---|
| **Landform** | Undulating plain |
| **Soil** | Orange-brown light clay |
| **Observed vegetation** | RE 11.4.9 (mapped as 11.3.2 / 11.3.1). Woodland with sparse canopy dominated by brigalow (*Acacia harpophylla*) and Yellowwood (*Terminalia oblongata*). Very sparse sub-canopy of brigalow, red bauhinia (*Lysiphyllum hookeri*) and boonaree (*Alectryon oleifolius*). Very sparse shrub layer of currant bush (*Carissa ovata*). Ground layer dominated by buffel grass (*Cenchrus ciliaris*), with frequent chaff flower (*Achyranthes aspera*). |
| **General Site Observations** | Trees form the ecologically dominant stratum; very small patch of brigalow dominated vegetation linked to another patch of brigalow (11.4.9) to the east on the same landform; low recruitment; fire scarring not obvious, high level of exotic ground cover; high level stock impacts; part of an intact riparian corridor approximately 750 m wide at this point. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Small hollows common, mostly in dead trees; scattered large logs; small logs abundant; scattered leaf litter; scattered shrub shelter. |
| **Food Potential Over Entire Year** | Lacking seeding grass cover; scattered fleshy fruiting plants, including currant bush and nipan (*Capparis lasiantha*); koala feed trees not detected. |
| **Signs** | Scattered macropod scats; rabbits; common woodland birds, including Australian magpie, Torresian crow, pied butcherbird and noisy miner. |
| **Koala Feed Trees** | None detected. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: low (0); habitat connectivity: high (2); key existing threats: medium (1); recovery value: low (0); overall score: 3 = Not critical habitat. |
| **Fauna habitat value – general** | Average. |

| | |
|---|---|
| **Survey Code**<br>RCQ24 (Fauna) | |
| **Location**<br>Iffley | |
| **Date**<br>17/11/2017 | |
| **Latitude**<br>-22.15464 | |
| **Longitude**<br>148.33347 | |
| **Slope:**<br>1° | |
| **Aspect:**<br>N | |
| **Infrastructure:**<br>ETL and access | |

| **General Site Description** | |
|---|---|
| **Landform** | Level plain |
| **Soil** | Brown loam |
| **Observed vegetation** | RE 11.3.2 (mapped as 11.3.2 / 11.3.7). Poplar box (*Eucalyptus populnea*) woodland. Very sparse sub-canopy of red bauhinia (*Lysiphyllum carronii*), sally wattle (*Acacia salicina*) and bean tree (*Cassia brewsteri*). Very sparse shrub layer of lantana (*Lantana camara*), peach bush (*Ehretia membranifolia*), nipan (*Capparis lasiantha*), boonaree (*Alectryon oleifolius*) and sally wattle. Ground layer dominated by buffel grass (*Cenchrus ciliaris*), with frequent black spear grass (*Heteropogon contortus*) and wiregrass (*Aristida* sp.), and occasional red Natal grass (*Melinis repens*), blue tongues (*Rostellularia adscendens*), *Glycine* sp. and shrubby stylo (*Stylosanthes scabra*). |
| **General Site Observations** | Trees form the ecologically dominant stratum; a thin strip of vegetation in the RE mapping with no discernible difference to the adjacent 11.5.3 community although close enough to the Isaac River to be considered part of the alluvium; part of a significant block of remnant vegetation (2.5 km x 3 km) with good connection through the Isaac River corridor; moderate recruitment; low erosion; no dieback or fire scars detected. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered small hollows, mostly in living trees; scattered small and large logs; scattered leaf litter; scattered shrub / grass shelter; scattered termite mounds. |
| **Food Potential Over Entire Year** | Seeding grass cover scattered; fleshy fruiting plants scattered, including lantana, peach bush, nipan, tree pear (*Opuntia tomentosa*), dysentery plant (*Grewia retusifolia*), quinine tree (*Petalostigma pubescens*) and harrisia (*Harrisia martinii*); koala feed trees common. |
| **Signs** | Scattered macropod scats; common woodland birds, including blue-winged kookaburra and rainbow bee-eater. |
| **Koala Feed Trees** | Poplar box (*E. populnea*). No scratches or pellets detected in the immediate vicinity, but koala scratches detected 90m north-west on the bank of the Isaac River. |
| **Koala habitat score** | Koala occurrence: medium (1); vegetation composition: high (2); habitat connectivity: high (2); key existing threats: medium (1); recovery value: high (2); overall score: 8 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>RCQ25 (Fauna) | |
| **Location**<br>Iffley | |
| **Date**<br>17/11/2017 | |
| **Latitude**<br>-22.16224 | |
| **Longitude**<br>148.33246 | |
| **Slope:**<br>0° | |
| **Aspect:**<br>NA | |
| **Infrastructure:**<br>Powerline | |
| **General Site Description** | |
| **Landform** | Shallow closed depression on level plain |
| **Soil** | Brown sandy light clay |
| **Observed vegetation** | Woodland dominated by forest red gum (*Eucalyptus tereticornis*), with frequent poplar gum (*E. platyphylla*). Very sparse sub-canopy of poplar gum and forest red gum, mostly as fringing vegetation to the wetland. Very sparse shrub layer of seedling poplar gum and lantana (*Lantana camara*). Ground layer dominated by *Cyperus victoriensis* and brown beetle grass (*Diplachne fusca* var. *fusca*), with frequent hairy joyweed (*Alternanthera nana*), sneezeweed (*Centipeda minima*), white eclipta (*Eclipta prostrata*) and slender knotweed (*Persicaria decipiens*). |
| **General Site Observations** | Trees form ecologically dominant stratum; good regeneration cohort about 5 years old, on high water line; connected through large vegetation unit (over 3 km long) with connection through to Isaac River corridor; light clay soils; erosion absent; moderate grazing stock impacts; exotic shrub weeds; no dieback evident; no fire scars evident. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Large hollows common and small hollows abundant, in a mixture of dead and alive trees; scattered small and large logs; scattered leaf litter. |
| **Food Potential Over Entire Year** | Scattered seeding grass cover; scattered fleshy fruiting plants, including lantana; koala feed trees common. |
| **Signs** | Scattered macropod scats; brushtail possum scats; small glider (sugar or squirrel) scratches; koala scratches; medium-sized woodland bird nests; common woodland birds, including pale-headed rosella, black-faced cuckoo shrike, noisy miner and blue-faced honeyeater. |
| **Koala Feed Trees** | Forest red gum (*E. tereticornis*). Koala scratches on two forest red gums. |
| **Koala habitat score** | Koala occurrence: high (2); vegetation composition: high (2); habitat connectivity: high (2); key existing threats: medium (1); recovery value: high (2); overall score: 9 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>RCQ26 (Fauna) | |
| **Location**<br>Deverill | |
| **Date**<br>18/11/2017 | |
| **Latitude**<br>-22.16665 | |
| **Longitude**<br>148.38162 | |
| **Slope:**<br><1° | |
| **Aspect:**<br>SE | |
| **Infrastructure:**<br>Waste dump | |

| **General Site Description** | |
|---|---|
| **Landform** | Watercourse (Isaac River) on level plain |
| **Soil** | Sand |
| **Observed vegetation** | RE 11.3.25 (mapped as 11.3.25). Open forest with a mid-dense canopy dominated by forest red gum (*Eucalyptus tereticornis*), with frequent river she-oak (*Casuarina cunninghamiana*) and carbeen (*Corymbia tessellaris*). Very sparse sub-canopy of river she-oak, snow in summer (*Melaleuca linariifolia*) and white bauhinia (*Lysiphyllum hookeri*). Sparse shrub layer of sandpaper fig (*Ficus opposita*), wombat berry (*Eustrephus latifolia*), white bauhinia, peach bush (*Ehretia membranifolia*) and lantana (*Lantana camara*). Ground layer dominated by green panic (*Megathyrsus maximus*). |
| **General Site Observations** | Trees form ecologically dominant stratum; mature community, but mostly young trees; part of the Isaac River corridor, high level of historical disturbance at this point and downstream, with riparian vegetation narrowed by clearing to little further than the high bank; moderate recruitment; normal watercourse erosion; no dieback or fire scars. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered small and large hollows, in a mixture of dead and alive trees; scattered small logs; leaf litter common; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Seeding grass cover common; scattered fleshy fruiting plants, including sandpaper fig, wombat berry, peach bush, lantana and quinine tree; koala feed trees abundant. |
| **Signs** | Red-necked wallaby and eastern grey kangaroo observed; glider scratches on landing and launch trees; koala scratches; common woodland birds, including whistling kite, pied butcherbird, rainbow lorikeet, emu, blue-faced honeyeater, pheasant coucal, noisy miner, channel-billed cuckoo, blue-winged kookaburra, laughing kookaburra and willie wagtail. |
| **Koala Feed Trees** | Forest red gum (*E. tereticornis*). Koala scratches on forest red gum. Koala identified during spotlighting approx. 225 m west on the opposite bank. |
| **Koala habitat score** | Koala occurrence: high (2); vegetation composition: high (2); habitat connectivity: high (2); key existing threats: medium (1); recovery value: high (2); overall score: 9 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>RCQ27 (Fauna) | |
| **Location**<br>Deverill | |
| **Date**<br>18/11/2017 | |
| **Latitude**<br>-22.16809 | |
| **Longitude**<br>148.38084 | |
| **Slope:**<br>1° | |
| **Aspect:**<br>SE | |
| **Infrastructure:**<br>Waste dump | |

| **General Site Description** | |
|---|---|
| **Landform** | Deposited low rises; old floodplain |
| **Soil** | Brown sandy loam |
| **Observed vegetation** | RE 11.3.7 (mapped as 11.5.3 / 11.4.9). Woodland with sparse canopy dominated by Clarkson's bloodwood (*Corymbia clarksoniana*) and carbeen (*C. tessellaris*), with frequent Dallachy's gum (*C. dallachiana*) and narrow-leaved ironbark (*Eucalyptus crebra*). Sparse sub-canopy of carbeen, sally wattle (*Acacia salicina*), narrow-leaved ironbark and Clarkson's bloodwood. Mid-dense shrub layer comprised mostly of lantana (*Lantana camara*). Ground layer is a mix of buffel grass (*Cenchrus ciliaris*), barbed wire grass (*Cymbopogon refractus*), kangaroo grass (*Themeda triandra*), black speargrass (*Heteropogon contortus*), rough fuzzweed (*Vittadinia pustula*), pineapple daisy (*Pterocaulon redolens*) and red Natal grass (*Melinis repens*). |
| **General Site Observations** | Trees form ecologically dominant stratum; some older trees, but mostly young 'regrowth' with a cohort of carbeen within more open patches, suggesting this area may have been burned at some time and is regenerating; part of the Isaac River corridor; high level of historical disturbance at this point and downstream, where riparian vegetation is narrowed by clearing to the high bank; no erosion detected; no fire scars detected. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered small hollows, mostly in dead trees; scattered small and large logs; leaf litter common; dense shrub cover abundant. |
| **Food Potential Over Entire Year** | Seeding grass cover common; fleshy fruiting plants scattered, including lantana and dysentery plant (*Grewia latifolia*); scattered koala feed trees. |
| **Signs** | Scattered macropod scats; red-necked wallaby observed; common woodland birds, including pied butcherbird, noisy miner, sulphur-crested cockatoo, red-backed fairy-wren, Torresian crow, Australian magpie, blue-winged kookaburra and rainbow lorikeet. |
| **Koala Feed Trees** | Narrow-leaved ironbark (*E. crebra*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: medium (1); vegetation composition: medium (1); habitat connectivity: high (2); key existing threats: medium (1); recovery value: high (2); overall score: 7 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>RCQ28 (Fauna) | |
| **Location**<br>Deverill | |
| **Date**<br>18/11/2017 | |
| **Latitude**<br>-22.17044 | |
| **Longitude**<br>148.39201 | |
| **Slope:**<br><1° | |
| **Aspect:**<br>NE | |
| **Infrastructure:**<br>Eastern waste dump | |

| **General Site Description** | |
|---|---|
| **Landform** | Level plain |
| **Soil** | Brown light to medium clay |
| **Observed vegetation** | RE 11.3.1 (mapped as non-remnant). Woodland dominated by brigalow (*Acacia harpophylla*) and coolabah (*Eucalyptus coolabah*), with occasional poplar box (*E. populnea*). Sparse sub-canopy of brigalow, white bauhinia (*Lysiphyllum hookeri*), boonaree (*Alectryon oleifolius*) and poplar box, with occasional quinine tree (*Petalostigma pubescens*). Very sparse shrub layer of white bauhinia, desert jasmine (*Jasminum didymum* subsp. *lineare*), currant bush (*Carissa ovata*), boonaree, brigalow, whitewood (*Atalaya hemiglauca*), wilga (*Geijera parviflora*), emu apple (*Owenia acidula*) and harrisia (*Harrisia martinii*). Buffel grass (*Cenchrus ciliaris*) dominates the ground layer. |
| **General Site Observations** | Trees form the ecologically dominant stratum; a small but healthy patch with moderate recruitment; part of a small unmapped remnant isolated from the Isaac River corridor by clearing; ground layer dominated by exotic species; no erosion detected; minimal dieback; no fire scars detected; moderate grazing impacts. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Small hollows common, mostly in dead trees; scattered large logs; small logs common; leaf litter common; scattered shrub cover. |
| **Food Potential Over Entire Year** | Seeding grass cover scattered; scattered fleshy fruiting plants, including currant bush, emu apple and harrisia; koala feed trees common. |
| **Signs** | Eastern grey kangaroo camping; medium-sized woodland bird nests; ruddy tree frog (*Litoria rubella*) calling; common woodland birds, including galah, pale-headed rosella, little friarbird, willie wagtail, rufous fantail, black-faced cuckoo shrike. |
| **Koala Feed Trees** | Coolabah (*E. coolabah*) and poplar box (*E. populnea*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: medium (1); vegetation composition: medium (1); habitat connectivity: low (0); key existing threats: medium (1); recovery value: low (0); overall score: 4 = Not critical habitat. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>RCQ29 (Fauna) | |
| **Location**<br>Deverill | |
| **Date**<br>18/11/2017 | |
| **Latitude**<br>-22.16993 | |
| **Longitude**<br>148.39247 | |
| **Slope:**<br>1° | |
| **Aspect:**<br>SE | |
| **Infrastructure:**<br>Eastern waste dump | |

| **General Site Description** | |
|---|---|
| **Landform** | Closed depression on level plain |
| **Soil** | Brown light clay |
| **Observed vegetation** | RE 11.3.27f (mapped as non-remnant). Fringing coolabah (*Eucalyptus coolabah*) woodland. Very sparse sub-canopy of brigalow (*Acacia harpophylla*) and coolabah. Very sparse shrub layer of white bauhinia (*Lysiphyllum hookeri*). Native wetland species dominate the ground layer and include tall flatsedge (*Cyperus exaltatus*), hairy carpet weed (*Glinus lotoides*), musk basil (*Basilicum polystachion*) and umbrella canegrass (*Leptochloa digitata*). |
| **General Site Observations** | Fringing trees form the ecologically dominant stratum; a healthy wetland with moderate recruitment; contains old mature trees with hollows; part of a small unmapped remnant isolated from the Isaac River corridor by clearing; ground layer dominated by native species; no erosion, dieback or fire scars detected; moderate grazing impacts. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Large hollows scattered and small hollows common, mostly in living trees; scattered large logs; small logs common; leaf litter common; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Seeding grass cover common; scattered fleshy fruiting plants, including harrisia (*Harrisia martinii*); koala feed trees abundant. |
| **Signs** | Scattered macropod scats; magpie-lark mud nests; other medium-sized woodland bird nests; common woodland birds, including pardalote, willie wagtail, rufous fantail, black-faced cuckoo shrike, magpie lark, Apostlebird, pale-headed rosella and little friarbird. |
| **Koala Feed Trees** | Coolabah (*E. coolabah*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: medium (1); vegetation composition: high (2); habitat connectivity: low (0); key existing threats: medium (1); recovery value: low (0); overall score: 4 = Not critical habitat. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>RCQ30 (Fauna) | |
| **Location**<br>Deverill | |
| **Date**<br>18/11/2017 | |
| **Latitude**<br>-22.17262 | |
| **Longitude**<br>148.39100 | |
| **Slope:**<br>1° | |
| **Aspect:**<br>SE | |
| **Infrastructure:**<br>Eastern waste dump | |

| **General Site Description** | |
|---|---|
| **Landform** | Level plain |
| **Soil** | Brown loam |
| **Observed vegetation** | RE 11.3.2 (mapped as non-remnant). Woodland dominated by poplar box (*Eucalyptus populnea*), with occasional Dallachy's gum (*Corymbia dallachiana*). Very sparse sub-canopy of poplar box, sally wattle (*Acacia salicina*) and boonaree (*Alectryon oleifolius*). Sparse shrub layer of white bauhinia (*Lysiphyllum hookeri),* sally wattle, bean tree (*Cassia brewsteri*) and flannel weed (*Sida cordifolia*). Ground layer dominated by buffel grass (*Cenchrus ciliaris*), with occasional green panic (*Megathyrsus maximus*), curly windmill grass (*Enteropogon ramosus*), red Natal grass (*Melinis repens*) and shrubby stylo (*Stylosanthes scabra*). |
| **General Site Observations** | Trees form the ecologically dominant stratum; a healthy community with good regeneration; contains old mature trees with hollows; part of a small unmapped remnant isolated from the Isaac River corridor by clearing; ground layer dominated by exotic species; no erosion, dieback or fire scars detected; moderate grazing impacts. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Large hollows scattered and small hollows common, in a mixture of dead and alive trees; scattered large logs; small logs common; leaf litter common; scattered shrub cover. |
| **Food Potential Over Entire Year** | Scattered seeding grass cover; scattered fleshy fruiting plants, including harrisia (*Harrisia martinii*) and dysentery plant (*Grewia retusifolia*); koala feed trees abundant. |
| **Signs** | Scattered macropod scats; common woodland birds, including pied butcherbird, black-faced cuckoo shrike, pale-headed rosella and Torresian crow. |
| **Koala Feed Trees** | Poplar box (*E. populnea*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: medium (1); vegetation composition: high (2); habitat connectivity: low (0); key existing threats: medium (1); recovery value: low (0); overall score: 4 = Not critical habitat. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>RCQ31 (Fauna) | |
| **Location**<br>Deverill | |
| **Date**<br>18/11/2017 | |
| **Latitude**<br>-22.18689 | |
| **Longitude**<br>148.38944 | |
| **Slope:**<br><1° | |
| **Aspect:**<br>S | |
| **Infrastructure:**<br>Eastern waste dump | |

| **General Site Description** | |
|---|---|
| **Landform** | Level plain |
| **Soil** | Brown loam |
| **Observed vegetation** | RE 11.3.2 (mapped as non-remnant). Woodland dominated by poplar box (*Eucalyptus populnea*), with occasional Clarkson's bloodwood (*Corymbia clarksoniana*), ironwood (*Acacia excelsa*) and sally wattle (*A. salicina*). Very sparse sub-canopy of poplar box and Dallachy's gum (*C. dallachiana*). Very sparse shrub layer of dysentery plant (*Grewia retusifolia*), sally wattle, bean tree (*Cassia brewsteri*) and lantana (*Lantana camara*). Ground layer dominated by Buffel grass (*Cenchrus ciliaris*), with abundant kangaroo grass (*Themeda triandra*) and occasional wiregrasses (*Aristida calycina* and *A. jerichoensis*), red Natal grass (*Melinis repens*), curly windmill grass (*Enteropogon ramosus*), winter apple (*Eremophila debilis*) and kangaroo grass (*Themeda triandra*). |
| **General Site Observations** | Trees form the ecologically dominant stratum; a healthy remnant community with good regeneration; contains older mature trees with hollows; part of an unmapped linear remnant adjacent to the Isaac River corridor; ground layer dominated by exotic species; no erosion, dieback or fire scars detected; moderate grazing impacts. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Large hollows scattered and small hollows common, in a mixture of dead and alive trees; scattered large logs; small logs common; leaf litter common; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Scattered seeding grass cover; scattered fleshy fruiting plants, including dysentery plant, lantana and tree pear (*Opuntia tomentosa*); koala feed trees abundant. |
| **Signs** | Eastern grey kangaroos camping; common woodland birds, including noisy miner and pied butcherbird. |
| **Koala Feed Trees** | Poplar box (*E. populnea*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: medium (1); vegetation composition: high (2); habitat connectivity: high (2); key existing threats: medium (1); recovery value: high (2); overall score: 8 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>RCQ32 (Fauna) | |
| **Location**<br>Deverill | |
| **Date**<br>19/11/2017 | |
| **Latitude**<br>-22.17577 | |
| **Longitude**<br>148.38503 | |
| **Slope:**<br><1° | |
| **Aspect:**<br>S | |
| **Infrastructure:**<br>Eastern waste dump | |

| **General Site Description** | |
|---|---|
| **Landform** | Level plain; deposited low rises; old floodplain |
| **Soil** | Brown sandy loam |
| **Observed vegetation** | RE 11.3.7 (mapped as non-remnant). Woodland dominated by Clarkson's bloodwood (*Corymbia clarksoniana*), with frequent Dallachy's gum (*C. dallachiana*), carbeen (*C. tessellaris*) and narrow-leaved ironbark (*Eucalyptus crebra*). Very sparse sub-canopy of carbeen, sally wattle (*Acacia salicina*), Dallachy's gum and Clarkson's bloodwood. Very sparse shrub layer composed of sally wattle, Dallachy's gum, Clarkson's bloodwood and lantana (*Lantana camara*). Ground layer dominated by buffel grass (*Cenchrus ciliaris*), with occasional red Natal grass (*Melinis repens*), vernonia (*Cyanthillium cinereum*), wandering jew (*Commelina diffusa*), snail flower (*Galactia tenuiflora*), lilac tassel-flower (*Emilia sonchifolia*), purple spade flower (*Hybanthus enneaspermus*) and austral bugle (*Ajuga australis*). |
| **General Site Observations** | Trees form the ecologically dominant stratum; naturally sparse community with some older trees with hollows; a good range of regenerating canopy species; part of an unmapped linear remnant adjacent to the Isaac River corridor; no erosion or fire detected. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Large hollows scattered and small hollows abundant, in a mixture of dead and alive trees; scattered small and large logs; scattered leaf litter; scattered shrub / grass shelter. |
| **Food Potential Over Entire Year** | Scattered seeding grass cover; scattered fleshy fruiting plants, including lantana; scattered koala feed trees. |
| **Signs** | Scattered macropod scats; brushtail possum scats; galahs nesting; common woodland birds throughout (see list for fauna site BIRDRC7). |
| **Koala Feed Trees** | Narrow-leaved ironbark (*E. crebra*). No scratches or pellets detected in immediate vicinity, despite targeted searches. Koala scratches detected 300 m west, on bank of the Isaac River. |
| **Koala habitat score** | Koala occurrence: medium (1); vegetation composition: medium (1); habitat connectivity: high (2); key existing threats: medium (1); recovery value: medium (1); overall score: 6 = **Critical habitat**. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>RCQ33 (Fauna) | |
| **Location**<br>Deverill | |
| **Date**<br>19/11/2017 | |
| **Latitude**<br>-22.15224 | |
| **Longitude**<br>148.40768 | |
| **Slope:**<br>1-2° | |
| **Aspect:**<br>SSW | |
| **Infrastructure:**<br>Eastern waste dump | |

| **General Site Description** | |
|---|---|
| **Landform** | Gently undulating plain |
| **Soil** | Brown sandy loam |
| **Observed vegetation** | RE 11.5.9 (mapped as 11.5.9b). Open woodland of narrow-leaved ironbark (*Eucalyptus crebra*) and Clarkson's bloodwood (*Corymbia clarksoniana*). Very sparse sub-canopy of red ash (*Alphitonia excelsa*), *Acacia faucium*, tea tree (*Melaleuca viridiflora*), quinine tree (*Petalostigma pubescens*) and Clarkson's bloodwood. Very sparse shrub layer of red ash, lantana (*Lantana camara*), tea tree, Clarkson's bloodwood and sweet canthium (*Psydrax oleifolius*). Ground layer dominated by buffel grass (*Cenchrus ciliaris*), with frequent shrubby stylo (*Stylosanthes scabra*) and flannel weed (*Sida cordifolia*), and occasional golden beard grass (*Chrysopogon fallax*), red Natal grass (*Melinis repens*) and northern silk pod (*Parsonsia lanceolata*). |
| **General Site Observations** | Trees form the ecologically dominant stratum; sparse community which may have been partly cleared by fire; good recruitment; significant dieback of immature canopy species noted, possibly related to dry seasons; no fire scars noted; light grazing pressure. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered small hollows, mostly in dead trees; scattered small logs; leaf litter common; scattered shrub shelter. |
| **Food Potential Over Entire Year** | Seeding grass cover scattered; scattered fleshy fruiting plants, including quinine tree, lantana and harrisia (*Harrisia martinii*); scattered koala feed trees. |
| **Signs** | Scattered macropod scats; common woodland birds, including pale-headed rosella, noisy miner, pied butcherbird, double-barred finch, rainbow bee-eater, Torresian crow and red-winged parrot. |
| **Koala Feed Trees** | Narrow-leaved ironbark (*E. crebra*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: medium (1); habitat connectivity: low (0); key existing threats: medium (1); recovery value: medium (1); overall score: 3 = Not critical habitat. |
| **Fauna habitat value – general** | Average. |

| | |
|---|---|
| **Survey Code**<br>RCQ34 (Fauna) | |
| **Location**<br>Deverill | |
| **Date**<br>19/11/2017 | |
| **Latitude**<br>-22.15531 | |
| **Longitude**<br>148.40104 | |
| **Slope:**<br>2° | |
| **Aspect:**<br>SW | |
| **Infrastructure:**<br>Eastern waste dump | |

| **General Site Description** | |
|---|---|
| **Landform** | Gently undulating plain |
| **Soil** | Brown sandy light clay |
| **Observed vegetation** | RE 11.5.3 (mapped as non-remnant). Woodland with sparse canopy dominated by poplar box (*Eucalyptus populnea*), with occasional narrow-leaved ironbark (*E. crebra*). Very sparse sub-canopy of poplar box, sally wattle (*Acacia salicina*), red ash (*Alphitonia excelsa*) and ironwood (*Acacia excelsa*). Very sparse shrub layer of currant bush (*Carissa ovata*), cocaine tree (*Erythroxylum australe*), bean tree (*Cassia brewsteri*), boonaree (*Alectryon oleifolius*), poplar box, narrow-leaved ironbark, northern silk pod (*Parsonsia lanceolata*), harrisia (*Harrisia martinii*), sally wattle, red bauhinia (*Lysiphyllum carronii*) and sandalwood (*Santalum lanceolatum*). Ground layer dominated by buffel grass (*Cenchrus ciliaris*), with frequent red Natal grass (*Melinis repens*), purple wiregrass (*Aristida ramosa*), curly windmill grass (*Enteropogon ramosus*), flannel weed (*Abutilon oxycarpum*) and shrubby stylo (*Stylosanthes scabra*). |
| **General Site Observations** | Trees form the ecologically dominant stratum; stock impacts; erosion areas with gullying in parts mostly associated with old roads or stock movement; mostly exotic grasses; some dieback in otherwise healthy canopy. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | Scattered small hollows, mostly in dead trees; scattered large logs; small logs abundant; leaf litter common; scattered shrub / grass shelter; scattered termite mounds. |
| **Food Potential Over Entire Year** | Scattered seeding grass cover; scattered fleshy fruiting plants, including currant bush, harrisia, quinine tree (Petalostigma pubescens) and winter apple (*Eremophila debilis*); koala feed trees common. |
| **Signs** | Scattered macropod scats; common woodland birds, including Torresian crow, rainbow bee-eater and grey shrike-thrush. |
| **Koala Feed Trees** | Poplar box (*E. populnea*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: high (2); habitat connectivity: low (0); key existing threats: medium (1); recovery value: medium (1); overall score: 4 = Not critical habitat. |
| **Fauna habitat value – general** | Good. |

| | |
|---|---|
| **Survey Code**<br>RCQ35 (Fauna) | |
| **Location**<br>Carborough Downs | |
| **Date**<br>20/11/2017 | |
| **Latitude**<br>-21.97890 | |
| **Longitude**<br>148.23054 | |
| **Slope:**<br>1° | |
| **Aspect:**<br>SW | |
| **Infrastructure:**<br>ETL and access | |

| **General Site Description** | |
|---|---|
| **Landform** | Level plain |
| **Soil** | Red loam |
| **Observed vegetation** | RE 11.5.9b (mapped as 11.5.9b). Woodland of narrow-leaved ironbark (*Eucalyptus crebra*) and Clarkson's bloodwood (*Corymbia clarksoniana*). Mid-dense sub-canopy of red ash (*Alphitonia excelsa*), *Acacia faucium,* black wattle (*A. leiocalyx*), quinine tree (*Petalostigma pubescens*), Clarkson's bloodwood and wild pear (*Persoonia falcata*). Very sparse shrub layer of quinine tree. Ground layer sparsely covered by golden beard grass (*Chrysopogon fallax*), black speargrass (*Heteropogon contortus*) and red Natal grass (*Melinis repens*). |
| **General Site Observations** | Trees form the ecologically dominant stratum; young community which may have been cleared by fire and is in the process of regrowing, with some trees have coppiced, indicating regrowth from rootstock; good recruitment; shrubby sub-canopy dominated by *Acacias*; no fire scars noted; no grazing pressure. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | No hollows detected; scattered small logs; abundant leaf litter; dense shrub / grass shelter common. |
| **Food Potential Over Entire Year** | Scattered seeding grass cover; fleshy fruiting plants common, including quinine tree; nectar / pollen producing plant common; koala feed trees species common, but too small to be significant. |
| **Signs** | Scattered macropod scats; common woodland birds, including Torresian crow, Australian magpie, pied butcherbird, little friarbird, noisy friarbird, magpie-lark, red-backed fairy-wren, pied currawong, double-barred finch and rainbow bee-eater. |
| **Koala Feed Trees** | Narrow-leaved ironbark (*E. crebra*). No scratches or pellets detected, despite targeted searches. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: medium (1); habitat connectivity: low (0); key existing threats: medium (1); recovery value: medium (1); overall score: 3 = Not critical habitat. |
| **Fauna habitat value – general** | Average. |

| | |
|---|---|
| **Survey Code**<br>RCQ36 (Fauna) | |
| **Location**<br>Carborough Downs | |
| **Date**<br>20/11/2017 | |
| **Latitude**<br>-21.98543 | |
| **Longitude**<br>148.23941 | |
| **Slope:**<br>1° | |
| **Aspect:**<br>SE | |
| **Infrastructure:**<br>Powerline | |

| **General Site Description** | |
|---|---|
| **Landform** | Level plain |
| **Soil** | Pale skeletal loam |
| **Observed vegetation** | Non-remnant (mapped as non-remnant). Open scrub of red lancewood (*Acacia shirleyi*), currawong (*A. sparsiflora*) and red ash (*Alphitonia excelsa*). Very sparse shrub layer of red lancewood, red ash and *Bertya pedicellata*. Ground layer sparsely covered, dominated by red Natal grass (*Melinis repens*). |
| **General Site Observations** | Trees form the ecologically dominant stratum; this is a regrowth community which appears to have been mechanically cleared and is in the process of regrowing; good recruitment; *Bertya pedicellata* (listed as Near Threatened under the Qld NC Act) is growing on sandstone spoil that has been dumped in this locality; no fire scars noted; no grazing pressure. |
| **Fauna Habitat Observations** | |
| **Shelter / Cover** | No hollows detected; scattered small logs; abundant leaf litter; dense shrub / grass shelter common. |
| **Food Potential Over Entire Year** | Scattered nectar / pollen producing plant. |
| **Signs** | Little sign of fauna usage, apart from common woodland birds calling nearby. |
| **Koala Feed Trees** | None detected. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: low (0); habitat connectivity: low (0); key existing threats: medium (1); recovery value: low (0); overall score: 1 = Not critical habitat. |
| **Fauna habitat value – general** | Poor. |

| | |
|---|---|
| **Survey Code**<br>RCQ37 (Fauna) | |
| **Location**<br>Carborough Downs | |
| **Date**<br>20/11/2017 | |
| **Latitude**<br>-21.98707 | |
| **Longitude**<br>148.24238 | |
| **Slope:**<br>25° | |
| **Aspect:**<br>SE | |
| **Infrastructure:**<br>ETL and access | |

| **General Site Description** | |
|---|---|
| **Landform** | Escarpment |
| **Soil** | Pale skeletal loam |
| **Observed vegetation** | RE 11.7.2 (mapped as 11.7.2). Open forest of red lancewood (*Acacia shirleyi*), with a sparse shrub layer of red lancewood, cocaine tree (*Erythroxylum australe*) and *Bertya pedicellata*. Sparse ground layer dominated by *Cleistochloa subjuncea.* |
| **General Site Observations** | Trees form the ecologically dominant stratum; mature community in good condition; good recruitment; no fire scars noted; no grazing pressure. |

| **Fauna Habitat Observations** | |
|---|---|
| **Shelter / Cover** | No hollows detected; scattered large logs; small logs common; rock outcrop common; abundant leaf litter; dense shrub shelter. |
| **Food Potential Over Entire Year** | Scattered seeding grass cover. |
| **Signs** | Common woodland birds, including red-backed fairy-wren and little friarbird. |
| **Koala Feed Trees** | None detected. |
| **Koala habitat score** | Koala occurrence: low (0); vegetation composition: low (0); habitat connectivity: low (0); key existing threats: medium (1); recovery value: low (0); overall score: 1 = Not critical habitat. |
| **Fauna habitat value – general** | Average – good cover for reptiles and ground-dwelling fauna. |

# Appendix C: Fauna species detected

**Table 17 Amphibians recorded from the Study area (M LA), 1-14 November 2016**

| Scientific name | Common name | Status | | Site | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | EPBC Act[1] | NC Act[2] | FAC1 | FAC2 | FAC3 | FAC5 | FAC6 | FAC7 | FAC8 | SPOT1 | SPOT2 | SPOT3 | SPOT4 | SPOT5 | SPOT6 | SPOT7 | SPOT8 | SPOT9 | AS1 | AS2 | AS3 | AS4 | AS5 |
| *Cyclorana alboguttata* | Green-striped frog | - | LC | | | ✓ | | ✓ | | | | | ✓ | | | | | | | | | | | |
| *Cyclorana brevipes* | Superb collared frog | - | LC | ✓ | ✓ | | | | | | | | ✓ | | ✓ | | | | | | | | | |
| *Cyclorana novaehollandiae* | Eastern snapping frog | - | LC | | | | | ✓ | ✓ | | | | ✓ | ✓ | | | ✓ | | | | | | | |
| *Limnodynastes tasmaniensis* | Spotted grassfrog | - | LC | | ✓ | | | | | | ✓ | | | | ✓ | | | | | | | | | |
| *Litoria caerulea* | Green tree frog | - | LC | | ✓ | | | ✓ | | | ✓ | | | | | | | | | ✓ | | | | |
| *Litoria latopalmata* | Broad-palmed rocketfrog | - | LC | | | | ✓ | ✓ | | | | | ✓ | ✓ | | | | | | | | | | |
| *Litoria peronii* | Emerald spotted tree frog | - | LC | | | | | ✓ | | | | | ✓ | | | | | | | | | | | |
| *Litoria rubella* | Ruddy treefrog | - | LC | | | | | ✓ | | | | ✓ | ✓ | ✓ | | | | | | | | | | |
| *Platyplectrum ornatum* | Ornate burrowing frog | - | LC | | ✓ | ✓ | ✓ | ✓ | | | | | | | | | | | | | | | | |
| *Rhinella marina** | Cane toad | - | - | | | | | ✓ | | | ✓ | ✓ | ✓ | ✓ | | | | | | | | | | |

Notes:

1. EPBC Act = *Environment Protection and Biodiversity Conservation Act 1999*; 2. NC Act = *Nature Conservation Act 1992*; * = introduced species.

**Table 18 Reptiles recorded from the Study area (MLA), 1-14 November 2016**

| Scientific name | Common name | Status | | Site | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | EPBC Act[1] | NC Act[2] | FAC1 | FAC2 | FAC3 | FAC5 | FAC6 | FAC7 | FAC8 | SPOT1 | SPOT2 | SPOT3 | SPOT4 | SPOT5 | SPOT6 | SPOT7 | SPOT8 | SPOT9 | AS1 | AS2 | AS3 | AS4 | AS5 | Incidental |
| *Carlia pectoralis* | - | - | LC | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | | | | | | | | | | ✓ | ✓ | | | | |
| *Chlamydosaurus kingii* | Frilled lizard | - | LC | | | | | | | | | | | | | | | | | | | | | | ✓ |
| *Cryptoblepharus pannosus* | | - | LC | | | | | | | ✓ | | | | | | | | | | | | | | | |
| *Cryptoblepharus pulcher* | - | - | LC | ✓ | ✓ | | | | | | | | | | | | | | | | | | | | |
| *Ctenotus robustus* | A Striped Skink | - | LC | | | | | | | | | | | | | | | | | | | ✓ | | | |
| *Demansia psammophis* | Yellow-faced whipsnake | - | LC | | | | ✓ | | | | | | | | | | | | | | | | | | |
| *Dendrelaphis punctulata* | Green Tree Snake | - | LC | | | | | | | | | | | | | | | | | | | | | | ✓ |
| *Denisonia maculata* | Ornamental Snake | V | V | ✓ | | | | | | | | | | | | | | | | | | | | | |
| *Diporiphora australis* | Tommy Roundhead | - | LC | | | | | | | ✓ | | | | | | | | | | | | | | | |
| *Gehyra catenata* | - | - | LC | ✓ | | | | | | | | | | | | | | | | | | | | | |
| *Gehyra dubia* | - | - | LC | | ✓ | | | ✓ | ✓ | | | | | | | | | | | | | | | | |
| *Heteronotia binoei* | Bynoe's Gecko | - | LC | ✓ | ✓ | ✓ | ✓ | | | ✓ | | | | | | | | | | ✓ | ✓ | | | ✓ | |
| *Menetia greyii* | | - | LC | | ✓ | | | | | | | | | | | | | | | | | | | | |
| *Morethia boulengeri* | Boulenger's Skink | - | LC | ✓ | | | | | | | | | | | | | | | | | | ✓ | | | |
| *Morethia taeniopleura* | - | - | LC | ✓ | | ✓ | | | | | | | | | | | | | | ✓ | ✓ | | | | |
| *Paradelma orientalis* | Brigalow scaly-foot | - | LC | ✓ | | | | | | | | | | | | | | | | | | | | | |
| *Pseudonaja textilis* | Eastern Brown Snake | - | LC | | | ✓ | | | | | | | | | | | | | | | | | | | |
| *Tropidonophis mairii* | Keelback | - | LC | | | | | | | | | | | | | | | | | | | | | | ✓ |
| *Varanus tristis* | Freckled monitor | - | LC | | | | | | | ✓ | | | | | | | | | | | | ✓ | | | |

Notes:

1. EPBC Act = *Environment Protection and Biodiversity Conservation Act 1999*; 2. NC Act = *Nature Conservation Act 1992*.

**Table 19 Mammals recorded from the Study area (MLA), 1-14 November 2016**

| Scientific name | Common name | Status | | Site | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | EPBC Act[1] | NC Act[2] | FAC1 | FAC2 | FAC3 | FAC5 | FAC6 | FAC7 | FAC8 | SPOT1 | SPOT2 | SPOT3 | SPOT4 | SPOT5 | SPOT6 | SPOT7 | SPOT8 | SPOT9 | ANA1 | ANA2 | ANA3 | ANA4 | ANA5 | ANA6 | ANA7 | HARP1 | HARP2 | KTRANS1 | KTRANS2 | KTRANS3 | Incidental |
| *Aepyprymnus rufescens* | Rufous Bettong | - | LC | | | | | | ✓ | | | | | | | ✓ | | | | | | | | | | | | | | | | |
| *Canis lupus familiaris** | Dog | - | - | | | | | | | | | | | | | | | | | | | | | | | | | | | | | ✓ |
| *Chaerephon jobensis* | Northern Freetail Bat | - | LC | | | ✓ | | | ✓ | ✓ | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | | | | | | |
| *Chalinolobus gouldii* | Gould's wattled bat | - | LC | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | |
| *Chalinolobus morio* | Chocolate wattled bat | - | LC | ✓ | | | | | | | | | | | | | | | | ✓ | | | ✓ | | ✓ | ✓ | | | | | | |
| *Chalinolobus nigrogriseus* | Hoary wattled bat | - | LC | ✓ | | | | | | | | | | | | | | | | ✓ | | | | | | | | | | | | |
| *Chalinolobus picatus* | Little pied bat | - | LC | | ✓ | | | ✓ | ✓ | | | | | | | | | | | | ✓ | | ✓ | | ✓ | | | | | | | |
| *Felis catus** | Cat | - | - | ✓ | | | | | ✓ | | | | | | | | | ✓ | ✓ | | | | | | | | | | | | | |
| *Hydromys chrysogaster* | Water rat | - | LC | | | | | | | | | | | | | | | | | | | | | | | | | | | | | ✓ |
| *Lepus europaeus** | Hare | - | - | ✓ | | | | | | | | | | | | | | ✓ | ✓ | | | | | | | | | | | | | |
| *Macropus giganteus* | Eastern grey kangaroo | - | LC | ✓ | | | | | ✓ | | | | | | | ✓ | | | ✓ | | | | | | | | | | | | | |
| *Mormopterus lumsdenae* | Northern free-tailed bat | - | LC | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | |
| *Mormopterus ridei* | Eastern free-tailed bat | - | LC | | | ✓ | ✓ | ✓ | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | | | | | | |
| *Mus musculus** | House mouse | | - | ✓ | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Nyctophilus geoffroyi* | Lesser long-eared bat | - | LC | | | | | | | | | | | | | | | | | | | | | | | | | ✓ | | | | |
| *Nyctophilus sp.* | Long-eared bat | - | LC | | | ✓ | | | | | | | | | | | | | | ✓ | | | ✓ | | | | | | | | | |
| *Oryctolagus cuniculus** | European rabbit | - | - | ✓ | | | | | | | | | | | | ✓ | | | ✓ | | | | | | | | | | | | | |
| *Petauroides volans* | Greater glider | V | LC | ✓ | | | | | | | | | | | ✓ | ✓ | ✓ | | ✓ | | | | | | | | | | ✓ | | | ✓ |
| *Petaurus breviceps* | Sugar glider | - | LC | | | | | | | | | | | | ✓ | | | | | | | | | | | | | | | | | |
| *Petaurus norfolcensis* | Squirrel glider | - | LC | | | | | | | | | | | | ✓ | | | | | | | | | | | | | | | | | |
| *Phascolarctos cinereus* | Koala | V | V | | | ✓ | | | | | | | | | | | | | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ |
| *Pseudomys delicatulus* | Delicate mouse | - | LC | | ✓ | | | ✓ | | | | | | | | | | | | | | | | | | | | | | | | |
| *Saccolaimus flaviventris* | Yellow-bellied sheathtail bat | - | LC | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | |

| Scientific name | Common name | Status | | Site | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| | | EPBC Act[1] | NC Act[2] | FAC1 | FAC2 | FAC3 | FAC5 | FAC6 | FAC7 | FAC8 | SPOT1 | SPOT2 | SPOT3 | SPOT4 | SPOT5 | SPOT6 | SPOT7 | SPOT8 | SPOT9 | ANA1 | ANA2 | ANA3 | ANA4 | ANA5 | ANA6 | ANA7 | HARP1 | HARP2 | KTRANS1 | KTRANS2 | KTRANS3 | Incidental |
| *Scotorepens balstoni* | Inland broad-nosed bat | - | LC | | | | | ✓ | | | | | | | | | | | | ✓ | ✓ | | ✓ | | ✓ | | | | | | | |
| *Scotorepens greyi* | Little broad-nosed bat | - | LC | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | |
| *Sminthopsis macroura* | Striped-faced dunnart | - | LC | ✓ | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Sus scrofa** | Pig | - | - | | | | | | | | | | | | | | | | | | | | | | | | | | | | | ✓ |
| *Trichosurus vulpecula* | Common brushtail possum | - | LC | | | | | | | | | | | | | ✓ | | | ✓ | | | | | | | | | | | | | |
| *Vespadelus baverstocki* | Inland forest bat | - | LC | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | | | | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | | | | | | |
| *Wallabia bicolor* | Swamp wallaby | - | LC | | | | | | | ✓ | | | | | | | | | | | | | | | | | | | | | | |

Notes:

1. EPBC Act = *Environment Protection and Biodiversity Conservation Act 1999*; 2. NC Act = *Nature Conservation Act 1992*; * = introduced species.

**Table 20 Birds recorded from the Study area (MLA), 1-14 November 2016**

| Scientific name | Common name | Status | | Site | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| | | EPBC Act[1] | NC Act[2] | FAC1 | FAC2 | FAC3 | FAC5 | FAC6 | FAC7 | FAC8 | BIRD1 | BIRD2 | BIRD3 | BIRD4 | BIRD5 | BIRD6 | BIRD7 | BIRD8 | BIRD9 | BIRD10 | BIRD11 | SPOT1 | SPOT2 | SPOT3 | SPOT4 | SPOT5 | SPOT6 | SPOT7 | SPOT8 | SPOT9 | Incidental |
| *Accipiter cirrhocephalus* | Collared Sparrowhawk | - | LC | | | | | | | | | | | | | | | | | | | | | | | | | | | | ✓ |
| *Aegotheles cristatus* | Owlet Nightjar | - | LC | | | | | | | | | | | | | | | | | | | | | | | | | ✓ | | | |
| *Anas gracilis* | Grey Teal | - | LC | | | | | | | | | | | ✓ | | ✓ | | ✓ | ✓ | | ✓ | | | | | | | | | | |
| *Anas superciliosa* | Black Duck | - | LC | | | | | | | | ✓ | ✓ | | ✓ | | ✓ | | ✓ | ✓ | | ✓ | | | | | | | | | | |
| *Anhinga melanogaster* | Darter | - | LC | | | | | | | | | | | ✓ | | ✓ | | | | | | | | | | | | | | | |
| *Anthus novaeseelandiae* | Richard's Pipit | - | LC | | | | | | | | | | | | | | | | | | | | | | | | | | | | ✓ |
| *Aprosmictus erythropterus* | Red-winged Parrot | - | LC | ✓ | | | ✓ | ✓ | | | | | | | | | | | | | | | | | | | | | | | |
| *Aquila audax* | Wedged-tailed Eagle | - | LC | | ✓ | ✓ | | | ✓ | ✓ | | | | | | | | | | | | | | | | | | | | | ✓ |
| *Ardea ibis* | Cattle Egret | - | LC | | | | | | | | | | | | | ✓ | | | | | | ✓ | | | | | | | | | ✓ |
| *Ardea modesta* | Eastern great egret | - | LC | | | | | | | | | | | | | ✓ | | | | | | | | | | | | | | | |
| *Ardeotis australis* | Australian Bustard | - | LC | | | | | | | | | | | | | | | | | | | | | | | | | | | | ✓ |
| *Artamus minor* | Little Woodswallow | - | LC | | | | | | | | | | | | | | | | ✓ | | | | | | | | | | | | |
| *Aviceda subcristata* | Pacific Baza | - | LC | | | | | | | | | | | | | | | ✓ | | | | | | | | | | | | | |
| *Aythya australis* | Hardhead | - | LC | | | | | | | | | | | | | ✓ | | | ✓ | | | | | | | | | | | | |
| *Cacatua galerita* | Sulphur Crested Cockatoo | - | LC | ✓ | | | | | ✓ | | ✓ | ✓ | | ✓ | | | ✓ | | | ✓ | | | | | | | | | | | |
| *Cacatua roseicapilla* | Galah | - | LC | ✓ | | | ✓ | | | | ✓ | | | | | | | | | | | | | | | | | | | | |
| *Cacomantis pallidus* | Pallid cuckoo | - | LC | ✓ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Centropus phasianinus* | Pheasant Coucal | - | LC | ✓ | ✓ | | ✓ | | ✓ | | ✓ | ✓ | | | ✓ | | | | | | | | | | | | | | | | |
| *Chenonetta jubata* | Wood Duck | - | LC | | | | | | | | | | | | | ✓ | | | | | ✓ | | | | | | | | | | |
| *Chlamydera maculata* | Spotted Bowerbird | - | LC | | | | | | | | | | | | | | | | | | | | | | | | | | | | ✓ |
| *Chroicocephalus novaehollandiae* | Silver gull | - | LC | | | | | | | | | | | | | ✓ | | | | | | | | | | | | | | | |
| *Chrysococcyx basalis* | Horsefield's bronze cuckoo | - | LC | | | | | | ✓ | | | | | | | | | | | | | | | | | | | | | | |
| *Chrysococcyx minutillus* | Little Bronze Cuckoo | - | LC | | | | | | | | | | | | | | | | | | | | | | | | | | | | ✓ |

| Scientific name | Common name | Status | | Site | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| | | EPBC Act[1] | NC Act[2] | FAC1 | FAC2 | FAC3 | FAC5 | FAC6 | FAC7 | FAC8 | BIRD1 | BIRD2 | BIRD3 | BIRD4 | BIRD5 | BIRD6 | BIRD7 | BIRD8 | BIRD9 | BIRD10 | BIRD11 | SPOT1 | SPOT2 | SPOT3 | SPOT4 | SPOT5 | SPOT6 | SPOT7 | SPOT8 | SPOT9 | Incidental |
| *Cincloramphus mathewsi* | Rufous Songlark | - | LC | | | | | | | | | | | | | | | | | | ✓ | | | | | | | | | | |
| *Circus assimilis* | Spotted Harrier | - | LC | | | | | | | | | | | | | | | | | | | | | | | | | | | | ✓ |
| *Cisticola exilis* | Golden Headed Cisticola | - | LC | | | | | | | | | | | | | ✓ | | | | | ✓ | | | | | | | | | | |
| *Colluricincla harmonica* | Grey Shrike-thrush | - | LC | | | | | | ✓ | | | | | | | | | ✓ | | | | | | | | | | | | | |
| *Coracina novaehollandiae* | Black-faced Cuckoo Shrike | - | LC | | | | | ✓ | | | ✓ | | | | | | | | | | | | | | | | | | | | |
| *Coracina papuensis* | White-bellied Cuckoo Shrike | - | LC | | | | | | | | | | | | | | | | | | | | | | | | | | | | ✓ |
| *Coracina tenuirostris* | Cicadabird | - | LC | | | | | | | | | | | | | | | ✓ | | | | | | | | | | | | | |
| *Corcorax melanorhamphos* | White-winged Chough | - | LC | | | | | | | | | | | | | | | | | | | | | | | | | | | | ✓ |
| *Corvus orru* | Torresian Crow | - | LC | ✓ | ✓ | | | | ✓ | ✓ | ✓ | ✓ | | ✓ | | | ✓ | ✓ | ✓ | | ✓ | | | | | | | | | | |
| *Coturnix ypsilophora* | Brown Quail | - | LC | | | | | | | | | | | | | | | | | | | | | | | | | | | | ✓ |
| *Cracticus nigrogularis* | Pied Butcherbird | - | LC | ✓ | ✓ | | | ✓ | | ✓ | ✓ | ✓ | | ✓ | | | | | | | | | | | | | | | | | |
| *Cracticus torquatus* | Grey butcherbird | - | LC | ✓ | | | | ✓ | ✓ | | | | | | ✓ | | | | | | | | | | | | | | | | |
| *Cygnus atratus* | Black swan | - | LC | | | | | | | | | | | | | ✓ | | | | | | | | | | | | | | | |
| *Dacelo leachii* | Blue-winged kookaburra | - | LC | | | | | | | | ✓ | | | ✓ | ✓ | | | | | | | | | | | | | | | | |
| *Dacelo novaeguineae* | Laughing kookaburra | - | LC | | | ✓ | ✓ | | ✓ | | ✓ | ✓ | | | | | | | | ✓ | | | | | | | | | | | |
| *Daphoenositta chrysoptera* | Varied sitella | - | LC | | | | | | ✓ | | | | | | | | | | | | | | | | | | | | | | |
| *Dendrocygna arcuata* | Wandering whistling-duck | - | LC | | | | | | | | | | | | | ✓ | ✓ | | | | | | | | | | | | | | |
| *Dendrocygna eytoni* | Plumed whistling-duck | - | LC | | | | | | | | | | | | | | | | | | ✓ | | | | | | | | | | |
| *Dicrurus bracteatus* | Spangled drongo | - | LC | | | | | | | | | | | | | | | | | | | | | | | | | | | | ✓ |
| *Dromaius novaehollandiae* | Emu | - | LC | | | | | | | | | | | | | | | | | | | | | | | | | | | | ✓ |
| *Egretta intermedia* | Intermediate Egret | - | LC | | | | | | | | | | | | | ✓ | | ✓ | | | | | | | | | | | | | |
| *Egretta novaehollandiae* | White-faced Heron | - | LC | | | | | | | | | | | | | ✓ | | | | | | | | | | | | | | | |
| *Elseyornis melanops* | Black-fronted Dotterel | - | LC | | | | | | | | | | | | | ✓ | | | | | | | | | | | | | | | |
| *Entomyzon cyanotis* | Blue-faced Honeyeater | - | LC | ✓ | | | | ✓ | | | | ✓ | | | | | | ✓ | | | | | | | | | | | | | |

| Scientific name | Common name | Status | | Site | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| | | EPBC Act[1] | NC Act[2] | FAC1 | FAC2 | FAC3 | FAC5 | FAC6 | FAC7 | FAC8 | BIRD1 | BIRD2 | BIRD3 | BIRD4 | BIRD5 | BIRD6 | BIRD7 | BIRD8 | BIRD9 | BIRD10 | BIRD11 | SPOT1 | SPOT2 | SPOT3 | SPOT4 | SPOT5 | SPOT6 | SPOT7 | SPOT8 | SPOT9 | Incidental |
| *Ephippiorhynchus asiaticus* | Black-necked Stork | - | LC | | | | | | | | | | | | | ✓ | | | | | | | | | | | | | | | |
| *Eudnamys orientalis* | Eastern koel | - | LC | | | | | | | | | ✓ | | | ✓ | | | | | ✓ | | | | | | | | | | | |
| *Eurystomus orientalis* | Dollarbird | - | LC | ✓ | ✓ | | ✓ | ✓ | ✓ | | ✓ | ✓ | | ✓ | ✓ | | | ✓ | | ✓ | | | | | | | | | | | |
| *Falco berigora* | Brown Falcon | - | LC | | | | | | ✓ | ✓ | | | | | ✓ | | | | | | | | | | | | | | | | |
| *Falco cenchroides* | Nankeen Kestrel | - | LC | | | | | | | ✓ | | | | | | | | | | | | | | | | | | | | | ✓ |
| *Falco longipennis* | Australian Hobby | - | LC | | ✓ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Gallinago hardwickii* | Latham's Snipe | M | SLC | | | | | | | | | | | | | ✓ | | | | | | | | | | | | | | | |
| *Geopelia striata* | Peaceful Dove | - | LC | | | | ✓ | | | | ✓ | | | ✓ | | | | | | | | | | | | | | | | | |
| *Geophaps scripta* | Squatter Pigeon | V | V | | | | | | | | | | | | | ✓ | | | | | | | | | | | | | | | |
| *Gerygone albogularis* | White-throated gerygone | - | LC | ✓ | | | | | | | | ✓ | | | ✓ | | | | | | | | | | | | | | | | |
| *Grallina cyanoleuca* | Magpie Lark | - | LC | | ✓ | | ✓ | ✓ | ✓ | | ✓ | | | ✓ | | ✓ | | ✓ | ✓ | | | | | | | | | | | | |
| *Grus rubicunda* | Brolga | - | LC | ✓ | | | ✓ | | | | ✓ | | | | | ✓ | | ✓ | | | ✓ | | | | | | | | | | ✓ |
| *Gymnorhina tibicen* | Australian Magpie | - | LC | | | | | | ✓ | ✓ | ✓ | | | ✓ | | | ✓ | | | | | | | | | | | | | | |
| *Haliaeetus leucogaster* | White-bellied Sea-eagle | - | LC | | | | | | | | | | | | | ✓ | | | | | | | | | | | | | | | |
| *Haliastur sphenurus* | Whistling Kite | - | LC | | ✓ | | ✓ | ✓ | ✓ | | | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | | | | | | | | | | | | | |
| *Hydroprogne caspia* | Caspian tern | M | SLC | | | | | | | | | | | | | ✓ | | | | | | | | | | | | | | | |
| *Irediparra gallinacea* | Jacana | - | LC | | | | | | | | | | | | | ✓ | | | | | | | | | | | | | | | |
| *Ixobrychus flavicollis* | Black Bittern | - | LC | | | | | | | | | | | | | | | | ✓ | | | | | | | | | | | | |
| *Lalage sueurii* | White-winged Triller | - | LC | | | | | | ✓ | | ✓ | | | | | | | | ✓ | | | | | | | | | | | | |
| *Lichenostomus virescens* | Singing Honeyeater | - | LC | | | | | | | | | | | | | | ✓ | | | | | | | | | | | | | | |
| *Lichmera indistincta* | Brown Honeyeater | - | LC | | | | | | | | | | | | | | | | | | | | | | | | | | | | ✓ |
| *Malurus melanocephalus* | Red-backed Fairy-wren | - | LC | | | | | | | | | | | | | | | | | | | | | | | | | | | | ✓ |
| *Manorina flavigula* | Yellow-throated Miner | - | LC | ✓ | ✓ | | | ✓ | | | ✓ | | | ✓ | | | | | ✓ | | | | | | | | | | | | |
| *Manorina melanocephala* | Noisy Miner | - | LC | | | | | | | | | | | | | | | | | | | | | | | | | | | | ✓ |

| Scientific name | Common name | Status | | Site | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| | | EPBC Act[1] | NC Act[2] | FAC1 | FAC2 | FAC3 | FAC5 | FAC6 | FAC7 | FAC8 | BIRD1 | BIRD2 | BIRD3 | BIRD4 | BIRD5 | BIRD6 | BIRD7 | BIRD8 | BIRD9 | BIRD10 | BIRD11 | SPOT1 | SPOT2 | SPOT3 | SPOT4 | SPOT5 | SPOT6 | SPOT7 | SPOT8 | SPOT9 | Incidental |
| *Melithreptus albogularis* | White-throated Honeyeater | - | LC | | ✓ | | | | ✓ | | | | ✓ | | ✓ | | | | | | | | | | | | | | | | ✓ |
| *Merops ornatus* | Rainbow Bee-eater | - | LC | | ✓ | ✓ | | | ✓ | | ✓ | | | | | | | ✓ | | | | | | | | | | | | | |
| *Microeca fascinans* | Jacky Winter | - | LC | | | | | | | | | | | | | | | | | | | | | | | | | | | | ✓ |
| *Milvus migrans* | Black kite | - | LC | | | | | | | | | ✓ | | | | | | | | | | | | | | | | | | | |
| *Mirafra javanica* | Horsefield's bushlark | - | LC | | | | | | | | | | | | | | | | | | | | | | | | | | | | ✓ |
| *Myiagra cyanoleuca* | Satin flycatcher | M | SLC | | | | | | | | | | | | | | | | | | | | | | | | | | | | ✓ |
| *Myiagra rubecula* | Leaden Flycatcher | - | LC | | | | | | ✓ | ✓ | | ✓ | | | ✓ | | | ✓ | | | | | | | | | | | | | |
| *Nettapus coromandelianus* | Cotton Pygmy-goose | - | LC | | | | | | | | | | | | | ✓ | | | ✓ | | | | | | | | | | | | |
| *Ninox novaeseelandiae* | Southern Boobook | - | LC | | | | ✓ | | | | | | | | | | | | | | | | | | | | | | | ✓ | |
| *Nycticorax caledonicus* | Nankeen Night Heron | - | LC | | | | | | | | | | | | | | | | | | | | | | | | | | | | ✓ |
| *Nymphicus hollandicus* | Cockatiel | - | LC | | | | | | | | | | | | | | | | | | | | | | | | | | | | ✓ |
| *Ocyphaps lophotes* | Crested pigeon | - | LC | | | | | | | | ✓ | | | | | | | | | | | | | | | | | | | | |
| *Oriolus sagittatus* | Olive-backed Oriole | - | LC | ✓ | | | ✓ | | | | ✓ | ✓ | ✓ | ✓ | | | | ✓ | | ✓ | | | | | | | | | | | |
| *Pachycephala rufiventris* | Rufous Whistler | - | LC | | | | | | ✓ | ✓ | | | | | | | | ✓ | | | | | | | | | | | | | |
| *Pardalotus striatus* | Striated Pardalote | - | LC | | | | | | | | | | ✓ | ✓ | | | ✓ | | | | | | | | | | | | | | |
| *Pelecanus conspicillatus* | Australian Pelican | - | LC | | | | | | | | | | ✓ | | | ✓ | | | | | | | | | | | | | | | |
| *Petrochelidon nigricans* | Tree martin | - | LC | | | | | | | | | | | | | | | | | | ✓ | | | | | | | | | | |
| *Phalacrocorax melanoleucos* | Little Pied Cormorant | - | LC | | | | | | | | | | | | | ✓ | ✓ | | | | | | | | | | | | | | |
| *Phalacrocorax sulcirostris* | Little Black Cormorant | - | LC | | | | | | | | | | | | | ✓ | | | | | | | | | | | | | | | |
| *Phalacrocorax varius* | Pied Cormorant | - | LC | | | | | | | | | | | | | ✓ | | | | | | | | | | | | | | | |
| *Phaps chalcoptera* | Common bronzewing | - | LC | | | | | | | | | | | | | | | | | | | | | | | | | | | | ✓ |
| *Philemon citreogularis* | Little Friarbird | - | LC | | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | | | | | ✓ | | | | | | | | | | | | |
| *Philemon corniculatus* | Noisy Friarbird | - | LC | | | | | | | | | | | | | | | | | ✓ | | | | | | | | | | | |
| *Platalea regia* | Royal Spoonbill | - | LC | | | | | | | | | | | | | ✓ | | | | | | | | | | | | | | | |

| Scientific name | Common name | Status | | Site | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| | | EPBC Act[1] | NC Act[2] | FAC1 | FAC2 | FAC3 | FAC5 | FAC6 | FAC7 | FAC8 | BIRD1 | BIRD2 | BIRD3 | BIRD4 | BIRD5 | BIRD6 | BIRD7 | BIRD8 | BIRD9 | BIRD10 | BIRD11 | SPOT1 | SPOT2 | SPOT3 | SPOT4 | SPOT5 | SPOT6 | SPOT7 | SPOT8 | SPOT9 | Incidental |
| *Platycercus adscitus* | Pale-headed Rosella | - | LC | | | | ✓ | | ✓ | | ✓ | | | | | | ✓ | | ✓ | | | | | | | | | | | | |
| *Plectorhyncha lanceolata* | Striped honeyeater | - | LC | | | | | | | | | | | | | | | ✓ | | | | | | | | | | | | | |
| *Plegadis falcinellus* | Glossy ibis | M | SLC | | | | | | | | | | | | | ✓ | | ✓ | | | | | | | | | | | | | |
| *Podargus strigoides* | Tawny Frogmouth | - | LC | ✓ | ✓ | | ✓ | | | ✓ | | | | | | | | | | | | | | | | | | | | | |
| *Podiceps cristatus* | Great crested grebe | - | LC | | | | | | | | | | | | | ✓ | | | | | | | | | | | | | | | |
| *Pomatostomus temporalis* | Grey Crowned Babbler | - | LC | | | | | | | | ✓ | | | | | | | | | | | | | | | | | | | | |
| *Rhipidura leucophrys* | Willy Wagtail | - | LC | | | | | ✓ | ✓ | | ✓ | | | | | | ✓ | | | | | | | | | | | | | | |
| *Scythrops novaehollandiae* | Channel-billed Cuckoo | - | LC | | | | ✓ | ✓ | | | | ✓ | | | ✓ | | | | | | | | | | | | | | | | |
| *Smicrornis brevirostris* | Weebill | - | LC | | | | ✓ | | ✓ | ✓ | | | | | ✓ | | ✓ | ✓ | | | | | | | | | | | | | |
| *Sphecotheres viridis* | Figbird | - | LC | | | | | | | | | | | | | | | | | | | | | | | | | | | | ✓ |
| *Strepera graculina* | Pied Currawong | - | LC | | | | ✓ | ✓ | | | | | | | | | | | | | | | | | | | | | | | |
| *Struthidea cinerea* | Apostlebird | - | LC | | | | ✓ | | | | | | | | | ✓ | ✓ | | ✓ | | | | | | | | | | | | |
| *Tachybaptus novaehollandiae* | Australasian Grebe | - | LC | | | | | | | | | | | ✓ | | ✓ | | | ✓ | | | | | | | | | | | | |
| *Taeniopygia bichenovii* | Double Barred Finch | - | LC | | | | | | | | | | ✓ | | | | ✓ | ✓ | | | | | | | | | | | | | |
| *Taeniopygia guttata* | Zebra finch | - | LC | | | | | | | | | | | | | | | | | | | | | | | | | | | | ✓ |
| *Threskiornis molucca* | White Ibis | - | LC | | | | | | | | | | | | | ✓ | | | | | | | | | | | | | | | |
| *Threskiornis spinicollis* | Straw-necked Ibis | - | LC | | | | | | | | | | | | | ✓ | | | | | | | | | | | | | | | |
| *Todiramphus macleayii* | Forest Kingfisher | - | LC | | | | | ✓ | | | | | ✓ | | | | | | | ✓ | | | | | | | | | | | |
| *Trichoglossus chlorolepidotus* | Scaly-breasted Lorikeet | - | LC | | | | | | | | | | | | ✓ | | | | | | | | | | | | | | | | |
| *Trichoglossus haematodus* | Rainbow Lorikeet | - | LC | | ✓ | | | ✓ | | | | ✓ | | ✓ | | | | | | ✓ | | | | | | | | | | | |
| *Tyto alba* | Barn Owl | - | LC | | | | | | | | | | | | | | | | | | ✓ | | | | | | | ✓ | | | |
| *Vanellus miles* | Masked Lapwing | - | LC | | | | | | | | | | | | | ✓ | | | | | ✓ | | | | | | | | | | |

Notes:

1. EPBC Act = *Environment Protection and Biodiversity Conservation Act 1999*; 2. NC Act = *Nature Conservation Act 1992*.

**Table 21 Amphibians recorded from the Study area (MLA), 23 April to 4 May 2017**

| Scientific Name | Common Name | Status | | Site | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | EPBC Act | NC Act | FAC9 | FAC10 | FAC11 | FAC12 | FAC13 | FAC14 | SPOT11 | SPOT12 | SPOT13 | SPOT14 | SPOT15 | SPOT16 | SPOT17 | SPOT8 | SPOT9 | AS7 | AS8 | AS9 | AS10 | TT1 | TT2 | TT3 | TT4 | TT5 | |
| *Cyclorana alboguttata* | Green-striped frog | - | LC | | | X | X | | | X | X | X | X | | X | X | | | X | | | X | | X | | | | |
| *Cyclorana brevipes* | Superb collared frog | - | LC | | | X | X | | X | | X | | | | X | | | | | | | | | | | | | |
| *Cyclorana novaehollandiae* | New Holland frog | - | LC | | | | | | | | X | | | | | | | | | | | | | | | | | |
| *Limnodynastes peronii* | Striped Marsh Frog | - | LC | | | | | | | X | | | | | | | | | | | | | | | | | | |
| *Limnodynastes tasmaniensis* | Spotted grass frog | - | LC | X | | X | X | | | | X | | | | X | X | | | | | | | | X | | | | |
| *Litoria caerulea* | Green tree frog | - | LC | | | X | X | | | X | X | X | | | X | | | | X | | | X | | | | | | |
| *Litoria latopalmata* | Broad-palmed rocket frog | - | LC | | | | X | | | | | | | | | | | | | | | | | | | | | |
| *Litoria peronii* | Emerald spotted tree frog | - | LC | X | | | X | | | X | | | | | X | X | | | | | | | | | | | | |
| *Litoria rubella* | Naked tree frog | - | LC | X | | | X | | | | | | | | | X | | | | X | | | | | | | | |
| *Platyplectrum ornatum* | Ornate burrowing frog | - | LC | X | | | X | X | | X | | | | | X | | | | | X | | | | | | | | |
| *Rhinella marinus** | Cane toad | - | LC | X | | X | X | | X | X | | | | X | | X | | | | | | | | | | | X | |

Notes:

1. EPBC Act = *Environment Protection and Biodiversity Conservation Act 1999*; 2. NC Act = *Nature Conservation Act 1992*.

**Table 22 Reptiles recorded from the Study area (MLA), 23 April to 4 May 2017**

| Scientific Name | Common Name | Status | | Site | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | EPBC Act | NC Act | FAC9 | FAC10 | FAC11 | FAC12 | FAC13 | FAC14 | SPOT11 | SPOT12 | SPOT13 | SPOT14 | SPOT15 | SPOT16 | SPOT17 | SPOT8 | SPOT9 | AS7 | AS8 | AS9 | AS10 | INC |
| *Antaresia maculosa* | Spotted Python | - | LC | | | | X | | | | | | | | | | | | | | | | |
| *Boiga irregularis* | Brown Tree Snake | - | LC | X | | | | | | | | | | | | | | | | | | | |
| *Carlia pectoralis* | - | - | LC | | X | | | X | | | | | | | | | | | | | | | |
| *Chelodina longicollis* | Eastern snake-necked turtle | - | LC | | | | | | | | | | | | | | | | | | | | X |
| *Cryptoblepharus pannosus* | - | - | LC | | | | | | | | | | | | | | | | | X | | | |
| *Demansia papuensis* | Greater black whipsnake | | | | | | | | | | | | | | | | | | | | | | X |
| *Demansia psammophis* | Yellow-faced whipsnake | - | LC | | X | | | | | | | | | | | | | | | | | | |
| *Dendrelaphis punctulatus* | Common tree snake | - | LC | | | | | | | | | | | | | | | | | | | | X |
| *Denisonia maculata* | Ornamental Snake | V | V | | | X | X | | | X | | X | | | | | | | | | | | |
| *Gehyra dubia* | - | - | LC | X | | | | | | | | | | | | X | | | | | | | |
| *Heteronotia binoei* | Bynoe's Gecko | - | LC | | X | X | | | X | | | | | | | | | | | X | X | | |
| *Hoplocephalus bitorquatus* | Pale-headed Snake | - | LC | | | | | | | | | | | | | X | | | | | | | |
| *Lerista fragilis* | | - | LC | | X | | | | | | | | | | | | | | | | | | |
| *Lygisaurus foliorum* | Tree-base Litter Skink | - | LC | X | | | | X | | | | | | | | | | | | | | | |
| *Menetia greyii* | | - | LC | X | | | | | | | | | | | | | | | | | | | |
| *Morethia boulengeri* | Boulenger's Skink | - | LC | X | X | | | | | | | | | | | | | | | | | | |
| *Morethia taeniopleura* | - | - | LC | X | | | | | | | | | | | | | | | | | | | |
| *Oedura monilis* | Ocellated velvet gecko | - | LC | | | | X | | | | | | | | | | | | | | | | |
| *Ramphotyphlops affinis* | Small-headed Blind Snake | - | LC | | | | | X | | | | | | | | | | | | | | | |
| *Tropidonophis mairii* | Keelback | - | LC | | | | | | | | | | | | | | | | | | | | X |
| *Varanus tristis* | Freckled monitor | - | LC | | | | | | X | | | | | | | | | | | | | | |

Notes:

1. EPBC Act = *Environment Protection and Biodiversity Conservation Act 1999*; 2. NC Act = *Nature Conservation Act 1992*.

**Table 23 Mammals recorded from the Study area (MLA), 23 April to 4 May 2017**

| Scientific Name | Common Name | Status | | Site | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | EPBC Act | NC Act | FAC9 | FAC10 | FAC11 | FAC12 | FAC13 | FAC14 | SPOT11 | SPOT12 | SPOT13 | SPOT14 | SPOT15 | SPOT16 | SPOT17 | ANA13 | ANA14 | ANA15 | ANA16 | ANA17 | ANA18 | ANA19 | HARP3 | HARP4 | AS9 | KT1 | KT2 | TT1 | TT2 | TT3 | TT4 | TT5 | TT6 | TT7 | INC |
| *Aepyprymnus rufescens* | Rufous Bettong | - | LC | | X | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Canis lupus familiaris* | Dog | - | LC | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | X | | | | |
| *Chaerephon jobensis* | Northern Freetail Bat | - | LC | X | X | X | X | X | X | | | | | | | | X | X | X | X | X | X | X | | | | | | | | | | | | | | |
| *Chalinolobus gouldii* | Gould's wattled bat | - | LC | X | X | X | X | X | X | | | | | | | | X | X | X | X | X | X | X | | | | | | | | | | | | | | |
| *Chalinolobus morio* | Chocolate wattled bat | - | LC | X | X | | | X | | | | | | | | | X | X | | X | X | X | | | | | | | | | | | | | | | |
| *Chalinolobus nigrogriseus* | Hoary wattled bat | - | LC | | X | | | X | | | | | | | | | | | | | X | | | | | | | | | | | | | | | | |
| *Chalinolobus picatus* | Little pied bat | - | LC | X | | X | X | X | | | | | | | | | | X | | | | X | | | | | | | | | | | | | | | |
| *Felis catus** | Cat | - | LC | | | | | | | | | | | | X | | | | | | | | | | | | | | | | | | | | | | |
| *Hydromys chrysogaster* | Water rat | - | LC | | | | | | | X | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Lepus europaeus** | Hare | - | LC | | | | | | | | X | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Macropus giganteus* | Eastern grey kangaroo | - | LC | | | | | X | | | | | | | | X | | | | | | | | | | | | | | | | | | | | | |
| *Mormopterus lumsdenae* | Northern free-tailed bat | - | LC | X | X | X | | X | | | | | | | | | X | X | X | X | | | X | | | | | | | | | | | | | | |
| *Mormopterus ridei* | Eastern free-tailed bat | - | LC | X | | X | X | X | | | | | | | | | X | X | X | | X | | | | | | | | | | | | | | | | |
| *Mus musculus** | House mouse | | - | | | | | | | | | | | | | | | | | | | | | | | X | | | | | | | | | | | |
| *Nyctophilus* sp. | Long-eared bat | - | LC | X | X | | X | X | | | | | | | | | | | X | X | | | | | | | | | | | | | | | | | |
| *Oryctolagus cuniculus** | European rabbit | - | - | | | | | | | | | | | | | | | | | | | | | | | | | | | X | | | | | | | |
| *Petauroides volans* | Greater glider | V | LC | | | | | X | | | | | | | | | | | | | | | | | | | | | X | X | | | | X | | | |
| *Petaurus norfolcensis* | Squirrel glider | - | LC | | | | | X | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Phascolarctos cinereus* | Koala | V | V | | | | | | | | | | | | | | | | | | | | | | | | X | X | | | | | | | | | X |
| *Pseudomys delicatulus* | Delicate mouse | - | LC | | X | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Scientific Name | Common Name | Status | | Site | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | EPBC Act | NC Act | FAC9 | FAC10 | FAC11 | FAC12 | FAC13 | FAC14 | SPOT11 | SPOT12 | SPOT13 | SPOT14 | SPOT15 | SPOT16 | SPOT17 | ANA13 | ANA14 | ANA15 | ANA16 | ANA17 | ANA18 | ANA19 | HARP3 | HARP4 | AS9 | KT1 | KT2 | TT1 | TT2 | TT3 | TT4 | TT5 | TT6 | TT7 | INC |
| *Saccolaimus flaviventris* | Yellow-bellied sheathtail bat | - | LC | X | X | X | X | X | X | | | | | | | | X | X | X | X | X | X | X | | | | | | | | | | | | | |
| *Scotorepens balstoni* | Inland broad-nosed bat | - | LC | X | | | | | | | | | | | | | | | | | | | X | | | | | | | | | | | | | |
| *Scotorepens greyii* | Little broad-nosed bat | - | LC | X | X | X | X | X | X | | | | | | | | X | X | X | X | X | X | X | | | | | | | | | | | | | |
| *Sminthopsis macroura* | Striped-faced dunnart | - | LC | | | X | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Sus scrofa** | Pig | - | - | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | X |
| *Trichosurus vulpecula* | Common brushtail possum | - | LC | | | | | | | | | | | | | X | | | | | | | | | | | | | | X | | | | X | X | |
| *Vespadelus baverstocki* | Inland forest bat | - | LC | | X | X | X | | X | | | | | | | | | | X | X | | | X | | X | | | | | | | | | | | |
| *Wallabia bicolor* | Swamp wallaby | - | LC | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | X |

Notes:

1. EPBC Act = *Environment Protection and Biodiversity Conservation Act 1999*; 2. NC Act = *Nature Conservation Act 1992*.

**Table 24 Birds recorded from the Study area (MLA), 23 April to 4 May 2017**

| Scientific Name | Common Name | Status | | Site | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | EPBC Act | NC Act | FAC9 | FAC10 | FAC11 | FAC12 | FAC13 | FAC14 | BIRD12 | BIRD13 | BIRD14 | BIRD15 | BIRD16 | BIRD17 | BIRD18 | BIRD20 | BIRD21 | BIRD22 | SPOT11 | SPOT12 | SPOT13 | SPOT14 | SPOT15 | SPOT16 | SPOT17 | TT1 | TT2 | TT3 | TT4 | TT5 | TT6 | TT7 | INC |
| *Accipiter cirrhocephalus* | Collared Sparrowhawk | - | LC | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | X |
| *Accipiter fasciatus* | Brown Goshawk | - | LC | | | | | | | | | | | | | | X | | | | | | | | | | | | | | | | | |
| *Aegotheles cristatus* | Owlet Nightjar | - | LC | X | | | X | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Anas gracilis* | Grey Teal | - | LC | | | | | | | X | X | | X | X | | X | X | X | X | | X | | | | | X | | | | X | | | | |
| *Anas rhynchotis* | Australian Shoveler | - | LC | | | | | | | | | | | X | | | | X | X | | | | | | | | | | | | | | | |
| *Anas superciliosa* | Black Duck | - | LC | | | | | | | X | X | | | X | | | X | X | X | | | | | X | | X | | | | | | | | |
| *Anhinga melanogaster* | Darter | - | LC | | | | | | | | | X | | | | | | | | | | | | X | | | | | | | | | | |
| *Anthus novaeseelandiae* | Richard's Pipit | - | LC | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | X |
| *Aprosmictus erythropterus* | Red-winged Parrot | - | LC | | X | | | X | | | X | | | | | | | | | | | | | | | | | | | | | | | |
| *Aquila audax* | Wedged-tailed Eagle | - | LC | | | | | | | X | X | | | | | | | | | | | | | | | | | | | | | | | X |
| *Ardea ibis* | Cattle Egret | - | LC | | | | | | | | | | | | X | | | | | | | | | | | | | | | | | | | X |
| *Ardea modesta* | Eastern great egret | M | SL | | | | | | | | | | | X | | | | X | | | | | | | | | | | | | | | | |
| *Ardea pacifica* | White-necked Heron | - | LC | | | | | | | | | | | | | | | X | | | | | | X | | | | | | X | | | | |
| *Ardeotis australis* | Australian Bustard | - | LC | | | | | | | | | | X | | | | | | | | | | | | | | | | | X | | | | X |
| *Artamus cyanopterus* | Dusky Woodswallow | | | | | | | | | | | | | | | | | | X | | | | | | | | | | | | | | | |
| *Artamus leucorynchus* | White-breasted Woodswallow | - | LC | | | X | | | | | | | | | | | | | X | | | | | | | | | | | | | | | |
| *Artamus minor* | Little Woodswallow | - | LC | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | X |
| *Artamus personatus* | Masked Woodswallow | - | LC | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | X |
| *Aviceda subcristata* | Pacific Baza | - | LC | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | X |
| *Aythya australis* | Hardhead | - | LC | | | | | | | X | X | X | | | | | | X | | | | | | | | | | | | | | | | |
| *Burhinus grallarius* | Bush stone curlew | - | LC | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | X |
| *Cacatua galerita* | Sulphur Crested Cockatoo | - | LC | X | X | X | X | | | | X | | | | X | | | | X | | | | | | | | | | | | | | | |
| *Cacatua roseicapilla* | Galah | - | LC | | X | X | | | X | X | X | | | X | X | X | | X | | | | | | | | | | | | | | | | |
| *Cacomantis pallidus* | Pallid cuckoo | - | LC | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | X |

| Scientific Name | Common Name | Status | | Site | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | EPBC Act | NC Act | FAC9 | FAC10 | FAC11 | FAC12 | FAC13 | FAC14 | BIRD12 | BIRD13 | BIRD14 | BIRD15 | BIRD16 | BIRD17 | BIRD18 | BIRD20 | BIRD21 | BIRD22 | SPOT11 | SPOT12 | SPOT13 | SPOT14 | SPOT15 | SPOT16 | SPOT17 | TT1 | TT2 | TT3 | TT4 | TT5 | TT6 | TT7 | INC |
| *Centropus phasianinus* | Pheasant Coucal | - | LC | | | | | X | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Chenonetta jubata* | Wood Duck | - | LC | | | | | | | | | X | | | | X | | X | X | | | | | | | | | | | | | | | |
| *Chlamydera maculata* | Spotted Bowerbird | - | LC | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | X |
| *Chrysococcyx minutillus* | Little Bronze Cuckoo | - | LC | X | | | | | | | | | | | | | X | | | | | | | | | | | | | | | | | X |
| *Cincloramphus mathewsi* | Rufous Songlark | - | LC | | | | | | | | | | | | | | | X | | | | | | | | | | | | | | | | |
| *Circus assimilis* | Spotted Harrier | - | LC | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | X |
| *Cisticola exilis* | Golden Headed Cisticola | - | LC | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | X |
| *Colluricincla harmonica* | Grey Shrike-thrush | - | LC | | | | | X | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Coracina novaehollandiae* | Black-faced Cuckoo Shrike | - | LC | X | X | | X | | | | | | | | | | X | | | | | | | | | | | | | | | | | |
| *Coracina papuensis* | White-bellied Cuckoo Shrike | - | LC | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | X |
| *Corcorax melanorhamphos* | White-winged Chough | - | LC | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | X |
| *Corvus orru* | Torresian Crow | - | LC | | | X | | X | X | X | | | | | X | | X | X | | | | | | | | | | | | | | | | |
| *Coturnix ypsilophora* | Brown Quail | - | LC | | | X | | | | | | | | | | | | | | | | | | | | | | | | | | | | X |
| *Cracticus nigrogularis* | Pied Butcherbird | - | LC | X | X | X | | | | X | | | | | | | | | | | | | | | | | | | | | | | | |
| *Cracticus torquatus* | Grey butcherbird | - | LC | X | X | | | | X | X | | | | X | | | | | | | | | | | | | | | | | | | | |
| *Cygnus atratus* | Black swan | - | LC | | | | | | | | X | | | | | | | X | | | | | | | | | | | | | | | | |
| *Dacelo leachii* | Blue-winged kookaburra | - | LC | | | | | | | | | X | | | | | | | | | | | | | | | | | | | | | | |
| *Dacelo novaeguineae* | Laughing kookaburra | - | LC | X | | | | | | | | | | | | | X | | | | | | | | | | | | | | | | | |
| *Dendrocygna eytoni* | Plumed whistling-duck | - | LC | | | | | | | X | | | | | X | | | | X | | | | | | | | | | | | | | | |
| *Dicaeum hirundincaceum* | Mistletoebird | - | LC | | | | | | | | | | | | | | | | X | | | | | | | | | | | | | | | |
| *Dicrurus bracteatus* | Spangled drongo | - | LC | X | | | | X | | | | | | | | | | | | | | | | | | | | | | | | | | X |
| *Dromaius novaehollandiae* | Emu | - | LC | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | X |
| *Egretta intermedia* | Intermediate Egret | - | LC | | | | | | | | | | | X | X | | | | X | | | | | | | | | | | | | | | |
| *Egretta novaehollandiae* | White-faced Heron | - | LC | | | X | | | | X | X | X | X | X | | X | X | | X | | | | | X | | | | | | | | | | |
| *Elseyornis melanops* | Black-fronted Dotterel | - | LC | | | | | | | | X | | | | | | | X | X | | X | | | | | | | | | | | | | |
| *Entomyzon cyanotis* | Blue-faced Honeyeater | - | LC | X | | | | X | | X | X | | | | X | | | | | | | | | | | | | | | | | | | |

| Scientific Name | Common Name | Status | | Site | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | EPBC Act | NC Act | FAC9 | FAC10 | FAC11 | FAC12 | FAC13 | FAC14 | BIRD12 | BIRD13 | BIRD14 | BIRD15 | BIRD16 | BIRD17 | BIRD18 | BIRD20 | BIRD21 | BIRD22 | SPOT11 | SPOT12 | SPOT13 | SPOT14 | SPOT15 | SPOT16 | SPOT17 | TT1 | TT2 | TT3 | TT4 | TT5 | TT6 | TT7 | INC |
| *Falco berigora* | Brown Falcon | - | LC | | | X | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Falco cenchroides* | Nankeen Kestrel | - | LC | | | X | | | | | | | | | | | | | | | | | | | | | | | | | | | | X |
| *Falco longipennis* | Australian Hobby | - | LC | | | | | | | | | | | | | | | X | | | | | | | | | | | | | | | | |
| *Fulica atra* | Eurasian Coot | - | LC | | | | | | | | | X | | | | | | X | | | | | | | | | | | | | | | | |
| *Gallinula tenebrosa* | Dusky Moorhen | - | LC | | | | | | | | | | | | X | | | | | | | | | | | X | | | | | | | | |
| *Geopelia humeralis* | Bar-shoulder Dove | - | LC | X | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Geopelia striata* | Peaceful Dove | - | LC | X | | | | | | | | | | | | | | | X | | | | | | | | | | | | | | | |
| *Geophaps scripta* | Squatter Pigeon | V | V | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Gerygone albogularis* | White-throated gerygone | - | LC | X | | | X | X | | | | | | | | | X | | X | | | | | | | | | | | | | | | |
| *Grallina cyanoleuca* | Magpie Lark | - | LC | | X | X | | | | X | X | | | | X | | | | X | | | | | | | | | | | | | | | |
| *Grus rubicunda* | Brolga | - | LC | X | | X | X | | | | | | | | | | | X | | | | | | | | | | | | | | | | X |
| *Gymnorhina tibicen* | Australian Magpie | - | LC | X | X | X | X | | X | X | | | X | | | | | X | X | | | | | | | | | | | | | | | |
| *Haliaeetus leucogaster* | White-bellied Sea-eagle | M | LC | | | | | | | | | X | | | | | | | | | | | | | | | | | | | | | | |
| *Haliastur sphenurus* | Whistling Kite | - | LC | | X | | | | | X | X | X | | | X | | X | X | | | | | | | | | | | | | | | | |
| *Himantopus himantopus* | Black-winged Stilt | - | LC | | | | | | | | | X | | | | | | | | | | | | | | | | | | X | | | | |
| *Irediparra gallinacea* | Jacana | - | LC | | | | | | | | | | | | | | | X | | | | | | | | | | | | | | | | |
| *Lalage leucomela* | Varied Triller | - | LC | | | | | | | | | | | | | | | | X | | | | | | | | | | | | | | | |
| *Lichenostomus virescens* | Singing Honeyeater | - | LC | | | | | | | | | X | X | | | | | | | | | | | | | | | | | | | | | |
| *Lichmera indistincta* | Brown Honeyeater | - | LC | | | | | X | | | | | | | | | X | | | | | | | | | | | | | | | | | X |
| *Malacorhynchus membranaceus* | Pink-eared Duck | - | LC | | | | | | | | X | X | | X | | | | | | | X | | | | | | | | | X | | | | |
| *Malurus melanocephalus* | Red-backed Fairy-wren | - | LC | | | | | | | | | | | | X | | | X | | | | | | | | | | | | | | | | X |
| *Manorina flavigula* | Yellow-throated Miner | - | LC | | X | X | | | | X | | | X | | | | | | | | | | | | | | | | | | | | | |
| *Manorina melanocephala* | Noisy Miner | - | LC | | X | | | | | X | X | | | | | | | | | | | | | | | | | | | | | | | x |
| *Megalurus timoriensis* | Tawny Grassbird | - | LC | | | | | | | | | | | | X | | | | | | | | | | | | | | | | | X | | |
| *Melithreptus albogularis* | White-throated Honeyeater | - | LC | X | | | X | X | | | | | | | | | X | | X | | | | | | | | | | | | | | | |
| *Melopsittacus undulatus* | Budgerigar | - | LC | | | | | | | | | X | | | | | | | X | | | | | | | | | | | | | | | |

| Scientific Name | Common Name | Status | | Site | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | EPBC Act | NC Act | FAC9 | FAC10 | FAC11 | FAC12 | FAC13 | FAC14 | BIRD12 | BIRD13 | BIRD14 | BIRD15 | BIRD16 | BIRD17 | BIRD18 | BIRD20 | BIRD21 | BIRD22 | SPOT11 | SPOT12 | SPOT13 | SPOT14 | SPOT15 | SPOT16 | SPOT17 | TT1 | TT2 | TT3 | TT4 | TT5 | TT6 | TT7 | INC |
| *Microeca fascinans* | Jacky Winter | - | LC | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | X |
| *Milvus migrans* | Black Kite | - | LC | | | | | | | | | | | X | | | | X | | | | | | | | | | | | | | | | | |
| *Mirafra javanica* | Horsefield's bushlark | - | LC | | | X | | | | | | | | | | | | | | | | | | | | | | | | | | | | | X |
| *Myiagra cyanoleuca* | Satin flycatcher | M | SL | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | X |
| *Myiagra rubecula* | Leaden Flycatcher | - | LC | | | | X | X | | | | | | | | | | | X | | | | | | | | | | | | | | | | |
| *Nettapus coromandelianus* | Cotton Pygmy Goose | - | LC | | | | | | | | | | | | | | | X | | | | | | | | | | | | | | | | | |
| *Ninox novaeseelandiae* | Southern Boobook | - | LC | | | | | | | | | | | | | | | | | | | | | | | | | X | | | | X | | | |
| *Nycticorax caledonicus* | Nankeen Night Heron | - | LC | | | | | | | | | | | | X | | X | | | | | | | X | | | | | | | | | | | X |
| *Nymphicus hollandicus* | Cockatiel | - | LC | | | X | | | | | X | | | | X | | | X | | | | | | | | | | | | | | | | | X |
| *Ocyphaps lophotes* | Crested pigeon | - | LC | | | X | | | | X | | | | | | | | X | | | | | | | | | | | | | | | | | |
| *Oriolus sagittatus* | Olive-backed Oriole | - | LC | X | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Pachycephala rufiventris* | Rufous Whistler | - | LC | X | | | X | | X | X | | | | | | | X | | X | | | | | | | | | | | | | | | | |
| *Pardalotus striatus* | Striated Pardalote | - | LC | X | | X | X | X | X | X | | | | X | X | | X | X | X | | | | | | | | | | | | | | | | |
| *Petrochelidon nigricans* | Tree martin | - | LC | | | X | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Petroica goodenovii* | Red-capped Robin | - | LC | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | X |
| *Phalacrocorax melanoleucos* | Little Pied Cormorant | - | LC | | | | | | | | | | X | X | | | | X | | | | | | | | | | | | | | | | | |
| *Phalacrocorax sulcirostris* | Little Black Cormorant | - | LC | | | | | | | | | | | X | X | | | X | | | | | | | | | | | | | | | | | |
| *Phalacrocorax varius* | Pied Cormorant | - | LC | | | | | | | X | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Phaps chalcoptera* | Common Bronzewing | - | LC | | | | | | | | X | | | | | | | | | | | | | | | | | | | | | | | | |
| *Philemon corniculatus* | Noisy Friarbird | - | LC | | | | X | | X | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Platalea flavipes* | Yellow-billed Spoonbill | - | LC | | | | | | | | | | | X | | | | | X | | | | | | | | | | | | | | | | |
| *Platalea regia* | Royal Spoonbill | - | LC | | | | | | | | | | | X | X | | | | | | | | | | | | | | | | | | | | |
| *Platycercus adscitus* | Pale-headed Rosella | - | LC | | X | X | | X | | | | | | X | | | X | X | X | | | | | | | | | | | | | | | | |
| *Plectorhyncha lanceolata* | Striped honeyeater | - | LC | | | | | | | | | | | | | | X | | | | | | | | | | | | | | | | | | |
| *Podargus strigoides* | Tawny Frogmouth | - | LC | X | | | | | | | | | | | | | | | | | | | | | | | | | | | X | | X | | |
| *Podiceps cristatus* | Great crested grebe | - | LC | | | | | | | | | | | | | | | X | | | | | | | | | | | | | | | | | |

| Scientific Name | Common Name | Status | | Site | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| | | EPBC Act | NC Act | FAC9 | FAC10 | FAC11 | FAC12 | FAC13 | FAC14 | BIRD12 | BIRD13 | BIRD14 | BIRD15 | BIRD16 | BIRD17 | BIRD18 | BIRD20 | BIRD21 | BIRD22 | SPOT11 | SPOT12 | SPOT13 | SPOT14 | SPOT15 | SPOT16 | SPOT17 | TT1 | TT2 | TT3 | TT4 | TT5 | TT6 | TT7 | INC |
| *Poliocephalis poliocephalis* | Hoary-headed grebe | - | LC | | | | | | | | | X | | | | | | X | | | | | | | | | | | | | | | | | |
| *Pomatostomus temporalis* | Grey Crowned Babbler | - | LC | | X | | | | X | X | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Rhipidura albiscapa* | Grey Fantail | - | LC | X | | | X | X | X | X | | | | | | | X | | X | | | | | | | | | | | | | | | | |
| *Rhipidura leucophrys* | Willy Wagtail | - | LC | | | X | X | | | X | | | X | | X | | | | | | | | | | | | | | | | | | | | |
| *Rostratula australis* | Australian Painted Snipe | E | V | | | | | | | | | | | | | | | | | | | X | | | | | | | | | | | | | |
| *Scythrops novaehollandiae* | Channel-billed Cuckoo | - | LC | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Smicrornis brevirostris* | Weebill | - | LC | X | | | X | X | X | X | | | | | | | X | | | | | | | | | | | | | | | | | | |
| *Sphecotheres viridis* | Figbird | - | LC | X | | | | | | | | | | | | | X | | | | | | | | | | | | | | | | | | X |
| *Struthidea cinerea* | Apostlebird | - | LC | | | | | | | | | X | | | X | | | X | | | | | | | | | | | | | | | | | |
| *Tachybaptus novaehollandiae* | Australasian Grebe | - | LC | | | | | | | X | X | X | X | | | | X | X | X | | | | | | | | | | | | | | | | |
| *Taeniopygia bichenovii* | Double Barred Finch | - | LC | X | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Taeniopygia guttata* | Zebra Finch | - | LC | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | X |
| *Threskiornis molucca* | White Ibis | - | LC | | | | | | | | | X | | X | | | | | | | | | | | | | | | | | | | | | |
| *Threskiornis spinicollis* | Straw-necked Ibis | - | LC | | | | | | | | | X | | X | | | | X | X | | | | | | | | | | | | | | | | |
| *Todiramphus macleayii* | Forest Kingfisher | - | LC | | | | | X | | | | | | | | | | | X | | | | | | | | | | | | | | | | |
| *Todiramphus pyrrhopygius* | Red-backed Kingfisher | - | LC | | | | | | | | | | | | | | | | X | | | | | | | | | | | | | | | | |
| *Trichoglossus haematodus* | Rainbow Lorikeet | - | LC | | X | X | | | | | X | | | X | | X | X | | X | | | | | | | | | | | | | | | | |
| *Trybonix ventralis* | Black-tailed Native-hen | - | LC | | | | | | | | | X | | | X | | | | | | | | | | | | | | | | | | | | |
| *Turnix velox* | Little Button-quail | - | LC | | | | | | | | | | | | | | | | | | | | X | | | | | | | | | | | | |
| *Tyto alba* | Barn Owl | - | LC | X | | | | | | | | | | | | | | | | | X | | | | | | | | | X | X | X | | | |
| *Vanellus miles* | Masked Lapwing | - | LC | | | | | | | X | X | X | | X | | X | | X | X | | | | | | | X | | | | | | | | | |
| *Vanellus tricolor* | Banded Lapwing | - | LC | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | X |

Notes:

1. EPBC Act = *Environment Protection and Biodiversity Conservation Act 1999*; 2. NC Act = *Nature Conservation Act 1992*

**Table 25 Amphibians recorded from the Study area (infrastructure corridors), 7 - 14 May 2017**

| Scientific Name | Common Name | Status | | Site | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | EPBC Act | NC Act | SPOTC1 | SPOTC2 | SPOTC3 | SPOTC4 | SPOTC5 | SPOTC6 | ASC1 | INC |
| *Limnodynastes tasmaniensis* | Spotted grass frog | - | LC | | | | | | X | | |
| *Litoria latopalmata* | Broad-palmed rocket frog | - | LC | X | X | | | | | | |
| *Platyplectrum ornatum* | Ornate burrowing frog | - | LC | | | | | | X | | |
| *Rhinella marina** | Cane toad | - | LC | X | X | | | | X | | |

Notes:

1. EPBC Act = *Environment Protection and Biodiversity Conservation Act 1999*; 2. NC Act = *Nature Conservation Act 1992*

**Table 26 Reptiles recorded from the Study area (infrastructure corridors), 7 May to 14 May 2017**

| Scientific Name | Common Name | Status | | Site | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | EPBC Act | NC Act | SPOTC1 | SPOTC2 | SPOTC3 | SPOTC4 | SPOTC5 | SPOTC6 | ASC1 | INC |
| *Cryptoblepharus pannosus* | - | - | LC | | | | | | | X | |
| *Gehyra catenata* | | - | LC | | | | X | | | | |
| *Heteronotia binoei* | Bynoe's Gecko | - | LC | | | | | | | X | |

Notes:

1. EPBC Act = *Environment Protection and Biodiversity Conservation Act 1999*; 2. NC Act = *Nature Conservation Act 1992*

**Table 27 Mammals recorded from the Study area (infrastructure corridors), 7 May to 14 May 2017**

| Scientific Name | Common Name | Status | | Site | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | EPBC Act | NC Act | SPOTC1 | SPOTC2 | SPOTC3 | SPOTC4 | SPOTC5 | SPOTC6 | KTRANSC | KTRANSC | KTRANSC | KTRANSC | KTRANSC | INC |
| *Aepyprymnus rufescens* | Rufous Bettong | - | LC | | X | | | | | | | | | | |
| *Canis lupus familiaris* | Dog | - | LC | | | | | | | | | | | | X |
| *Hydromys chrysogaster* | Water rat | - | LC | | | | | | | | | | | | X |
| *Macropus giganteus* | Eastern grey kangaroo | - | LC | | | | | | | | | | | | X |
| *Oryctolagus cuniculus** | European rabbit | - | - | | | | | | | | | | | | X |
| *Petauroides volans* | Greater glider | V | LC | X | | X | | | X | | | | | | |
| *Petaurus breviceps* | Sugar Glider | - | LC | X | | | | | | | | | | | |
| *Phascolarctos cinereus* | Koala | V | V | | | | | | | X | X | X | X | X | |
| *Trichosurus vulpecula* | Common brushtail possum | - | LC | X | X | | X | X | X | | | | | | |

Notes:

1. EPBC Act = *Environment Protection and Biodiversity Conservation Act 1999*; 2. NC Act = *Nature Conservation Act 1992*

**Table 28 Birds recorded from the Study area (infrastructure corridors), 7 May to 14 May 2017**

| Scientific Name | Common Name | Status | | Site | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | EPBC Act | NC Act | BIRDC1 | BIRDC2 | BIRDC3 | BIRDC4 | BIRDC5 | BIRDC6 | BIRDC7 | SPOTC1 | SPOTC2 | SPOTC3 | SPOTC4 | SPOTC5 | SPOTC6 | INC |
| *Accipiter fasciatus* | Brown Goshawk | | LC | | | X | | | X | | | | | | | | |
| *Aegotheles cristatus* | Owlet Nightjar | | LC | | | | | | | | | X | | | | X | |
| *Aprosmictus erythropterus* | Red-winged Parrot | | LC | X | X | X | | | | | | | | | | | |
| *Cacatua galerita* | Sulphur Crested Cockatoo | | LC | X | | | | X | | | | | | | | | |
| *Cacatua roseicapilla* | Galah | | LC | | X | | | X | X | | | | | | | | |
| *Coracina novaehollandiae* | Black-faced Cuckoo Shrike | | LC | | X | | | | X | X | | | | | | | |
| *Coracina papuensis* | White-bellied Cuckoo Shrike | | LC | X | | | | | | | | | | | | | |
| *Corcorax melanorhamphos* | White-winged Chough | | LC | | X | | | | | | | | | | | | |
| *Corvus orru* | Torresian Crow | | LC | X | X | | | X | X | X | | | | | | | |
| *Cracticus nigrogularis* | Pied Butcherbird | | LC | X | | | X | | X | | | | | | | | |
| *Cracticus torquatus* | Grey butcherbird | | LC | X | | X | | X | X | | | | | | | | |
| *Dacelo leachii* | Blue-winged kookaburra | | LC | | | | X | | | | | | | | | | |
| *Dacelo novaeguineae* | Laughing kookaburra | | LC | X | X | | | | | | | | | | | | |
| *Entomyzon cyanotis* | Blue-faced Honeyeater | | LC | | | X | | X | X | | | | | | | | |
| *Falco berigora* | Brown Falcon | | LC | | | | | X | | | | | | | | | |
| *Geopelia cuneata* | Diamond Dove | | LC | | X | | | | | | | | | | | | |
| *Geopelia striata* | Peaceful Dove | | LC | | | | | X | | | | | | | | | |
| *Grallina cyanoleuca* | Magpie Lark | | LC | X | | X | | X | | | | | | | | | |
| *Gymnorhina tibicen* | Australian Magpie | | LC | X | X | | X | X | | | | | | | | | |
| *Haliastur sphenurus* | Whistling Kite | | LC | X | | | | | | X | | | | | | | |
| *Lichenostomus virescens* | Singing Honeyeater | | LC | | X | | | | | | | | | | | | |
| *Manorina flavigula* | Yellow-throated Miner | | LC | | | X | | | | | | | | | | | |
| *Manorina melanocephala* | Noisy Miner | | LC | X | | | | X | X | X | | | | | | | |
| *Melithreptus albogularis* | White-throated Honeyeater | | LC | | | X | X | | X | | | | | | | | |

| Scientific Name | Common Name | Status | | Site | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | EPBC Act | NC Act | BIRDC1 | BIRDC2 | BIRDC3 | BIRDC4 | BIRDC5 | BIRDC6 | BIRDC7 | SPOTC1 | SPOTC2 | SPOTC3 | SPOTC4 | SPOTC5 | SPOTC6 | INC |
| *Melopsittacus undulatus* | Budgerigar | | LC | | X | | | | | | | | | | | | |
| *Neochima modesta* | Plum-headed finch | | LC | | | | | | | | | | | | | | X |
| *Nycticorax caledonicus* | Nankeen Night Heron | | LC | | | | | | | | | | X | | | | |
| *Nymphicus hollandicus* | Cockatiel | | LC | | X | | | | | | | | | | | | |
| *Oriolus sagittatus* | Olive-backed Oriole | | LC | | | | | | X | | | | | | | | |
| *Pachycephala rufiventris* | Rufous Whistler | | LC | X | X | | X | | X | | | | | | | | |
| *Pardalotus striatus* | Striated Pardalote | | LC | X | X | | X | X | X | X | | | | | | | |
| *Philemon corniculatus* | Noisy Friarbird | | LC | | | | X | X | | | | | | | | | |
| *Platalea flavipes* | Yellow-billed Spoonbill | | LC | | | | | | | | | | | | | | |
| *Platalea regia* | Royal Spoonbill | | LC | | | | | | | | | | | | | | |
| *Platycercus adscitus* | Pale-headed Rosella | | LC | | | | | X | | | | | | | | | |
| *Plectorhyncha lanceolata* | Striped honeyeater | | LC | X | | X | | | | | | | | | | | |
| *Podargus strigoides* | Tawny Frogmouth | | LC | | | | | | | | | | X | | X | X | |
| *Pomatostomus temporalis* | Grey Crowned Babbler | | LC | X | | | | | | | | | | | | | |
| *Rhipidura albiscapa* | Grey Fantail | | LC | X | | X | X | | X | X | | | | | | | |
| *Rhipidura leucophrys* | Willy Wagtail | | LC | | X | | | | | | | | | | | | |
| *Smicrornis brevirostris* | Weebill | | LC | | | X | X | | X | | | | | | | | |
| *Trichoglossus haematodus* | Rainbow Lorikeet | | LC | X | | | | X | | X | | | | | | | |

Notes:

1. EPBC Act = *Environment Protection and Biodiversity Conservation Act 1999*; 2. NC Act = *Nature Conservation Act 1992*

**Table 29 Amphibians recorded from the Study area (infrastructure corridors), 4-9 September 2017**

| Scientific name | Common name | Status | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | EPBC Act[1] | NC Act[2] | SPOT7 | SPOT8 | SPOT9 | SPOT10 | SPOT11 | SPOT12 | SPOT13 | SPOT14 | SPOT15 | SPOT16 | SPOT17 | SPOT18 | SPOT19 | SPOT20 | SPOT21 |
| *Limnodynastes tasmaniensis* | Spotted grassfrog | - | LC | x | | | | | x | | x | | | | | | | |
| *Litoria latopalmata* | Broad-palmed rocketfrog | - | LC | | X | | | | | | | | | | | | | |
| *Rhinella marina** | Cane toad | - | - | x | X | | | | x | | | x | | | | | | |

Notes:

1. EPBC Act = *Environment Protection and Biodiversity Conservation Act 1999*; 2. NC Act = *Nature Conservation Act 1992*; * = introduced species.

**Table 30 Reptiles recorded from the Study area (infrastructure corridors), 4-9 September 2017**

| Scientific Name | Common Name | Status | | Site | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | EPBC Act | NC Act | BIRDC9 | BIRDC13 | BIRDC15 | ASC2 | ASC3 | ASC4 | ASC6 | SPOT13 | SPOT18 | SPOT19 |
| *Carlia pectoralis* | *open-litter rainbow-skink* | - | LC | | | | X | | | | | | |
| *Gehyra catenata* | *chain-backed dtella* | - | LC | | | | | | | X | | X | X |
| *Gehyra dubia* | *dubious dtella* | - | LC | | | | | X | | | | | |
| *Heteronotia binoei* | *Bynoe's gecko* | - | LC | | | X | X | X | X | X | | | |
| *Hoplocephalus bitorquatus* | *pale-headed snake* | - | LC | | | | | | | X | | | |
| *Lerista fragilis* | *Eastern mulch slider* | - | LC | | | | | | | X | | | |
| *Lucasium steindachneri* | *box-patterned gecko* | - | LC | | | | | | | | X | | |
| *Morethia boulengeri* | *south-eastern morethia skink* | - | LC | | | X | | | X | | | | |
| *Morethia taeniopleura* | *fire-tailed skink* | - | LC | X | | | | | | | | | |
| *Oedura monilis* | *ocellated velvet gecko* | - | LC | | | | | | | X | | | |
| *Pogona barbata* | *eastern bearded dragon* | - | LC | | | | X | | | | | | |
| *Pseudonaja textilis* | *eastern brown snake* | - | LC | | X | | | | | | | | |

Notes:

1. EPBC Act = *Environment Protection and Biodiversity Conservation Act 1999*; 2. NC Act = *Nature Conservation Act 1992*

**Table 31 Mammals recorded from the Study area (infrastructure corridors), 4 – 9 September 2017**

| Scientific Name | Common Name | Status | | Site | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | EPBC Act | NC Act | BIRDC9 | BIRD12 | BIRD14 | BIRD15 | ASC6 | SPOTC8 | SPOTC9 | SPOTC112 | SPOTC123 | SPOTC134 | SPOTC17 | SPOTC18 | SPOTC19 | SPOTC20 | KTRANS10 | KTRANS11 |
| *Aepyprymnus rufescens* | Rufous Bettong | - | LC | | | | | X | | | X | | | | | | | | |
| *Canis lupus* | Dingo, Domestic Dog | - | LC | | | | | | | | | | | | X | X | | | |
| *Hydromys chrysogaster* | Water-rat | - | LC | | | | | | | | | X | | | | | | | |
| *Phascolarctos cinereus* | Koala (including scratches and scats) | V | V | X | X | X | X | | | | X | | | | | | | X | X |
| *Macropus giganteus* | Eastern Grey Kangaroo | - | LC | | | X | | X | | | X | | | | | | X | | |
| *Oryctolagus cuniculus** | Rabbit | - | - | | | | | | | | X | | | | | | | | |
| *Petauroides volans* | Greater Glider | V | LC | | | X | | X | | | X | | | X | | X | X | | |
| *Petaurus breviceps* | Sugar Glider | - | LC | | | | | | | | | | X | | | X | | | |
| *Petaurus norfolcensis* | Squirrel Glider | - | LC | | | | | | | | | | | X | | | | | |
| *Planigale ingrami* | Long-tailed Planigale | - | LC | | | | | | X | | | | | | | | | | |
| *Pseudomys delicatulus* | Delicate Mouse | - | LC | | | | | X | | | | | | | | | | | |
| *Pteropus scapulatus* | little red flying-fox | - | LC | | | | | X | | X | | | | X | | X | X | | |
| *Tachyglossus aculeatus* | Short-beaked Echidna | - | SLC | | | | | | | | | | | | X | | | | X |
| *Trichosurus vulpecula* | Common Brushtail Possum | - | LC | | | | | X | | X | X | | | | X | X | | | |

Notes:

1. EPBC Act = *Environment Protection and Biodiversity Conservation Act 1999*; 2. NC Act = *Nature Conservation Act 1992*

**Table 32 Birds recorded from the Study area (infrastructure corridors), 4 – 9 September 2017**

| Scientific Name | Common Name | Status | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | EPBC Act | NC Act | BIRD8 | BIRD9 | BIRD10 | BIRD11 | BIRD12 | BIRD13 | BIRD14 | BIRD15 | BIRD16 | BIRD17 | ASC3 | ASC6 | SPOTC7 | SPOTC8 | SPOTC10 | SPOTC11 | SPOTC12 | SPOTC14 | SPOTC15 | SPOTC17 | SPOTC18 | SPOTC20 | SPOTC21 | KTRANSC10 | KTRANSC11 |
| *Accipiter cirrocephalus* | Collared Sparrowhawk | - | LC | | X | | | | | | | | | | | | | | | | | | | | | | | |
| *Anas gracilis* | Grey Teal | - | LC | | X | X | | | | | | X | | | | | | | | | | | | | | | | |
| *Anas superciliosa* | Pacific Black Duck | - | LC | X | X | X | | | | | | X | | | | X | | | | | | | | | | | | |
| *Anas superciliosa* | | - | LC | X | X | | | | | | X | | | | X | | | | | | | | | | | | | |
| *Anhinga novaehollandiae* | Australasian Darter | - | LC | X | | X | X | | | | | | | | | | | | | X | | | | | | | | |
| *Aprosmictus erythropterus* | Red-winged Parrot | - | LC | | | | X | | | | | | | | | | | | | | | | | | | | | |
| *Aquila audax* | Wedge-tailed Eagle | - | LC | | | | | | X | | X | | | | | | | | | | | | | | | | | |
| *Ardea modesta* | Eastern Great Egret | - | LC | X | | X | | | | | | X | | | | | | | | | | | | | | | | |
| *Ardea pacifica* | White-necked Heron | - | LC | X | X | X | | | | | | | | | | | | | | | | | | | | | | |
| *Artamus superciliosus* | White-browed Woodswallow | - | LC | | X | | | | | | | | | | | | | | | | | | | | | | | |
| *Aythya australis* | Hardhead | - | LC | | | X | | | | | | | | | | | | | | | | | | | | | | |
| *Burhinus grallarius* | Bush Stone-curlew | - | LC | | | | | | | | | | | | | | | | | X | | | | | | | | |
| *Cacatua galerita* | Sulphur-crested Cockatoo | - | LC | | X | | | | X | X | X | | | | | | | | | | | | | | | | | |
| *Chalcites basalis* | Horsfield's Bronze-Cuckoo | - | LC | | X | | | | | | | | | | | | | | | | | | | | | | | |
| *Chenonetta jubata* | Australian Wood Duck | - | LC | X | | X | | | | | | | | | | | | | | | | | | | | | | |
| *Cincloramphus mathewsi* | Rufous Songlark | - | LC | | | | | | | | | | | | | | | | | | | | | | | X | | |
| *Colluricincla harmonica* | Grey Shrike-thrush | - | LC | | | | | | | | X | | | | | | | | | | | | | | | | | |
| *Conopophila whitei* | Grey Honeyeater | - | LC | | | | | | | | X | | | | | | | | | | | | | | | | | |
| *Coracina novaehollandiae* | Black-faced Cuckoo-shrike | - | LC | X | X | | | | | X | X | | | | | | | | | | | | | | | | | |
| *Coracina papuensis* | White-bellied Cuckoo-shrike | - | LC | | X | | | | | | | | | | | | | | | | | | | | | | | |
| *Corcorax melanorhamphos* | White-winged Chough | - | LC | | | | | | | X | | | | | | | | | | | | | | | | | | |
| *Corvus orru* | Torresian Crow | - | LC | | X | X | | | X | | X | | | | | | | | | | | | | | | | | |
| *Coturnix pectoralis* | Stubble Quail | - | LC | | | X | | | | | | | | | | | | | | | X | | | | | | X | |
| *Cracticus nigrogularis* | Pied Butcherbird | - | LC | | X | X | | | X | | X | | | | | | | | | | | | | | | | | |

| Scientific Name | Common Name | Status | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | EPBC Act | NC Act | BIRD8 | BIRD9 | BIRD10 | BIRD11 | BIRD12 | BIRD13 | BIRD14 | BIRD15 | BIRD16 | BIRD17 | ASC3 | ASC6 | SPOTC7 | SPOTC8 | SPOTC10 | SPOTC11 | SPOTC12 | SPOTC14 | SPOTC15 | SPOTC17 | SPOTC18 | SPOTC20 | SPOTC21 | KTRANSC10 | KTRANSC11 |
| *Cracticus tibicen* | Australian Magpie | - | LC | X | X | X | | | | X | X | | | | | | | | | | | | | | | | | |
| *Cracticus torquatus* | Grey Butcherbird | - | LC | | X | X | | | | X | X | X | | | | | | | | | | | | | | | | |
| *Dacelo novaeguineae* | Laughing Kookaburra | - | LC | | X | | X | | | X | X | | | | | | | | | | | | | | | | | |
| *Dicaeum hirundinaceum* | Mistletoebird | - | LC | X | | | | | | | | | | | | | | | | | | | | | | | | |
| *Egretta novaehollandiae* | White-faced Heron | | | X | X | X | | | | | | X | X | | | | | | | | | | | | | | | |
| *Elseyornis melanops* | Black-fronted Dotterel | | | | | X | | X | | | | X | | | | X | | | | X | | X | | | | | | |
| *Entomyzon cyanotis* | Blue-faced Honeyeater | - | LC | | | | X | | | X | X | | | | | | | | | | | | | | | | | |
| *Eolophus roseicapillus* | Galah | - | LC | | | X | | | X | | | | | | | | | | | | | | | | | | | |
| *Falco cenchroides* | Nankeen Kestrel | - | LC | | X | | | | | | | | | | | | | | | | | X | | | | | | |
| *Fulica atra* | Eurasian Coot | - | LC | X | | | | | | | | | | | | | | | | | | | | | | | | |
| *Gallinago hardwickii* | Latham's Snipe | M | SL | | | | X | | | | | | | | | | | | | | | | | | | | | |
| *Geopelia striata* | Peaceful Dove | - | LC | X | | | | | | X | | | | | | | | | | | | | | | | | | |
| *Geophaps scripta* | Squatter Pigeon | V | V | | | | | | X | | | | | | | | | | | | | | | | | | | |
| *Gerygone albogularis* | White-throated Gerygone | - | LC | | X | | | | X | X | X | | | | | | | | | | | X | | | | | | |
| *Grallina cyanoleuca* | Magpie-lark | - | LC | X | X | X | | | X | | X | | | | | | | | | | | | | | | | | |
| *Haliastur sphenurus* | Whistling Kite | - | LC | | | X | | | X | X | | | | | | | | | X | | | | | | | | | |
| *Himantopus himantopus* | Black-winged Stilt | - | LC | | | X | | | | | | | | | | | | | | | | | | | | | | |
| *Lalage sueurii* | White-winged Triller | - | LC | | | | X | | X | | | | | | | | | | | | | | | | | | | |
| *Lichenostomus virescens* | Singing Honeyeater | - | LC | X | | | X | | | | X | | | | | | | | | | | | | | | | | |
| *Lichmera indistincta* | Brown Honeyeater | - | LC | | | | | | | | X | | | | | | | | | | | X | | | | | | |
| *Malurus melanocephalus* | Red-backed Fairy-wren | - | LC | X | | | | | | | X | | | | | | | | | | | | | | | | | |
| *Manorina flavigula* | Yellow-throated Miner | - | LC | | | | X | | | | | | | | | | | | | | | | | | | | | |
| *Manorina melanocephala* | Noisy Miner | - | LC | | X | X | | | X | | | | | | | | | | | | | | | | | | | |
| *Megalurus timoriensis* | Tawny Grassbird | - | LC | X | | | | | | | | | | | | | | | | | | | | | | | | |
| *Melithreptus albogularis* | White-throated Honeyeater | - | LC | | | | X | | | | | | | | | | | | | | | X | | | | | | |
| *Merops ornatus* | Rainbow Bee-eater | - | LC | | | | | | | X | | | | | | | | | | | | X | | | | | | |

| Scientific Name | Common Name | Status | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | EPBC Act | NC Act | BIRD8 | BIRD9 | BIRD10 | BIRD11 | BIRD12 | BIRD13 | BIRD14 | BIRD15 | BIRD16 | BIRD17 | ASC3 | ASC6 | SPOTC7 | SPOTC8 | SPOTC10 | SPOTC11 | SPOTC12 | SPOTC14 | SPOTC15 | SPOTC17 | SPOTC18 | SPOTC20 | SPOTC21 | KTRANSC10 | KTRANSC11 |
| *Microcarbo melanoleucos* | Little Pied Cormorant | - | LC | X | X | X | | | | | | X | | | | | | | | | | | | | | | | |
| *Milvus migrans* | Black Kite | - | LC | X | | | | | X | | | | | | | | | | | | | | | | | | | |
| *Myiagra rubecula* | Leaden Flycatcher | - | LC | | | | | | | X | X | | | | | | | | | | | X | | | | | | |
| *Myzomela sanguinolenta* | Scarlet Honeyeater | - | LC | | | | | | | | | | | | | | | | | | | X | | | | | | |
| *Ninox novaeseelandiae* | Southern Boobook | - | LC | | | | | | | | | | | | | | | | | | | | X | | X | | | |
| *Nycticorax caledonicus* | Nankeen Night-Heron | - | LC | | | | | | | | | | | | | | X | | | X | | | | | | | | |
| *Ocyphaps lophotes* | Crested Pigeon | - | LC | | | X | | | | | | | | | | | | | | | | | | | | | | |
| *Pachycephala rufiventris* | Rufous Whistler | - | LC | | X | | | | X | X | | | | | | | | | | | | | | | | | | |
| *Pardalotus striatus* | Striated Pardalote | - | LC | | X | X | | | X | X | X | | | | | | | | | | | X | | | | | | |
| *Pelecanus conspicillatus* | Australian Pelican | - | LC | | | X | | | | | | | | | | | | | | | | | | | | | | |
| *Petrochelidon nigricans* | Tree Martin | - | LC | X | | | | | | | | | | | | | | | | | | | | | | | | |
| *Phalacrocorax sulcirostris* | Little Black Cormorant | - | LC | | | X | | | | | | | | | | | | | | | | | | | | | | |
| *Phalacrocorax varius* | Pied Cormorant | - | LC | | | X | | | | | | | | | | | | | | | | | | | | | | |
| *Phaps chalcoptera* | Common Bronzewing | - | LC | | | | | | | | | | | X | | | | | | | | | | | | | | |
| *Philemon citreogularis* | Little Friarbird | - | LC | | X | | X | X | X | | X | | | | | | | | | | | | | | | | | |
| *Philemon corniculatus* | Noisy Friarbird | - | LC | X | X | | X | | | X | X | | | | | | | | | | | | | | | | | |
| *Platalea flavipes* | Yellow-billed Spoonbill | - | LC | | | X | | | | | | X | | | | | | | | | | | | | | | | |
| *Platalea regia* | Royal Spoonbill | - | LC | | | 1 | | | | | | | | | | | | | | | | | | | | | | |
| *Platycercus adscitus* | Pale-headed Rosella | - | LC | X | X | | X | | X | X | X | X | | | | | | | | | | X | | | | | | |
| *Plectorhyncha lanceolata* | Striped Honeyeater | - | LC | | X | | | | X | | | | | | | | | | | | | | | | | | | |
| *Podargus strigoides* | Tawny Frogmouth | - | LC | | X | | | | | | | | | | X | | X | X | X | | X | X | X | X | | | | |
| *Poliocephalus poliocephalus* | Hoary-headed Grebe | - | LC | | | X | | | | | | | | | | | | | | | | | | | | | | |
| *Pomatostomus temporalis* | Grey-crowned Babbler | - | LC | | | | | | X | | | | | | | | | | | | | | | | | X | | |
| *Ptilonorhynchus maculatus* | Spotted Bowerbird | - | LC | | | X | | | | | | | | | | | | | | | | | | | | | | |
| *Rhipidura albiscapa* | Grey Fantail | - | LC | | | | | X | | X | X | | | | | | | | | | | | | | | | | |
| *Rhipidura leucophrys* | Willie Wagtail | - | LC | X | | X | X | | X | | | | | | | | | | | | | | | | | | | |

| Scientific Name | Common Name | Status | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | EPBC Act | NC Act | BIRD8 | BIRD9 | BIRD10 | BIRD11 | BIRD12 | BIRD13 | BIRD14 | BIRD15 | BIRD16 | BIRD17 | ASC3 | ASC6 | SPOTC7 | SPOTC8 | SPOTC10 | SPOTC11 | SPOTC12 | SPOTC14 | SPOTC15 | SPOTC17 | SPOTC18 | SPOTC20 | SPOTC21 | KTRANSC10 | KTRANSC11 |
| *Smicrornis brevirostris* | Weebill | - | LC | | | | | | | X | X | | | | | | | | | | | | | | | | | |
| *Strepera graculina* | Pied Currawong | - | LC | | | | | X | | | | | | | | | | | | | | | | | | | | |
| *Struthidea cinerea* | Apostlebird | - | LC | X | X | | | | X | | | | | | | | | | | | | | | | | | | |
| *Tachybaptus novaehollandiae* | Australasian Grebe | - | LC | X | | | | | | | | X | | | | | | | | | | | | | | | | |
| *Taeniopygia bichenovii* | Double-barred Finch | - | LC | X | | | X | | | | X | | | | | | | | | | | X | | | | | | |
| *Taeniopygia guttata* | Zebra Finch | - | LC | | | | | | | X | | | | | | | | | | | | | | | | | | |
| *Threskiornis spinicollis* | Straw-necked Ibis | - | LC | | X | X | | | | | | | | | | | | | | | | | | | | | | |
| *Todiramphus macleayii* | Forest Kingfisher | - | LC | | | | | X | | | | | | | | | | | | | | | | | | | | |
| *Todiramphus sanctus* | Sacred Kingfisher | - | LC | X | | | | | | | | | | | | | | | | | | | | | | | | |
| *Tribonyx ventralis* | Black-tailed Native-hen | - | LC | | | X | X | | | | | | | | | | | | | | | X | | | | | | |
| *Trichoglossus haematodus* | Rainbow Lorikeet | - | LC | | X | | | | | | X | | | | | | | | | | | | | | | | | X |
| *Turnix maculosus* | Red-backed Button-quail | - | LC | | | | | | | | | | | | | X | | | | | | | | | | | | |
| *Vanellus miles* | Masked Lapwing | - | LC | | X | X | | | | | | | | | | X | | | | | | X | | | | | | |

Notes:

1. EPBC Act = *Environment Protection and Biodiversity Conservation Act 1999*; 2. NC Act = *Nature Conservation Act 1992*; * = introduced species.

**Table 33 Amphibians recorded from the Study area (infrastructure corridors), 14-20 November 2017**

| Scientific name | Common name | Status | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | EPBC Act[1] | NC Act[2] | ASCR6 | SPOTRC2 | SPOTRC3 | SPOTRC4 | SPOTRC5 |
| *Limnodynastes tasmaniensis* | Spotted grassfrog | - | LC | X | | | | |
| *Litoria caerulea* | Green Tree Frog | - | LC | X | | | | |
| *Litoria rubella* | Desert Tree Frog | - | LC | X | | | | X |
| *Platyplectrum ornatum* | Ornate Burrowing Frog | - | LC | | | | X | |
| *Rhinella marina** | Cane Toad | - | - | X | X | X | X | |

Notes:

1. EPBC Act = *Environment Protection and Biodiversity Conservation Act 1999*; 2. NC Act = *Nature Conservation Act 1992*; * = introduced species.

**Table 34 Reptiles recorded from the Study area (infrastructure corridors), 14-20 November 2017**

| Scientific Name | Common Name | Status | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | EPBC Act | NC Act | ASRC1 | ASRC2 | ASRC3 | ASRC4 | ASRC5 | ASRC6 | SPOTRC3 | SPOTRC4 |
| *Anilios unguirostris* | Claw-snouted Blind Snake | - | LC | | | | | | | | X |
| *Carlia pectoralis* | Open-litter Rainbow Skink | - | LC | | | | | X | X | | |
| *Carlia vivax* | Lively Rainbow Skink | - | LC | X | | | | | | | |
| *Cryptoblepharus pannosus* | Ragged Snake-eyed Skink | - | LC | | | | | | X | | |
| *Ctenotus robustus* | Eastern Striped Skink | - | LC | | 1 | | | | | | |
| *Heteronotia binoei* | Bynoe's Gecko | - | LC | | | 1 | 1 | 1 | X | X | |
| *Lerista fragilis* | Eastern Mulch Slider | - | LC | X | | | | | | | |
| *Lygisaurus foliorum* | Tree-based Litter-skink | - | LC | X | 1 | | | | | | |
| *Mentia greyii* | Common Dwarf Skink | - | LC | | | | | | X | | |
| *Morethia boulengeri* | Boulenger's Snake-eyed Skink | - | LC | X | | | | | X | | |
| *Morethia ruficauda* | Lined Firetail Skink | - | LC | | 1 | | | | | | |
| *Morethia taeniopleura* | Eastern Fire-tailed Skink | - | LC | | | X | | | X | | |
| *Carlia pectoralis* | Rainbow skink | - | LC | X | | | | | | | |

Notes:

1. EPBC Act = *Environment Protection and Biodiversity Conservation Act 1999*; 2. NC Act = *Nature Conservation Act 1992*

**Table 35 Mammals recorded from the Study area (infrastructure corridors), 14-20 November 2017**

| Scientific Name | Common Name | Status | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | EPBC Act | NC Act | ASRC1 | ASRC2 | SPOTRC1 | SPOTRC2 | SPOTRC3 | SPOTRC4 | SPOTRC5 | SPOTRC6 |
| *Macropus giganteus* | Eastern Grey Kangaroo | - | LC | X | X | | | | | | |
| *Macropus rufogriseus* | Red-necked Wallaby | - | LC | | | | | | | | X |
| *Felis catus** | Cat | - | - | | | | | | | | X |
| *Oryctolagus cuniculus** | Rabbit | - | - | | | | | | | X | |
| *Petauroides volans* | Greater Glider | V | LC | | X | X | X | X | X | | X |
| *Petaurus breviceps* | Sugar Glider | - | LC | | | | | | | X | |
| *Phascolarctos cinereus* | Koala | V | V | X | | | | X | | | X |
| *Trichosurus vulpecula* | Common Brushtail Possum | - | LC | | | | | | X | X | |

Notes:

1. EPBC Act = *Environment Protection and Biodiversity Conservation Act 1999*; 2. NC Act = *Nature Conservation Act 1992*

**Table 36 Birds recorded from the Study area (infrastructure corridors), 14-20 November 2017**

| Scientific Name | Common Name | Status | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | EPBC Act | NC Act | BIRDRC1 | BIRDRC2 | BIRDRC3 | BIRDRC4 | BIRDRC5 | BIRDRC6 | BIRDRC7 | BIRDRC8 | SPOTRC1 | SPOTRC2 | SPOTRC4 |
| *Acrocephalus australis* | Australian Reed-Warbler | - | LC | | | | | | | | X | | | |
| *Anas superciliosa* | Pacific Black Duck | - | LC | | | | | | | | X | | | |
| *Aprosmictus erythropterus* | Red-winged Parrot | - | LC | | X | | | | X | X | | | | |
| *Aquila audax* | Wedge-tailed Eagle | - | LC | | | | | X | | | | | | |
| *Ardea intermedia* | Intermediate Egret | - | LC | | | | | | | | X | | | |
| *Artamus cinereus* | Black-faced Woodswallow | - | LC | | | | | | X | | | | | |
| *Aythya australis* | Hardhead | - | LC | | | | | | | | X | | | |
| *Cacatua galerita* | Sulphur-crested Cockatoo | - | LC | | | X | | X | | X | | | | |
| *Cacomantis pallidus* | Pallid Cuckoo | - | LC | | | | X | | | | X | | | |
| *Centropus phasianinus* | Pheasant Coucal | - | LC | X | | | X | X | X | | | | | |
| *Cincloramphus mathewsi* | Rufous Songlark | - | LC | | | | | | X | | | | | |
| *Coracina novaehollandiae* | Black-faced Cuckoo-shrike | - | LC | X | X | | X | X | X | | X | | | |
| *Corvus orru* | Torresian Crow | - | LC | | X | X | X | X | X | X | | | | |
| *Coturnix pectoralis* | Stubble Quail | - | LC | | | | X | | | | | | | |
| *Cracticus nigrogularis* | Pied Butcherbird | - | LC | X | X | | | X | X | X | | | | |
| *Cracticus tibicen* | Australian Magpie | - | LC | X | X | | X | X | X | X | | | | |
| *Cracticus torquatus* | Grey Butcherbird | - | LC | | X | | X | X | X | X | | | | |
| *Dacelo leachii* | Blue-winged Kookaburra | - | LC | | | | | | X | X | | | X | |
| *Dacelo novaeguineae* | Laughing Kookaburra | - | LC | X | X | X | X | X | X | | | | | |
| *Dromaius novaehollandiae* | Emu | - | LC | | | | | X | X | X | | | | |
| *Elseyornis melanops* | Black-fronted Dotterel | - | LC | | | | | | | | X | | | |
| *Entomyzon cyanotis* | Blue-faced Honeyeater | - | LC | X | X | | | X | | X | | | | |
| *Eolophus roseicapillus* | Galah | - | LC | | X | | | | X | X | | | | |
| *Eudynamys orientalis* | Eastern Koel | - | LC | | | | | X | | | | | | |

| Scientific Name | Common Name | Status | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | EPBC Act | NC Act | BIRDRC1 | BIRDRC2 | BIRDRC3 | BIRDRC4 | BIRDRC5 | BIRDRC6 | BIRDRC7 | BIRDRC8 | SPOTRC1 | SPOTRC2 | SPOTRC4 |
| *Eurystomus orientalis* | Dollarbird | - | LC | X | X | X | X | X | | | | | | |
| *Falco cenchroides* | Nankeen Kestrel | - | LC | | | | X | X | | | | | | |
| *Geopelia striata* | Peaceful Dove | - | LC | | X | | | X | | X | | | | |
| *Gerygone albogularis* | White-throated Gerygone | - | LC | | | | | | X | | | | | |
| *Grallina cyanoleuca* | Magpie-lark | - | LC | X | | | | | X | | X | | | |
| *Grus rubicunda* | Brolga | - | LC | | | | | | X | X | | | | |
| *Haliastur sphenurus* | Whistling Kite | - | LC | | | | | X | | X | X | | | |
| *Malurus melanocephalus* | Red-backed Fairy-wren | - | LC | | | | | X | | | | | | |
| *Manorina melanocephala* | Noisy Miner | - | LC | X | X | X | X | X | | X | | | | |
| *Melithreptus albogularis* | White-throated Honeyeater | - | LC | | | | | | | | X | | | |
| *Merops ornatus* | Rainbow Bee-eater | - | LC | X | X | X | X | | | X | | | | |
| *Microcarbo melanoleucos* | Little Pied Cormorant | - | LC | | | | | | | | X | | | |
| *Ninox novaeseelandiae* | Southern Boobook | - | LC | | | | | | | | | X | X | X |
| *Ocyphaps lophotes* | Crested Pigeon | - | LC | X | | | | X | X | | | | | |
| *Pachycephala rufiventris* | Rufous Whistler | - | LC | | | | | | | | X | | | |
| *Pardalotus striatus* | Striated Pardalote | - | LC | | | | X | X | | | | | | |
| *Philemon citreogularis* | Little Friarbird | - | LC | | | | X | X | X | | | | | |
| *Philemon corniculatus* | Noisy Friarbird | - | LC | X | X | | | X | X | X | | | | |
| *Platycercus adscitus* | Pale-headed Rosella | - | LC | | X | | X | X | X | | | | | |
| *Podargus strigoides* | Tawny Frogmouth | - | LC | | X | | | | | | | | | |
| *Ptilonorhynchus maculatus* | Spotted Bowerbird | - | LC | X | X | | | | | | | | | |
| *Rhipidura leucophrys* | Willie Wagtail | - | LC | | | | X | | X | | | | | |
| *Scythrops novaehollandiae* | Channel-billed Cuckoo | - | LC | X | X | X | | | | | | | | |
| *Smicrornis brevirostris* | Weebill | - | LC | | | X | X | X | X | X | | | | |
| *Sphecotheres vieilloti* | Australasian Figbird | - | LC | | X | | | | | | | | | |
| *Strepera graculina* | Pied Currawong | - | LC | X | X | | | X | | | | | | |

| Scientific Name | Common Name | Status | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | EPBC Act | NC Act | BIRDRC1 | BIRDRC2 | BIRDRC3 | BIRDRC4 | BIRDRC5 | BIRDRC6 | BIRDRC7 | BIRDRC8 | SPOTRC1 | SPOTRC2 | SPOTRC4 |
| *Struthidea cinerea* | Apostlebird | - | LC | X | | | | X | X | | | | | |
| *Taeniopygia bichenovii* | Double-barred Finch | - | LC | | | | X | | | | X | | | |
| *Taeniopygia guttata* | Zebra Finch | - | LC | | | | X | | | | X | | | |
| *Todiramphus pyrrhopygius* | Red-backed Kingfisher | - | LC | | | X | | | | | | | | |
| *Trichoglossus haematodus* | Rainbow Lorikeet | - | LC | X | X | | | | | X | | | | |
| *Tyto javanica* | Eastern Barn Owl | - | LC | | | | | | | | | X | | X |
| *Vanellus miles* | Masked Lapwing | - | LC | | | | | | X | | X | | | |

# Appendix D: Significant Impact Assessments

# Significant Impact Analysis for Threatened Fauna Species

In accordance with the *Matters of National Environmental Significance: Significant impact guidelines 1.1 Environment Protection and Biodiversity Conservation Act 1999* (DoE 2013), a 'significant impact' is an impact which is important, notable, or of consequence, having regard to its context or intensity. Whether or not an action is likely to have a significant impact depends upon the sensitivity, value, and quality of the environment which is impacted, and upon the intensity, duration, magnitude and geographic extent of the impacts. A significant impact is considered to be 'likely' if there is a real or not remote chance or possibility that it could happen (DoE 2013). If there is scientific uncertainty about the potential impacts and they may be serious or irreversible, the precautionary principle is applicable. Actions leading to 'likely significant impacts' must referred to the Commonwealth Government under EPBC Act and residual significant impacts (after mitigation has been applied) are subject to provision of offsets under the *Environment Protection and Biodiversity Conservation Act 1999 Environmental Offsets Policy* (DSEWPC 2012).

To determine 'significance' of residual impacts the guideline contains significance criteria as follows:

**Significance Criteria for Vulnerable Species**

1. *lead to a long-term decrease in the size of an important population of a species*
2. *reduce the area of occupancy of an important population*
3. *fragment an existing important population into two or more populations*
4. *adversely affect habitat critical to the survival of a species (e.g. for activities such as foraging, breeding, roosting, or dispersal or habitat listed in a recovery plan)*
5. *disrupt the breeding cycle of an important population*
6. *modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline*
7. *result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat*
8. *introduce disease that may cause the species to decline*
9. *interfere substantially with the recovery of the species.*

**Significance Criteria for Endangered Species**

As above, except that any population is considered important.

Notes:

An 'important population' is a population that is necessary for a species' long term survival and recovery. This may include populations identified as such in recovery plans, and/or that are:

- key source populations either for breeding or dispersal
- populations that are necessary for maintaining genetic diversity, and/or
- populations that are near the limit of the species range.

Habitat critical to the survival of a species or ecological community' refers to areas that are necessary:

- for activities such as foraging, breeding, roosting, or dispersal
- for the long-term maintenance of the species or ecological community (including the maintenance of species essential to the survival of the species or ecological community, such as pollinators)
- to maintain genetic diversity and long term evolutionary development, or

- for the reintroduction of populations or recovery of the species or ecological community.

Such habitat may be but is not limited to: habitat identified in a recovery plan for the species or ecological community as habitat critical for that species or ecological community; and/or habitat listed on the Register of Critical Habitat maintained by the minister under the EPBC Act.

## Significant Impact Assessments completed for the Project

### Species listed under the EPBC Act

Five threatened species listed under the EPBC Act were recorded within the Study area, namely:

- ornamental snake (*Denisonia maculata*) – Vulnerable;
- Australian painted snipe (*Rostratula australis*) – Endangered;
- squatter pigeon (southern) (*Geophaps scripta scripta*) – Vulnerable;
- koala (*Phascolarctos cinereus*) – Vulnerable; and
- greater glider (*Petauroides volans*) – Vulnerable.

These fauna species have been the subject of Significant Impact Assessment in accordance with DotE 2013) (Tables D1 and D2). The impact of each of four separate Action areas associated with the Project has been considered within the Significant Impact Assessments.

### *Species listed under the NC Act*

The *Queensland Environmental Offsets Policy – Significant Residual Impact Guideline* (DEHP 2014) also utilises a similar set of criteria to assess the significance of potential impacts on threatened species. An action is likely to have a significant impact on endangered and vulnerable wildlife if the impact on the habitat is likely to (DEHP 2014):

1. *lead to a long-term decrease in the size of a local population; or*
2. *reduce the extent of occurrence of the species; or*
3. *fragment an existing population; or*
4. *result in genetically distinct populations forming as a result of habitat isolation; or*
5. *result in invasive species that are harmful to an endangered or vulnerable species becoming established in the endangered or vulnerable species' habitat; or*
6. *introduce disease that may cause the population to decline, or*
7. *interfere with the recovery of the species; or*
8. *cause disruption to ecologically significant locations (breeding, feeding, nesting, migration or resting sites) of a species.*

An action is likely to have a significant impact on special least concern wildlife if the impact on the habitat is likely to result in (DEHP 2014):

1. *a long-term decrease in the size of a local population; or*
2. *a reduced extent of occurrence of the species; or*
3. *fragmentation of an existing population; or*
4. *result in genetically distinct populations forming as a result of habitat isolation; or*
5. *disruption to ecologically significant locations (breeding, feeding or nesting sites) of a species.*

A population for a species is defined by these guidelines (DEHP 2014) as an occurrence of the species in a particular area. In relation to endangered and vulnerable species, occurrences include but are not limited to:

- a geographically distinct regional population, or collection of local populations; or
- a population, or collection of local populations, that occurs within that particular bioregion.

Seven species listed under the Queensland *Nature Conservation Act 1992* are known to occur within the Study area. These are:

- ornamental snake (*Denisonia maculata*) – Vulnerable.
- common death adder (*Acanthophis antarcticus*) – Vulnerable; and
- Australian Painted snipe (*Rostratula australis*) – Endangered;
- squatter pigeon (southern) (*Geophaps scripta scripta*) – Vulnerable;
- koala (*Phascolarctos cinereus*) – Vulnerable;
- short-beaked echidna (T*achyglossus aculeatus*) – Special Least Concern; and
- greater glider (*Petauroides volans*) – Vulnerable.

These seven fauna species have been the subject of Significant Impact Assessment in accordance with DEHP (2014) (Tables D3 and D4). The impact of the Project as a whole has been considered within the Significant Impact Assessments for these species.

**Table D1: Significant Impact Assessment for threatened fauna species listed under the EPBC Act**

| Topic | Criteria | Squatter pigeon – southern (*Geophaps scripta scripta*) | Australian painted snipe (*Rostratula australis*) | Ornamental snake (*Denisonia maculata*) |
|---|---|---|---|---|
| Legal status | **EPBC Act** | Vulnerable | Endangered | Vulnerable |
| Life History and Occurrence | **Distribution** | The squatter pigeon's distribution extends from the Burdekin-Lynd divide in central Queensland, west to Charleville and Longreach, east to the coastline between Proserpine and Port Curtis (near Gladstone), and south to a number of scattered sites throughout south-eastern Queensland (DEE 2018). | The Australian painted snipe has been recorded at wetlands in all states. It is most common in eastern Australia, where it has been recorded at scattered locations throughout much of Queensland, NSW, Victoria and south-eastern South Australia (DEE 2018). It has been recorded less frequently in South Australia, the Northern Territory and Western Australia (DEE 2018). | The ornamental snake is known to inhabit the north and south Brigalow Belt Bioregions. The species' core distribution occurs within the drainage system of the Fitzroy and Dawson Rivers (Cogger 2000). The Project area is located within an area mapped by DEE (2018) as one in which the species is known or likely to occur. |
| | **General habitat requirements** | The squatter pigeon 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 and disturbed habitats such as stockyards, roads, railways and settlements (DEE 2018). It remains common in heavily grazed country north of the Tropic of Capricorn and habitats that are located close to bodies of water (DEHP 2018). | The Australian painted snipe generally inhabits shallow terrestrial freshwater wetlands, including temporary and permanent lakes, swamps and claypans. They also use inundated or waterlogged grassland or saltmarsh, dams, rice crops, sewage farms and bore drains. Typical sites include those with rank emergent tussocks of grass, sedges, rushes or reeds, or samphire. The Australian painted snipe sometimes utilises areas that are lined with trees, or that have some scattered, fallen or washed-up timber (DEE 2018). Australian painted snipe can use modified habitats, such as low-lying woodlands converted to grazing pasture, sewage farms, dams, bores and irrigation schemes, however they do not necessarily breed in such habitats (DEE 2018). | The ornamental snake prefers habitat that is close to its prey (frogs). It prefers moist woodlands and open forests, particularly gilgai (melon-hole) mounds as well as lake margins and wetlands (DEE 2018). It is found in low-lying subtropical areas with deep-cracking clay soils (DERM 2010b) and persists in cleared, disturbed habitat. |
| | **Ecology** | The squatter pigeon feeds on grass seed and arthropods and is thought to occur as a single, contiguous inter-breeding population. It is usually seen in pairs or small groups of up to 20 or more birds and usually breeds in solitary pairs (DEE 2018). It is locally nomadic and not known to travel large distances (DEE 2018). | The Australian painted snipe does not appear to have a set breeding season, but rather breeds in response the availability of suitable conditions. It has been recorded breeding in all months in Australia. Australian painted snipe breeding habitat requirements may be quite specific: shallow wetlands with areas of bare wet mud and both upper and canopy cover nearby. Nest records are all, or nearly all, from or near small islands in freshwater wetlands, provided that these islands | Ornamental snakes are nocturnally active; they shelter during the day in deep soil cracks, under fallen timber, rocks and bark. The species is thought to be active year round with the exception of the cooler months. Peak activity is likely to be in early summer. The snake can remain inactive for months throughout dry times in suitable shelter sites (DEE 2018). Soil cracks are important sheltering sites for this species (DEE 2018). |

| Topic | Criteria | Squatter pigeon – southern (*Geophaps scripta scripta*) | Australian painted snipe (*Rostratula australis*) | Ornamental snake (*Denisonia maculata*) |
|---|---|---|---|---|
| | | | are a combination of very shallow water, exposed mud, dense low cover and sometimes some tall dense cover (DEE 2018). | |
| | **Occurrence within the Project site** | This species was recorded on ten occasions during the field surveys. Several birds were observed in Eucalypt dry woodlands on inland depositional plains within the Mine Site and Access Road (EPBC 2017/7867) and Electricity Transmission Line (EPBC 2017/7869) (Figure 11). Further to this, the squatter pigeon (southern) has been recorded on numerous occasions within 10 km of the study area (Figure 11).<br>This species was not recorded within the following components of the Project:<br>▪ Water Pipeline (EPBC 2017/7868).<br>▪ Rail Spur (EPBC 2017/7870). | This species was recorded once during the field surveys as a single bird. It was located in wetland habitat within Agricultural grasslands within the Mine Site and Access Road (EPBC 2017/7867) (Figure 12).<br>This species was not recorded within the following components of the Project:<br>▪ Water Pipeline (EPBC 2017/7868).<br>▪ Electricity Transmission Line (EPBC 2017/7869).<br>▪ Rail Spur (EPBC 2017/7870). | Four ornamental snake were recorded at three locations within the Olive Downs South Domain and a further five locations within the Willunga Domain (Figure 15).<br>This species was not recorded within the following components of the Project:<br>▪ Water Pipeline (EPBC 2017/7868).<br>▪ Electricity Transmission Line (EPBC 2017/7869).<br>▪ Rail Spur (EPBC 2017/7870).<br>Based on observations of ornamental snake across the study area, areas of potential habitat occur in a significant portion of agricultural grasslands, and small patches of palustrine wetlands (swamps) and Acacia dominated open forests, woodlands and shrublands where gilgais are present. |
| | **Generally Recognised threats to the species** | ▪ habitat loss;<br>▪ degradation of habitat by grazing herbivores;<br>▪ excessive predation (particularly by foxes and cats); and<br>▪ establishment of buffel grass pasture and associated land management practices.<br>(DEE 2018, DEHP 2018) | ▪ loss and alteration of wetland habitat, via drainage of wetlands and diversion of water for agriculture and reservoirs;<br>▪ inappropriate fire regime;<br>▪ overgrazing and trampling of wetlands;<br>▪ replacement of endemic wetland vegetation by invasive, noxious weeds; and<br>▪ predation by feral species.<br>(DEE 2018, DEHP 2018) | ▪ habitat loss and degradation;<br>▪ habitat fragmentation;<br>▪ alteration of landscape hydrology and water quality;<br>▪ contact with the cane toad;<br>▪ predation by feral species; and<br>▪ invasive weeds.<br>(Cogger et al. 1993) |
| | **Recovery Actions** | There is no national recovery plan, but the following actions have been recommended by DEE (2018):<br>▪ determine the population size and distribution of the squatter pigeon; | There is no national recovery plan, but the following actions have been recommended by DEE (2018):<br>▪ determine the population size and distribution of the Australian painted snipe;<br>▪ protect and manage habitat at principal breeding and wintering sites; | The Action Plan for Australian Reptiles (Cogger et al. 1993) lists the following recovery actions:<br>▪ identify suitable habitat for conservation of the ornamental snake;<br>▪ identify key threats and develop management guidelines to protect key habitat; |

| Topic | Criteria | Squatter pigeon – southern (*Geophaps scripta scripta*) | Australian painted snipe (*Rostratula australis*) | Ornamental snake (*Denisonia maculata*) |
|---|---|---|---|---|
| | | ▪ undertake studies to determine the relationship between abundance, tree density and stocking rates;<br>▪ population monitoring;<br>▪ protect grassy woodlands and forests; and<br>▪ establish control measures for predators (especially cats and foxes). | ▪ develop management guidelines for landholders, including wetland management and fencing;<br>▪ rehabilitate wetlands formerly used for breeding;<br>▪ investigate feeding and other habitat requirements; and<br>▪ establish control measures for feral predators. | ▪ ensure ornamental snake conservation is incorporated into appropriate land management decisions; and<br>▪ maximise the establishment of appropriate reserves to protect ornamental snake habitat and landscape connectivity over the long term; e.g. on stock route networks, road reserves and private lands<br>▪ implement recommended fire management guidelines in property and reserve designs.<br>▪ work with landholders and key stakeholders to undertake monitoring programs on selected sites<br>▪ maximise ornamental snake habitat and landscape connectivity<br>▪ ensure ornamental snake conservation is incorporated into appropriate land management decisions. |
| Significant Impact Assessment<br>(from EPBC Act Policy Statement 1.1 (DoTE 2013). | **Commonwealth significance assessment of importance of the on-site population** | The southern subspecies of the squatter pigeon population is thought to occur as a single contiguous (i.e. inter-breeding) population, consisting of approximately 40,000 mature individuals, although this estimate is considered to have low reliability (DEE 2018). All of the relatively small, isolated and sparsely distributed sub-populations occurring south of the Carnarvon Ranges in Central Queensland are considered to be important subpopulations of the subspecies. The Project area is not south of the Carnarvon Ranges, therefore there are no important populations defined for the area. | The population is thought to occur as a single contiguous population, consisting of 1,000 to 1,500 birds (Garnett et al. 2011). The species is dispersive, and there is evidence of partial migration from south-eastern Australia to wetlands in coastal central and northern Queensland in autumn and winter (Garnett et al. 2011). As only one individual was observed (despite repeat attempts to locate the species), it is unlikely that the Project area supports a population. This individual is likely utilizing the wetland habitats for occasional foraging.<br><br>The Project area does not support an isolated population, is not on the edge of the species' range, and has not been identified as an area supporting a high density of birds or a high density of particularly high quality habitat. | The draft *Referral Guidelines for the Nationally Listed Brigalow Belt Reptiles* (DSEWPC 2011) define important habitat for the Ornamental Snake as:<br>• *habitat where the species has been identified during a survey;*<br>• *habitat near the limit of the species known range;*<br>• *large patches of continuous, suitable habitat and viable landscape corridors (necessary for the purposes of breeding, dispersal or maintaining the genetic diversity of the species over successive generations); or*<br>• *a habitat type where the species is identified during a survey, but which was previously thought not to support the species.* |

| Topic | Criteria | Squatter pigeon – southern (*Geophaps scripta scripta*) | Australian painted snipe (*Rostratula australis*) | Ornamental snake (*Denisonia maculata*) |
|---|---|---|---|---|
| | | | | Under this definition, areas of habitat where the ornamental snake was found are important habitat for the ornamental snake. The draft *Referral Guidelines for the Nationally Listed Brigalow Belt Reptiles* (DSEWPC 2011) defines important habitat as a surrogate for important populations (i.e. under this definition, all ornamental snakes in their habitat would be part of important populations). The Study area contains areas of gilgai, which can be considered important habitat for the species.<br>The habitat where the ornamental snake was recorded is important habitat (by definition above), but it is also not likely to be critical to the survival of the species given:<br>• the species is more widely distributed in the region and the habitat is not at a limit of the species range (Figure 15); and<br>• large areas of potential and important habitat (as demonstrated by ornamental snake records) are located in the wider locality and would be avoided by the Project (Figure 15). |
| | **Will the action lead to a long-term decrease in the size of an important population of a species?** | The squatter pigeon (southern) is commonly recorded in fragmented landscapes in the Brigalow Belt South Bioregion. The population of Squatter Pigeon (southern) in the Project locality is likely to occur more widely in the Isaac River catchment given the extent of database records and habitat in locality (Figures 10 and 11). | The single individual Australian Painted Snipe was observed within gilgai habitats at the Willunga Domain. This species may use the wetted habitats within the Mine Site and Access Road area for occasional foraging, however it is unlikely that the habitat would be necessary to sustain a population. The Project is therefore unlikely to lead to a long-term decrease in the size of the species population. | The Project would result in the removal of approximately 7,666 ha of potential habitat for the species, divided into the four Project components as follows:<br>▪ Mine Site and Access Road (EPBC 2017/7867) – 7,621.5 ha<br>▪ Water Pipeline (EPBC 2017/7868) – 7 ha<br>▪ Electricity Transmission Line (EPBC 2017/7869) – 10.5 ha<br>▪ Rail Spur (EPBC 2017/7870) – 27.5 ha<br>The reduction in available habitat may lead to a localized decrease in the local population, but |

| Topic | Criteria | Squatter pigeon – southern (*Geophaps scripta scripta*) | Australian painted snipe (*Rostratula australis*) | Ornamental snake (*Denisonia maculata*) |
|---|---|---|---|---|
| | | | | due to the amount of available habitat in the region and the number of records surrounding the site (Figures 10 and 15) it is unlikely that this decrease would be significant at a regional scale. |
| | **Will the action reduce the area of occupancy of an important population of a species?** | Given the abundance of this species and the availability of surrounding potential habitat it is unlikely that the Project would significantly reduce the area of occupancy of the species relative to its range. | Given only a single individual was recorded within the Mine Site and Access Road area, and the species is known to occur widely throughout the rest of Qld and the rest of Australia (ALA, 2018), it is unlikely that the Mine Site and Access Road would reduce the area of occupancy of the species relative to its range. | The reduction in available habitat would likely lead to a localized decrease in the area of occupancy of the local population, but due to the amount of available habitat in the region and the number of records surrounding the site (Figures 10 and 15), it is unlikely that this decrease would be significant at a regional scale. |
| | **Will the action fragment an existing important population into two or more populations?** | Given the abundance of this species in the surrounding locality, lack of identified important populations, the availability of surrounding potential habitat, and existing level of habitat fragmentation in the Project locality, it is unlikely that the Project would fragment an existing important population into two or more populations. | This species is widespread throughout Qld and the rest of Australia (ALA, 2018) and is a highly mobile species. Given this, it is unlikely that a population of this species would be fragmented into two or more populations. | The Project is not likely to fragment an existing important population into two or more populations due to the location of the existing important populations and the current level of fragmentation (and cleared land between the areas) (Figures 15.1 and 15.2). |
| | **Will the action adversely affect habitat critical to the survival of a species?** | No habitat within the Project locality has been identified as important or critical habitat for the Squatter Pigeon (southern) in any recovery plans or listed on the EPBC Act *Register of Critical Habitat* maintained by the Minister of the Environment under the EPBC Act (DEE, 2018).<br><br>The habitat in the Project area for the Squatter Pigeon (southern) is not deemed to meet the definition of 'important habitat' or 'critical habitat' under the EPBC Act due to the heavily fragmented nature of the habitat which is more widespread in the wider landscape. The Project is not at a limit of the species range and the population squatter pigeon (southern) in the Project locality is likely to occur more widely outside the Project area given | No critical habitat for the species has been identified in any recovery plans or listed on the EPBC Act *Register of Critical Habitat* maintained by the Minister of the Environment under the EPBC Act (DEE, 2018).<br>The habitat in the Project area for the Australian Painted Snipe is not deemed to meet the definition of 'critical habitat' under the EPBC Act due to the heavily fragmented nature of the habitat which is more widespread in the wider landscape. The Project is not at a limit of the species range and the Australian Painted Snipe is known to occur more widely outside the Project area given the extent of database records. | The habitat where the ornamental snake was recorded is important habitat, but it is also not likely to be critical to the survival of the species given:<br>▪ the species is more widely distributed in the region and the habitat is not at a limit of the species range (Figure 15); and<br>▪ large areas of potential and important habitat (as demonstrated by ornamental snake records) are located in the wider locality and would be avoided by the Project (Figure 15).<br>Given the above, the Project is unlikely to adversely impact habitat critical to the survival of this species. |

| Topic | Criteria | Squatter pigeon – southern (*Geophaps scripta scripta*) | Australian painted snipe (*Rostratula australis*) | Ornamental snake (*Denisonia maculata*) |
|---|---|---|---|---|
| | | the extent of database records and habitat (Figure 11). | | |
| | **Will the action disrupt the breeding cycle of an important population?** | The Project area does not offer any unique or particularly high quality habitat resources required by squatter pigeons. Similar or better habitat would remain in the Project locality. The species is known to breed throughout the year, hence the Project is unlikely to disrupt the breeding cycle of this species. | The Project area does not offer any unique or particularly high-quality habitat resources required by the Australian painted snipe. Similar or better habitat would remain in the Project locality. The species is known to breed throughout the year, hence the Project is unlikely to disrupt the breeding cycle of this species. | An important population has been identified in the Project area, and the Project would result in the removal of potential breeding and nesting habitat for these populations. |
| | **Will the action modify, destroy or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline?** | The Project would result in the loss of potential habitat that is of sub-optimal quality (due to high occurrence of buffel grass). The loss of this habitat would not isolate remaining habitat from other patches of habitat and it is unlikely that the Project would significantly reduce the area of habitat occupied by the species relative to its regional distribution. It is therefore unlikely that the Project would result in the decline of the species. | The loss of potential habitat for this species would not isolate remaining habitat from other patches and it is unlikely that the Mine Site and Access Road would significantly reduce the area of habitat occupied by the species relative to its regional distribution. However, the Project would remove approximately 120 ha of habitat for this species. | The Project would result in a reduction in available habitat within the Mine Site and Access Road (EPBC 2017/7867). However due to the amount of available habitat in the locality and the number of records surrounding the Project area it is unlikely that this decrease would be significant at a regional scale.<br>In addition, as the majority of the potential habitat for this species is mapped within the agricultural grasslands, there are a number of existing threats to the ornamental snake. These include, heavy weed infestation, presence of introduced fauna species (including cane toads); agricultural grazing and sever habitat fragmentation.<br>It is therefore unlikely that the Project would result in the decline of the species. |
| | **Will the action result in establishment of harmful invasive species in the species' habitat?** | The prevalence of weeds and feral animals in the Project area and surrounds is unlikely to change significantly due to the Project given the current agricultural use of the surrounding area and implementation of mitigation and management measure proposed to be implemented by Pembroke.<br><br>Reduction of food resources and cover from the establishment and maintenance of buffel grass pastures have been identified as a threat to squatter pigeons (DEE 2018). Along with | The prevalence of weeds and feral animals in the Project area and surrounds is unlikely to change significantly due to the Project given the current agricultural use of the surrounding area and implementation of mitigation and management measure proposed to be implemented by Pembroke.<br><br>Predation by foxes and feral cats has been suggested as a threat to the Australian painted snipe (DEE 2018). (Garnett et al. 2011). | The prevalence of weeds and feral animals in the Project area and surrounds is unlikely to change significantly due to the Project given the current agricultural use of the surrounding area.<br><br>As outlined above, the majority of the potential habitat for this species is mapped within the agricultural grasslands, there are a number of existing threats to the ornamental snake. These include, heavy weed infestation, presence of introduced fauna species (including cane toads); |

| Topic | Criteria | Squatter pigeon – southern (*Geophaps scripta scripta*) | Australian painted snipe (*Rostratula australis*) | Ornamental snake (*Denisonia maculata*) |
|---|---|---|---|---|
| | | excessive predation by foxes and feral cats, this often increases in response to disturbance (DEE 2018).<br><br>However, through effective pest, weed and introduced pasture grass management, Pembroke would seek to identify, treat, and propose removal strategies to manage these threat through the implementation of a Weed and Pest Management Plan. | However, through effective pest, weed and introduced pasture grass management, Pembroke would seek to identify, treat and propose removal strategies to manage this threat through the implementation of a Weed and Pest Management Plan. | agricultural grazing and sever habitat fragmentation.<br><br>Through effective pest, weed and introduced pasture grass management, Pembroke's Weed and Pest Management Plan would seek to identify, treat, and propose removal strategies to manage these risks to avoid a significant impact to this species. |
| | **Will the action result in the introduction of disease(s) that may cause the species to decline?** | The Project does not include activities that would result in a disease that may cause the species to decline. | The Project does not include activities that would result in a disease that may cause the species to decline. | The Project does not include activities that would result in a disease that may cause the species to decline. |
| | **Will the action interfere substantially with the recovery of the species?** | Given the amount of habitat proposed to be cleared, the Project may interfere with the recovery of the species within the Project locality. | Given the availability of habitat (e.g. wetlands) in the Project locality it is unlikely that the Project would interfere with the recovery of the species. | Although the Project would result in the removal of potential habitat for the species, Pembroke would implement mitigation strategies and offsets to assist in minimising impacts to the species. As such, the Project would not interfere substantially with the recovery of the species. |

| Topic | Criteria | Squatter pigeon – southern (*Geophaps scripta scripta*) | Australian painted snipe (*Rostratula australis*) | Ornamental snake (*Denisonia maculata*) |
|---|---|---|---|---|
| | **Conclusion** | Several birds were observed within the Mine Site and Access Road (EPBC 2017/7867) and Electricity Transmission Line (EPBC 2017/7869) (Figure 11).<br>This species was not recorded within the following components of the Project:<br>▪ Water Pipeline (EPBC 2017/7868).<br>▪ Rail Spur (EPBC 2017/7870)<br>The Project would result in the removal of approximately 5,463.5 ha of potential habitat for the species, divided into the four Project components as follows:<br>▪ Mine Site and Access Road (EPBC 2017/7867) – 5,387 ha<br>▪ Water Pipeline (EPBC 2017/7868) – 27 ha<br>▪ Electricity Transmission Line (EPBC 2017/7869) - 12 ha<br>▪ Rail Spur (EPBC 2017/7870) – 37 ha | This species was located in wetland habitat within Agricultural grasslands within the Mine Site and Access Road (EPBC 2017/7867).<br>This species was not recorded within the following components of the Project:<br>▪ Water Pipeline (EPBC 2017/7868).<br>▪ Electricity Transmission Line (EPBC 2017/7869)<br>▪ Rail Spur (EPBC 2017/7870).<br>The Project would result in the removal of approximately 120 ha of potential habitat for the species, divided into the four Project components as follows:<br>▪ Mine Site and Access Road (EPBC 2017/7867) – 113 ha<br>▪ Water Pipeline (EPBC 2017/7868) - 1 ha<br>▪ Electricity Transmission Line (EPBC 2017/7869) – 0 ha<br>▪ Rail Spur (EPBC 2017/7870) – 6 ha | Four ornamental snake were recorded at three locations within the Olive Downs South Domain and a further five locations within the Willunga Domain (Figure 11).<br>This species was not recorded within the following components of the Project:<br>▪ Water Pipeline (EPBC 2017/7868).<br>▪ Electricity Transmission Line (EPBC 2017/7869).<br>▪ Rail Spur (EPBC 2017/7870).<br>The draft Referral Guidelines for Brigalow Belt reptiles (DSEWPC 2011) suggests clearing of >2ha of important habitat is considered to have a high risk of a significant impact to the Ornamental Snake. The Project would result in the removal of approximately 7,666 ha of potential habitat (including areas of important habitat as defined by draft *Referral Guidelines for the Nationally Listed Brigalow Belt Reptiles* [DSEWPC 2011]) for the species, divided into the four Project components as follows:<br>▪ Mine Site and Access Road (EPBC 2017/7867) – 7,621.5 ha<br>▪ Water Pipeline (EPBC 2017/7868) – 7 ha<br>▪ Electricity Transmission Line (EPBC 2017/7869) – 10.5 ha<br>▪ Rail Spur (EPBC 2017/7870) – 27.5 ha |

**Table D2: Significant Impact Assessment for threatened fauna species listed under the EPBC Act**

| Topic | Criteria | Koala (*Phascolarctos cinereus)*) | Greater glider (*Petauroides volans*) |
|---|---|---|---|
| Legal status | **EPBC Act** | Vulnerable | Vulnerable |
| Life History and Occurrence | **Distribution** | The koala occurs in scattered populations throughout Queensland, in moist forests along the coast, sub-humid woodlands in southern and central Queensland, and in some eucalypt woodlands along watercourses in the semi-arid environments of the western part of the State. The greatest densities of koalas occur in southeast Queensland (DEE 2018). | The greater glider is restricted to eastern Australia, occurring from the Windsor Tableland in north Queensland through to central Victoria (Wombat State Forest), with an elevational range from sea level to 1200 m above sea level (TSSC 2016). |
| | **General habitat requirements** | Koalas inhabit a range of temperate, subtropical and tropical forest, woodland and semi-arid communities dominated by Eucalyptus (DEE 2018). The distribution of koalas is also affected by altitude, temperature and at the western and northern ends of the range, leaf moisture (DEE 2018). | The greater glider is largely restricted to eucalypt forests and woodlands. It is typically found in highest abundance in taller, montane, moist eucalypt forests with relatively old trees and abundant hollows (TSSC 2016). The distribution may be patchy even in suitable habitat. The greater glider favours forests with a diversity of eucalypt species, due to seasonal variation in its preferred tree species (TSSC 2016). |
| | **Ecology** | Female koala can potentially produce up to one offspring each year, with births occurring between October and May. Their diet is restricted mainly to foliage of eucalyptus spp. Koalas also show strong preferences between individual trees within species, they are not territorial and the home range of individuals extensively overlaps (DEE 2018). | It is primarily folivorous, with a diet mostly comprising eucalypt leaves, and occasionally flowers. During the day it shelters in tree hollows, with a particular selection for large hollows in large, old trees. Home ranges are typically relatively small (1−4 ha) but are larger in lower productivity forests and more open woodlands (up to 16 h) (TSSC 2016). |
| | **Occurrence within the Project site** | Within the Study area, the koala was recorded on numerous occasions along the Isaac River and associated tributaries (Figures 13.1 and 13.2). Recordings included direct observation and identification of scats and scratches within Eucalypt dry woodlands on inland depositional plains, Eucalypt open forest to woodlands on floodplains, and around wetlands. Koala, or evidence of its presence, was also recorded along each of the three proposed infrastructure corridors (Figures 13.1 and 13.2).<br>Within the Study area potential koala habitat is located within the areas mapped as eucalypt open forests to woodlands on floodplains, eucalypt dry woodlands on inland depositional plains and the vegetation surrounding and within the lacustrine and palustrine wetlands (Figures 14.1 and 14.2). The potential habitat connections along the waterways (primarily the Isaac River and Ripstone Creek) provide movement corridors and refuge habitat for this species in an otherwise cleared and generally unsuitable landscape. | Within the Study area, the greater glider was recorded on numerous occasions along the Isaac River and associate tributaries (Figure 14). Recordings included direct observation and identification of scats within Eucalypt dry woodlands on inland depositional plains and Eucalypt open forest to woodlands on floodplains. The greater glider, or evidence of its presence, was also recorded along each of the three propose infrastructure corridors (Figure 14).<br>In the Study area all areas of eucalypt open forests to woodlands on floodplains and eucalypt dry woodlands on inland depositional plains are considered potential habitat (Figure 14.1 and 14.2). The potential habitat connections along the waterways (primarily the Isaac River and Ripstone Creek) provide movement corridors and refuge habitat for this species in an otherwise cleared and generally unsuitable landscape. |
| | **Generally Recognised** | ▪ habitat loss, fragmentation and degradation;<br>▪ climate change and drought;<br>▪ habitat degradation due to over-browsing; | ▪ habitat loss, fragmentation and degradation;<br>▪ inappropriate fire regimes;<br>▪ timber production; |

| Topic | Criteria | Koala (*Phascolarctos cinereus*) | Greater glider (*Petauroides volans*) |
|---|---|---|---|
| | **threats to the species** | ▪ lack of access to refuge habitat;<br>▪ dogs and cars;<br>▪ disease; and<br>▪ low genetic variability.<br>(DEE 2018, DotE 2014) | ▪ barbed wire;<br>▪ climate change;<br>▪ excessive predation (particularly by owls);<br>▪ competition for hollows; and<br>▪ Phytophthora root fungus<br>(TSSC 2016) |
| | **Recovery Actions** | The National Koala Conservation and Management Strategy 2009-2014 (NRMMC 2009) identifies the following actions:<br>▪ habitat identification and protection;<br>▪ management of over-browsed habitats;<br>▪ establish control measures for feral predators;<br>▪ national guidelines for road development;<br>▪ community involvement;<br>▪ caring for captive populations;<br>▪ identify populations of high conservation priority;<br>▪ develop and implement vegetation; and<br>▪ recovery and connectivity. | There is no national recovery plan, but the following actions have been recommended by DEE (2018):<br>▪ determine the population size and distribution;<br>▪ undertake studies to determine the relationship between abundance and forest structure;<br>▪ fire management;<br>▪ reduce clearing where significant populations occur;<br>▪ population monitoring;<br>▪ assess impacts of a range of fire regimes;<br>▪ assess response to habitat re-connections; and<br>▪ assess practicality of artificial hollows. |
| Significant Impact Assessment<br>(from EPBC Act Policy Statement 1.1 (DoTE 2013). | **Commonwealth significance assessment of importance of the on-site population** | Given the dense distribution of the species along the east coast of Australia (ALA 2018), populations observed within the Project area are not likely to meet the criteria for being an important population (DEWHA 2009), that is, the population in the Project area:<br>▪ has not been identified in any recovery or action plan;<br>▪ is not likely to be a key source population;<br>▪ is not likely to be necessary for dispersal or genetic diversity; and<br>▪ the Project site is not near the limit of the species' range. | Given the dense distribution of the species along the east coast of Australia (ALA 2018), populations observed within the Project area are not likely to meet the criteria for being an important population (DEWHA 2009), that is, the population in the Project area:<br>▪ has not been identified in any recovery or action plan;<br>▪ is not likely to be a key source population;<br>▪ is not likely to be necessary for dispersal or genetic diversity; and<br>▪ the Project site is not near the limit of the species' range. |
| | **Will the action lead to a long-term decrease in the size of an important population of a species?** | The Koala population that has been identified in the Project locality is likely to occur more widely in the surrounding locality and the availability of potential habitat surrounding the Project area extends along the Isaac River and its associated tributaries.<br>Each of the four Actions would involve at least one crossing of the Isaac River and/or its associated tributaries. These crossings have been minimised through the mine design to the smallest extent practicable to minimise the potential impacts on riparian vegetation. | The Greater Glider population that has been identified in the Project locality is likely to occur more widely in the surrounding locality and the availability of potential habitat surrounding the Project area extends along the Isaac River and its associated tributaries.<br>Each of the four Actions would involve at least one crossing of the Isaac River and/or its associated tributaries. These crossings have been minimised through the mine design to the smallest extent practicable to minimise the potential impacts on riparian vegetation. |

| Topic | Criteria | Koala (*Phascolarctos cinereus*)) | Greater glider (*Petauroides volans*) |
|---|---|---|---|
| | | It is unlikely that the Project would result in a long-term decrease in the size of in an important population. | It is unlikely that the Project would result in a long-term decrease in the size of in an important population. |
| | **Will the action reduce the area of occupancy of an important population of a species?** | Given the abundance of this species (ALA 2018) and the availability of surrounding potential habitat that is of similar or better quality (particularly along the Isaac River), it is unlikely that the Project would significantly reduce the area of occupancy of the species relative to its distribution. | Whilst the Project is likely to result in a loss of supporting woodland habitat, given the abundance of this species (ALA 2018) and the availability of surrounding potential habitat that is of similar or better quality (particularly along the Isaac River), it is unlikely that the Project would significantly reduce the area of occupancy of the species. |
| | **Will the action fragment an existing important population into two or more populations?** | Due to the abundance of the species and availability of surrounding habitat, and existing level of habitat fragmentation in the Project locality, it is unlikely that the Project would result in fragmentation of the population into two or more populations. Where possible, riparian vegetation along the Isaac River has been avoided within the mine design in aid of reducing population fragmentation and facilitating movement of this species. | Due to the abundance of the species and availability of surrounding habitat, and existing level of habitat fragmentation in the Project locality, it is unlikely that the Project would result in fragmentation of the population into two or more populations. Where possible, riparian vegetation along the Isaac River has been avoided within the mine design in aid of reducing population fragmentation and facilitating movement of this species. |
| | **Will the action adversely affect habitat critical to the survival of a species?** | The Koala Referral Guidelines (DotE 2014) contain a habitat assessment tool for identifying critical habitat. Impact areas that score five or more using the habitat assessment tool for the koala contain habitat critical to the survival of the koala. The assessment was completed over all areas of potential habitat in the Project area. The Project would remove habitat which meets the definition of 'Critical Habitat' for the Koala as defined in the *EPBC Act referral guidelines for the vulnerable Koala (combined Qld, New South Wales and the Australian Capital Territory)* (DotE 2014). | No habitat within the Project locality has been identified as important or critical habitat for the greater glider in any recovery plans or listed on the EPBC Act *Register of Critical Habitat* maintained by the Minister of the Environment under the EPBC Act (DEE 2018).<br><br>The habitat in the Project area for the greater glider is not deemed to meet the definition of 'important habitat' or 'critical habitat' under the EPBC Act due to the heavily fragmented nature of the habitat which is more widespread in the wider landscape. The Project is not at a limit of the species range and the population of greater glider in the Project locality is likely to occur more widely outside the Project area given the extent of database records and habitat (Figure 14). |

| Topic | Criteria | Koala (*Phascolarctos cinereus*) | Greater glider (*Petauroides volans*) |
|---|---|---|---|
| | **Will the action disrupt the breeding cycle of an important population?** | Given the Project would largely avoid disturbance to the better quality riparian vegetation along the Isaac River, it is unlikely that the Project would disrupt the breeding cycle of an important population. | Although the Project area offers a reasonable density of large hollow-bearing trees required by the greater glider for successful breeding, the majority of records of this species are located within the better quality riparian vegetation along the Isaac River (including large hollow-bearing trees) which would be largely avoided by the Project. Given this, it is unlikely that the Project would disrupt the breeding cycle of the greater glider. |
| | **Will the action modify, destroy or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline?** | It is possible that local populations may suffer a small reduction in numbers, however, maintenance of the movement corridor and better quality riparian habitat along the Isaac River is likely to mitigate this impact such that, at a regional level, the species would not decline. | It is likely that the Project would result in the loss of sub-optimal quality habitat and a reduction in supporting woodland from within the Project area. However, due to the high occurrence of the species on the east coast, and maintenance of the movement corridor and better quality riparian habitat along the Isaac River, it is unlikely that the loss of potential habitat within the Project area would result in the overall decline of the species as a whole. |
| | **Will the action result in establishment of harmful invasive species in the species' habitat?** | The prevalence of weeds and feral animals in the Project area and surrounds is unlikely to change significantly due to the Project given the current agricultural use of the surrounding area and implementation of mitigation and management measure proposed to be implemented by Pembroke.<br><br>Feral dogs have been identified as posing a direct threat to the koala (DotE 2014). However, through effective pest and weed management Pembroke would seek to identify, treat and propose removal strategies through the implementation of a Weed and Pest Management Plan. | The prevalence of weeds and feral animals in the Project area and surrounds is unlikely to change significantly due to the Project given the current agricultural use of the surrounding area and implementation of mitigation and management measure proposed to be implemented by Pembroke.<br><br>No particular weeds or feral animals have been implicated as a threat to the species. However, threat levels would be managed by Pembroke through effective pest and weed management Pembroke would seek to identify, treat and propose removal strategies through the implementation of a Weed and Pest Management Plan. |
| | **Will the action result in the introduction of disease(s) that may cause the species to decline?** | Koala populations are threatened by at least two diseases: chlamydia and koala retrovirus (KoRV). KoRV is estimated to infect up to 100% of koalas in Queensland, with infection rates slightly lower in southern populations (DEE 2017b). It is likely that both these diseases already occur in the populations found on and around the Project area. The Project does not include activities that would result in the spread of a disease that may cause the species to decline. | The Project does not include activities that would result in a disease that may cause the species to decline. |

| Topic | Criteria | Koala (*Phascolarctos cinereus*)) | Greater glider (*Petauroides volans*) |
|---|---|---|---|
| | **Will the action interfere substantially with the recovery of the species?** | Impacts which are likely to substantially interfere with the recovery of the koala (DotE 2014) may include:<br>▪ increasing koala fatalities in habitat critical to the survival of the koala due to dog attacks.<br>▪ increasing koala fatalities in habitat critical to the survival of the koala due to vehicle-strikes.<br>▪ facilitating the introduction or spread of disease or pathogens for example Chlamydia or *Phytophthora cinnamomi*, to habitat critical to the survival of the koala, that are likely to significantly reduce the reproductive output of koalas or reduce the carrying capacity.<br>▪ creating a barrier to movement to, between or within habitat critical to the survival of the koala that is likely to result in a long-term reduction in genetic fitness.<br>▪ changing hydrology which degrades habitat critical to the survival of the koala to the extent that the carrying capacity of the habitat is reduced.<br><br>The Project is unlikely to result in these impacts in consideration of the mitigation measure proposed to be implemented for the Project (Section 7 of the main report), including the retention of the majority of the Isaac River corridor. As such, the Project would not interfere substantially with the recovery of the species | A recovery plan has not yet been developed for the Greater Glider. Due to the preservation of the majority of the Isaac River riparian corridor, the Project is unlikely to interfere with any of the actions listed for the recovery of the species. |
| | **Conclusion** | This species was recorded during the field surveys within each of the four Action areas (Figure 13). The Project would result in the removal of approximately 5,583.5 ha of potential habitat (including areas of critical habitat as defined by as defined in the *EPBC Act referral guidelines for the vulnerable Koala (combined Qld, New South Wales and the Australian Capital Territory)* (DotE 2014) for the species, divided into the four Project components as follows:<br>▪ Mine Site and Access Road (EPBC 2017/7867) – 5,500 ha<br>▪ Water Pipeline (EPBC 2017/7868) – 28.5 ha<br>▪ Electricity Transmission Line (EPBC 2017/7869) – 12 ha<br>▪ Rail Spur (EPBC 2017/7870) – 43 ha | This species was recorded during the field surveys within each of the four Action areas, however records were heavily concentrated around Ripstone Creek and the Isaac River (Figure 14).<br>The Mine Site and Access Road (EPBC 2017/7867) proposes to remove approximately 5,500 ha of potential habitat for the greater glider which may result in a significant impact to this species.<br>In addition, the Project infrastructure corridors would also result in clearance of the following areas of potential habitat:<br>▪ Water Pipeline (EPBC 2017/7868) – 28.5 ha;<br>▪ Electricity Transmission Line (EPBC 2017/7869) – 12 ha; and<br>▪ Rail Spur (EPBC 2017/7870) – 43 ha. |

**Table D3: Significant Impact Assessment for threatened fauna species listed under the NC Act**

| Topic | Criteria | Squatter pigeon – southern (*Geophaps scripta scripta*) | Australian painted snipe (*Rostratula australis*) | Ornamental snake (*Denisonia maculata*) |
|---|---|---|---|---|
| Legal status | **NC Act** | Vulnerable | Endangered | Vulnerable |
| Life History and Occurrence | **Distribution** | The squatter pigeon's distribution extends from the Burdekin-Lynd divide in central Queensland, west to Charleville and Longreach, east to the coastline between Proserpine and Port Curtis (near Gladstone), and south to a number of scattered sites throughout south-eastern Queensland (DEE 2018). | The Australian painted snipe has been recorded at wetlands in all states. It is most common in eastern Australia, where it has been recorded at scattered locations throughout much of Queensland, NSW, Victoria and south-eastern South Australia (DEE 2018). It has been recorded less frequently in South Australia, the Northern Territory and Western Australia (DEE 2018). | The ornamental snake is known to inhabit the north and south Brigalow Belt Bioregions. The species' core distribution occurs within the drainage system of the Fitzroy and Dawson Rivers (Cogger 2000). The Project area is located within an area mapped by DEE (2018) as one in which the species is known or likely to occur. |
| | **General habitat requirements** | The squatter pigeon 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 and disturbed habitats such as stockyards, roads, railways and settlements (DEE 2018). It remains common in heavily grazed country north of the Tropic of Capricorn and habitats that are located close to bodies of water (DEHP 2018). | The Australian painted snipe generally inhabits shallow terrestrial freshwater wetlands, including temporary and permanent lakes, swamps and claypans. They also use inundated or waterlogged grassland or saltmarsh, dams, rice crops, sewage farms and bore drains. Typical sites include those with rank emergent tussocks of grass, sedges, rushes or reeds, or samphire. The Australian painted snipe sometimes utilises areas that are lined with trees, or that have some scattered, fallen or washed-up timber (DEE 2018). Australian painted snipe can use modified habitats, such as low-lying woodlands converted to grazing pasture, sewage farms, dams, bores and irrigation schemes, however they do not necessarily breed in such habitats (DEE 2018). | The ornamental snake prefers habitat that is close to its prey (frogs). It prefers moist woodlands and open forests, particularly gilgai (melon-hole) mounds as well as lake margins and wetlands (DEE 2018). It is found in low-lying subtropical areas with deep-cracking clay soils (DERM 2010b) and persists in cleared, disturbed habitat. |
| | **Ecology** | The squatter pigeon feeds on grass seed and arthropods and is thought to occur as a single, contiguous inter-breeding population. It is usually seen in pairs or small groups of up to 20 or more birds and usually breeds in solitary pairs (DEE 2018). It is locally nomadic and not known to travel large distances (DEE 2018). | The Australian painted snipe does not appear to have a set breeding season, but rather breeds in response the availability of suitable conditions. It has been recorded breeding in all months in Australia. Australian painted snipe breeding habitat requirements may be quite specific: shallow wetlands with areas of bare wet mud and both upper and canopy cover nearby. Nest records are all, or nearly all, from or near small islands in freshwater wetlands, provided that these islands are a combination of very shallow water, exposed mud, | Ornamental snakes are nocturnally active; they shelter during the day in deep soil cracks, under fallen timber, rocks and bark. The species is thought to be active year round with the exception of the cooler months. Peak activity is likely to be in early summer. The snake can remain inactive for months throughout dry times in suitable shelter sites (DEE 2018). Soil cracks are important sheltering sites for this species (DEE 2018). |

| Topic | Criteria | Squatter pigeon – southern (*Geophaps scripta scripta*) | Australian painted snipe (*Rostratula australis*) | Ornamental snake (*Denisonia maculata*) |
|---|---|---|---|---|
| | | | dense low cover and sometimes some tall dense cover (DEE 2018). | |
| | **Occurrence within the Project site** | This species was recorded on nine occasions during the field surveys. Several individuals were observed in Eucalypt dry woodlands on inland depositional plains within the Mine Site and Access Road (EPBC 2017/7867) and Electricity Transmission Line (EPBC 2017/7869) (Figure 11). Further to this, the squatter pigeon (southern) has been recorded on numerous occasions within 10 km of the study area (Figure 11).<br>This species was not recorded within the following components of the Project:<br>▪ Water Pipeline (EPBC 2017/7868).<br>▪ Rail Spur (EPBC 2017/7870). | This species was recorded once during the field surveys as a single bird. It was located in wetland habitat within Agricultural grasslands within the Mine Site and Access Road (EPBC 2017/7867) (Figure 12).<br>This species was not recorded within the following components of the Project:<br>▪ Water Pipeline (EPBC 2017/7868).<br>▪ Electricity Transmission Line (EPBC 2017/7869).<br>▪ Rail Spur (EPBC 2017/7870). | Four ornamental snake were recorded at three locations within the Olive Downs South Domain and a further five locations within the Willunga Domain (Figure 15).<br>This species was not recorded within the following components of the Project:<br>▪ Water Pipeline (EPBC 2017/7868).<br>▪ Electricity Transmission Line (EPBC 2017/7869).<br>▪ Rail Spur (EPBC 2017/7870).<br>Based on observations of ornamental snake across the study area, areas of potential habitat occur in a significant portion of agricultural grasslands, and small patches of palustrine wetlands (swamps) and Acacia dominated open forests, woodlands and shrublands where gilgais are present. |
| | **Generally recognised threats to the species** | ▪ habitat loss;<br>▪ degradation of habitat by grazing herbivores;<br>▪ excessive predation (particularly by foxes and cats); and<br>▪ establishment of buffel grass pasture and associated land management practices.<br>(DEE 2018, DEHP 2018) | ▪ loss and alteration of wetland habitat, via drainage of wetlands and diversion of water for agriculture and reservoirs;<br>▪ inappropriate fire regime;<br>▪ overgrazing and trampling of wetlands;<br>▪ replacement of endemic wetland vegetation by invasive, noxious weeds; and<br>▪ predation by feral species.<br>(DEE 2018, DEHP 2018) | ▪ habitat loss and degradation;<br>▪ habitat fragmentation;<br>▪ alteration of landscape hydrology and water quality;<br>▪ contact with the cane toad;<br>▪ predation by feral species; and<br>▪ invasive weeds.<br>(Cogger et al. 1993) |
| | **Recovery Actions** | There is no national recovery plan, but the following actions have been recommended by DEE (2018):<br>▪ determine the population size and distribution of the squatter pigeon;<br>▪ undertake studies to determine the relationship between abundance, tree density and stocking rates; | There is no national recovery plan, but the following actions have been recommended by DEE (2018):<br>▪ determine the population size and distribution of the Australian painted snipe;<br>▪ protect and manage habitat at principal breeding and wintering sites; | The Action Plan for Australian Reptiles (Cogger et al. 1993) lists the following recovery actions:<br>▪ identify suitable habitat for conservation of the ornamental snake;<br>▪ identify key threats and develop management guidelines to protect key habitat; |

| Topic | Criteria | Squatter pigeon – southern (*Geophaps scripta scripta*) | Australian painted snipe (*Rostratula australis*) | Ornamental snake (*Denisonia maculata*) |
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| | | ▪ population monitoring;<br>▪ protect grassy woodlands and forests; and<br>▪ establish control measures for predators (especially cats and foxes). | ▪ develop management guidelines for landholders, including wetland management and fencing;<br>▪ rehabilitate wetlands formerly used for breeding;<br>▪ investigate feeding and other habitat requirements; and<br>▪ establish control measures for feral predators. | ▪ ensure ornamental snake conservation is incorporated into appropriate land management decisions; and<br>▪ maximise the establishment of appropriate reserves to protect ornamental snake habitat and landscape connectivity over the long term; e.g. on stock route networks, road reserves and private lands<br>▪ implement recommended fire management guidelines in property and reserve designs.<br>▪ work with landholders and key stakeholders to undertake monitoring programs on selected sites<br>▪ maximise ornamental snake habitat and landscape connectivity<br>▪ ensure ornamental snake conservation is incorporated into appropriate land management decisions. |
| | **Will the Project lead to a long-term decrease in the size of a local population?** | The Squatter Pigeon (southern) is commonly recorded in fragmented landscapes in the Brigalow Belt South Bioregion. The population of Squatter Pigeon (southern) in the Project locality is likely to occur more widely in the Isaac River catchment given the extent of database records and habitat in locality (Figures 10 and 11). | The single individual Australian Painted Snipe was observed within gilgai habitats at the Willunga Domain. This species may use the wetted habitats within the Project area for occasional foraging, however it is unlikely that the habitat would be necessary to sustain a population. The Project is therefore unlikely to lead to a long-term decrease in the size of the species population. | The Project would result in the removal of approximately 7,666 ha of potential habitat for the species. The reduction in available habitat may lead to a localized decrease in the local population, but due to the amount of available habitat in the region and the number of records surrounding the site (Figures 10 and 15) it is unlikely that this decrease would be significant at a regional scale. |
| | **Will the Project reduce the extent of occurrence of the species?** | Given the abundance of this species and the availability of surrounding potential habitat it is unlikely that the Project would significantly reduce the area of occupancy of the species relative to its range. | Given only a single individual was recorded within the Project area, and the species is known to occur widely throughout the rest of Qld and the rest of Australia (ALA, 2018), it is unlikely that the Project would reduce the extent of occurence of the species relative to its range. | The reduction in available habitat would likely lead to a localized decrease in the area of occupancy of the local population, but due to the amount of available habitat in the region and the number of records surrounding the site (Figures 10 and 15), it is unlikely that this decrease would be significant at a regional scale. |
| | **Will the Project fragment an existing** | Given the abundance of this species in the surrounding locality, lack of identified important populations, the availability of surrounding potential habitat, and existing level of habitat | This species is widespread throughout Qld and the rest of Australia (ALA, 2018) and is a highly mobile species. Given this, it is unlikely that a population of | The Project is not likely to fragment an existing important population into two or more populations due to the location of the existing important populations and the current level of |

| Topic | Criteria | Squatter pigeon – southern (*Geophaps scripta scripta*) | Australian painted snipe (*Rostratula australis*) | Ornamental snake (*Denisonia maculata*) |
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| | **population?** | fragmentation in the Project locality, it is unlikely that the Project would fragment an existing important population into two or more populations. | this species would be fragmented into two or more populations. | fragmentation (and cleared land between the areas) (Figures 15.1 and 15.2). |
| | **Will the Project result in genetically distinct populations forming as a result of habitat isolation?** | As discussed above, no fragmentation or isolation of the local population is likely to result from the Project. | As discussed above, no fragmentation or isolation of the local population is likely to result from the Project. | Parts of the Project area are identified as important habitat, rather than critical habitat. The habitat is important locally to the species but is not critical to the survival of the species as a whole given the surrounding available habitat and number of records. |
| | **Will the Project result in invasive species that are harmful to an endangered or vulnerable species becoming established in the endangered or vulnerable species' habitat?** | The prevalence of weeds and feral animals in the Project area and surrounds is unlikely to change significantly due to the Project given the current agricultural use of the surrounding area and implementation of mitigation and management measure proposed to be implemented by Pembroke.<br><br>Reduction of food resources and cover from the establishment and maintenance of buffel grass pastures have been identified as a threat to squatter pigeons (DEE 2018). Along with excessive predation by foxes and feral cats, this often increases in response to disturbance (DEE 2018).<br><br>However, through effective pest, weed and introduced pasture grass management, Pembroke would seek to identify, treat, and propose removal strategies to manage these threats through the implementation of a Weed and Pest Management Plan. | The prevalence of weeds and feral animals in the Project area and surrounds is unlikely to change significantly due to the Project given the current agricultural use of the surrounding area and implementation of mitigation and management measure proposed to be implemented by Pembroke.<br><br>Predation by foxes and feral cats has been suggested as a threat to the Australian painted snipe (DEE 2018 & Garnett et al. 2011).<br><br>However, through effective pest, weed and introduced pasture grass management, Pembroke would seek to identify, treat and propose removal strategies to manage this threat through the implementation of a Weed and Pest Management Plan. | The prevalence of weeds and feral animals in the Project area and surrounds is unlikely to change significantly due to the Project given the current agricultural use of the surrounding area. As outlined above, the majority of the potential habitat for this species is mapped within the agricultural grasslands, there are a number of existing threats to the ornamental snake. These include, heavy weed infestation, presence of introduced fauna species (including cane toads); agricultural grazing and habitat fragmentation.<br><br>Through effective pest, weed and introduced pasture grass management, Pembroke's Weed and Pest Management Plan would seek to identify, treat, and propose removal strategies to manage these risks to avoid a significant impact to this species. |
| | **Will the Project introduce disease that may cause** | The Project does not include activities that would result in a disease that may cause the species to decline. | The Project does not include activities that would result in a disease that may cause the species to decline. | The Project does not include activities that would result in a disease that may cause the species to decline. |

| Topic | Criteria | Squatter pigeon – southern (*Geophaps scripta scripta*) | Australian painted snipe (*Rostratula australis*) | Ornamental snake (*Denisonia maculata*) |
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| | **the population to decline?** | | | |
| | **Will the Project interfere with the recovery of the species?** | Given the amount of habitat proposed to be cleared, the Project may interfere with the recovery of the species within the Project locality. | Given the availability of habitat (e.g. wetlands) in the Project locality it is unlikely that the Project would interfere with the recovery of the species. | Although the Project would result in the removal of potential habitat for the species, Pembroke would implement mitigation strategies and offsets to assist in minimising impacts to the species. As such, the Project would not interfere substantially with the recovery of the species. |
| | **Will the Project cause disruption to ecologically significant locations (breeding, feeding, nesting, migration or resting sites) of a species?** | The Project would affect generic foraging and potentially breeding habitat for the local squatter pigeon (southern) population. Given the extent of similar and higher quality habitat located on adjacent and nearby, the habitat on site is unlikely to be of any specific significance to the local population. | The Project would affect generic foraging and potentially breeding habitat for the Australian painted snipe. Given the extent of similar and higher quality habitat located on adjacent and nearby, the habitat on site is unlikely to be of any specific significance to the local population. | No specific diseases have been identified as a threat to the species. |
| | **Conclusion** | Several birds were observed in Eucalypt dry woodlands on inland depositional plains within the Project area (Figure 11).<br>The Project would result in the removal of approximately 5,463.5 ha of potential habitat for the species. Impacts to this species would be mitigated and offset by Pembroke. | This species was located in wetland habitat within Agricultural grasslands within the Project area.<br>The Project would result in the removal of approximately 120 ha of potential habitat for the species. Impacts to this species would be mitigated and offset by Pembroke. | Four ornamental snake were recorded at three locations within the Olive Downs South Domain and a further five locations within the Willunga Domain (Figure 15).<br>The Project would result in the removal of approximately 7,666 ha of potential habitat for the species. Impacts to this species would be mitigated and offset by Pembroke. |

**Table D4: Significant Impact Assessment for threatened fauna species listed under the NC Act**

| Topic | Criteria | Koala (*Phascolarctos cinereus)*) | Greater glider (*Petauroides volans*) | Common death adder (*Acanthophis antarcticus*) |
|---|---|---|---|---|
| Legal status | **NC Act** | Vulnerable | Vulnerable | Vulnerable |
| Life History and Occurrence | **Distribution** | The koala occurs in scattered populations throughout Queensland, in moist forests along the coast, sub-humid woodlands in southern and central Queensland, and in some eucalypt woodlands along watercourses in the semi-arid environments of the western part of the State. The greatest densities of koalas occur in southeast Queensland (DEE 2018). | The greater glider is restricted to eastern Australia, occurring from the Windsor Tableland in north Queensland through to central Victoria (Wombat State Forest), with an elevational range from sea level to 1200 m above sea level (TSSC 2016). | The common death adder occurs from the Gulf region of the Northern Territory across to central and eastern Queensland and New South Wales, and through to the southern parts of South Australia and Western Australia (DEHP 2018). |
| | **General habitat requirements** | Koalas inhabit a range of temperate, subtropical and tropical forest, woodland and semi-arid communities dominated by Eucalyptus (DEE 2018). The distribution of koalas is also affected by altitude, temperature and at the western and northern ends of the range, leaf moisture (DEE 2018). | The greater glider is largely restricted to eucalypt forests and woodlands. It is typically found in highest abundance in taller, montane, moist eucalypt forests with relatively old trees and abundant hollows (TSSC 2016). The distribution may be patchy even in suitable habitat. The greater glider favours forests with a diversity of eucalypt species, due to seasonal variation in its preferred tree species (TSSC 2016). | The species is found in a wide variety of habitats in association with deep leaf litter, including rainforests, wet sclerophyll forests, woodland, grasslands, chenopod dominated shrublands, and coastal heathlands (DEHP 2018). |
| | **Ecology** | Female koala can potentially produce up to one offspring each year, with births occurring between October and May. Their diet is restricted mainly to foliage of eucalyptus spp. Koalas also show strong preferences between individual trees within species, they are not territorial and the home range of individuals extensively overlaps (DEE 2018). | It is primarily folivorous, with a diet mostly comprising eucalypt leaves, and occasionally flowers. During the day it shelters in tree hollows, with a particular selection for large hollows in large, old trees. Home ranges are typically relatively small (1−4 ha) but are larger in lower productivity forests and more open woodlands (up to 16 h) (TSSC 2016). | The common death adder is diurnal and nocturnal, although night activity is dependent on temperature. The species is secretive and relies on cryptic colouration to avoid detection. It will ambush prey by resting coiled and motionless while half-buried in sand, soil or litter and twitches its tail to mimic the movement of a worm. This attracts the attention of potential prey. Its diet consists mostly of lizards and small mammals, and to a lesser extent, birds and frogs (DEHP 2018). |
| | **Occurrence within the Project site** | Within the study area, the koala was recorded on numerous occasions along the Isaac River and associate tributaries (Figures 13.1 and 13.2). Recordings included direct observation and identification of scats and scratches within Eucalypt dry woodlands on inland depositional plains, Eucalypt open forest to woodlands on floodplains, and around wetlands. Koala, or | Within the study area, the greater glider was recorded on numerous occasions along the Isaac River and associate tributaries (Figure 15). Recordings included direct observation and identification of scats within Eucalypt dry woodlands on inland depositional plains and Eucalypt open forest to woodlands on floodplains. The greater glider, or evidence of its presence, was also | The common death adder (*Acanthophis antarcticus*) has previously been recorded from the Study area, but was not detected during the fauna surveys by DPM Envirosciences. The next closest database record of this species is located approximately 90 km north-east of the Project area (ALA, 2018). |

| Topic | Criteria | Koala (*Phascolarctos cinereus*)) | Greater glider (*Petauroides volans*) | Common death adder (*Acanthophis antarcticus*) |
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| | | evidence of its presence, was also recorded along each of the three propose infrastructure corridors (Figures 13.1 and 13.2).<br>Within the Study area potential koala habitat is located within the areas mapped as eucalypt open forests to woodlands on floodplains, eucalypt dry woodlands on inland depositional plains and the vegetation surrounding and within the lacustrine and palustrine wetlands (Figures 13.1 and 13.2). The potential habitat connections along the waterways (primarily the Isaac River and Ripstone Creek) provide movement corridors and refuge habitat for this species in an otherwise cleared and generally unsuitable landscape. | recorded along each of the three propose infrastructure corridors (Figure 15).<br>In the Study area all areas of eucalypt open forests to woodlands on floodplains and eucalypt dry woodlands on inland depositional plains are considered potential habitat (Figure 14.1 and 14.2). The potential habitat connections along the waterways (primarily the Isaac River and Ripstone Creek) provide movement corridors and refuge habitat for this species in an otherwise cleared and generally unsuitable landscape. | The existing record was reported to be a large individual found dead (presumably by cane toad poisoning) on the Iffley property during fauna surveys by 3d Environmental / Ecosmart for the Arrow Bowen Gas Project in 2011, in a patch of brigalow (*Acacia harpophylla*) with gilgai (pers. comm. Mark Sanders 16 February 2018). This isolated patch of vegetation falls within the Study area approximately 100 m west of the Isaac River (Figure 10). |
| | **Generally recognised threats to the species** | ▪ habitat loss, fragmentation and degradation;<br>▪ climate change and drought;<br>▪ habitat degradation due to over-browsing;<br>▪ lack of access to refuge habitat;<br>▪ dogs and cars;<br>▪ disease; and<br>▪ low genetic variability.<br>(DEE 2018, DotE 2014) | ▪ habitat loss, fragmentation and degradation;<br>▪ inappropriate fire regimes;<br>▪ timber production;<br>▪ barbed wire;<br>▪ climate change;<br>▪ excessive predation (particularly by owls);<br>▪ competition for hollows; and<br>▪ Phytophthora root fungus<br>(TSSC 2016) | ▪ inappropriate grazing and fire regimes, which can degrade and destroy their habitat and food sources;<br>▪ poisoning by cane toads; and<br>▪ clearing of vegetation, including loss of habitat through coastal development.<br>(DEHP 2018) |
| | **Recovery Actions** | The National Koala Conservation and Management Strategy 2009-2014 (NRMMC 2009) identifies the following actions:<br>▪ habitat identification and protection;<br>▪ management of over-browsed habitats;<br>▪ establish control measures for feral predators;<br>▪ national guidelines for road development;<br>▪ community involvement;<br>▪ caring for captive populations;<br>▪ identify populations of high conservation priority;<br>▪ develop and implement vegetation; and<br>▪ recovery and connectivity. | There is no national recovery plan, but the following actions have been recommended by DEE (2018):<br>▪ determine the population size and distribution;<br>▪ undertake studies to determine the relationship between abundance and forest structure;<br>▪ fire management;<br>▪ reduce clearing where significant populations occur;<br>▪ population monitoring;<br>▪ assess impacts of a range of fire regimes;<br>▪ assess response to habitat re-connections; and<br>▪ assess practicality of artificial hollows. | There is no recovery plan for the species, but the following actions are listed by DEHP (2018) to address the decline of the species:<br>▪ encourage sustainable grazing regimes that will maintain areas of habitat for common death adder;<br>▪ encourage micro-mosaic patch burning for fire regimes, which will allow common death adders to find refuge from fires in unburnt patches;<br>▪ protect reptile habitat on the stock route network and shire roadsides and reserves;<br>▪ prevent the destruction and degradation of important habitat, through: identifying guidelines to protect habitat; appropriate zoning; identifying development alternatives |

| Topic | Criteria | Koala (*Phascolarctos cinereus)*) | Greater glider (*Petauroides volans*) | Common death adder (*Acanthophis antarcticus*) |
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| | | | | and incentives to retain habitat; and, educating communities;<br>▪ encourage the retention of fallen logs, leaf litter and rocks, to provide refuges for common death adder; and<br>▪ adopt a collaborative approach to reptile conservation and encourage involvement from government agencies, regional Natural Resource Management (NRM) bodies, industry groups, indigenous groups, landholders and the community. |
| Significant Impact Assessment | **Will the Project lead to a long-term decrease in the size of a local population?** | The Koala population that has been identified in the Project locality is likely to occur more widely in the surrounding locality and the availability of potential habitat surrounding the Project area extends along the Isaac River and its associated tributaries.<br>The Project would involve crossings of the Isaac River and/or its associated tributaries. These crossings have been mininmised through the mine design to the smallest extent practicable to minimise the potential impacts on riparian vegetation.<br>As such, it is unlikely that the Project would result in a long-term decrease in the size of in an important population. | The Greater Glider population that has been identified in the Project locality is likely to occur more widely in the surrounding locality and the availability of potential habitat surrounding the Project area extends along the Isaac River and its associated tributaries.<br>The Project would involve crossings of the Isaac River and/or its associated tributaries. These crossings have been mininmised through the mine design to the smallest extent practicable to minimise the potential impacts on riparian vegetation.<br>As such, it is unlikely that the Project would result in a long-term decrease in the size of in an important population. | As the species has only been detected in study area once in the past 5 years, and the next closest database record is located approximately 90 km from the Project area, it is unlikely that the Project area supports a local population of this species. If the species were to occur, it is expected only to be in very low numbers. The Project is unlikely to lead to a long-term decrease in the size of any local population, if it were present. |
| | **Will the Project reduce the extent of occurrence of the species?** | Given the abundance of this species (ALA 2018) and the availability of surrounding potential habitat that is of similar or better quality (particularly along the Isaac River), it is unlikely that the Project would significantly reduce the area of occupancy of the species relative to its distribution. | Whilst the Project is likely to result in a loss of supporting woodland habitat, given the abundance of this species (ALA 2018) and the availability of surrounding potential habitat that is of similar or better quality (particularly along the Isaac River), it is unlikely that the Project would significantly reduce the area of occupancy of the species. | Given the reasons outlined above, the Project is not likely to reduce the extent of occurrence of this species. |
| | **Will the Project fragment an existing** | Due to the abundance of the species and availability of surrounding habitat, and existing level of habitat fragmentation in the Project locality, | Due to the abundance of the species and availability of surrounding habitat, and existing level of habitat fragmentation in the Project locality, it is unlikely that | The Project is not likely to fragment an existing population into two or more populations given the |

| Topic | Criteria | Koala (*Phascolarctos cinereus*)) | Greater glider (*Petauroides volans*) | Common death adder (*Acanthophis antarcticus*) |
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| | **population?** | it is unlikely that the Project would result in fragmentation of the population into two or more populations. Where possible, riparian vegetation along the Isaac River has been avoided within the mine design in aid of reducing population fragmentation and facilitating movement of this species. | the Project would result in fragmentation of the population into two or more populations. Where possible, riparian vegetation along the Isaac River has been avoided within the mine design in aid of reducing population fragmentation and facilitating movement of this species. | lack of records of this species within the Project area. |
| | **Will the Project result in genetically distinct populations forming as a result of habitat isolation?** | As discussed above, no fragmentation or isolation of the local population is likely to result from the Project. | As discussed above, no fragmentation or isolation of the local population is likely to result from the Project. | As outlined above, the Project is not likely to fragment an existing population, and as such would not result in genetically distinct populations forming, given the lack of records of this species within the Project area. |
| | **Will the Project result in invasive species that are harmful to an endangered or vulnerable species becoming established in the endangered or vulnerable species' habitat?** | The prevalence of weeds and feral animals in the Project area and surrounds is unlikely to change significantly due to the Project given the current agricultural use of the surrounding area and implementation of mitigation and management measure proposed to be implemented by Pembroke.<br><br>Feral dogs have been identified as posing a direct threat to the koala (DotE 2014). However, through effective pest and weed introduced pasture management Pembroke would seek to identify, treat and propose removal strategies through the implementation of a Weed and Pest Management Plan. | The prevalence of weeds and feral animals in the Project area and surrounds is unlikely to change significantly due to the Project given the current agricultural use of the surrounding area and implementation of mitigation and management measure proposed to be implemented by Pembroke.<br><br>No particular weeds or feral animals have been implicated as a threat to the species. However, threat levels would be managed by Pembroke through effective pest and weed introduced pasture management Pembroke would seek to identify, treat and propose removal strategies through the implementation of a Weed and Pest Management Plan. | Cane toads are implicated as a threat to the species (DEHP 2018). There are a number of existing threats to the common death adder, including the presence of introduced fauna species (including cane toads), as evidenced by the only record of this species within the study area being a snake that was found dead from likely cane toad poisoning.<br><br>Through effective pest management, Pembroke's Weed and Pest Management Plan would seek to identify, treat, and propose removal strategies to manage these risks to avoid a significant impact to this species. |
| | **Will the Project introduce disease that may cause the population to decline?** | Koala populations are threatened by at least two diseases: chlamydia and koala retrovirus (KoRV). KoRV is estimated to infect up to 100% of koalas in Queensland, with infection rates slightly lower in southern populations (DEE 2017b). It is likely that both these diseases already occur in the populations found on and around the Project area. The Project does not include activities that would | The Project does not include activities that would result in a disease that may cause the species to decline. | The Project does not include activities that would result in a disease that may cause the species to decline. |

| Topic | Criteria | Koala (*Phascolarctos cinereus*)) | Greater glider (*Petauroides volans*) | Common death adder (*Acanthophis antarcticus*) |
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| | | result in the spread of a disease that may cause the species to decline. | | |
| | **Will the Project interfere with the recovery of the species?** | Impacts which are likely to substantially interfere with the recovery of the koala (DotE 2014) may include:<br>▪ increasing koala fatalities in habitat critical to the survival of the koala due to dog attacks.<br>▪ increasing koala fatalities in habitat critical to the survival of the koala due to vehicle-strikes.<br>▪ facilitating the introduction or spread of disease or pathogens for example Chlamydia or *Phytophthora cinnamomi*, to habitat critical to the survival of the koala, that are likely to significantly reduce the reproductive output of koalas or reduce the carrying capacity.<br>▪ creating a barrier to movement to, between or within habitat critical to the survival of the koala that is likely to result in a long-term reduction in genetic fitness.<br>▪ changing hydrology which degrades habitat critical to the survival of the koala to the extent that the carrying capacity of the habitat is reduced.<br><br>The Project is unlikely to result in these impacts in consideration of the mitigation measure proposed to be implemented for the Project (Section 7 of the main report), including the retention of the majority of the Isaac River corridor. As such, the Project would not interfere substantially with the recovery of the species | A recovery plan has not yet been developed for the Greater Glider.<br><br>Due to the preservation of the majority of the Isaac River riparian corridor, the Project is unlikely to interfere with any of the actions listed for the recovery of the species. | The Project would not interfere substantially with the recovery of the species because habitat resources for the common death adder would remain outside of the Project area, such that the species is likely to persist in the landscape, if it were to occur. |
| | **Will the Project cause disruption to ecologically** | The Project would affect generic foraging and potentially breeding habitat for the local koala population. Given the extent of similar and higher quality habitat located on adjacent and nearby | The Project would affect generic foraging and potentially breeding habitat for the local greater glider population. Given the extent of similar and higher quality habitat located on adjacent and | The Project would affect generic foraging and potentially breeding habitat for the common death adder. Given the extent of similar and higher quality habitat located on adjacent and nearby |

| Topic | Criteria | Koala (*Phascolarctos cinereus)*) | Greater glider (*Petauroides volans*) | Common death adder (*Acanthophis antarcticus*) |
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| | **significant locations (breeding, feeding, nesting, migration or resting sites) of a species?** | lands (including riparian habitat along the Isaac River and associated tributaries), the habitat on site is unlikely to be of any specific significance to the local population. | nearby lands (including riparian habitat along the Isaac River and associated tributaries), the habitat on site is unlikely to be of any specific significance to the local population. | lands, the habitat on site is unlikely to be of any specific significance to the local population, if it were to occur. |
| | **Conclusion** | This species was recorded during the field surveys within each of the four Action areas (Figure 13). The Project would result in the removal of approximately 5,583.5 ha of potential habitat (including critical habitat) for the species. Impacts to this species would be mitigated and offset by Pembroke. | This species was recorded during the field surveys within the Project area, however records were heavily concentrated around Ripstone Creek and the Isaac River (Figure 14).<br>The Project proposes to remove approximately 5,583.5 ha of potential habitat for the greater glider which may result in a significant impact to this species. Impacts to this species would be mitigated and offset by Pembroke. | The common death adder (*Acanthophis antarcticus*) has previously been recorded from the Study area, but was not detected during the fauna surveys by DPM Envirosciences. The next closest database record of this species is located approximately 90 km north-east of the Project area (ALA 2018).<br><br>The existing record was reported to be a large individual found dead (presumably by cane toad poisoning) on the Iffley property during fauna surveys by 3d Environmental / Ecosmart for the Arrow Bowen Gas Project in 2011, in a patch of brigalow (*Acacia harpophylla*) with gilgai (pers. comm. Mark Sanders 16 February 2018). This isolated patch of vegetation falls within the Study area approximately 100 m west of the Isaac River (Figure 10).<br><br>Given the lack of recent records within the Study area, it is considered that there is a low risk of a significant impact on the species. |

| Topic | Criteria | Short-beaked Echidna (*Tachyglossus aculeatus*) |
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| Legal status | **NC Act** | Special Least Concern |
| Life History and Occurrence | **Distribution** | The short-beaked echidna is found throughout Australia, including Tasmania. Although it is found all over Australia, it is not as common in Sydney as it once was (Australian Museum 2017). |
| | **General habitat requirements** | The short-beaked echidna lives in forests and woodlands, heath, grasslands and arid environments (Australian Museum 2017). |
| | **Ecology** | The short-beaked echidna feeds on ants and termites (Australian Museum 2017). It is more active during the warmer months, entering torpor in winter (Australian Museum 2017). Females lay one egg in a den underground. When the egg hatches the young crawls into the pouch and suckles for 2-3 months. It continues to suckle from outside the pouch until about 9 months (Australian Museum 2017). |
| **Occurrence within the Project site** | | Short-beaked echidna scats were recorded within brigalow (*Acacia harpophylla*) woodland at site Q28 and within poplar box (*Eucalyptus populnea*) woodland at site Q99 in November 2016.<br>The short-beaked echidna would potentially occur in all habitats across the Project area including cleared areas. As this species occurs in a wide range of habitats including cleared areas, it is unlikely that the removal of the habitat within the Project area would have a significant impact on this species. |
| **Generally recognised threats to the species** | | The primary threat to echidnas is habitat loss, especially the loss of fallen logs and tree stumps, and protective understory vegetation. As they move so slowly they‘re also vulnerable to being hit by vehicles. Cats, dingoes and large goannas may eat young or young adults, but generally echidnas don’t have many natural predators (Australian Museum 2017). |
| **Recovery Actions** | | There is no recovery plan for the species or recognised recovery actions. |
| **Project specific impacts** | | All areas of remnant vegetation and agricultural grasslands within the Project area constitute potential habitat for the species. The Project footprint is approximately 16,300 ha. |
| **Significant Impact Assessment** | **Will the Project lead to a long-term decrease in the size of a local population?** | It is highly likely that a local population of the Echidna would extend well beyond the study area given the number of previous records in the locality (ALA 2018) and that large areas of suitable habitat occurs on adjacent and nearby lands.<br>The Project would impact the Echidna through the removal of habitat which includes open woodland and regrowth. This would affect foraging habitat and connectivity would also be reduced. However given that the local population would extend well beyond the site, and that large areas of suitable habitat would remain outside the Project area, the Project is only likely to affect a few individuals of the overall population and would be unlikely to lead to a decline. |

| Topic | Criteria | Short-beaked Echidna (*Tachyglossus aculeatus*) |
|---|---|---|
| | **Will the Project lead to a reduced extent of occurrence of the species?** | Given the abundance of this species and the availability of surrounding potential habitat it is unlikely that the Project would significantly reduce the area of occupancy of the species relative to its range. |
| | **Will the Project fragment an existing population?** | The echidna is relatively mobile and would be able to cross disturbed areas and open ground. Sufficient connectivity for this species is likely to remain after clearance and no populations are likely to become fragmented as a result of the Project. |
| | **Will the Project result in genetically distinct populations forming as a result of habitat isolation?** | As discussed above, no fragmentation or isolation of the local population is likely to result from the Project. |
| | **Will the Project cause disruption to ecologically significant locations (breeding, feeding, nesting, migration or resting sites) of a species?** | The Project would affect generic foraging and potentially breeding habitat for the local echidna population. Given the extent of similar and higher quality habitat located on adjacent and nearby lands, the habitat on site is unlikely to be of any specific significance to the local population. |
| | **Conclusion** | Short-beaked echidna scats were recorded within brigalow (*Acacia harpophylla*) woodland at site Q28 and within poplar box (*Eucalyptus populnea*) woodland at site Q99 in November 2016.<br>The short-beaked echidna would potentially occur in all habitats across the Project area, including cleared areas. Given the abundance of this species and the availability of surrounding potential habitat it is unlikely that the Project would have a significant impact on the habitat or local population of the short-beaked Echidna. |

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# Appendix E: Offset Calculator Input Justification

**Justification of values entered into the Offset Assessment Guide for breeding and foraging habitat for squatter pigeon *Geophaps scripta* (Vulnerable)**

The Olive Downs Project (Stage 1) proposes to clear 806 ha of potential breeding and foraging habitat for squatter pigeon. The location of the modelled potential habitat in the Project area coincides with the location of a mineral resource suitable for mining and the proponent has taken out a mining lease over the area. Whilst careful location of mining infrastructure has resulted in a slight reduction in the impact of the proposed mining footprint on squatter pigeon, there will be a residual impact that cannot be avoided and will be offset by the proponent (although the residual impact is assessed as being non-significant in EIS documentation).

The offset calculator has been used to assess the suitability of the proposed offset area as an offset for squatter pigeon potential breeding and foraging habitat. The offset calculator also requires the provision of crucial data to assess whether a proposed area (and management) is a suitable offset for a given impact. The variables that have been put into the offset calculator are described as follows:

- **Time over which loss is averted (max. 20 years)** – this is equivalent to the time the risk to the offset area is actively managed. A time span of 20 years was applied in this case, because this represents the maximum time taken for the areas of regrowth potential habitat to recover to remnant status. It is the length of time the proponent anticipates actively managing the offset property to achieve offset and conservation targets.
- **Start area (hectares)** – there is approximately 1,601 ha of remnant habitat within the proposed offset and approximately 1,135 ha of regrowth habitat.
- **Start quality** – the terrestrial habitat quality assessment process outlined in Section 3.4 of the Offsets Strategy was applied to the proposed offset areas. The remnant habitat within the proposed offset has a quality score of 7 and regrowth habitat has a quality score of 6.
- **Future quality with offset** – this is the habitat quality score desired for the offset within the time until ecological benefit. For squatter pigeon, the habitat quality score of remnant habitat is estimated to increase to 8 (from 7) within 5 years due to the implementation of management measures outlined below for remnant vegetation. The habitat quality score of regrowth habitat is estimated to be 8 within 10 years due to the implementation of management measures outlined below for regrowth vegetation.
- **Time until ecological benefit** – this is equivalent to the estimated time it will take for the habitat quality to improve and the offset to be realised. It is estimated that it will take 5 years for the habitat quality of the remnant habitat to improve 1 point given the implementation of the management measures outlined below. It is estimated that it will take 10 years for the habitat quality of the regrowth habitat to improve 2 points given the implementation of the management measures outlined below.
- **Risk of loss (%) with/without offset** – risk of loss is a percentage figure that describes the chance that the habitat on the proposed offset site will be completely lost (i.e. no longer hold any value for the protected matter) over the foreseeable future (either the life of the offset or 20 years, whichever is shorter). The risk of loss with offset is the perceived risk of losing the protected matter on site, despite the offset going ahead. The risk of loss without offset is the perceived risk of losing the protected matter on site in a business as usual scenario. The difference between the risk of loss with and without an offset is the level of averted loss provided by the proposed offset. In accordance with recent advice from DEE, the risk of loss with/without offset has been set at 0%.
- **Future quality without offset** – a habitat quality score was allocated considering the start quality of the habitat and the current threatening processes that would continue to

impact the squatter pigeon habitat without the offset. Current threatening processes for squatter pigeon habitat include:

- lack of core habitat areas (i.e. large patches of remnant open forest);
- fragmentation of existing habitat (which exists in the local area as small patches of remnant and riparian corridors that are not necessarily connected);
- degradation of habitat by grazing herbivores;
- establishment of buffel grass pasture and associated land management practices;
- predation from feral animals (particularly cats, dogs and foxes); and
- clearing of regrowth habitat (that contributes to foraging resources and connectivity) for agriculture.

Without the offset, the future habitat quality score of remnant habitat is estimated to be 6 within 5 years. Without the offset, the future habitat quality score of regrowth habitat is estimated to be 4 within 10 years.

- **Confidence in result (%)** – describes the level of certainty about the success of the proposed offset or the confidence in the proposed change in quality of the offset area. For the area of community and area of habitat attributes, there are two components to which confidence in result relates: change in habitat quality and averted loss (threats).

  The level of confidence in the result for the remnant habitat is considered to be 90% given the start quality (7) is close to the future desired quality (8) and there is a high level of confidence that an improvement in condition can be made within a reasonable timeframe that is proportionate to the time over which loss is averted. It is likely that this increase in habitat quality can be achieved within 5 years with management measures to improve foraging quality and reduce threatening processes (which were indicated as having a lower score in the terrestrial habitat quality assessments for the species). The following measures will be implemented to reduce threatening processes relevant to remnant areas:

  - conservation of remnant areas with offset agreement and covenant on title to ensure long-term protection;
  - removal of grazing pressure to prevent further degradation of habitat; and
  - feral animal management (particularly cats, dogs and foxes).

  The level of confidence in the result for the regrowth habitat is considered to be 85% given a higher level of management would be required to improve the quality of regrowth (6) to the future desired quality (8) – an increase of 2 points. To improve the start quality of the regrowth, improvements must be made on site condition – in particular quality of foraging, threats and connectivity. These elements were indicated as requiring improvement in the terrestrial habitat quality assessments for squatter pigeon in the regrowth habitat. Management actions that would improve the quality of the regrowth and contribute to habitat for the species are:

  - strategic protection of regrowth to increase core habitat areas that will be available to the species in the long-term;
  - strategic protection of regrowth to improve connectivity between remnant patches of habitat;
  - removal of grazing pressure to encourage natural regeneration of native grasses (increasing quality of foraging habitat);
  - feral animal control to reduce predator pressures (particularly from dogs) (reducing direct threats); and
  - reducing weed cover (reducing indirect threats that affect habitat quality).

# Offsets Assessment Guide

For use in determining offsets under the *Environment Protection and Biodiversity Conservation Act 1999*
2 October 2012

This guide relies on Macros being enabled in your browser.

| Matter of National Environmental Significance | |
|---|---|
| **Name** | Squatter pigeon |
| **EPBC Act status** | Vulnerable |
| **Annual probability of extinction**<br>Based on IUCN category definitions | **0.2%** |

| Key to Cell Colours |
|---|
| User input required |
| Drop-down list |
| Calculated output |
| Not applicable to attribute |

## Impact calculator

| Protected matter attributes | Attribute relevant to case? | Description | Quantum of impact | | Units | Information source |
|---|---|---|---|---|---|---|
| ***Ecological communities*** | | | | | | |
| **Area of community** | No | | **Area** | | | |
| | | | **Quality** | | | |
| | | | **Total quantum of impact** | 0.00 | | |
| ***Threatened species habitat*** | | | | | | |
| **Area of habitat** | Yes | Squatter pigeon | **Area** | 806 | Hectares | Olive Downs Projcet - Fauna Technical Report (DPM Envirosciences 2018b) |
| | | | **Quality** | **8** | Scale 0-10 | |
| | | | **Total quantum of impact** | 644.80 | Adjusted hectares | |
| **Protected matter attributes** | **Attribute relevant to case?** | **Description** | **Quantum of impact** | | **Units** | **Information source** |
| **Number of features**<br>e.g. Nest hollows, habitat trees | No | | | | | |
| **Condition of habitat**<br>Change in habitat condition, but no change in extent | No | | | | | |
| ***Threatened species*** | | | | | | |
| **Birth rate**<br>e.g. Change in nest success | No | | | | | |
| **Mortality rate**<br>e.g Change in number of road kills per year | No | | | | | |
| **Number of individuals**<br>e.g. Individual plants/animals | No | | | | | |

## Offset calculator

| Protected matter attributes | Attribute relevant to case? | Total quantum of impact | Units | Proposed offset | Time horizon (years) | | Start area and quality | | Future area and quality without offset | | Future area and quality with offset | | Raw gain | Confidence in result (%) | Adjusted gain | Net present value (adjusted hectares) | % of impact offset | Minimum (90%) direct offset requirement met? | Cost ($ total) | Information source |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Ecological Communities*** | | | | | | | | | | | | | | | | | | | | |
| **Area of community** | No | | | | **Risk-related time horizon (max. 20 years)** | | **Start area (hectares)** | | **Risk of loss (%) without offset** | | **Risk of loss (%) with offset** | | | | | | | | | |
| | | | | | | | | | **Future area without offset (adjusted hectares)** | 0.0 | **Future area with offset (adjusted hectares)** | 0.0 | | | | | | | | | |
| | | | | | **Time until ecological benefit** | | **Start quality (scale of 0-10)** | | **Future quality without offset (scale of 0-10)** | | **Future quality with offset (scale of 0-10)** | | | | | | | | | |
| ***Threatened species habitat*** | | | | | | | | | | | | | | | | | | | | |
| **Area of habitat** | Yes | 644.80 | Adjusted hectares | 1601 | **Time over which loss is averted (max. 20 years)** | 20 | **Start area (hectares)** | 1601 | **Risk of loss (%) without offset** | 0% | **Risk of loss (%) with offset** | 0% | 0.00 | 95% | 0.00 | 0.00 | 285.32 | 44.25% | No | |
| | | | | | | | | | **Future area without offset (adjusted hectares)** | 1601.0 | **Future area with offset (adjusted hectares)** | 1601.0 | | | | | | | | |
| | | | | | **Time until ecological benefit** | 5 | **Start quality (scale of 0-10)** | **7** | **Future quality without offset (scale of 0-10)** | **6** | **Future quality with offset (scale of 0-10)** | **8** | 2.00 | 90% | 1.80 | 1.78 | | | | |
| **Protected matter attributes** | **Attribute relevant to case?** | **Total quantum of impact** | **Units** | **Proposed offset** | **Time horizon (years)** | | **Start value** | | **Future value without offset** | | **Future value with offset** | | **Raw gain** | **Confidence in result (%)** | **Adjusted gain** | **Net present value** | **% of impact offset** | **Minimum (90%) direct offset requirement met?** | **Cost ($ total)** | **Information source** |
| **Number of features**<br>e.g. Nest hollows, habitat trees | No | | | | | | | | | | | | | | | | | | | |
| **Condition of habitat**<br>Change in habitat condition, but no change in extent | No | | | | | | | | | | | | | | | | | | | |
| ***Threatened species*** | | | | | | | | | | | | | | | | | | | | |
| **Birth rate**<br>e.g. Change in nest success | No | | | | | | | | | | | | | | | | | | | |
| **Mortality rate**<br>e.g Change in number of road kills per year | No | | | | | | | | | | | | | | | | | | | |
| **Number of individuals**<br>e.g. Individual plants/animals | No | | | | | | | | | | | | | | | | | | | |

## Summary

| Protected matter attributes | Quantum of impact | Net present value of offset | % of impact offset | Direct offset adequate? | Cost ($) | | |
|---|---|---|---|---|---|---|---|
| | | | | | Direct offset ($) | Other compensatory measures ($) | Total ($) |
| **Birth rate** | 0 | | | | $0.00 | | $0.00 |
| **Mortality rate** | 0 | | | | $0.00 | | $0.00 |
| **Number of individuals** | 0 | | | | $0.00 | | $0.00 |
| **Number of features** | 0 | | | | $0.00 | | $0.00 |
| **Condition of habitat** | 0 | | | | $0.00 | | $0.00 |
| **Area of habitat** | 644.8 | 285.32 | 44.25% | **No** | $0.00 | #DIV/0! | #DIV/0! |
| **Area of community** | 0 | | | | $0.00 | | $0.00 |
| | | | | | **$0.00** | **#DIV/0!** | **#DIV/0!** |

# Offsets Assessment Guide

For use in determining offsets under the *Environment Protection and Biodiversity Conservation Act 1999*
2 October 2012

This guide relies on Macros being enabled in your browser.

| Matter of National Environmental Significance | |
|---|---|
| **Name** | Squatter pigeon |
| **EPBC Act status** | Vulnerable |
| **Annual probability of extinction**<br>Based on IUCN category definitions | **0.2%** |

| Key to Cell Colours |
|---|
| User input required |
| Drop-down list |
| Calculated output |
| Not applicable to attribute |

## Impact calculator

| Protected matter attributes | Attribute relevant to case? | Description | Quantum of impact | | Units | Information source |
|---|---|---|---|---|---|---|
| ***Ecological communities*** | | | | | | |
| **Area of community** | No | | **Area** | | | |
| | | | **Quality** | | | |
| | | | **Total quantum of impact** | 0.00 | | |
| ***Threatened species habitat*** | | | | | | |
| **Area of habitat** | Yes | Squatter pigeon | **Area** | 806 | Hectares | Olive Downs Projcet - Fauna Technical Report (DPM Envirosciences 2018b) |
| | | | **Quality** | **8** | Scale 0-10 | |
| | | | **Total quantum of impact** | 644.80 | Adjusted hectares | |
| **Protected matter attributes** | **Attribute relevant to case?** | **Description** | **Quantum of impact** | | **Units** | **Information source** |
| **Number of features**<br>e.g. Nest hollows, habitat trees | No | | | | | |
| **Condition of habitat**<br>Change in habitat condition, but no change in extent | No | | | | | |
| ***Threatened species*** | | | | | | |
| **Birth rate**<br>e.g. Change in nest success | No | | | | | |
| **Mortality rate**<br>e.g Change in number of road kills per year | No | | | | | |
| **Number of individuals**<br>e.g. Individual plants/animals | No | | | | | |

## Offset calculator

| Protected matter attributes | Attribute relevant to case? | Total quantum of impact | Units | Proposed offset | Time horizon (years) | | Start area and quality | | Future area and quality without offset | | Future area and quality with offset | | Raw gain | Confidence in result (%) | Adjusted gain | Net present value (adjusted hectares) | % of impact offset | Minimum (90%) direct offset requirement met? | Cost ($ total) | Information source |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Ecological Communities*** | | | | | | | | | | | | | | | | | | | | |
| **Area of community** | No | | | | **Risk-related time horizon (max. 20 years)** | | **Start area (hectares)** | | **Risk of loss (%) without offset** | | **Risk of loss (%) with offset** | | | | | | | | | |
| | | | | | | | | | **Future area without offset (adjusted hectares)** | 0.0 | **Future area with offset (adjusted hectares)** | 0.0 | | | | | | | | | |
| | | | | | **Time until ecological benefit** | | **Start quality (scale of 0-10)** | | **Future quality without offset (scale of 0-10)** | | **Future quality with offset (scale of 0-10)** | | | | | | | | | |
| ***Threatened species habitat*** | | | | | | | | | | | | | | | | | | | | |
| **Area of habitat** | Yes | 644.80 | Adjusted hectares | 1135 | **Time over which loss is averted (max. 20 years)** | 20 | **Start area (hectares)** | 1135 | **Risk of loss (%) without offset** | 0% | **Risk of loss (%) with offset** | 0% | 0.00 | 90% | 0.00 | 0.00 | 378.27 | 58.66% | No | |
| | | | | | | | | | **Future area without offset (adjusted hectares)** | 1135.0 | **Future area with offset (adjusted hectares)** | 1135.0 | | | | | | | | |
| | | | | | **Time until ecological benefit** | 10 | **Start quality (scale of 0-10)** | **6** | **Future quality without offset (scale of 0-10)** | **4** | **Future quality with offset (scale of 0-10)** | **8** | 4.00 | 85% | 3.40 | 3.33 | | | | |
| **Protected matter attributes** | **Attribute relevant to case?** | **Total quantum of impact** | **Units** | **Proposed offset** | **Time horizon (years)** | | **Start value** | | **Future value without offset** | | **Future value with offset** | | **Raw gain** | **Confidence in result (%)** | **Adjusted gain** | **Net present value** | **% of impact offset** | **Minimum (90%) direct offset requirement met?** | **Cost ($ total)** | **Information source** |
| **Number of features**<br>e.g. Nest hollows, habitat trees | No | | | | | | | | | | | | | | | | | | | |
| **Condition of habitat**<br>Change in habitat condition, but no change in extent | No | | | | | | | | | | | | | | | | | | | |
| ***Threatened species*** | | | | | | | | | | | | | | | | | | | | |
| **Birth rate**<br>e.g. Change in nest success | No | | | | | | | | | | | | | | | | | | | |
| **Mortality rate**<br>e.g Change in number of road kills per year | No | | | | | | | | | | | | | | | | | | | |
| **Number of individuals**<br>e.g. Individual plants/animals | No | | | | | | | | | | | | | | | | | | | |

## Summary

| Protected matter attributes | Quantum of impact | Net present value of offset | % of impact offset | Direct offset adequate? | Cost ($) | | |
|---|---|---|---|---|---|---|---|
| | | | | | Direct offset ($) | Other compensatory measures ($) | Total ($) |
| **Birth rate** | 0 | | | | $0.00 | | $0.00 |
| **Mortality rate** | 0 | | | | $0.00 | | $0.00 |
| **Number of individuals** | 0 | | | | $0.00 | | $0.00 |
| **Number of features** | 0 | | | | $0.00 | | $0.00 |
| **Condition of habitat** | 0 | | | | $0.00 | | $0.00 |
| **Area of habitat** | 644.8 | 378.27 | 58.66% | **No** | $0.00 | #DIV/0! | #DIV/0! |
| **Area of community** | 0 | | | | $0.00 | | $0.00 |
| | | | | | **$0.00** | **#DIV/0!** | **#DIV/0!** |

**Justification of values entered into the Offset Assessment Guide for breeding and foraging habitat for greater glider *Petauroides volans* (Vulnerable)**

The Olive Downs Project (Stage 1) proposes to clear 827 ha of potential breeding and foraging habitat for greater glider. The location of the modelled potential habitat in the Project area coincides with the location of a mineral resource suitable for mining and the proponent has taken out a mining lease over the area. Whilst careful location of mining infrastructure has resulted in a slight reduction in the impact of the proposed mining footprint on greater glider, there will be a residual impact that cannot be avoided and will be offset by the proponent.

The offset calculator has been used to assess the suitability of the proposed offset area as an offset for greater glider potential breeding and foraging habitat. The offset calculator also requires the provision of crucial data to assess whether a proposed area (and management) is a suitable offset for a given impact. The variables that have been put into the offset calculator are described as follows:

- **Time over which loss is averted (max. 20 years)** – this is equivalent to the time the risk to the offset area is actively managed. A time span of 20 years was applied in this case, because this represents the maximum time taken for the areas of regrowth potential habitat to recover to remnant status. It is the length of time the proponent anticipates actively managing the offset property to achieve offset and conservation targets.
- **Start area (hectares)** – there is approximately 1,601 ha of remnant habitat within the proposed offset and approximately 1,135 ha of regrowth habitat.
- **Start quality** – the terrestrial habitat quality assessment process outlined in Section 3.4 of the Offsets Strategy was applied to the proposed offset areas. The remnant habitat within the proposed offset has a quality score of 7 and regrowth habitat has a quality score of 4.
- **Future quality with offset** – this is the habitat quality score desired for the offset within the time until ecological benefit. For greater glider, the habitat quality score of remnant habitat is estimated to increase to 8 (from 7) within 7 years due to the implementation of management measures outlined below for remnant vegetation. The habitat quality score of regrowth habitat is estimated to increase to 7 within 10 years due to the implementation of management measures outlined below for regrowth vegetation.
- **Time until ecological benefit** – this is equivalent to the estimated time it will take for the habitat quality to improve and the offset to be realised. It is estimated that it will take 7 years for the habitat quality of the remnant habitat to improve 1 point given the implementation of the management measures outlined below. It is estimated that it will take 10 years for the habitat quality of the regrowth habitat to improve 3 points given the implementation of the management measures outlined below.
- **Risk of loss (%) with/without offset** – risk of loss is a percentage figure that describes the chance that the habitat on the proposed offset site will be completely lost (i.e. no longer hold any value for the protected matter) over the foreseeable future (either the life of the offset or 20 years, whichever is shorter). The risk of loss with offset is the perceived risk of losing the protected matter on site, despite the offset going ahead. The risk of loss without offset is the perceived risk of losing the protected matter on site in a business as usual scenario. The difference between the risk of loss with and without an offset is the level of averted loss provided by the proposed offset. In accordance with recent advice from DEE, the risk of loss with/without offset has been set at 0%.
- **Future quality without offset** – a habitat quality score was allocated considering the start quality of the habitat and the current threatening processes that would continue to impact the greater glider habitat without the offset. Current threatening processes for greater glider habitat include:

- lack of core habitat areas (i.e. large patches of remnant open forest with old growth trees providing hollows);
- fragmentation of existing habitat (which exists in the local area as small patches of remnant and riparian corridors that are not necessarily connected);
- high fuel loads (particularly buffel grass) contributing to high fire intensity and potential loss of hollow trees;
- predation from feral animals (particularly cats, dogs and foxes);
- use of barbed wire for fencing; and
- clearing of regrowth habitat (that contributes to foraging resources and connectivity) for agriculture.

Without the offset, the future habitat quality score of remnant habitat is estimated to be 6 within 7 years. Without the offset, the future habitat quality score of regrowth habitat is estimated to be 3 within 10 years.

- **Confidence in result (%)** – describes the level of certainty about the success of the proposed offset or the confidence in the proposed change in quality of the offset area. For the area of community and area of habitat attributes, there are two components to which confidence in result relates: change in habitat quality and averted loss (threats).

  The level of confidence in the result for the remnant habitat is considered to be 90% given the start quality (7) is close to the future desired quality (8) and there is a high level of confidence that an improvement in condition can be made within a reasonable timeframe that is proportionate to the time over which loss is averted. It is likely that this increase in habitat quality can be achieved within 7 years with management measures to improve foraging quality and reduce threatening processes (which were indicated as having a lower score in the terrestrial habitat quality assessments for the species). The following measures will be implemented to reduce threatening processes relevant to remnant areas:

  - conservation of remnant areas with offset agreement and covenant on title to ensure long-term protection;
  - fuel management to avoid high intensity bushfires and loss of habitat trees;
  - feral animal management (particularly cats, dogs and foxes); and
  - removal of barbed wire fencing.

  The level of confidence in the result for the regrowth habitat is considered to be 70% given a higher level of management would be required to improve the quality of regrowth (4) to the future desired quality (7). To improve the start quality of the regrowth, improvements must be made on site condition – in particular quality of foraging and quality of shelter, threats and connectivity. These elements were indicated as requiring improvement in the terrestrial habitat quality assessments for greater glider in the regrowth habitat. Management actions that would improve the quality of the regrowth and contribute to habitat for the species are:

  - strategic protection of regrowth to increase core habitat areas that will be available to the species in the long-term;
  - strategic protection of regrowth to improve connectivity between remnant patches of habitat;
  - removal of grazing pressure to encourage natural regeneration of greater glider foraging trees (increasing quality of foraging habitat);
  - addition of species specific greater glider nest boxes (to improve sheltering habitat);

- feral animal control to reduce predator pressures (particularly from dogs) (reducing direct threats); and
- reducing weed cover (reducing indirect threats that affect habitat quality).

# Offsets Assessment Guide

For use in determining offsets under the *Environment Protection and Biodiversity Conservation Act 1999*
2 October 2012

This guide relies on Macros being enabled in your browser.

| Matter of National Environmental Significance | |
|---|---|
| **Name** | Greater Glider |
| **EPBC Act status** | Vulnerable |
| **Annual probability of extinction**<br>Based on IUCN category definitions | **0.2%** |

| Key to Cell Colours |
|---|
| User input required |
| Drop-down list |
| Calculated output |
| Not applicable to attribute |

## Impact calculator

| Protected matter attributes | Attribute relevant to case? | Description | Quantum of impact | | Units | Information source |
|---|---|---|---|---|---|---|
| ***Ecological communities*** | | | | | | |
| **Area of community** | No | | **Area** | | | |
| | | | **Quality** | | | |
| | | | **Total quantum of impact** | 0.00 | | |
| ***Threatened species habitat*** | | | | | | |
| **Area of habitat** | Yes | Greater Glider | **Area** | 827 | Hectares | Olive Downs Projcet - Fauna Technical Report (DPM Envirosciences 2018b) |
| | | | **Quality** | 7 | Scale 0-10 | |
| | | | **Total quantum of impact** | 578.90 | Adjusted hectares | |
| **Protected matter attributes** | **Attribute relevant to case?** | **Description** | **Quantum of impact** | | **Units** | **Information source** |
| **Number of features**<br>e.g. Nest hollows, habitat trees | No | | | | | |
| **Condition of habitat**<br>Change in habitat condition, but no change in extent | No | | | | | |
| ***Threatened species*** | | | | | | |
| **Birth rate**<br>e.g. Change in nest success | No | | | | | |
| **Mortality rate**<br>e.g Change in number of road kills per year | No | | | | | |
| **Number of individuals**<br>e.g. Individual plants/animals | No | | | | | |

## Offset calculator

| Protected matter attributes | Attribute relevant to case? | Total quantum of impact | Units | Proposed offset | Time horizon (years) | | Start area and quality | | Future area and quality without offset | | Future area and quality with offset | | Raw gain | Confidence in result (%) | Adjusted gain | Net present value (adjusted hectares) | % of impact offset | Minimum (90%) direct offset requirement met? | Cost ($ total) | Information source |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Ecological Communities*** | | | | | | | | | | | | | | | | | | | | |
| **Area of community** | No | | | | **Risk-related time horizon (max. 20 years)** | | **Start area (hectares)** | | **Risk of loss (%) without offset** | | **Risk of loss (%) with offset** | | | | | | | | | |
| | | | | | | | | | **Future area without offset (adjusted hectares)** | 0.0 | **Future area with offset (adjusted hectares)** | 0.0 | | | | | | | | | |
| | | | | | **Time until ecological benefit** | | **Start quality (scale of 0-10)** | | **Future quality without offset (scale of 0-10)** | | **Future quality with offset (scale of 0-10)** | | | | | | | | | |
| ***Threatened species habitat*** | | | | | | | | | | | | | | | | | | | | |
| **Area of habitat** | Yes | 578.90 | Adjusted hectares | 1601 | **Time over which loss is averted (max. 20 years)** | 20 | **Start area (hectares)** | 1601 | **Risk of loss (%) without offset** | 0% | **Risk of loss (%) with offset** | 0% | 0.00 | 95% | 0.00 | 0.00 | 284.18 | 49.09% | No | |
| | | | | | | | | | **Future area without offset (adjusted hectares)** | 1601.0 | **Future area with offset (adjusted hectares)** | 1601.0 | | | | | | | | |
| | | | | | **Time until ecological benefit** | 7 | **Start quality (scale of 0-10)** | **7** | **Future quality without offset (scale of 0-10)** | **6** | **Future quality with offset (scale of 0-10)** | **8** | 2.00 | 90% | 1.80 | 1.78 | | | | |
| **Protected matter attributes** | **Attribute relevant to case?** | **Total quantum of impact** | **Units** | **Proposed offset** | **Time horizon (years)** | | **Start value** | | **Future value without offset** | | **Future value with offset** | | **Raw gain** | **Confidence in result (%)** | **Adjusted gain** | **Net present value** | **% of impact offset** | **Minimum (90%) direct offset requirement met?** | **Cost ($ total)** | **Information source** |
| **Number of features**<br>e.g. Nest hollows, habitat trees | No | | | | | | | | | | | | | | | | | | | |
| **Condition of habitat**<br>Change in habitat condition, but no change in extent | No | | | | | | | | | | | | | | | | | | | |
| ***Threatened species*** | | | | | | | | | | | | | | | | | | | | |
| **Birth rate**<br>e.g. Change in nest success | No | | | | | | | | | | | | | | | | | | | |
| **Mortality rate**<br>e.g Change in number of road kills per year | No | | | | | | | | | | | | | | | | | | | |
| **Number of individuals**<br>e.g. Individual plants/animals | No | | | | | | | | | | | | | | | | | | | |

## Summary

| Protected matter attributes | Quantum of impact | Net present value of offset | % of impact offset | Direct offset adequate? | Cost ($) | | |
|---|---|---|---|---|---|---|---|
| | | | | | Direct offset ($) | Other compensatory measures ($) | Total ($) |
| **Birth rate** | 0 | | | | $0.00 | | $0.00 |
| **Mortality rate** | 0 | | | | $0.00 | | $0.00 |
| **Number of individuals** | 0 | | | | $0.00 | | $0.00 |
| **Number of features** | 0 | | | | $0.00 | | $0.00 |
| **Condition of habitat** | 0 | | | | $0.00 | | $0.00 |
| **Area of habitat** | 578.9 | 284.18 | 49.09% | **No** | $0.00 | #DIV/0! | #DIV/0! |
| **Area of community** | 0 | | | | $0.00 | | $0.00 |
| | | | | | **$0.00** | **#DIV/0!** | **#DIV/0!** |

# Offsets Assessment Guide

For use in determining offsets under the *Environment Protection and Biodiversity Conservation Act 1999*
2 October 2012

This guide relies on Macros being enabled in your browser.

| Matter of National Environmental Significance | |
|---|---|
| **Name** | Greater Glider |
| **EPBC Act status** | Vulnerable |
| **Annual probability of extinction**<br>Based on IUCN category definitions | **0.2%** |

| Key to Cell Colours |
|---|
| User input required |
| Drop-down list |
| Calculated output |
| Not applicable to attribute |

## Impact calculator

| Protected matter attributes | Attribute relevant to case? | Description | Quantum of impact | | Units | Information source |
|---|---|---|---|---|---|---|
| ***Ecological communities*** | | | | | | |
| **Area of community** | No | | **Area** | | | |
| | | | **Quality** | | | |
| | | | **Total quantum of impact** | 0.00 | | |
| ***Threatened species habitat*** | | | | | | |
| **Area of habitat** | Yes | Greater Glider | **Area** | 827 | Hectares | Olive Downs Projcet - Fauna Technical Report (DPM Envirosciences 2018b) |
| | | | **Quality** | 7 | Scale 0-10 | |
| | | | **Total quantum of impact** | 578.90 | Adjusted hectares | |
| **Protected matter attributes** | **Attribute relevant to case?** | **Description** | **Quantum of impact** | | **Units** | **Information source** |
| **Number of features**<br>e.g. Nest hollows, habitat trees | No | | | | | |
| **Condition of habitat**<br>Change in habitat condition, but no change in extent | No | | | | | |
| ***Threatened species*** | | | | | | |
| **Birth rate**<br>e.g. Change in nest success | No | | | | | |
| **Mortality rate**<br>e.g Change in number of road kills per year | No | | | | | |
| **Number of individuals**<br>e.g. Individual plants/animals | No | | | | | |

## Offset calculator

| Protected matter attributes | Attribute relevant to case? | Total quantum of impact | Units | Proposed offset | Time horizon (years) | | Start area and quality | | Future area and quality without offset | | Future area and quality with offset | | Raw gain | Confidence in result (%) | Adjusted gain | Net present value (adjusted hectares) | % of impact offset | Minimum (90%) direct offset requirement met? | Cost ($ total) | Information source |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Ecological Communities*** | | | | | | | | | | | | | | | | | | | | |
| **Area of community** | No | | | | **Risk-related time horizon (max. 20 years)** | | **Start area (hectares)** | | **Risk of loss (%) without offset** | | **Risk of loss (%) with offset** | | | | | | | | | |
| | | | | | | | | | **Future area without offset (adjusted hectares)** | 0.0 | **Future area with offset (adjusted hectares)** | 0.0 | | | | | | | | | |
| | | | | | **Time until ecological benefit** | | **Start quality (scale of 0-10)** | | **Future quality without offset (scale of 0-10)** | | **Future quality with offset (scale of 0-10)** | | | | | | | | | |
| ***Threatened species habitat*** | | | | | | | | | | | | | | | | | | | | |
| **Area of habitat** | Yes | 578.90 | Adjusted hectares | 1135 | **Time over which loss is averted (max. 20 years)** | 20 | **Start area (hectares)** | 1135 | **Risk of loss (%) without offset** | 0% | **Risk of loss (%) with offset** | 0% | 0.00 | 85% | 0.00 | 0.00 | 311.51 | 53.81% | No | |
| | | | | | | | | | **Future area without offset (adjusted hectares)** | 1135.0 | **Future area with offset (adjusted hectares)** | 1135.0 | | | | | | | | |
| | | | | | **Time until ecological benefit** | 10 | **Start quality (scale of 0-10)** | 4 | **Future quality without offset (scale of 0-10)** | 3 | **Future quality with offset (scale of 0-10)** | 7 | 4.00 | 70% | 2.80 | 2.74 | | | | |
| **Protected matter attributes** | **Attribute relevant to case?** | **Total quantum of impact** | **Units** | **Proposed offset** | **Time horizon (years)** | | **Start value** | | **Future value without offset** | | **Future value with offset** | | **Raw gain** | **Confidence in result (%)** | **Adjusted gain** | **Net present value** | **% of impact offset** | **Minimum (90%) direct offset requirement met?** | **Cost ($ total)** | **Information source** |
| **Number of features**<br>e.g. Nest hollows, habitat trees | No | | | | | | | | | | | | | | | | | | | |
| **Condition of habitat**<br>Change in habitat condition, but no change in extent | No | | | | | | | | | | | | | | | | | | | |
| ***Threatened species*** | | | | | | | | | | | | | | | | | | | | |
| **Birth rate**<br>e.g. Change in nest success | No | | | | | | | | | | | | | | | | | | | |
| **Mortality rate**<br>e.g Change in number of road kills per year | No | | | | | | | | | | | | | | | | | | | |
| **Number of individuals**<br>e.g. Individual plants/animals | No | | | | | | | | | | | | | | | | | | | |

## Summary

| Protected matter attributes | Quantum of impact | Net present value of offset | % of impact offset | Direct offset adequate? | Cost ($) | | |
|---|---|---|---|---|---|---|---|
| | | | | | Direct offset ($) | Other compensatory measures ($) | Total ($) |
| **Birth rate** | 0 | | | | $0.00 | | $0.00 |
| **Mortality rate** | 0 | | | | $0.00 | | $0.00 |
| **Number of individuals** | 0 | | | | $0.00 | | $0.00 |
| **Number of features** | 0 | | | | $0.00 | | $0.00 |
| **Condition of habitat** | 0 | | | | $0.00 | | $0.00 |
| **Area of habitat** | 578.9 | 311.51 | 53.81% | **No** | $0.00 | #DIV/0! | #DIV/0! |
| **Area of community** | 0 | | | | $0.00 | | $0.00 |
| | | | | | **$0.00** | **#DIV/0!** | **#DIV/0!** |

**Justification of values entered into the Offset Assessment Guide for breeding and foraging habitat for koala *Phascolarctos cinereus* (Vulnerable)**

The Olive Downs Project (Stage 1) proposes to clear 827 ha of potential breeding and foraging habitat for koala. The location of the modelled potential habitat in the Project area coincides with the location of a mineral resource suitable for mining and the proponent has taken out a mining lease over the area. Whilst careful location of mining infrastructure has resulted in a slight reduction in the impact of the proposed mining footprint on koala, there will be a residual impact that cannot be avoided and will be offset by the proponent.

The offset calculator has been used to assess the suitability of the proposed offset area as an offset for koala potential breeding and foraging habitat. The offset calculator also requires the provision of crucial data to assess whether a proposed area (and management) is a suitable offset for a given impact. The variables that have been put into the offset calculator are described as follows:

- **Time over which loss is averted (max. 20 years)** – this is equivalent to the time the risk to the offset area is actively managed. A time span of 20 years was applied in this case, because this represents the maximum time taken for the areas of regrowth potential habitat to recover to remnant status. It is the length of time the proponent anticipates actively managing the offset property to achieve offset and conservation targets.
- **Start area (hectares)** – there is approximately 1,601 ha of remnant habitat within the proposed offset and approximately 1,135 ha of regrowth habitat.
- **Start quality** – the terrestrial habitat quality assessment process outlined in Section 3.4 of the Offsets Strategy was applied to the proposed offset areas. The remnant habitat within the proposed offset has a quality score of 7 and regrowth habitat has a quality score of 5.
- **Future quality with offset** – this is the habitat quality score desired for the offset within the time until ecological benefit. For koala, the habitat quality score of remnant habitat is estimated to increase to 8 (from 7) within 7 years due to the implementation of management measures outlined below for remnant vegetation. The habitat quality score of regrowth habitat is estimated to be 8 within 10 years due to the implementation of management measures outlined below for regrowth vegetation.
- **Time until ecological benefit** – this is equivalent to the estimated time it will take for the habitat quality to improve and the offset to be realised. It is estimated that it will take 5 years for the habitat quality of the remnant habitat to improve 1 point given the implementation of the management measures outlined below. It is estimated that it will take 10 years for the habitat quality of the regrowth habitat to improve 3 points given the implementation of the management measures outlined below.
- **Risk of loss (%) with/without offset** – risk of loss is a percentage figure that describes the chance that the habitat on the proposed offset site will be completely lost (i.e. no longer hold any value for the protected matter) over the foreseeable future (either the life of the offset or 20 years, whichever is shorter). The risk of loss with offset is the perceived risk of losing the protected matter on site, despite the offset going ahead. The risk of loss without offset is the perceived risk of losing the protected matter on site in a business as usual scenario. The difference between the risk of loss with and without an offset is the level of averted loss provided by the proposed offset. In accordance with recent advice from DEE, the risk of loss with/without offset has been set at 0%.
- **Future quality without offset** – a habitat quality score was allocated considering the start quality of the habitat and the current threatening processes that would continue to impact the koala habitat without the offset. Current threatening processes for koala habitat include:

- lack of core habitat areas (i.e. large patches of remnant open forest)
- fragmentation of existing habitat (which exists in the local area as small patches of remnant and riparian corridors that are not necessarily connected)
- predation from feral animals (particularly cats, dogs and foxes); and
- clearing of regrowth habitat (that contributes to foraging resources and connectivity) for agriculture.

Without the offset, the future habitat quality score of remnant habitat is estimated to be 6 within 5 years. Without the offset, the future habitat quality score of regrowth habitat is estimated to be 4 within 10 years.

- **Confidence in result (%)** – describes the level of certainty about the success of the proposed offset or the confidence in the proposed change in quality of the offset area. For the area of community and area of habitat attributes, there are two components to which confidence in result relates: change in habitat quality and averted loss (threats).

  The level of confidence in the result for the remnant habitat is considered to be 90% given the start quality (7) is close to the future desired quality (8) and there is a high level of confidence that an improvement in condition can be made within a reasonable timeframe that is proportionate to the time over which loss is averted. It is likely that this increase in habitat quality can be achieved within 5 years with management measures to improve foraging quality and reduce threatening processes (which were indicated as having a lower score in the terrestrial habitat quality assessments for the species). The following measures will be implemented to reduce threatening processes relevant to remnant areas:

  - conservation of remnant areas with offset agreement and covenant on title to ensure long-term protection;
  - feral animal management (particularly cats, dogs and foxes); and
  - weed management to improve recruitment rate of feed trees.

  The level of confidence in the result for the regrowth habitat is considered to be 80% given a higher level of management would be required to improve the quality of regrowth (5) to the future desired quality (8). To improve the start quality of the regrowth, improvements must be made on site condition – in particular quality of foraging, threats and connectivity. These elements were indicated as requiring improvement in the terrestrial habitat quality assessments for koala in the regrowth habitat. Management actions that would improve the quality of the regrowth and contribute to habitat for the species are:

  - strategic protection of regrowth to increase core habitat areas that will be available to the species in the long-term;
  - strategic protection of regrowth to improve connectivity between remnant patches of habitat;
  - removal of grazing pressure to encourage natural regeneration of koala foraging trees (increasing quality of foraging habitat);
  - feral animal control to reduce predator pressures (particularly from dogs) (reducing direct threats); and
  - reducing weed cover (reducing indirect threats that affect habitat quality).

# Offsets Assessment Guide

For use in determining offsets under the *Environment Protection and Biodiversity Conservation Act 1999*
2 October 2012

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| Matter of National Environmental Significance | |
|---|---|
| **Name** | Koala |
| **EPBC Act status** | Vulnerable |
| **Annual probability of extinction**<br>Based on IUCN category definitions | **0.2%** |

| Key to Cell Colours |
|---|
| User input required |
| Drop-down list |
| Calculated output |
| Not applicable to attribute |

## Impact calculator

| Protected matter attributes | Attribute relevant to case? | Description | Quantum of impact | | Units | Information source |
|---|---|---|---|---|---|---|
| ***Ecological communities*** | | | | | | |
| **Area of community** | No | | **Area** | | | |
| | | | **Quality** | | | |
| | | | **Total quantum of impact** | 0.00 | | |
| ***Threatened species habitat*** | | | | | | |
| **Area of habitat** | Yes | Koala | **Area** | 827 | Hectares | Olive Downs Projcet - Fauna Technical Report (DPM Envirosciences 2018b) |
| | | | **Quality** | 7 | Scale 0-10 | |
| | | | **Total quantum of impact** | 578.90 | Adjusted hectares | |
| **Protected matter attributes** | **Attribute relevant to case?** | **Description** | **Quantum of impact** | | **Units** | **Information source** |
| **Number of features**<br>e.g. Nest hollows, habitat trees | No | | | | | |
| **Condition of habitat**<br>Change in habitat condition, but no change in extent | No | | | | | |
| ***Threatened species*** | | | | | | |
| **Birth rate**<br>e.g. Change in nest success | No | | | | | |
| **Mortality rate**<br>e.g Change in number of road kills per year | No | | | | | |
| **Number of individuals**<br>e.g. Individual plants/animals | No | | | | | |

## Offset calculator

| Protected matter attributes | Attribute relevant to case? | Total quantum of impact | Units | Proposed offset | Time horizon (years) | | Start area and quality | | Future area and quality without offset | | Future area and quality with offset | | Raw gain | Confidence in result (%) | Adjusted gain | Net present value (adjusted hectares) | % of impact offset | Minimum (90%) direct offset requirement met? | Cost ($ total) | Information source |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Ecological Communities*** | | | | | | | | | | | | | | | | | | | | |
| **Area of community** | No | | | | **Risk-related time horizon (max. 20 years)** | | **Start area (hectares)** | | **Risk of loss (%) without offset** | | **Risk of loss (%) with offset** | | | | | | | | | |
| | | | | | | | | | **Future area without offset (adjusted hectares)** | 0.0 | **Future area with offset (adjusted hectares)** | 0.0 | | | | | | | | |
| | | | | | **Time until ecological benefit** | | **Start quality (scale of 0-10)** | | **Future quality without offset (scale of 0-10)** | | **Future quality with offset (scale of 0-10)** | | | | | | | | | |
| ***Threatened species habitat*** | | | | | | | | | | | | | | | | | | | | |
| **Area of habitat** | Yes | 578.90 | Adjusted hectares | 1601 | **Time over which loss is averted (max. 20 years)** | 20 | **Start area (hectares)** | 1601 | **Risk of loss (%) without offset** | 0% | **Risk of loss (%) with offset** | 0% | 0.00 | 95% | 0.00 | 0.00 | 284.18 | 49.09% | No | |
| | | | | | | | | | **Future area without offset (adjusted hectares)** | 1601.0 | **Future area with offset (adjusted hectares)** | 1601.0 | | | | | | | | |
| | | | | | **Time until ecological benefit** | 7 | **Start quality (scale of 0-10)** | **7** | **Future quality without offset (scale of 0-10)** | **6** | **Future quality with offset (scale of 0-10)** | **8** | 2.00 | 90% | 1.80 | 1.78 | | | | |
| **Protected matter attributes** | **Attribute relevant to case?** | **Total quantum of impact** | **Units** | **Proposed offset** | **Time horizon (years)** | | **Start value** | | **Future value without offset** | | **Future value with offset** | | **Raw gain** | **Confidence in result (%)** | **Adjusted gain** | **Net present value** | **% of impact offset** | **Minimum (90%) direct offset requirement met?** | **Cost ($ total)** | **Information source** |
| **Number of features**<br>e.g. Nest hollows, habitat trees | No | | | | | | | | | | | | | | | | | | | |
| **Condition of habitat**<br>Change in habitat condition, but no change in extent | No | | | | | | | | | | | | | | | | | | | |
| ***Threatened species*** | | | | | | | | | | | | | | | | | | | | |
| **Birth rate**<br>e.g. Change in nest success | No | | | | | | | | | | | | | | | | | | | |
| **Mortality rate**<br>e.g Change in number of road kills per year | No | | | | | | | | | | | | | | | | | | | |
| **Number of individuals**<br>e.g. Individual plants/animals | No | | | | | | | | | | | | | | | | | | | |

## Summary

| Protected matter attributes | Quantum of impact | Net present value of offset | % of impact offset | Direct offset adequate? | Cost ($) | | |
|---|---|---|---|---|---|---|---|
| | | | | | Direct offset ($) | Other compensatory measures ($) | Total ($) |
| **Birth rate** | 0 | | | | $0.00 | | $0.00 |
| **Mortality rate** | 0 | | | | $0.00 | | $0.00 |
| **Number of individuals** | 0 | | | | $0.00 | | $0.00 |
| **Number of features** | 0 | | | | $0.00 | | $0.00 |
| **Condition of habitat** | 0 | | | | $0.00 | | $0.00 |
| **Area of habitat** | 578.9 | 284.18 | 49.09% | **No** | $0.00 | #DIV/0! | #DIV/0! |
| **Area of community** | 0 | | | | $0.00 | | $0.00 |
| | | | | | **$0.00** | **#DIV/0!** | **#DIV/0!** |

# Offsets Assessment Guide

For use in determining offsets under the *Environment Protection and Biodiversity Conservation Act 1999*
2 October 2012

This guide relies on Macros being enabled in your browser.

| Matter of National Environmental Significance | |
|---|---|
| **Name** | Koala |
| **EPBC Act status** | Vulnerable |
| **Annual probability of extinction**<br>Based on IUCN category definitions | **0.2%** |

| Key to Cell Colours |
|---|
| User input required |
| Drop-down list |
| Calculated output |
| Not applicable to attribute |

## Impact calculator

| Protected matter attributes | Attribute relevant to case? | Description | Quantum of impact | | Units | Information source |
|---|---|---|---|---|---|---|
| ***Ecological communities*** | | | | | | |
| **Area of community** | No | | **Area** | | | |
| | | | **Quality** | | | |
| | | | **Total quantum of impact** | 0.00 | | |
| ***Threatened species habitat*** | | | | | | |
| **Area of habitat** | Yes | Koala | **Area** | 827 | Hectares | Olive Downs Projcet - Fauna Technical Report (DPM Envirosciences 2018b) |
| | | | **Quality** | 7 | Scale 0-10 | |
| | | | **Total quantum of impact** | 578.90 | Adjusted hectares | |
| **Protected matter attributes** | **Attribute relevant to case?** | **Description** | **Quantum of impact** | | **Units** | **Information source** |
| **Number of features**<br>e.g. Nest hollows, habitat trees | No | | | | | |
| **Condition of habitat**<br>Change in habitat condition, but no change in extent | No | | | | | |
| ***Threatened species*** | | | | | | |
| **Birth rate**<br>e.g. Change in nest success | No | | | | | |
| **Mortality rate**<br>e.g Change in number of road kills per year | No | | | | | |
| **Number of individuals**<br>e.g. Individual plants/animals | No | | | | | |

## Offset calculator

| Protected matter attributes | Attribute relevant to case? | Total quantum of impact | Units | Proposed offset | Time horizon (years) | | Start area and quality | | Future area and quality without offset | | Future area and quality with offset | | Raw gain | Confidence in result (%) | Adjusted gain | Net present value (adjusted hectares) | % of impact offset | Minimum (90%) direct offset requirement met? | Cost ($ total) | Information source |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Ecological Communities*** | | | | | | | | | | | | | | | | | | | | |
| **Area of community** | No | | | | **Risk-related time horizon (max. 20 years)** | | **Start area (hectares)** | | **Risk of loss (%) without offset** | | **Risk of loss (%) with offset** | | | | | | | | | |
| | | | | | | | | | **Future area without offset (adjusted hectares)** | 0.0 | **Future area with offset (adjusted hectares)** | 0.0 | | | | | | | | |
| | | | | | **Time until ecological benefit** | | **Start quality (scale of 0-10)** | | **Future quality without offset (scale of 0-10)** | | **Future quality with offset (scale of 0-10)** | | | | | | | | | |
| ***Threatened species habitat*** | | | | | | | | | | | | | | | | | | | | |
| **Area of habitat** | Yes | 578.90 | Adjusted hectares | 1135 | **Time over which loss is averted (max. 20 years)** | 20 | **Start area (hectares)** | 1135 | **Risk of loss (%) without offset** | 0% | **Risk of loss (%) with offset** | 0% | 0.00 | 95% | 0.00 | 0.00 | 356.02 | 61.50% | No | |
| | | | | | | | | | **Future area without offset (adjusted hectares)** | 1135.0 | **Future area with offset (adjusted hectares)** | 1135.0 | | | | | | | | |
| | | | | | **Time until ecological benefit** | 10 | **Start quality (scale of 0-10)** | **5** | **Future quality without offset (scale of 0-10)** | **4** | **Future quality with offset (scale of 0-10)** | **8** | 4.00 | 80% | 3.20 | 3.14 | | | | |
| **Protected matter attributes** | **Attribute relevant to case?** | **Total quantum of impact** | **Units** | **Proposed offset** | **Time horizon (years)** | | **Start value** | | **Future value without offset** | | **Future value with offset** | | **Raw gain** | **Confidence in result (%)** | **Adjusted gain** | **Net present value** | **% of impact offset** | **Minimum (90%) direct offset requirement met?** | **Cost ($ total)** | **Information source** |
| **Number of features**<br>e.g. Nest hollows, habitat trees | No | | | | | | | | | | | | | | | | | | | |
| **Condition of habitat**<br>Change in habitat condition, but no change in extent | No | | | | | | | | | | | | | | | | | | | |
| ***Threatened species*** | | | | | | | | | | | | | | | | | | | | |
| **Birth rate**<br>e.g. Change in nest success | No | | | | | | | | | | | | | | | | | | | |
| **Mortality rate**<br>e.g Change in number of road kills per year | No | | | | | | | | | | | | | | | | | | | |
| **Number of individuals**<br>e.g. Individual plants/animals | No | | | | | | | | | | | | | | | | | | | |

## Summary

| Protected matter attributes | Quantum of impact | Net present value of offset | % of impact offset | Direct offset adequate? | Cost ($) | | |
|---|---|---|---|---|---|---|---|
| | | | | | Direct offset ($) | Other compensatory measures ($) | Total ($) |
| **Birth rate** | 0 | | | | $0.00 | | $0.00 |
| **Mortality rate** | 0 | | | | $0.00 | | $0.00 |
| **Number of individuals** | 0 | | | | $0.00 | | $0.00 |
| **Number of features** | 0 | | | | $0.00 | | $0.00 |
| **Condition of habitat** | 0 | | | | $0.00 | | $0.00 |
| **Area of habitat** | 578.9 | 356.02 | 61.50% | **No** | $0.00 | #DIV/0! | #DIV/0! |
| **Area of community** | 0 | | | | $0.00 | | $0.00 |
| | | | | | **$0.00** | **#DIV/0!** | **#DIV/0!** |

**Justification of values entered into the Offset Assessment Guide for breeding and foraging habitat for ornamental snake *Denisonia maculata* (Vulnerable)**

The Olive Downs Project (Stage 1) proposes to clear 506 ha of potential breeding and foraging habitat for ornamental snake. The location of the modelled potential habitat in the Project area coincides with the location of a mineral resource suitable for mining and the proponent has taken out a mining lease over the area. Whilst careful location of mining infrastructure has resulted in a slight reduction in the impact of the proposed mining footprint on ornamental snake, there will be a residual impact that cannot be avoided and will be offset by the proponent.

The offset calculator has been used to assess the suitability of the proposed offset area as an offset for ornamental snake potential breeding and foraging habitat. The offset calculator also requires the provision of crucial data to assess whether a proposed area (and management) is a suitable offset for a given impact. The variables that have been put into the offset calculator are described as follows:

- **Time over which loss is averted (max. 20 years)** – this is equivalent to the time the risk to the offset area is actively managed. A time span of 20 years was applied in this case, because this represents the maximum time taken for the areas of regrowth potential habitat to recover to remnant status. It is the length of time the proponent anticipates actively managing the offset property to achieve offset and conservation targets.
- **Start area (hectares)** – there is approximately 854 ha of gilgai habitat within the proposed offset area.
- **Start quality** – the terrestrial habitat quality assessment process outlined in Section 3.4 of the Offsets Strategy was applied to the proposed offset areas. The gilgai habitat within the proposed offset area has a quality score of 6.
- **Future quality with offset** – this is the habitat quality score desired for the offset within the time until ecological benefit. For ornamental snake, the habitat quality score of gilgai habitat is estimated to increase to 8 (from 6) within 10 years due to the implementation of management measures outlined below.
- **Time until ecological benefit** – this is equivalent to the estimated time it will take for the habitat quality to improve and the offset to be realised. It is estimated that it will take 10 years for the habitat quality of the gilgai habitat to improve 2 points given the implementation of the management measures outlined below.
- **Risk of loss (%) with/without offset** – risk of loss is a percentage figure that describes the chance that the habitat on the proposed offset site will be completely lost (i.e. no longer hold any value for the protected matter) over the foreseeable future (either the life of the offset or 20 years, whichever is shorter). The risk of loss with offset is the perceived risk of losing the protected matter on site, despite the offset going ahead. The risk of loss without offset is the perceived risk of losing the protected matter on site in a business as usual scenario. The difference between the risk of loss with and without an offset is the level of averted loss provided by the proposed offset. In accordance with recent advice from DEE, the risk of loss with/without offset has been set at 0%.
- **Future quality without offset** – a habitat quality score was allocated considering the start quality of the habitat and the current threatening processes that would continue to impact the ornamental snake habitat without the offset. Current threatening processes for ornamental snake habitat include:
    - fragmentation of existing habitat (which exists in the local area as small patches that are not necessarily connected);
    - degradation of habitat by grazing herbivores;
    - degradation of habitat by feral pigs;

- fatality from ingestion of poisonous cane toads;
- establishment of buffel grass pasture and associated land management practices;
- filling in of gilgai depressions (alteration of landscape hydrology) to improve quality of cattle grazing land; and
- predation from feral animals (particularly cats and foxes).

Without the offset, the future habitat quality score of gilgai habitat is estimated to be 4 within 8 years.

- **Confidence in result (%)** – describes the level of certainty about the success of the proposed offset or the confidence in the proposed change in quality of the offset area. For the area of community and area of habitat attributes, there are two components to which confidence in result relates: change in habitat quality and averted loss (threats).

  The level of confidence in the result for the remnant habitat is considered to be 80% given the start quality (6) is close to the future desired quality (8) and there is a high level of confidence that an improvement in condition can be made within a reasonable timeframe that is proportionate to the time over which loss is averted. It is likely that this increase in habitat quality can be achieved within 10 years with management measures to improve shelter quality and reduce threatening processes (which were indicated as having a lower score in the terrestrial habitat quality assessments for the species). The following measures will be implemented to reduce threatening processes relevant to gilgai areas:

  - conservation of gilgai areas with offset agreement and covenant on title to ensure long-term protection;
  - removal of grazing pressure to prevent further degradation of habitat;
  - feral animal control to reduce predator pressures (particularly from cats and foxes) and habitat degradation (particularly by feral pigs); and
  - reducing weed cover (reducing indirect threats that affect habitat quality).

# Offsets Assessment Guide

For use in determining offsets under the *Environment Protection and Biodiversity Conservation Act 1999*
2 October 2012

This guide relies on Macros being enabled in your browser.

| Matter of National Environmental Significance | |
|---|---|
| **Name** | Ornamental snake |
| **EPBC Act status** | Vulnerable |
| **Annual probability of extinction**<br>Based on IUCN category definitions | **0.2%** |

| Key to Cell Colours |
|---|
| User input required |
| Drop-down list |
| Calculated output |
| Not applicable to attribute |

## Impact calculator

| Protected matter attributes | Attribute relevant to case? | Description | Quantum of impact | | Units | Information source |
|---|---|---|---|---|---|---|
| ***Ecological communities*** | | | | | | |
| **Area of community** | No | | **Area** | | | |
| | | | **Quality** | | | |
| | | | **Total quantum of impact** | 0.00 | | |
| ***Threatened species habitat*** | | | | | | |
| **Area of habitat** | Yes | Ornamental snake | **Area** | 506 | Hectares | Olive Downs Projcet - Fauna Technical Report (DPM Envirosciences 2018b) |
| | | | **Quality** | **5** | Scale 0-10 | |
| | | | **Total quantum of impact** | 253.00 | Adjusted hectares | |
| **Protected matter attributes** | **Attribute relevant to case?** | **Description** | **Quantum of impact** | | **Units** | **Information source** |
| **Number of features**<br>e.g. Nest hollows, habitat trees | No | | | | | |
| **Condition of habitat**<br>Change in habitat condition, but no change in extent | No | | | | | |
| ***Threatened species*** | | | | | | |
| **Birth rate**<br>e.g. Change in nest success | No | | | | | |
| **Mortality rate**<br>e.g Change in number of road kills per year | No | | | | | |
| **Number of individuals**<br>e.g. Individual plants/animals | No | | | | | |

## Offset calculator

| Protected matter attributes | Attribute relevant to case? | Total quantum of impact | Units | Proposed offset | Time horizon (years) | | Start area and quality | | Future area and quality without offset | | Future area and quality with offset | | Raw gain | Confidence in result (%) | Adjusted gain | Net present value (adjusted hectares) | % of impact offset | Minimum (90%) direct offset requirement met? | Cost ($ total) | Information source |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Ecological Communities*** | | | | | | | | | | | | | | | | | | | | |
| **Area of community** | No | | | | **Risk-related time horizon (max. 20 years)** | | **Start area (hectares)** | | **Risk of loss (%) without offset** | | **Risk of loss (%) with offset** | | | | | | | | | |
| | | | | | | | | | **Future area without offset (adjusted hectares)** | 0.0 | **Future area with offset (adjusted hectares)** | 0.0 | | | | | | | | | |
| | | | | | **Time until ecological benefit** | | **Start quality (scale of 0-10)** | | **Future quality without offset (scale of 0-10)** | | **Future quality with offset (scale of 0-10)** | | | | | | | | | |
| ***Threatened species habitat*** | | | | | | | | | | | | | | | | | | | | |
| **Area of habitat** | Yes | 253.00 | Adjusted hectares | 854 | **Time over which loss is averted (max. 20 years)** | 20 | **Start area (hectares)** | 854 | **Risk of loss (%) without offset** | 0% | **Risk of loss (%) with offset** | 0% | 0.00 | 90% | 0.00 | 0.00 | 267.87 | 105.88% | Yes | |
| | | | | | | | | | **Future area without offset (adjusted hectares)** | 854.0 | **Future area with offset (adjusted hectares)** | 854.0 | | | | | | | | |
| | | | | | **Time until ecological benefit** | 10 | **Start quality (scale of 0-10)** | **6** | **Future quality without offset (scale of 0-10)** | **4** | **Future quality with offset (scale of 0-10)** | **8** | 4.00 | 80% | 3.20 | 3.14 | | | | |
| **Protected matter attributes** | **Attribute relevant to case?** | **Total quantum of impact** | **Units** | **Proposed offset** | **Time horizon (years)** | | **Start value** | | **Future value without offset** | | **Future value with offset** | | **Raw gain** | **Confidence in result (%)** | **Adjusted gain** | **Net present value** | **% of impact offset** | **Minimum (90%) direct offset requirement met?** | **Cost ($ total)** | **Information source** |
| **Number of features**<br>e.g. Nest hollows, habitat trees | No | | | | | | | | | | | | | | | | | | | |
| **Condition of habitat**<br>Change in habitat condition, but no change in extent | No | | | | | | | | | | | | | | | | | | | |
| ***Threatened species*** | | | | | | | | | | | | | | | | | | | | |
| **Birth rate**<br>e.g. Change in nest success | No | | | | | | | | | | | | | | | | | | | |
| **Mortality rate**<br>e.g Change in number of road kills per year | No | | | | | | | | | | | | | | | | | | | |
| **Number of individuals**<br>e.g. Individual plants/animals | No | | | | | | | | | | | | | | | | | | | |

## Summary

| Protected matter attributes | Quantum of impact | Net present value of offset | % of impact offset | Direct offset adequate? | Cost ($) | | |
|---|---|---|---|---|---|---|---|
| | | | | | Direct offset ($) | Other compensatory measures ($) | Total ($) |
| **Birth rate** | 0 | | | | $0.00 | | $0.00 |
| **Mortality rate** | 0 | | | | $0.00 | | $0.00 |
| **Number of individuals** | 0 | | | | $0.00 | | $0.00 |
| **Number of features** | 0 | | | | $0.00 | | $0.00 |
| **Condition of habitat** | 0 | | | | $0.00 | | $0.00 |
| **Area of habitat** | 253 | 267.87 | 105.88% | **Yes** | $0.00 | N/A | $0.00 |
| **Area of community** | 0 | | | | $0.00 | | $0.00 |
| | | | | | **$0.00** | **$0.00** | **$0.00** |

**Justification of values entered into the Offset Assessment Guide for breeding and foraging habitat for Australian painted snipe *Rostratula australis* (Endangered)**

The Olive Downs Project (Stage 1) proposes to clear 21 ha of potential breeding and foraging habitat for Australian painted snipe. The location of the modelled potential habitat in the Project area coincides with the location of a mineral resource suitable for mining and the proponent has taken out a mining lease over the area. Whilst careful location of mining infrastructure has resulted in a slight reduction in the impact of the proposed mining footprint on Australian painted snipe, there will be a residual impact that cannot be avoided and will be offset by the proponent (although the residual impact is assessed as being non-significant in EIS documentation).

The offset calculator has been used to assess the suitability of the proposed offset area as an offset for Australian painted snipe potential breeding and foraging habitat. The offset calculator also requires the provision of crucial data to assess whether a proposed area (and management) is a suitable offset for a given impact. The variables that have been put into the offset calculator are described as follows:

- **Time over which loss is averted (max. 20 years)** – this is equivalent to the time the risk to the offset area is actively managed. A time span of 20 years was applied in this case, because this represents the maximum time taken for the areas of regrowth potential habitat to recover to remnant status. It is the length of time the proponent anticipates actively managing the offset property to achieve offset and conservation targets.
- **Start area (hectares)** – there is approximately 310 ha of remnant habitat within the proposed offset area.
- **Start quality** – the terrestrial habitat quality assessment process outlined in Section 3.4 of the Offsets Strategy was applied to the proposed offset areas. The remnant habitat within the proposed offset has a quality score of 6.
- **Future quality with offset** – this is the habitat quality score desired for the offset within the time until ecological benefit. For Australian painted snipe, the habitat quality score of remnant habitat is estimated to increase to 7 (from 6) within 5 years due to the implementation of management measures outlined below for remnant vegetation.
- **Time until ecological benefit** – this is equivalent to the estimated time it will take for the habitat quality to improve and the offset to be realised. It is estimated that it will take 5 years for the habitat quality of the remnant habitat to improve 1 point given the implementation of the management measures outlined below.
- **Risk of loss (%) with/without offset** – risk of loss is a percentage figure that describes the chance that the habitat on the proposed offset site will be completely lost (i.e. no longer hold any value for the protected matter) over the foreseeable future (either the life of the offset or 20 years, whichever is shorter). The risk of loss with offset is the perceived risk of losing the protected matter on site, despite the offset going ahead. The risk of loss without offset is the perceived risk of losing the protected matter on site in a business as usual scenario. The difference between the risk of loss with and without an offset is the level of averted loss provided by the proposed offset. In accordance with recent advice from DEE, the risk of loss with/without offset has been set at 0%.
- **Future quality without offset** – a habitat quality score was allocated considering the start quality of the habitat and the current threatening processes that would continue to impact the Australian painted snipe habitat without the offset. Current threatening processes for Australian painted snipe habitat include:
    - loss and alteration of wetland habitat, via drainage of wetlands and diversion of water for agriculture and reservoirs;
    - inappropriate fire regime and high fuel load (artificially increased by introduction of buffel grass for grazing pasture);
    - overgrazing and trampling of wetlands by livestock;

- degradation of habitat by feral pigs;
- replacement of endemic wetland vegetation by invasive, noxious weeds; and
- predation by feral species (particularly cats and foxes).

Without the offset, the future habitat quality score of remnant habitat is estimated to be 5 within 5 years.

- **Confidence in result (%)** – describes the level of certainty about the success of the proposed offset or the confidence in the proposed change in quality of the offset area. For the area of community and area of habitat attributes, there are two components to which confidence in result relates: change in habitat quality and averted loss (threats).

  The level of confidence in the result for the remnant habitat is considered to be 90% given the start quality (6) is close to the future desired quality (7) and there is a high level of confidence that an improvement in condition can be made within a reasonable timeframe that is proportionate to the time over which loss is averted. It is likely that this increase in habitat quality can be achieved within 5 years with management measures to improve foraging and sheltering quality and reduce threatening processes (which were indicated as having a lower score in the terrestrial habitat quality assessments for the species). The following measures will be implemented to reduce threatening processes relevant to remnant areas:

  - conservation of remnant areas with offset agreement and covenant on title to ensure long-term protection of wetland areas;
  - fuel reduction and management;
  - removal of grazing pressure to prevent further degradation of habitat;
  - feral animal management (particularly pigs, cats and foxes); and
  - reducing weed cover (reducing indirect threats that affect habitat quality).

# Offsets Assessment Guide

For use in determining offsets under the *Environment Protection and Biodiversity Conservation Act 1999*
2 October 2012

This guide relies on Macros being enabled in your browser.

| Matter of National Environmental Significance | |
|---|---|
| **Name** | Australian painted snipe |
| **EPBC Act status** | Endangered |
| **Annual probability of extinction**<br>Based on IUCN category definitions | **1.2%** |

| Key to Cell Colours |
|---|
| User input required |
| Drop-down list |
| Calculated output |
| Not applicable to attribute |

## Impact calculator

| Protected matter attributes | Attribute relevant to case? | Description | Quantum of impact | | Units | Information source |
|---|---|---|---|---|---|---|
| ***Ecological communities*** | | | | | | |
| **Area of community** | No | | **Area** | | | |
| | | | **Quality** | | | |
| | | | **Total quantum of impact** | 0.00 | | |
| ***Threatened species habitat*** | | | | | | |
| **Area of habitat** | Yes | Ornamental snake | **Area** | 21 | Hectares | Olive Downs Projcet - Fauna Technical Report (DPM Envirosciences 2018b) |
| | | | **Quality** | 7 | Scale 0-10 | |
| | | | **Total quantum of impact** | 14.70 | Adjusted hectares | |
| **Protected matter attributes** | **Attribute relevant to case?** | **Description** | **Quantum of impact** | | **Units** | **Information source** |
| **Number of features**<br>e.g. Nest hollows, habitat trees | No | | | | | |
| **Condition of habitat**<br>Change in habitat condition, but no change in extent | No | | | | | |
| ***Threatened species*** | | | | | | |
| **Birth rate**<br>e.g. Change in nest success | No | | | | | |
| **Mortality rate**<br>e.g Change in number of road kills per year | No | | | | | |
| **Number of individuals**<br>e.g. Individual plants/animals | No | | | | | |

## Offset calculator

| Protected matter attributes | Attribute relevant to case? | Total quantum of impact | Units | Proposed offset | Time horizon (years) | | Start area and quality | | Future area and quality without offset | | Future area and quality with offset | | Raw gain | Confidence in result (%) | Adjusted gain | Net present value (adjusted hectares) | % of impact offset | Minimum (90%) direct offset requirement met? | Cost ($ total) | Information source |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Ecological Communities*** | | | | | | | | | | | | | | | | | | | | |
| **Area of community** | No | | | | **Risk-related time horizon (max. 20 years)** | | **Start area (hectares)** | | **Risk of loss (%) without offset** | | **Risk of loss (%) with offset** | | | | | | | | | |
| | | | | | | | | | **Future area without offset (adjusted hectares)** | 0.0 | **Future area with offset (adjusted hectares)** | 0.0 | | | | | | | | | |
| | | | | | **Time until ecological benefit** | | **Start quality (scale of 0-10)** | | **Future quality without offset (scale of 0-10)** | | **Future quality with offset (scale of 0-10)** | | | | | | | | | |
| ***Threatened species habitat*** | | | | | | | | | | | | | | | | | | | | |
| **Area of habitat** | Yes | 14.70 | Adjusted hectares | 86.1 | **Time over which loss is averted (max. 20 years)** | 20 | **Start area (hectares)** | 86.1 | **Risk of loss (%) without offset** | 0% | **Risk of loss (%) with offset** | 0% | 0.00 | 95% | 0.00 | 0.00 | 14.60 | 99.32% | Yes | |
| | | | | | | | | | **Future area without offset (adjusted hectares)** | 86.1 | **Future area with offset (adjusted hectares)** | 86.1 | | | | | | | | |
| | | | | | **Time until ecological benefit** | 5 | **Start quality (scale of 0-10)** | **6** | **Future quality without offset (scale of 0-10)** | **5** | **Future quality with offset (scale of 0-10)** | **7** | 2.00 | 90% | 1.80 | 1.70 | | | | |
| **Protected matter attributes** | **Attribute relevant to case?** | **Total quantum of impact** | **Units** | **Proposed offset** | **Time horizon (years)** | | **Start value** | | **Future value without offset** | | **Future value with offset** | | **Raw gain** | **Confidence in result (%)** | **Adjusted gain** | **Net present value** | **% of impact offset** | **Minimum (90%) direct offset requirement met?** | **Cost ($ total)** | **Information source** |
| **Number of features**<br>e.g. Nest hollows, habitat trees | No | | | | | | | | | | | | | | | | | | | |
| **Condition of habitat**<br>Change in habitat condition, but no change in extent | No | | | | | | | | | | | | | | | | | | | |
| ***Threatened species*** | | | | | | | | | | | | | | | | | | | | |
| **Birth rate**<br>e.g. Change in nest success | No | | | | | | | | | | | | | | | | | | | |
| **Mortality rate**<br>e.g Change in number of road kills per year | No | | | | | | | | | | | | | | | | | | | |
| **Number of individuals**<br>e.g. Individual plants/animals | No | | | | | | | | | | | | | | | | | | | |

## Summary

| Protected matter attributes | Quantum of impact | Net present value of offset | % of impact offset | Direct offset adequate? | Cost ($) | | |
|---|---|---|---|---|---|---|---|
| | | | | | Direct offset ($) | Other compensatory measures ($) | Total ($) |
| **Birth rate** | 0 | | | | $0.00 | | $0.00 |
| **Mortality rate** | 0 | | | | $0.00 | | $0.00 |
| **Number of individuals** | 0 | | | | $0.00 | | $0.00 |
| **Number of features** | 0 | | | | $0.00 | | $0.00 |
| **Condition of habitat** | 0 | | | | $0.00 | | $0.00 |
| **Area of habitat** | 14.7 | 14.60 | 99.32% | **Yes** | $0.00 | #DIV/0! | #DIV/0! |
| **Area of community** | 0 | | | | $0.00 | | $0.00 |
| | | | | | **$0.00** | **#DIV/0!** | **#DIV/0!** |