

Appendix D

Terrestrial Fauna Study



Katherine to Gove Gas Pipeline

Terrestrial Fauna Report

Prepared for
Pacific Aluminium

30 April 2013



DOCUMENT TRACKING

ITEM	DETAIL
Project Name	Katherine to Gove Gas Pipeline Fauna Survey
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Status	FINAL
Version Number	1
Last saved on	30 April 2013
Cover photo	Gouldian Finches, Beswick / Chambers River area, by Bruce Mullins

This report should be cited as 'Eco Logical Australia 2013. *Katherine to Gove Gas Pipeline Terrestrial Fauna Report*. Prepared for Pacific Aluminium.'

ACKNOWLEDGEMENTS

This document has been prepared by Eco Logical Australia Pty Ltd with support from Terry Mahoney, Pacific Aluminium, Beswick Rangers, Minmal Rangers and the Northern Land Council.

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Abbreviations

ABBREVIATION	DESCRIPTION
DEWHA	Department of the Environment, Water, Heritage and the Arts
EIS	Environmental Impact Statement
ELA	Eco Logical Australia Pty Ltd
EPBC	Commonwealth Environment Protection and Biodiversity Conservation Act 1999
GAL	Gove Aluminium Limited
IUCN	International Union for the Conservation of Nature
KGGP	Katherine to Gove Gas Pipeline
LRM	Department of Land Resource Management
NES	National environmental significance
NRETAS	Department of Natural Resources, Environment, the Arts and Sport
NT	Northern Territory
NTPWS	Northern Territory Parks and Wildlife Service
PA	Pacific Aluminium
SAAS	Swiss Aluminium Australia Limited
SEWPAC	Commonwealth Department of Sustainability, Environment, Water, Populations and Communities
TPWC Act	NT Territory Parks and Wildlife Conservation Act
TTP	Trans Territory Pipeline

1 Executive summary

Eco Logical Australia has been contracted by Pacific Aluminium to undertake a study of fauna species and habitats occurring in the corridor of the proposed Katherine to Gove Gas Pipeline (KGGP). The KGGP will traverse approximately 600 km of the Northern Territory from south of Katherine to the Bauxite mine and alumina refinery at Gove, and will provide natural gas for power generation for the refinery.

This report reviews the findings of the 2004 EIS conducted for the predecessor project of the KGGP (the TTP, a pipeline continuing the KGGP to Wadeye on the north west coast of the NT, EcOz 2004a), and presents results from an additional survey conducted by Eco Logical Australia in November 2012.

2004 surveys (EcOz 2004b) comprised a desktop review and field survey of terrestrial fauna and a trapping program focused on a limited number of high values sites clustered towards the ends of the pipeline corridor. The existing information was updated and supplemented by a new desktop review and fauna surveys in the late dry season 2012. To complement the results of earlier surveys, the 2012 survey used less intensive methods implemented at a greater number of sites spread along the pipeline corridor; combined with targeted surveys within the known habitat of EPBC listed bird species (Gouldian Finch and Northern Crested Shrike tit).

A combined total of 222 native fauna species were recorded during the 2004 and 2012 surveys including ten EPBC Act listed endangered, vulnerable or migratory species and one NT listed species. Gouldian Finches (EPBC endangered and migratory and NT vulnerable) and EPBC Northern Crested shrike tits (EPBC vulnerable) were recorded in the eastern section of the study area in close proximity to the proposed pipeline right-of-way. Impact on these species will have to be managed during pipeline construction and management.

2 Introduction and background

2.1 THE KATHERINE TO GOVE GAS PIPELINE PROJECT

Pacific Aluminium (Swiss Aluminium Australia Ltd (SAAL; ACN 008 589 099) and Gove Aluminium Limited (GAL) (ACN 000 640 353) in a 70% / 30% unincorporated joint venture) own a bauxite mine and alumina refinery at Gove, 650 km east of Darwin in north east Arnhem Land. The Gove mine and refinery are operated by Alcan Gove Pty Limited (ACN 000 453 663), a subsidiary of SAAL and GAL.

The Gove refinery was constructed in the late 1960's, and production of bauxite began in 1972. The Gove facility is one of the world's leading bauxite mining and alumina processing operations. High grade bauxite is mined, refined into alumina and then shipped for smelting. The operation includes a mine, refinery, residue disposal area, steam power station, port and ship loading facilities. Refining operations at Gove were significantly expanded as part of the G3 Project (Alcan Gove Third Stage Expansion Project), completed in 2007.

Power to the Gove refinery and mining operations is currently generated from imported fuel oil. In early 2000 consideration was given to sourcing an alternate fuel option. The Trans Territory Pipeline (TTP) was proposed in 2003 by Alcan Gove Pty Limited in association with the Blacktip Joint Venture participants (Woodside and ENI Australia) to deliver natural gas from the offshore Blacktip gas field, via a processing plant at Wadeye and on to Gove, 940 km to the east. An EIS for the project was prepared and submitted to the NT government (EcOz 2004a), however this project did not proceed.

Pacific Aluminium now intends to revisit the gas option for its Gove operations by constructing the Katherine to Gove Gas Pipeline (KGGP). A shorter pipeline, connecting to the existing pipeline infrastructure approximately 20 km south of Katherine is proposed (Figure 1). The KGGP will be approximately 600 km long and largely traverse pastoral leases and Aboriginal freehold lands as well as small sections of private freehold and Crown lease.

2.2 LEGISLATIVE FRAMEWORK FOR ASSESSMENT OF KGGP ENVIRONMENTAL IMPACTS

Actions that may have a significant environmental impact on Matters of National Environment Significance (Matters of NES) under the Federal *Environment Protection and Biodiversity Conservation Act* (the EPBC Act) require approval under the Act. Matters of NES include listed threatened species, ecological communities and migratory species. The KGGP project was determined a "controlled action" under the Federal *Environment Protection and Biodiversity Conservation Act* (the EPBC Act) in early December 2012 on the basis of potential impacts to listed threatened species, ecological communities and migratory species. It will be assessed under the Bilateral Agreement between the Northern Territory and the Federal Government.

The Northern Territory Government has determined that the KGGP will require an Environmental Impact Statement (EIS) under the *Environmental Assessment Act*. The *Territory Parks and Wildlife Conservation Act* (the TPWC Act) provides for the protection and management of fauna and flora within the Northern Territory (other than aquatic life within the meaning of the Fisheries Act that has been harvested under a licence or comprises a managed fishery under that Act). Section 29 of the TPWC Act establishes a classification system for the conservation status of fauna and flora. Section 43 of the TPWC Act provides for the protection of all vertebrate fauna that is indigenous to Australia. Section 55

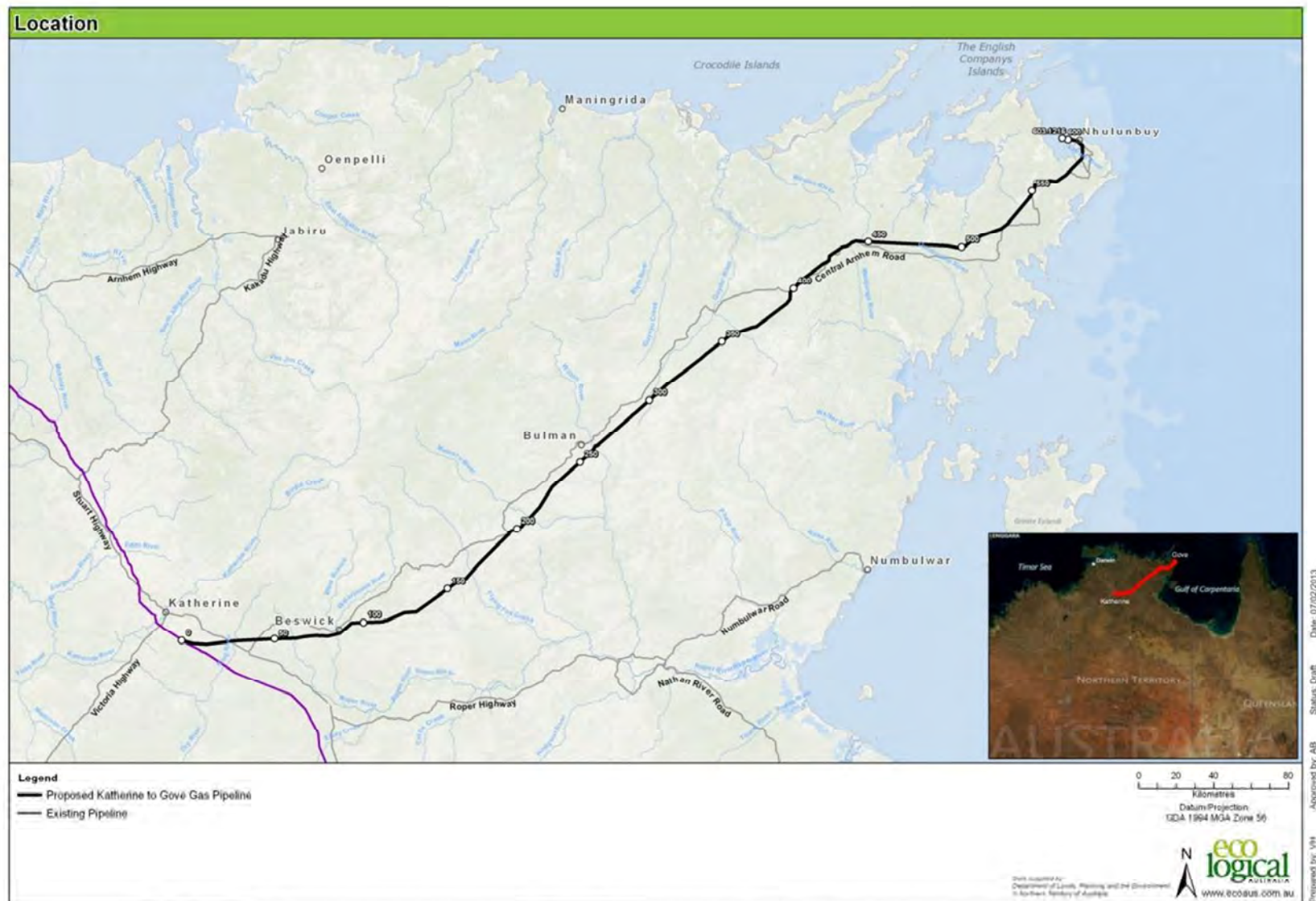


Figure 1: Location of the KGGP

of the TPWC Act establishes a permit regime for a person to take or interfere with protected wildlife including for the purposes of research or survey.

2.3 REPORT OBJECTIVES

Eco Logical Australia Pty Ltd (ELA) was engaged by Pacific Aluminium to:

- review and summarise the TTP fauna survey report (EcOz 2004b);
- update and supplement desktop analysis of fauna species within the pipeline corridor;
- update and supplement the existing fauna survey data with a late dry season 2012 survey; and
- identify potential impacts of KGGP construction and operation and recommend mitigation measures.

The following report is divided into three sections addressing:

- 1) results of the TTP terrestrial fauna survey (EcOz 2004b),
- 2) results of the 2012 terrestrial fauna survey; and
- 3) a synthesis of the fauna survey data taken as a whole.

2.3.1 Format notes

As the KGGP route covers only part of the former TTP proposed project, kilometre point (KP) references from the 2004 survey (EcOz 2004b) have been converted to KGGP KPs by subtracting the distance from the westernmost end of the TTP (near Wadeye) to the westernmost end of the KGGP (near Katherine; 340 km).

Where multiple common or scientific names exist, we have used names recognised by the Northern Territory Department of Land Resource Management (LRM, <http://lrm.nt.gov.au/biodiversity-conservation/animals/native>; accessed 15 Dec 2012). The only exception is where subspecies are recognised by the EPBC Act and not LRM, in this case a designator is appended to the common name (e.g., Northern Crested Shrike-tit).

Section A: 2004 Trans-territory Pipeline fauna survey: summary of Katherine to Gove section

3 2004 fauna survey introduction

3.1 BACKGROUND

EcOz Environmental Services (EcOz) were engaged by Alcan Engineering in 2004 to undertake a terrestrial fauna study in response to the proposed Trans Territory Pipeline (TTP) project. The 2004 terrestrial fauna survey was designed to satisfy the requirements of the *Guidelines for Preparation of a Draft Environmental Impact Statement on the Proposed Trans Territory Pipeline* (Department of Infrastructure, Planning and Environment, March 2004). The study included:

- A desktop review to identify vertebrate fauna species and habitats likely to be impacted by the construction and operation of the TTP;
- A field survey of key fauna habitats, and habitat for fauna species of conservation significance;
- An assessment of species of conservation significance along the length of the proposed pipeline; and
- Recommendations of management measures and safeguards to minimise the impacts of the project on terrestrial vertebrate fauna (EcOz 2004b).

The assessment of conservation significance primarily focused on species listed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) or protected under the *Territory Parks and Wildlife Conservation Act 2000* (TPWC Act). This study also addressed species listed as Near-threatened or those species recognised as being endemic to the Top End of the Northern Territory.

The results of the survey are fully reported in EcOz (2004b) which is publicly available at <http://www.ntepa.nt.gov.au/environmental-assessments/projects>. The current report summarises the major findings from the TTP fauna study with particular focus on the terrestrial fauna species and habitats observed in the field surveys at sites relevant to the KGGP corridor.

4 2004 fauna survey methods

A desktop review of fauna records was conducted by EcOz (2004b) to identify all species recorded from the pipeline corridor; these results were then reviewed to highlight species of conservation significance. The location of survey sites was selected based on results of conservation significance analysis and consultation with experts (Figure 2; EcOz 2004b).

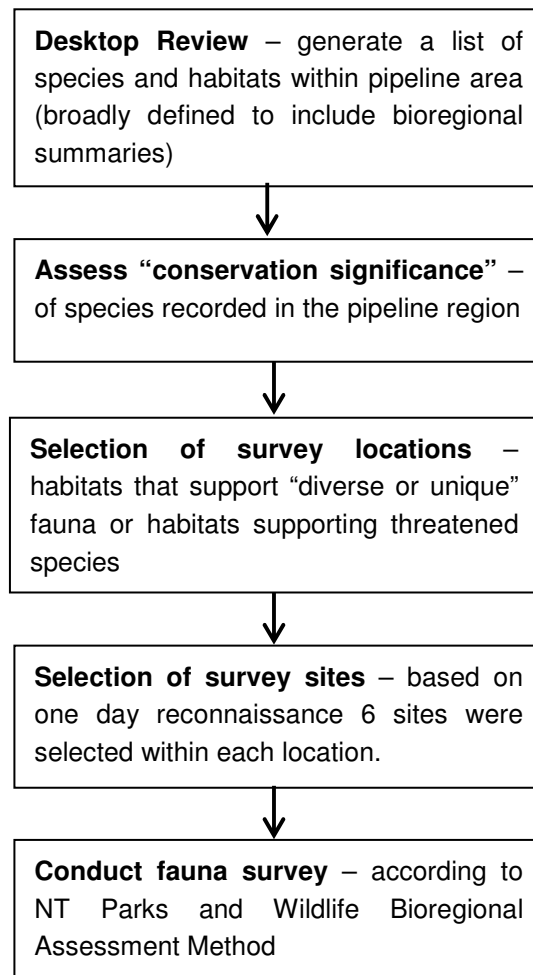


Figure 2: Project methodology (EcOz 2004b)

4.1 DESKTOP REVIEW

EcOz undertook a review of relevant literature and database searches to identify fauna and habitats likely to occur in or near the pipeline corridor, particularly those of conservation significance. The following fauna resources were consulted:

- NT Fauna Atlas records provided by the NT Parks and Wildlife Service (accessed 29 July 2004);
- Department of Sustainability, Environment, Water, Population and Communities' (SEWPAC) online Protected Matters Search (accessed 29 July 2004);
- Bioregional summaries for the Arnhem Coast, Central Arnhem, Daly Basin and Gulf Falls and Uplands bioregions (Woinarski 2002a-f);

- Data from surveys on seabirds (Chatto 2001), shorebirds (Chatto 2003) and waterbirds (Chatto 2000) across the Northern Territory;
- Specific literature relating to endemic species:
 - bats (Churchill 1998);
 - mammals (Cole and Woinarski 2002; Woinarski 2000; Strahan 1995);
 - birds (Barrett *et al* 2003; Garnett and Crowley 2000; Readers Digest 1997); and
 - reptiles (Cogger 2000; Wilson and Swan 2003);
- Consultation with regional fauna experts; and
- Key scientific papers and reference books.

Searches of the Protected Matters database and NT Fauna Atlas were conducted for the area within a 10 km radius of the pipeline centre line. Bioregional summaries however, cover a much wider area – including species from up to 700 km away from the pipeline (within the Gull Fall and Uplands bioregion).

Identification of fauna habitats along the pipeline was based on field surveys of vegetation and flora in the pipeline corridor and proposed construction camps and compressor stations (EcOz 2004c). These studies were conducted in 2003 and 2004 as part of larger surveys along the entire proposed TTP route including geotechnical, archaeological and anthropological studies. During the EcOz flora survey (EcOz 2004c) sampling was generally undertaken at 5 km intervals with denser sampling where complex vegetation patterns occur (Figure 3 and Figure 4). Details of the soil and geology, presence/absence of water, fire impacts and evidence of feral animals were recorded along with vegetation community details.

4.2 ASSESSMENT OF “CONSERVATION SIGNIFICANCE”

“Conservation significance” of species and habitats recorded within the pipeline region was assessed broadly and focused on the following classifications:

- Threatened species recognised by the Territory Parks and Wildlife Conservation Act 2000 (TPWC Act);
- Threatened species listed under EPBC Act;
- Migratory species listed under the EPBC Act (excluding marine mammals and reptiles);
- Species classified as Near-threatened when evaluated against International Union for the Conservation of Nature (IUCN) criteria;
- Species endemic to the Top End of the NT;
- Habitat of listed threatened species; and
- Habitats with outstanding biodiversity values.

4.3 SELECTION OF SURVEY LOCATIONS AND SURVEY SITES

Locations for the field survey were selected on the basis of desktop and conservation significance analysis and consultation with experts. Three survey locations within the KGGP corridor were selected for the field assessment in 2004 (Figure 5). Locations were selected in habitats “that typically exhibit diverse or unique fauna (or both), or in habitat types potentially utilised by species classified as “threatened” under NT and Commonwealth legislation” (EcOz 2004b). No further details were given of which species in particular were considered in this decision making process.

The field assessment was undertaken between the 8th of May and the 14th of July, 2004. Prior to the full assessment at each location, six survey sites per location were identified to account for representativeness, presence of microhabitats and accessibility.

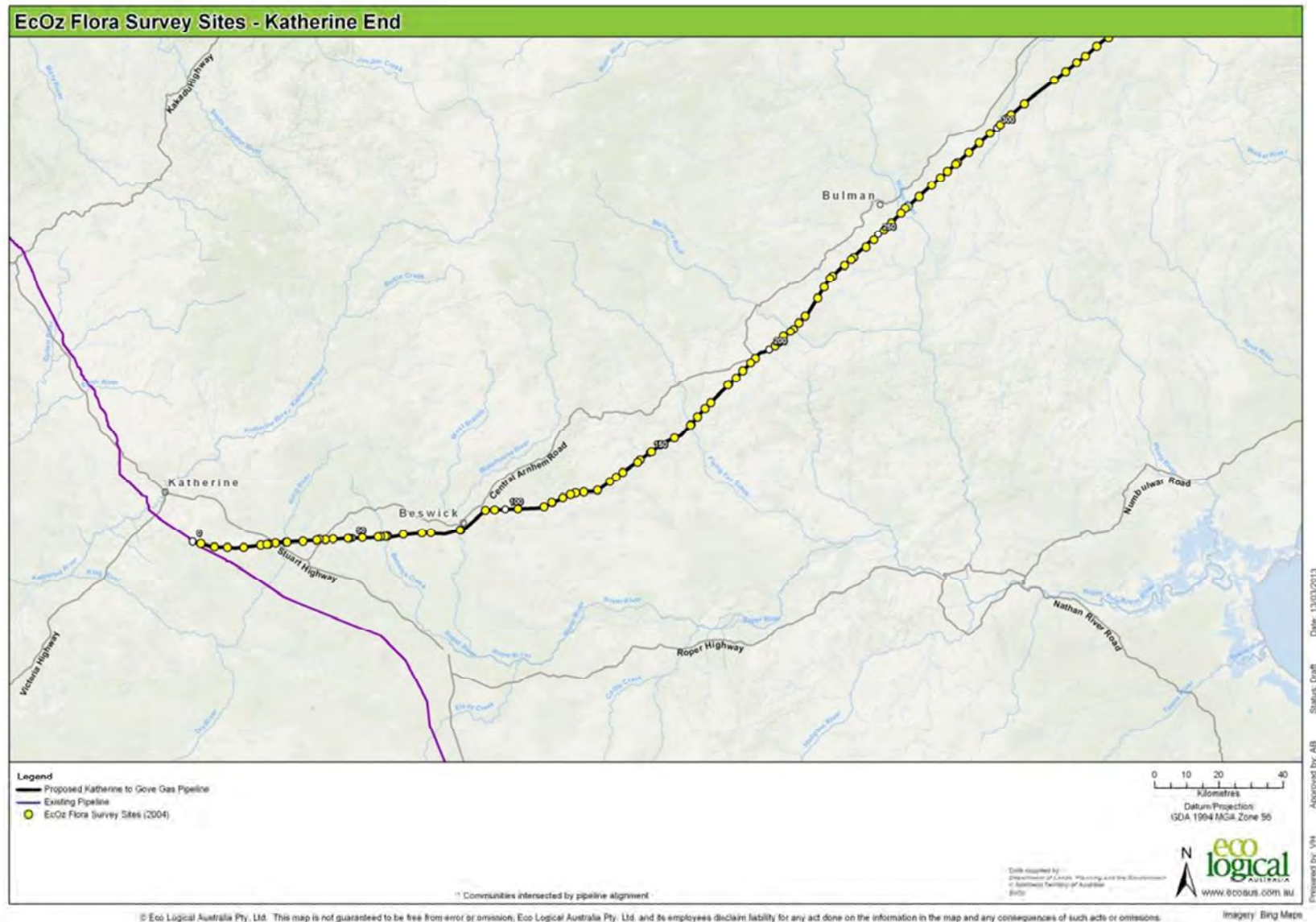


Figure 3: Flora survey sites (EcOz 2004) Katherine end

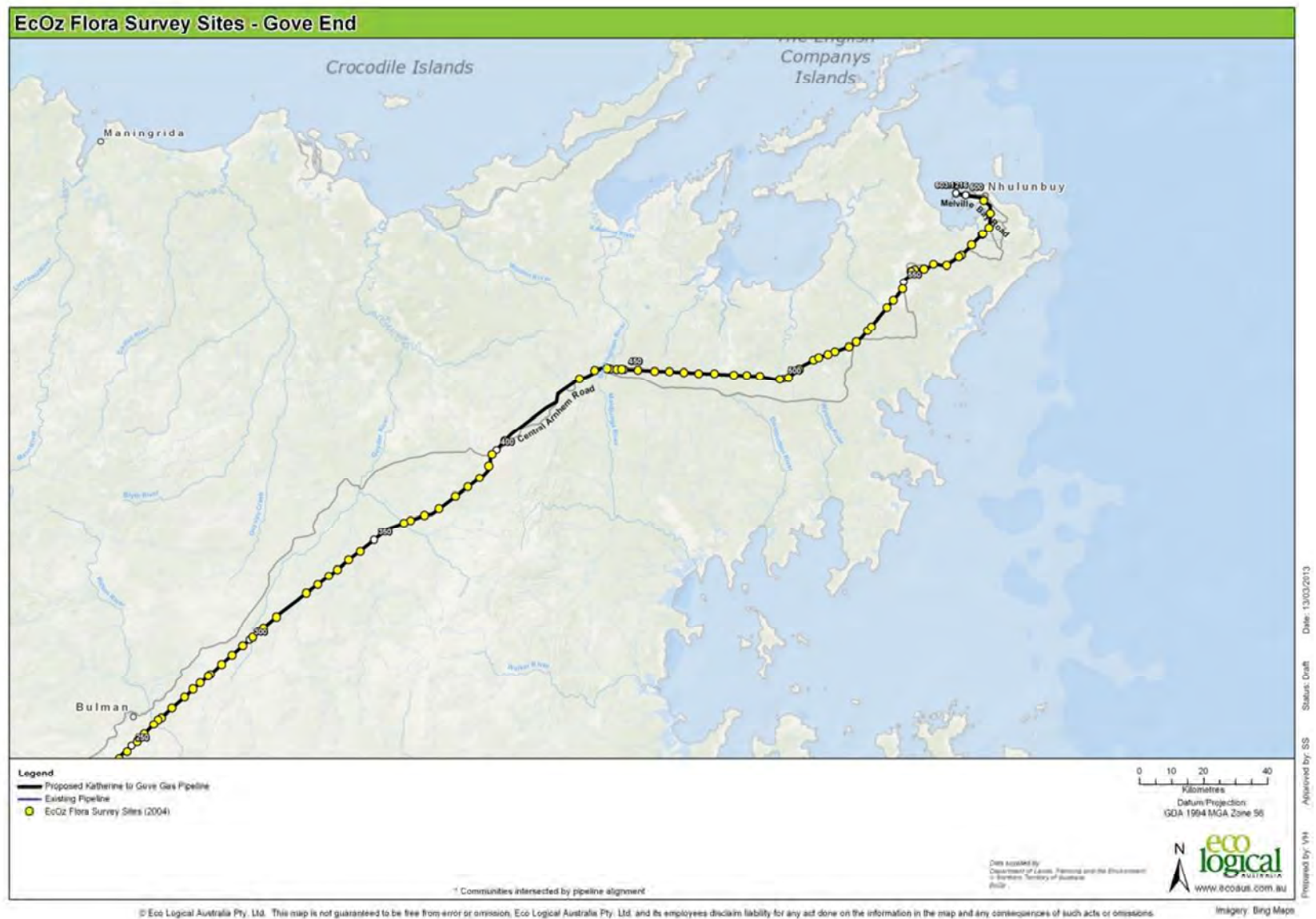


Figure 4: Flora survey sites (EcOz 2004) Gove end

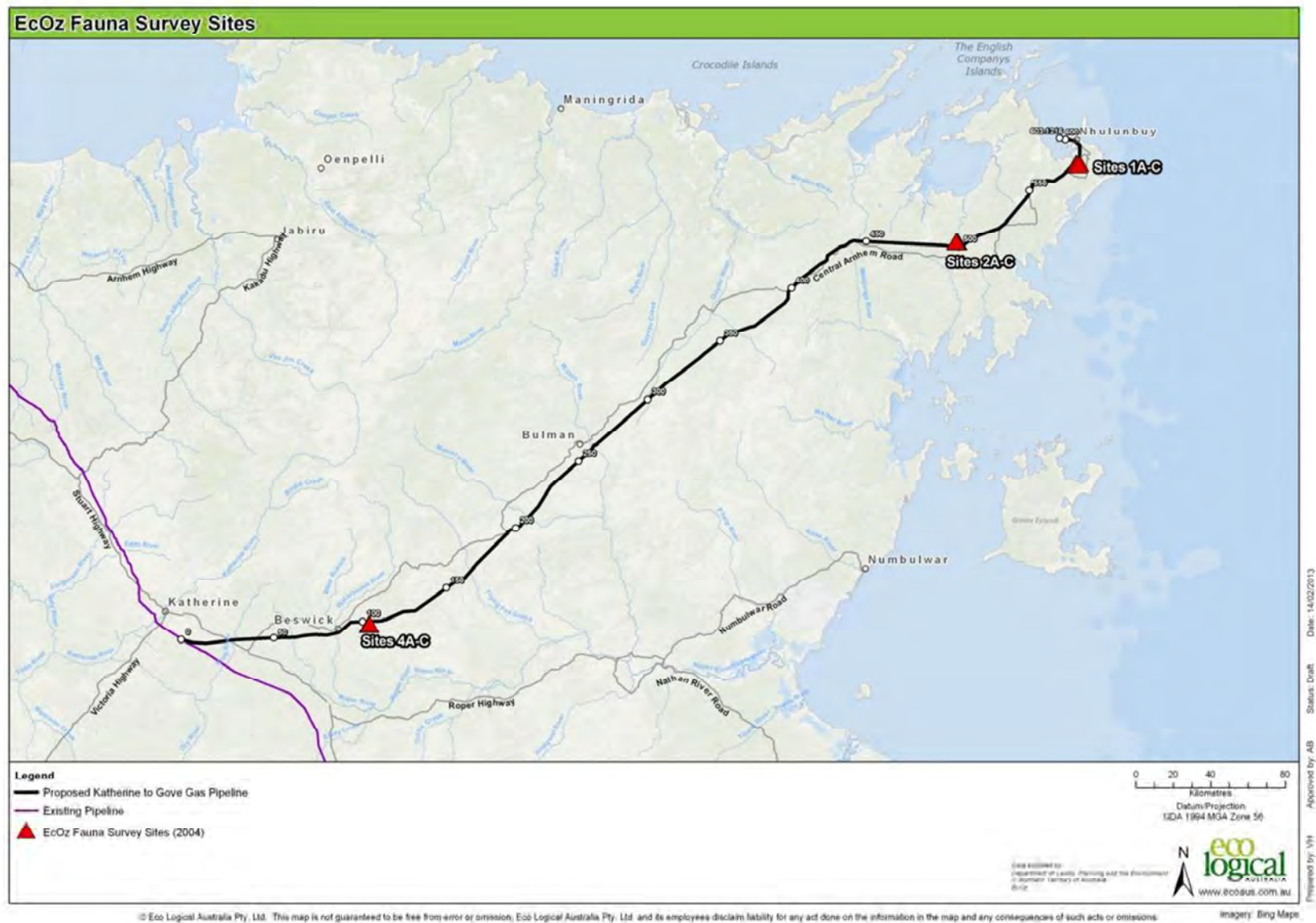


Figure 5: Sites surveyed in 2004 by EcOz (2004b)

4.4 FIELD SURVEY METHODS

Targeted surveys were undertaken using the NT Parks and Wildlife Service (NTPWS) Bioregional Assessment Method (NTPWS 2003). At each of the 18 sites (within the KGGP corridor) a 50 m x 50 m quadrat was established, survey effort at each quadrat consisted of:

- Twenty Elliott-type traps open for three consecutive nights;
- Four cage traps open for three consecutive nights;
- Four pitfall traps open for three consecutive nights (checked twice daily);
- Three diurnal active searches (comprising leaf litter raking and checking under bark and logs);
- Two nocturnal active searches (as for diurnal surveys with the addition of spotlighting); and
- Eight diurnal instantaneous bird counts.

Traps were baited with a peanut butter and oat mixture, and checked early each morning. Opportunistic observations were recorded during site visits and travel between survey locations. Animals that were unable to be identified in the field were taken as voucher specimens and lodged with the NT Museum for identification (EcOz 2004b).

4.5 LIMITATIONS

The three night survey effort at each site complied with the minimum requirements of the NT Parks and Wildlife Service Bioregional Assessment method (and would comply with NRETAS 2011). However, the subsequently released Commonwealth survey guidelines for Australia's threatened fauna (DSEWPaC 2011, DEWHA 2008) calls for more effort for many of the targeted species (for example four consecutive nights of trapping area recommended for Elliott and cage trapping programs – this represents a 30% increase over the 2004 survey effort). The duration of diurnal and nocturnal active surveys were not specified in the original report.

The selection of locations for the survey in habitats that typically exhibit diverse or unique species assemblages and those that support threatened species resulted in clustered sampling effort. The locations surveyed represented the easternmost and westernmost areas of the pipeline, with the central area between Chambers River (KP 104) and Goromuru River (KP 498) unsurveyed. *Eucalyptus tetrodonta* and *E. miniata* open savannah woodland constitutes the majority of the pipeline route and provides habitat for threatened mammal species (EcOz 2004 b), but was under-represented in the fauna survey.

These limitations were addressed by the sampling design of the 2012 survey.

5 2004 fauna survey results

5.1 DESKTOP REVIEW AND ASSESSMENT OF CONSERVATION SIGNIFICANCE

5.1.1 Fauna species

The 2004 desktop review identified 65 species of conservation significance that have been recorded in the KGGP region or occur in habitats that are present in the region (including the area covered by the relevant bioregional summaries). Migratory marine mammals and reptiles (turtles) occur around the Gove Peninsula, but were excluded from further consideration, as the project is not expected to have any marine impacts.

Table 1: Species of conservation significance recorded in the KGGP pipeline (adapted from Tables 3, 4 and 5, EcOz 2004b) and current conservation listing (where applicable)

Amphibian
Wood Frog (<i>Sylvirana daemeli</i>)
Bird
Australian Bustard (<i>Ardeotis australis</i>)
Banded Fruit Dove (<i>Ptilinopus cinctus</i>)
Barn Swallow (<i>Hirundo rustica</i>)
Black-tailed Godwit (<i>Limosa limosa</i>)
Bush Stone-curlew (<i>Burhinus grallarius</i>)
Clamorous Reed Warbler (<i>Acrocephalus stentoreus</i>)
Emu (<i>Dromaius novaehollandiae</i>)
Derby White-browed Robin (<i>Poecilodryas superciliosa cerviniventris</i>)
Gouldian Finch (<i>Erythrura gouldiae</i>) - EPBC endangered, EPBC migratory, NT vulnerable
Grass Owl (<i>Tyto capensis</i>)
Great Knot (<i>Calidris tenuirostris</i>) - EPBC migratory, NT vulnerable
Grey Falcon (<i>Falco hypoleucos</i>) - NT vulnerable
Hooded Parrot (<i>Psephotus dissimilis</i>)
Little Curlew (<i>Numenius minutus</i>) - EPBC migratory
Melville Cicadabird (<i>Coracina tenuirostris</i>) - EPBC migratory
Northern Crested Shrike-tit (<i>Falcunculus frontatus whitei</i>) - EPBC vulnerable, EPBC migratory

Oriental Plover (*Charadrius veredus*) - EPBC migratory

Oriental Pratincole (*Glareola maldivarum*) - EPBC migratory

Red Goshawk (*Erythrotriorchis radiatus*) - EPBC vulnerable, NT vulnerable

Rufous Fantail (*Rhipidura rufifrons*) - EPBC migratory

Square Tailed Kite (*Lophoictinia isura*)

White Bellied Sea-eagle (*Haliaeetus leucogaster*) - EPBC migratory

White Lined Honeyeater (*Meliphaga albilineata*)

Yellow-rumped Mannikin (*Lonchura flaviprymna*)

Insect

Gove Crow Butterfly (*Euploea alcathoe enastri*) - EPBC endangered

Mammal

Arnhem Sheath-tailed Bat (*Taphozous kapalgensis*)

Bare-rumped Sheath-tailed Bat (*Saccolaimus saccolaimus nudiclunatus*) - EPBC critically endangered

Black-footed Tree Rat (*Mesembriomys gouldii*) - NT vulnerable

Brush-tailed Tree-rat (*Conilurus penicillatus*) - EPBC vulnerable, NT endangered

Dusky Rat (*Rattus colletti*)

Fawn Antechinus (*Antechinus bellus*) - NT endangered

Ghost Bat (*Macroderma gigas*)

Golden Bandicoot (*Isodon auratus arnhemensis*) - EPBC vulnerable, NT endangered

Kakadu Dunnart (*Smithopsis bindi*)

Lesser Wart Nosed Horseshoe Bat (*Hipposideros stenotis*) - NT endangered

Northern Brush-tailed Phascogale (*Phascogale tapoatafa pirata*) - EPBC vulnerable, NT endangered

Northern Hopping Mouse (*Notomys aquilo*) - EPBC vulnerable, NT vulnerable

Northern Nailtail Wallaby (*Onychogalea unguifera*)

Northern Quoll (*Dasyurus hallucatus*) - EPBC endangered, NT critically endangered

Orange Horseshoe Bat (*Rhinonycteris aurantius*)

Pale Field Rat (*Rattus tunneyi*) - NT vulnerable

Red Cheeked Dunnart (*Smithopsis virginiae*)

Water Mouse (*Xeromys myoides*) - EPBC vulnerable

Western Chestnut Mouse (*Pseudomys nanus nanus*)

Reptile

Arnhem Land Spotted Dtella (*Gehyra pamela*)

Chameleon Dragon (*Chelosania brunnea*)

Dark Tailed Skink (*Glaphyromorphus nigricaudis*)

Douglas' Skink (*Glaphyromorphus douglasi*)

Freshwater Crocodile (*Crocodylus johnstoni*)

Hill's Ctenotus (*Ctenotus hilli*)

Karl Schmidt's Lerista (*Lerista karlschmidti*)

MacFarlane's Lerista (*Lygisaurus macfarlanei*)

Northern Red Faced Turtle (*Emydura victoriae*)

Northern Ridge Tailed Monitor (*Varanus primordius*)

Pig Nosed Turtle (*Carettochelys insculpta*)

Robust Rainbow Skink (*Carlia longipes*)

Saltwater Crocodile (*Crocodylus porosus*) - EPBC migratory

Scant Striped Ctenotus (*Ctenotus vertebralis*)

Single Toed Lerista (*Lerista stylis*)

Storr's Snake Eyed Skink (*Morethia storri*)

Stout tailed Skink (*Glaphyromorphus crassicaudus arnhemicus*)

White lipped Dragon (*Diporiphora albilabris sobria*)

Yellow-snouted Ground Gecko (*Diplodactylus occultus*) - EPBC endangered

5.1.2 Fauna habitats

Eucalyptus tetradonta and *E. miniata* woodland to open forest with an understorey of tussock grasses was the dominant habitat type along the proposed corridor (EcOz 2004c). Other major habitat types observed included associations of *Eucalyptus* or *Corymbia* occurring in rocky areas of high clay content and *Melaleuca* dominated woodlands and open grasslands occurring in seasonally inundated areas (EcOz, 2004c).

Land between KGGP KP 125 and 142 was under pastoral and agricultural use regimes; in these areas weed infestations and feral animal impacts were evident. Outside of this area most of the pipeline corridor showed little impact of weeds or feral species, although pigs, buffalo, donkeys, horses and cane toads occurred. Most of the pipeline corridor appeared to have been burnt annually (EcOz 2004 a,b).

In most cases the pipeline has been routed to avoid habitats of conservation significance, where this was not possible (e.g., where riparian corridors have to be crossed) construction methods will be modified to minimised impacts (EcOz, 2004b). Habitats of conservation significance (those that are restricted in distribution and typically support high species diversity) that occur in proximity to the pipeline include rainforest and monsoon vine forest, coastal tall Eucalypt forests, riparian corridors, wetlands and threatened species habitat.

Monsoon rainforest

Monsoon rainforest is highly diverse and significant vegetation community which acts as a critical resource for fauna including frugivorous birds and bats (Greening NT, 2012a). Discrete rainforest patches form a network with high rates of inter-patch seed dispersal. Monsoon rainforest fauna species often use resources from surrounding open habitats. Protection of monsoon vine forest therefore needs to focus on the habitat network as a whole, where each patch may be critical to the health of the system. Monsoon rainforest in north-east Arnhem Land is also the primary habitat of the EPBC listed Gove Crow Butterfly (*Euploea alcathoe enastr*). Four rainforest patches were identified in the vicinity of the KGGP pipeline route (Table 2). Each of these habitat patches will be avoided by the pipeline route and therefore there is no expected impact from pipeline construction and operation.

Table 2: Rainforest patches that occur in or near the proposed pipeline route (adapted from Table 6, EcOz 2004b)

KP RANGE	HABITAT DESCRIPTION
KP 8-16	Numerous dry rainforest patches occur 2-4 km north of the proposed pipeline corridor in association with limestone sinkholes near the Cutta Cutta Caves.
KP 494-500	Numerous spring-fed rainforest patches occur 2-5 km north of the proposed corridor in association with the Goromuru and Richard River floodplain.
KP 510	Large spring-fed rainforest patch on Boggy Creek. The original route proposed for the pipeline traversed through this rainforest patch, however, the route has subsequently been revised and now traverses 800m south through Melaleuca woodland.
KP 572-585	Numerous spring-fed and dry rainforest patches occur 2-4 km north of the proposed pipeline route in associated with the Giddy River and Latram River systems and coastline.

Riparian corridors

Riparian corridors provide a moist and shady habitat with high productivity compared to surrounding more open vegetation; these areas support a distinct assemblage of species and provide a dry season refuge for even more species (Greening NT, 2012a). EcOz (2004b) note that the riparian corridors associated with the Chambers, Goromuru and Richard and Latram Rivers support dense Melaleuca or monsoon rainforest flora with associated bird and bat species. Table 3 lists riparian corridors crossed by the KGGP pipeline corridor.

Table 3 Riparian corridors that occur in or near the proposed KGGP pipeline corridor (adapted from Table 7, EcOz 2004b)

KP LOCATION	NAME
KP 30	King River
KP 50	Maranboy Creek
KP 61	Beswick Creek
KP 84	Waterhouse River
KP 104	Chambers River
KP 123	Unnamed drainage
KP 159	Maiwok Creek
KP 166	Flying Fox Creek
KP 169	Derim Derim Creek
KP 198	Quibobikwi Creek
KP 210	Mainoru River
KP 230	Horse Creek
KP 239	Branch of Horse Creek
KP 260	Wilton River
KP 318	Branch of Annie Creek
KP 345	Annie Creek
KP 361	Goyder River
KP 446	Unnamed waterhole
KP 498	Goromuru and Richard Rivers
KP 512	Boggy Creek
KP 533	Branch of Cato River
KP 541	Cato River
KP 573	Giddy River
KP 582	Latram River
KP 589	Unnamed Creek

Wetlands

Isolated permanent or semi-permanent wetlands provide significant fauna habitat throughout the wet-dry tropics of the Top End (EcOz 2004b). Wetlands support a diverse range of bird species and provide dry season refuges for a diverse fauna assemblage. There are nine locations where wetlands occur within the pipeline corridor, recommended mitigation measures are given in Table 4.

Table 4 Wetlands of regional significance that occur in or near the pipeline corridor and recommended mitigation measures (adapted from Table 9, EcOz 2004b)

KP RANGE	HABITAT DESCRIPTION	MITIGATION
1 km S of KP 49	Permanent melaleuca swamp	None required
2 km N of KP 73	Spring-fed swamp	None required
1.2 km SE of KP 237	Permanent spring-fed swamp	None required
KP 289-290	Semi-permanent Melaleuca swamp	Move route
KP 371-372	Open swamp	Move route
KP 394-395	Permanent spring-fed open swamp	Open trench management
KP 446-447	Permanent open waterhole off main river channel	Move route
KP 448-449	Semi-permanent open waterhole in depression	Move route
KP 594	Permanent Melaleuca swamp	Open trench management

Arafura Swamp

The Arafura Swamp is a wetland of conservation significance at national and international levels, and supports recognised aggregations of waterbirds (DLRM 2013). Numerous rainforest patches occur around the margin of the swamp, and seven threatened species occur at the site. The KGGP passes approximately 25 km south of the swamp, but crosses the Goyder River which is the main surface inflow to the swamp. Horizontal directional drilling will likely be used at the Goyder River crossing and is expected to prevent any impact on the Arafura Swamp or its population of waterbirds.

5.2 SELECTION OF SURVEY LOCATIONS AND SURVEY SITES

Three survey locations were selected along the KGGP pipeline corridor according to their assessed conservation significance, the presence of threatened species and consultation with local fauna experts. The locations included the Chambers River at KP 104, the Goromuru and Richard Rivers at KP 498 and the Latram and Giddy Rivers at KP 582 (Table 5, Figure 5). At each location six survey sites were identified to account for representativeness, presence of microhabitats and accessibility (Appendix A). Table 5 lists the location, habitat type and target species for each location and site.

Table 5: Survey locations and sites (adapted from Table 1, EcOz 2004b)

SURVEY LOCATION	HABITAT	TARGETED SPECIES	SITE NO	VEGETATION STRUCTURE	LATITUDE	LONGITUDE
Chambers River (KP 104)	Riparian, sandstone	None listed	4A1	Open forest	-14.53706	133.26928
			4A2	Woodland	-14.53895	133.27121
			4B1	Open forest	-14.53846	133.27288
			4B2	Woodland	-14.53837	133.27649
			4C1	Woodland	-14.53593	133.27485
			4C2	Woodland	-14.53429	133.27521
Goromuru and Richard Rivers (KP 494 – 500)	Riparian, rainforest, tall Eucalyptus forest,	Brush-tailed Tree Rat (<i>Conilurus penicillatus</i>) Wood frog (<i>Sylvirana daemeli</i>)	2A1	Open forest	-12.68608	136.19212
			2A2	Open forest	-12.68612	136.18971
			2B1	Open forest	-12.68733	136.18758
			2B2	Isolated trees	-12.68601	136.18407
			2C1	Open forest	-12.68748	136.18534
			2C2	Open forest	-12.68515	136.18271

SURVEY LOCATION	HABITAT	TARGETED SPECIES	SITE NO	VEGETATION STRUCTURE	LATITUDE	LONGITUDE
Latram and Giddy Rivers (KP 582)	Riparian, rainforest, tall Eucalyptus forest	Brush-tailed Tree Rat (<i>Conilurus penicillatus</i>)	1A1	Woodland	-12.30373	136.77456
			1A2	Woodland	-12.30273	136.77252
		Northern Brush-tailed Phascogale (<i>Phascogale pirata</i>)	1B1	Woodland	-12.30171	136.79119
		Wood frog (<i>Sylvirana daemeli</i>)	1B2	Open forest	-12.30853	136.77483
			1C1	Closed forest	-12.30536	136.77326
			1C2	Open forest	-12.30789	136.78343

5.3 FIELD SURVEY RESULTS

5.3.1 Recorded species

A total of 153 species were recorded between the three survey locations (a full species list is provided in Appendix B). Chambers River had the greatest species diversity while Latram River survey location had the lowest (Table 6).

Table 6: Number of species recorded at each survey location (adapted from Table 2, EcOz 2004b)

CLASSIFICATION	CHAMBERS RIVER	GOROMURU RIVER	LATRAM RIVER
Amphibians	12	5	7
Birds	69	55	36
Mammals	7	7	2
Reptiles	20	13	13
Introduced species	2	3	3
Total	110	82	61

5.3.2 Listed threatened species

Table 7 lists threatened and migratory species recorded during the 2004 fauna surveys and one species recorded during the TTP aquatic fauna survey (the Wood Frog, EcOz 2004c). The threatened Northern Quoll (*Dasyurus hallucatus*) which is listed under the EPBC Act and TPWC Act was also observed in 2004 but only outside the KGGP corridor (at Moyle River, which is approximately 360 km east of Katherine).

Table 7: Threatened species recorded during 2004 surveys.

SPECIES RECORDED	IUCN CLASSIFICATION (AS AT 2004)	CLASSIFICATION (AS AT 2012)	SITE RECORDED
Amphibians			
Wood Frog (<i>Sylvirana daemeli</i>)	Least concern	NT vulnerable	Recorded during aquatic fauna surveys (EcOz 2004 c) at Giddy River (KP 573) and Cato River (KP 540-541)
Birds			
Gouldian Finch (<i>Erythrura gouldiae</i>)	Endangered	EPBC endangered, EPBC migratory, NT vulnerable	Chambers River, sites 4B1 and 4C1 (KP 104)
Rufous Fantail (<i>Rhipidura rufifrons</i>)	Least concern	EPBC migratory	Latram River, site 1C1 (KP 582)

SPECIES RECORDED	IUCN CLASSIFICATION (AS AT 2004)	CLASSIFICATION (AS AT 2012)	SITE RECORDED
White-bellied Sea Eagle (<i>Haliaeetus leucogaster</i>)	Least concern	EPBC migratory	Goromuru River, site 2B1 (KP 498)

Seven Gouldian Finches (*Erythrura gouldiae*) were recorded in Eucalypt woodlands on rocky sandstone hills near the Chambers River. Suitable habitat for the Red Goshawk was identified throughout the pipeline corridor although there was no evidence of nest sites.

5.3.3 Species of NT Significance

Although the TPWC Act was not in place at the time of the 2004 survey, ten species of conservation significance in the NT (near-threatened or Top End endemic) were recorded during the survey (Table 8).

Table 8 Species of NT significance recorded during 2004 survey

SPECIES RECORDED	CLASSIFICATION	SITE RECORDED
Birds		
Hooded Parrot (<i>Psephotus dissimilis</i>)	Near-threatened	Chambers River, site 4B1 (KP 104)
Yellow-rumped Mannikin (<i>Lonchura flaviprymna</i>)	Near-threatened	Goromuru Rivers, site 2B2 (KP 500)
Mammals		
Kakadu Dunnart (<i>Smithopsis bindi</i>)	Top End endemic	Chambers river, site 4C1 (KP 104)
Red-cheeked Dunnart (<i>Smithopsis virginiae</i>)	Top End endemic	Goromuru Rivers, site 2B1 (KP 500)
Reptiles		
Dark-tailed Skink (<i>Glaphyromorphus nigricaudis</i>)	Top End endemic	Latram River, site 1C1 (KP 582)
MacFarlane's Lerista (<i>Lygisaurus macfarlanei</i>)	Top End endemic	Latram River, site 1A1 (KP 582)
Northern Ridge-tailed Monitor (<i>Varanus primordius</i>)	Near-threatened	Chambers river, site 4C2 (KP 104)
Robust Rainbow Skink (<i>Carlia longipes</i>)	Top End endemic	Chambers River, sites 1B2, 1C1, 2A1, 2A2, 2B1 (KP 104)

SPECIES RECORDED	CLASSIFICATION	SITE RECORDED
Storr's Snake-eyed Skink (<i>Morethia storri</i>)	Top End endemic	Chambers River, sites 4A1, 4B2 (KP 104)
White-lipped Dragon (<i>Diporiphora albilabris sobria</i>)	Top End endemic	Latram River, site 4A2, 4C1, 4C2 (KP 582)

Section B: 2012 Katherine to Gove Gas Pipeline fauna survey report

6 2012 fauna survey introduction

Eco Logical Australia (ELA) was engaged by Pacific Aluminium to conduct fauna surveys for the KGGP project in the late dry / early wet season 2012. The survey area included the KGGP corridor between the intersection of the Central Arnhem Highway and the Stuart Highway, and Gove. The survey was designed to update and complement data presented in the Environmental Impact Statement for the original proposal (EcOz 2004a) and to satisfy EIS guidelines which were subsequently finalised in January 2013 (*Guidelines for Preparation of an Environmental Impact Statement: Katherine to Gove Gas Pipeline* Department of Lands, Planning and the Environment, January 2013).

An updated desktop review was conducted to account for any:

- Species listed or delisted as Threatened under the EPBC Act;
- Species whose status under the NT TPWC Act has changed (including as a result of the review conducted in 2010/11 and gazetted in December 2012);
- Species listed as Migratory under the EPBC Act; and
- Location records of threatened or migratory species added to the NT Fauna database after 2004.

The field survey conducted in 2012 was designed to complement and supplement the results of the 2004 fauna survey (EcOz 2004b). In 2004, EcOz conducted a fauna survey based on an intensive trapping program implemented at few high value sites clustered towards the ends of the KGGP corridor. To expand on these findings ELA has designed a survey using less intensive methods implemented at a greater number of sites spread along the pipeline corridor; combined with targeted surveys within the known habitat of EPBC listed bird species (the Gouldian Finch and Northern Crested Shrike-tit). This methodology was designed to:

- Fill key knowledge gaps along the route;
- Address as many target species as possible;
- Sample habitats that are widespread along the pipeline corridor; and
- Take advantage of seasonality by giving priority to sites likely to be holding water.

7 2012 fauna survey methods

A desktop review of fauna records was conducted to update the list of threatened and migratory species occurring in the pipeline corridor. These results were reviewed in consultation with experts and traditional owners to identify a list of target species that may be impacted by the KGGP project. Survey sites were selected to take advantage of the seasonal aggregation of fauna around water sources, and to be representative of habitats across the pipeline corridor (Figure 6).

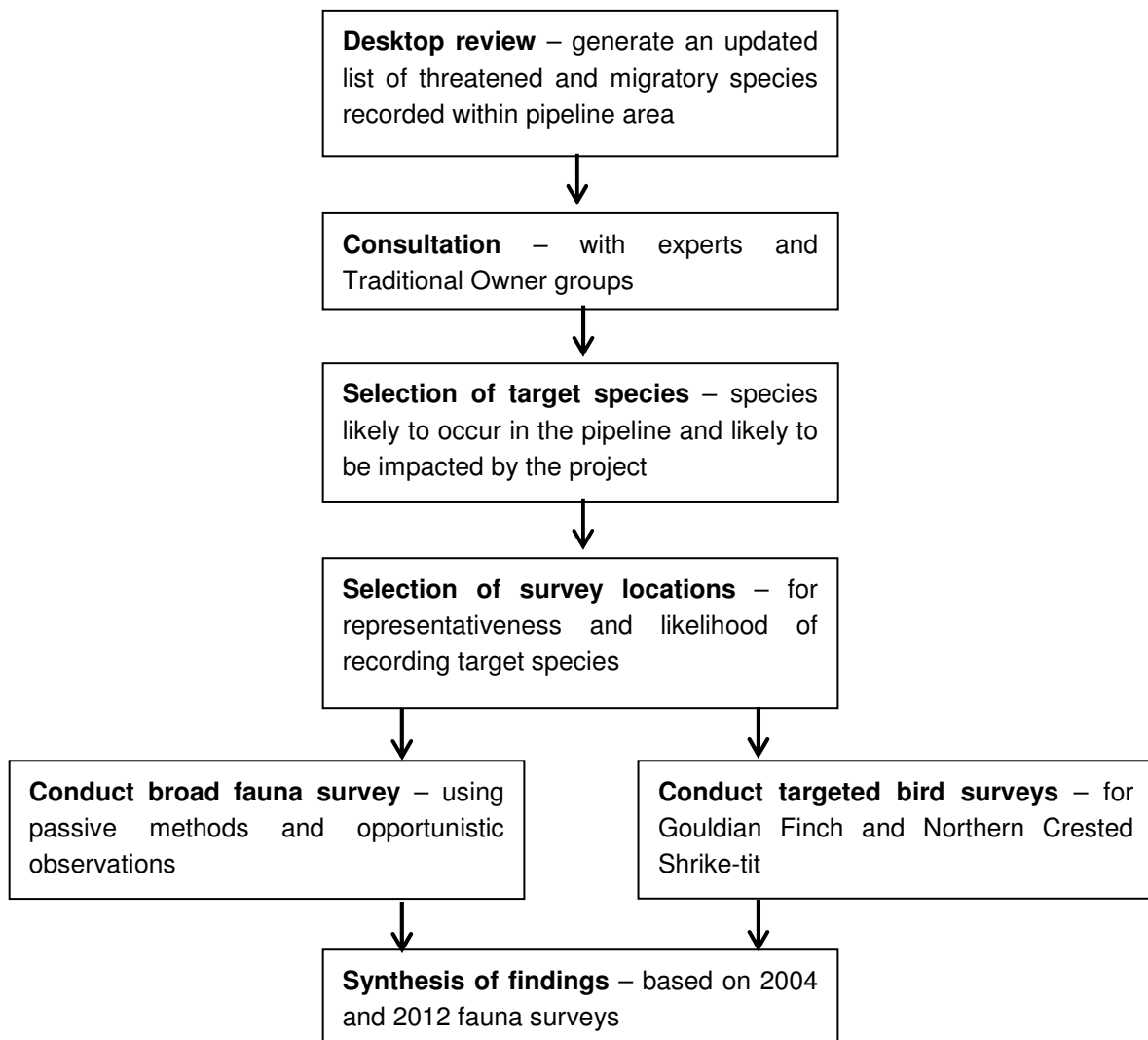


Figure 6: Project methodology for 2012 fauna survey

7.1 DESKTOP REVIEW

A review of readily available literature and database records pertaining to the study area and surrounding locality were reviewed to provide important background information for this survey. The literature and data reviewed were:

- Online search for Matters of National Environmental Significance (Department of Sustainability, Environment, Water, Population and Communities (SEWPAC) accessed 10 October 2012);
- Online search of Protected Matters (SEWPAC accessed 10 October 2012);
- Online search of Species Profiles and Threats database (SPRAT, SEWPAC accessed 10 October 2012);
- Environmental assessment guidelines for the Northern Territory: Terrestrial fauna survey, Draft 3. (Department of Natural Resources, Environment, the Arts and Sport, 2011);
- NT Fauna atlas (accessed 10 October 2012);
- Survey guidelines for Australia's threatened birds (Department of the Environment, Water, Heritage and the Arts (DEWHA) 2008);
- Survey guidelines for Australia's threatened mammals (DEWHA 2010);
- Environmental Impact Statement for the proposed Trans Territory Pipeline Terrestrial Fauna Report (EcOz, 2004a);
- Publications addressing the small mammal declines recorded throughout the NT (including Woinarski et al 2007 and 2010);
- Survey protocol for the Northern Crested Shrike-tit *Falcunculus frontatus whitei* (Ward 2009); and
- Habitat-use, foraging and breeding ecology of the Northern Crested Shrike-tit *Falcunculus frontatus whitei* (Ward 2008).

This data was used to gain an understanding of the existing environment, previous survey methods and results along the pipeline route, species that may potentially occur in the area (particularly threatened species, communities or migratory species listed or removed since 2004) and survey requirements. A revised list of threatened species and ecological communities that may occur along the pipeline route, and an assessment of their likely occurrence and distribution maps, is presented at Table 9. The results of the desktop study were used to compile a list of species targeted for the 2012 survey.

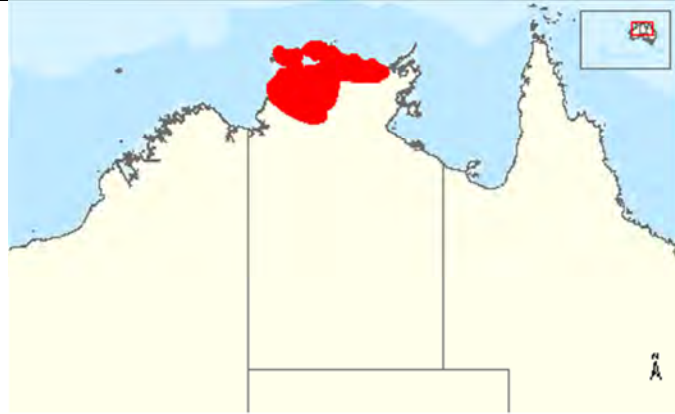
Table 9: EPBC Act listed threatened and migratory species identified through the protected matters search and their likelihood of occurrence in or near the KGGP Right of Way

SPECIES/COMMUNITY	CONSERVATION STATUS	LIKELIHOOD OF OCCURRENCE*	DISTRIBUTION MAP (SPRAT DATABASE)
Birds			
Australian Painted Snipe (<i>Rostratula australis</i>)	EPBC vulnerable and migratory NT vulnerable	Possible. Shallow inland wetlands comprise the preferred habitat of this species. Suitable habitat occurs along the pipeline route in the form of three regionally significant wetlands within the project area and six other regionally significant wetlands occur in the vicinity.	

SPECIES/COMMUNITY	CONSERVATION STATUS	LIKELIHOOD OF OCCURRENCE*	DISTRIBUTION MAP (SPRAT DATABASE)
Australasian Bittern (<i>Botaurus poiciloptilus</i>)	EPBC endangered	Possible. Prefers densely vegetated freshwater wetlands. Potential habitat present near the project area in the form of suitable habitat occurs along the pipeline route in the form of three regionally significant wetlands within the project area and six other regionally significant wetlands occur in the vicinity. However, wetlands present within the project area are not considered to be densely vegetated so are unlikely to be important habitat for this species.	 A map of Australia showing the distribution of the Australasian Bittern. Red dots indicate recorded locations, which are concentrated in the eastern and southern coastal regions, particularly in New South Wales, Victoria, and South Australia. An inset map in the top right corner shows the location of the project area within Australia.
Barn Swallow (<i>Hirundo rustica</i>)	EPBC migratory	Possible. The species has a wide recorded distribution across northern Australia and prefers open country in coastal lowlands (usually near towns or cities), and freshwater wetlands, paperbark Melaleuca woodland, mesophyll shrub thickets and tussock grassland.	 A map of Australia showing the distribution of the Barn Swallow. Red dots indicate recorded locations, which are concentrated along the northern and eastern coasts, particularly in the Northern Territory, Queensland, and New South Wales. An inset map in the top right corner shows the location of the project area within Australia.

SPECIES/COMMUNITY	CONSERVATION STATUS	LIKELIHOOD OF OCCURRENCE*	DISTRIBUTION MAP (SPRAT DATABASE)
Black-tailed Godwit (<i>Limosa limosa</i>)	EPBC migratory	Unlikely. Not recorded during 2004 or 2012 field surveys. The Black-tailed Godwit prefers coastal regions with the largest populations found on the north coast of Australia in sheltered bays, estuaries and lagoons with large intertidal mudflats or sandflats between Darwin and Weipa (DSEWPac 2013a). Although there are records of this species within the pipeline region they are located around the coast in the eastern extent of the region. The Black-tailed Godwit is unlikely to rely on any habitats within the project area and it is considered that the project area does not support important habitat for the Black-tailed Godwit according to criteria listed in EPBC Act Policy Statement 3.21 for migratory shorebirds (DEWHA 2009).	

SPECIES/COMMUNITY	CONSERVATION STATUS	LIKELIHOOD OF OCCURRENCE*	DISTRIBUTION MAP (SPRAT DATABASE)
Cattle Egret (<i>Ardea ibis</i>)	EPBC migratory	Known to occur. Recorded in 2012 by ELA. This species is a relatively small egret found in grasslands, woodlands and wetlands. The Cattle Egret is considered to be widespread and common. Breeding colonies have been observed in Arnhem Land.	 A map of Australia with the distribution of Cattle Egrets highlighted in red. The red areas are concentrated in the northern and eastern coastal regions, with a few isolated red dots in the south and west. An inset map in the top right corner shows the location of the main map area within Australia.
Derby White-browed Robin (<i>Poecilodryas superciliosa cerviniventris</i>)	EPBC migratory	Recorded in 2012 by ELA. The species has a wide recorded distribution across northern Australia and inhabits forests, shrublands and wetlands.	 A map of Australia with the distribution of Derby White-browed Robins highlighted in red. The red areas are concentrated in the northern coastal regions, with a few isolated red dots in the south and west. An inset map in the top right corner shows the location of the main map area within Australia.

SPECIES/COMMUNITY	CONSERVATION STATUS	LIKELIHOOD OF OCCURRENCE*	DISTRIBUTION MAP (SPRAT DATABASE)
Eastern Great Egret (<i>Ardea modesta</i>)	EPBC migratory	Known to occur. Recorded in 2012 by ELA. This species is widely distributed in Australia and is known to occur in habitat including wetlands, flooded pastures, dams, estuarine mudflats, mangroves and reefs. This species may utilise the site however habitat present is not considered to be important to the survival of the species.	
Eastern Partridge Pigeon (<i>Geophaps smithii smithii</i>)	EPBC vulnerable NT vulnerable	Likely. Prefers primarily open forest and woodland habitat, which is present within the project area.	

SPECIES/COMMUNITY	CONSERVATION STATUS	LIKELIHOOD OF OCCURRENCE*	DISTRIBUTION MAP (SPRAT DATABASE)
Fork-tailed Swift (<i>Apus pacificus</i>)	EPBC migratory	Possible. The project area traverses three regionally significant wetlands and six other regionally significant wetlands occur in the vicinity. This species favours shallow, open, freshwater wetlands and swamps. While this species does not breed locally, and the site is not considered to be an area of important habitat for this species, it may fly over the pipeline corridor.	
Glossy Ibis (<i>Plegadis falcinellus</i>)	EPBC migratory	Known to occur. Recorded in 2012 by ELA Within Australia, this species is distributed east of the Kimberley in WA and in the Eyre Peninsula in SA. The species prefers fresh water marshes at the edges of lakes and rivers, flood-plains, swamps and cultivated areas under irrigation. The Glossy Ibis is commonly in largest numbers in drying Top End grass/sedge swamps and Channel Country grass/forb meadows.	This map Atlas of Living Australia 

SPECIES/COMMUNITY	CONSERVATION STATUS	LIKELIHOOD OF OCCURRENCE*	DISTRIBUTION MAP (SPRAT DATABASE)
Gouldian Finch (<i>Erythrura gouldiae</i>)	EPBC endangered and migratory NT vulnerable	Known to occur. Recorded in 2004 (EcOz 2004b) and 2012 by ELA. Suitable habitat for this species is present between approximately KP 0 and KP 120 in the form of a range of annual and perennial grasses in lowlands, rocky hills with suitable smooth stem salmon gums (for breeding), and small pools that persist through the dry season. A number of historical records of the species exist for this area. Potential suitable habitat also occurs in isolated patches in the central portion of the pipeline corridor.	

SPECIES/COMMUNITY	CONSERVATION STATUS	LIKELIHOOD OF OCCURRENCE*	DISTRIBUTION MAP (SPRAT DATABASE)
Great Knot (<i>Calidris tenuirostris</i>)	EPBC migratory NT vulnerable	Unlikely. Not recorded during 2004 or 2012 field surveys. The Great Knot is a migratory wader mostly found in coastal habitats and wetlands, although rarely found on inland lakes and swamps (DSEWPaC 2013b; Higgins and Davies 1996). The Great Knot occurs in the greatest numbers on the coastal fringes of the NT. There have been four records of Great Knot within the far north eastern extent of the pipeline region in the last 20 years, however, there are no records within the project area and the Great Knot is unlikely to rely on any habitats within the project area. These records and potential habitat within the pipeline region are not considered indicative of a site that supports important habitat for the Great Knot according to criteria listed in EPBC Act Policy Statement 3.21 for migratory shorebirds (DEWHA 2009).	

SPECIES/COMMUNITY	CONSERVATION STATUS	LIKELIHOOD OF OCCURRENCE*	DISTRIBUTION MAP (SPRAT DATABASE)
Little Tern (<i>Sterna albifrons</i>)	EPBC migratory	Unlikely. Not recorded during 2004 or 2012 field surveys. In Australia, Little Terns inhabit sheltered coastal environments, including lagoons, estuaries, river mouths and deltas, lakes, bays, harbours and inlets, especially those with exposed sandbanks or sand-spits, and also on exposed ocean beaches. Little Terns are widespread on islands off the Northern Territory coast. In the Northern Territory, Little Terns are commonly seen in sandy coastal habitats and in mangrove-mudflat habitats along the coast or in bays and estuaries, but not recorded on wetlands more than 1 km from the coast. This species is widely distributed, occurring mostly around beaches and near-shore environments which are a minor habitat in the project area.	

SPECIES/COMMUNITY	CONSERVATION STATUS	LIKELIHOOD OF OCCURRENCE*	DISTRIBUTION MAP (SPRAT DATABASE)
Melville Cicadabird (<i>Coracina tenuirostris melvillensis</i>)	EPBC migratory	Known to occur. Recorded by ELA in 2012. The Melville Cicadabird occurs in northern Australia from Broome in WA to the far eastern Top End of the NT. This species prefers diverse forests and woodlands, including mangroves and paperbark swamps.	
Northern Crested Shrike-tit (<i>Falcunculus frontatus whitei</i>)	EPBC vulnerable and migratory	Known to occur. Recorded by ELA in 2012. Preferred habitat for the Northern Crested Shrike-tit occurs across the project area as woodlands, in particularly <i>Eucalyptus tectifica</i> and <i>Corymbia latifolia</i> woodlands.	

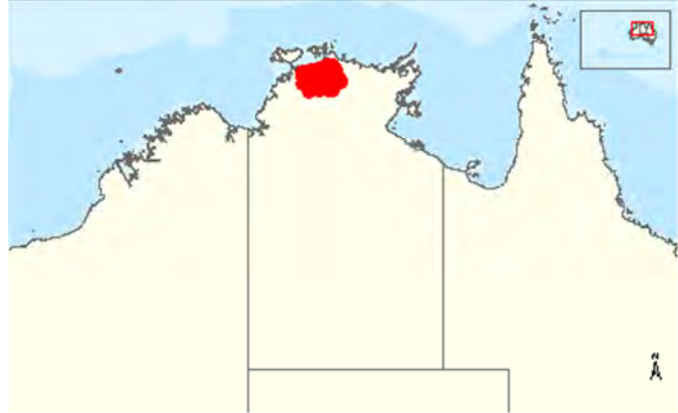
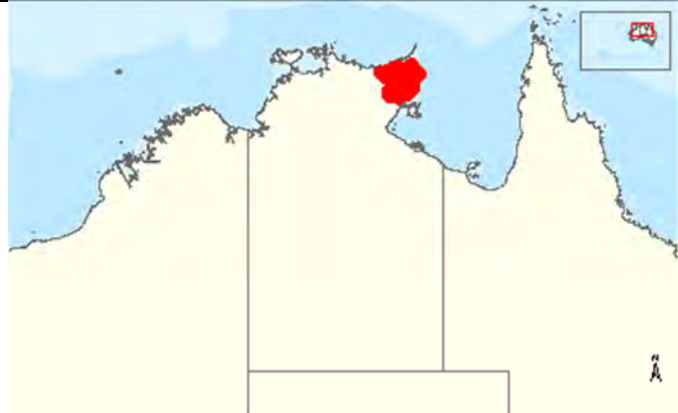
SPECIES/COMMUNITY	CONSERVATION STATUS	LIKELIHOOD OF OCCURRENCE*	DISTRIBUTION MAP (SPRAT DATABASE)
Northern Masked Owl (<i>Tyto novaehollandiae kimberli</i>)	EPBC vulnerable NT vulnerable	Possible. Preferred habitat consists of riverine forest, rainforest, open forest, paperbark swamp and the edge of mangroves. Some habitat present along corridor.	

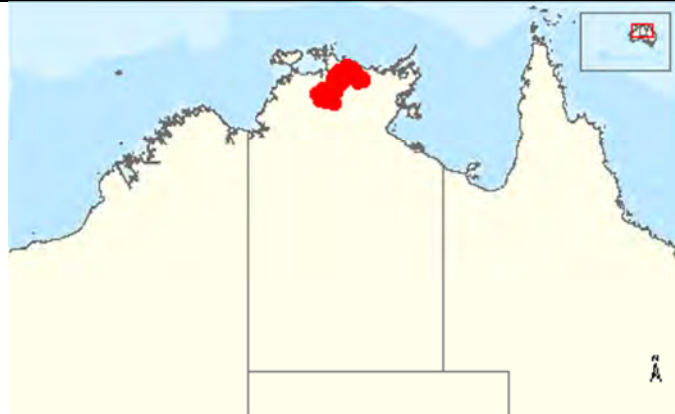
SPECIES/COMMUNITY	CONSERVATION STATUS	LIKELIHOOD OF OCCURRENCE*	DISTRIBUTION MAP (SPRAT DATABASE)
Oriental Plover (<i>Charadrius veredus</i>)	EPBC migratory	Unlikely. Not recorded during 2004 or 2012 field surveys. The Oriental Plover occurs in both coastal and inland areas. It is a migratory wader and in Australia usually inhabits flat, open, semi-arid or arid grasslands, interspersed with hard, bare ground, such as clay-pans (DSEWPaC 2013c). The Oriental Plover has sparse records from within the pipeline region, on the north-east coastal Arnhem Land or around the town of Katherine, although there are no records within the project area. These widespread records are few and are not indicative of a site that supports important habitat for the Oriental Plover according to criteria listed in EPBC Act Policy Statement 3.21 for migratory shorebirds (DEWHA 2009a)	

SPECIES/COMMUNITY	CONSERVATION STATUS	LIKELIHOOD OF OCCURRENCE*	DISTRIBUTION MAP (SPRAT DATABASE)
Oriental Pratincole (<i>Glareola maldivarum</i>)	EPBC migratory	Unlikely. Not recorded during 2004 or 2012 field surveys. The Oriental Pratincole is widespread in northern areas of Australia, occurring predominantly in coastal areas including beaches, mudflats and islands, as well as near some terrestrial wetlands (DSEWPac 2013d). There is only one record from the last 20 years of the Oriental Pratincole within the pipeline region that is located to the south near the junction of the Sturt Highway and Roper Highway. The lack of records and absence of the coastal habitats preferred by the Oriental Pratincole within the project area indicates that the project area does not support important habitat for the Oriental Pratincole according to criteria listed in EPBC Act Policy Statement 3.21 for migratory shorebirds (DEWHA 2009a).	

SPECIES/COMMUNITY	CONSERVATION STATUS	LIKELIHOOD OF OCCURRENCE*	DISTRIBUTION MAP (SPRAT DATABASE)
Rainbow Bee-eater (<i>Merops ornatus</i>)	EPBC migratory	Known to occur. Recorded in 2004 (EcOz 2004b) and 2012 by ELA. This species is distributed across much of inland Australia and occurs mainly in open forests and woodlands, shrublands, and in various cleared or semi-cleared habitats, including farmland and areas of human habitation. In northern Australia it often inhabits mangroves (DSEWPac 2013e).	 A map of Australia showing the distribution of the Rainbow Bee-eater. The entire landmass is shaded in solid red, indicating widespread occurrence across the country. A small inset map in the top right corner shows the location of Australia within the Pacific Ocean.
Red Goshawk (<i>Erythrotriorchis radiatus</i>)	EPBC vulnerable NT vulnerable	Likely. Several Records of this species in NT Fauna Atlas in proximity to pipeline route. In the NT the Red Goshawk prefers tall open forest and woodland or tall fringing woodlands along rivers in grassland, shrublands, and low open woodlands.	 A map of Australia showing the distribution of the Red Goshawk. The distribution is concentrated in the northern and eastern parts of the country, with red shading covering large areas in the Northern Territory, Queensland, and New South Wales. The western part of Australia is unshaded (yellow). A small inset map in the top right corner shows the location of Australia within the Pacific Ocean.

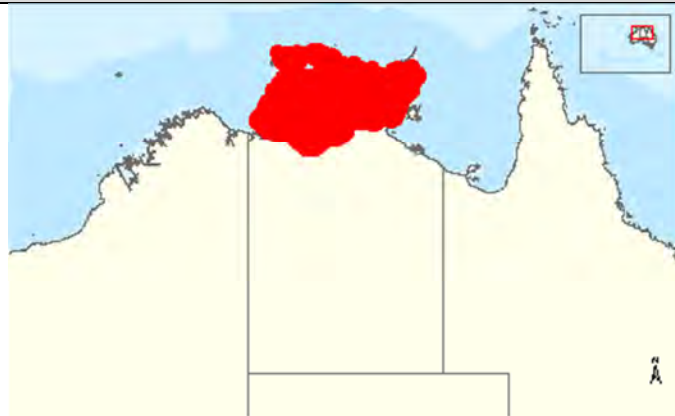
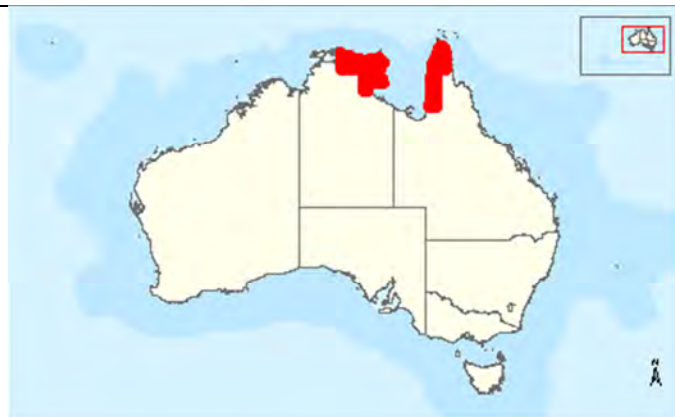
SPECIES/COMMUNITY	CONSERVATION STATUS	LIKELIHOOD OF OCCURRENCE*	DISTRIBUTION MAP (SPRAT DATABASE)
Rufous Fantail (<i>Rhipidura rufifrons</i>)	EPBC migratory	Known to occur. Recorded In 2004 by EcOz (2004b). This species was recorded in the north-east of the pipeline route. The Rufous Fantail occurs in coastal and near coastal districts of northern and eastern Australia and is a common and secure species. Significant impacts to this species are unlikely.	
White Bellied Sea-eagle (<i>Haliaeetus leucogaster</i>)	EPBC migratory	Known to occur. Recorded in 2004 by EcOz (2004). This species was recorded in the north-east of the pipeline route. This species is widely distributed.	

SPECIES/COMMUNITY	CONSERVATION STATUS	LIKELIHOOD OF OCCURRENCE*	DISTRIBUTION MAP (SPRAT DATABASE)
Yellow Chat (<i>Epthianura crocea tunneyi</i>)	EPBC endangered NT endangered	Unlikely. Some potential habitat may be present for this species which prefers channels and depressions on seasonally inundated floodplains. However, the pipeline corridor lies well south of its known distribution.	
Insects			
Gove Crow Butterfly (<i>Euploea alcathoe enastris</i>)	EPBC endangered	Possible. Pipeline route has been designed to avoid habitat for this species. Prefers patches in the transitional zone (ecotone) between evergreen monsoon vine-forest and eucalypt/paperbark woodland associated with permanent creeks or swamps.	

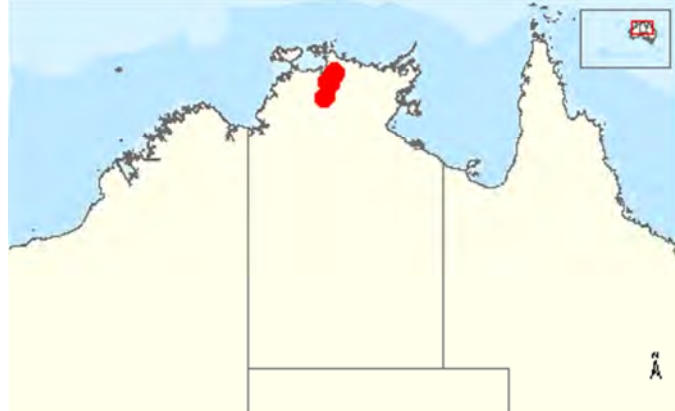
SPECIES/COMMUNITY	CONSERVATION STATUS	LIKELIHOOD OF OCCURRENCE*	DISTRIBUTION MAP (SPRAT DATABASE)
Mammals			
Arnhem Rock-rat (<i>Zyzomys maini</i>)	EPBC vulnerable NT vulnerable	Unlikely. The pipeline possibly overlaps with the known range of this species, however preferred habitat for this species (rugged sandstone environments, typically where there are many caves, crevices or boulders) is absent from the site.	
Bare-rumped Sheath-tailed Bat (<i>Saccolaimus saccolaimus nudiclunatus</i>)	EPBC critically endangered	Unlikely. Pipeline lies well south of few records of this species in the Northern Territory. There are no recent records from the Top End of the Northern Territory to even indicate whether the species still occurs in this region.	

SPECIES/COMMUNITY	CONSERVATION STATUS	LIKELIHOOD OF OCCURRENCE*	DISTRIBUTION MAP (SPRAT DATABASE)
Brush-tailed Tree-rat (<i>Conilurus penicillatus</i>)	EPBC vulnerable NT endangered	Possible. The pipeline corridor is located well south of the primary distribution of this species. However NT Fauna Atlas shows some records further south towards the pipeline corridor. The Brush-tailed Rabbit-rat occurs in eucalypt tall open forest and coastal grasslands and shelters in tree hollows, hollow logs and occasionally in the crowns of pandanus or sand-palms (Woinarski and Hill 2012).	
Golden-backed Tree-rat (<i>Mesembriomys macrurus</i>)	EPBC vulnerable NT critically endangered	Possible. All records within the NT of the Golden-backed Tree-rat are from riverine vegetation, however, in the Kimberley, the species' habitat use is broad, including eucalypt open forests with tussock grass understorey, rainforest patches on a variety of landforms and soils, eucalypt woodlands with hummock grass understorey, rugged sandstone screes, beaches, and blacksoil plains with pandanus (Woinarski et al. 2012b). Small areas of suitable riverine habitat may be present within site.	

SPECIES/COMMUNITY	CONSERVATION STATUS	LIKELIHOOD OF OCCURRENCE*	DISTRIBUTION MAP (SPRAT DATABASE)
Golden Bandicoot (<i>Isoodon auratus auratus</i>)	EPBC vulnerable NT endangered	Unlikely. Habitat preference comprises hummock grass and shrublands on sandstone and vine thicket. In the NT, the Golden Bandicoot is now known only from Marchinbar Island in the Wessel Islands group off north-east Arnhem Land (Southgate et al. 1996).	
Greater Bilby (<i>Macrotis lagotis</i>)	EPBC vulnerable NT vulnerable	Unlikely. Pipeline corridor lies well north of the known distribution of this species and limited habitat present. Preferred habitat for this species includes a variety of habitats, usually on landforms with level to low slope topography and light to medium soils. It occupies three major vegetation types; open tussock grassland on uplands and hills, mulga woodland/shrubland growing on ridges and rises, and hummock grassland in plains and alluvial areas.	

SPECIES/COMMUNITY	CONSERVATION STATUS	LIKELIHOOD OF OCCURRENCE*	DISTRIBUTION MAP (SPRAT DATABASE)
Northern Brush-tailed Phascogale (<i>Phascogale pirata</i>)	EPBC vulnerable NT endangered	Possible. Pipeline well south of recent records although old records exist from around Katherine and Gove. Preferred habitats present in site including tall open forests dominated by <i>Eucalyptus miniata</i> and <i>E. tetradonta</i> (Woinarski and Ward 2012a).	
Northern Hopping-mouse (<i>Notomys aquilo</i>)	EPBC vulnerable NT vulnerable	Unlikely. Largely restricted to sandy substrates, particularly those supporting floristically diverse heathlands and/or grasslands (Woinarski et al. 1999 as cited in Alcan Gove 2004). Majority of specimens known from Groote Eylandt and coastal north-eastern Arnhem Land and preferred habitat not present.	

SPECIES/COMMUNITY	CONSERVATION STATUS	LIKELIHOOD OF OCCURRENCE*	DISTRIBUTION MAP (SPRAT DATABASE)
Northern Quoll (<i>Dasyurus hallucatus</i>)	EPBC endangered NT critically endangered	Likely. Preferred habitat occurs across full length of the pipeline and this species has been recorded to the west of the pipeline route. Preferred habitat consists of some form of rocky area or structurally diverse woodland or forest for denning/shelter purposes, with surrounding vegetated habitats used for foraging and dispersal (DSEWPaC 2011a, DSEWPaC 2013f), with sandstone escarpment considered prime habitat (Braithwaite and Griffiths 1994).	
Water Mouse (<i>Xeromys myoides</i>)	EPBC vulnerable	Unlikely. Preferred habitat including mangroves and the associated saltmarsh, sedgeland and clay pans are not considered to be present and the pipeline corridor lies well south of known records in the NT.	

SPECIES/COMMUNITY	CONSERVATION STATUS	LIKELIHOOD OF OCCURRENCE*	DISTRIBUTION MAP (SPRAT DATABASE)
Reptiles			
Arnhem Land Egernia (<i>Bellatorias obiri</i>)	EPBC endangered NT endangered	Unlikely. Largely restricted to sandstone outcrops, typically with extensive fissures and cave systems.	

*Likelihood definitions:

Recorded – Recorded within the corridor.

Highly unlikely – No preferred habitat in corridor and known populations a large distance away from corridor.

Unlikely – Preferred habitat or similar available in corridor but known populations a large distance away from the corridor.

Possible – Preferred habitat or similar available in corridor and known populations in close proximity to the corridor.

Likely – Preferred habitat or similar available in corridor and known populations in close proximity to the corridor.

7.2 CONSULTATION

ELA consulted with government agencies, traditional owners and experts to identify recent records and trends in local fauna, and to help refine the list of subject species and survey techniques.

Dr Alaric Fisher (Senior Scientist Biodiversity Conservation Unit Department of Land Resource Management (DLRM), Darwin) was supportive of the use of remote cameras and hair tubes to survey remote sites and suggested that the decline in populations of small mammals recorded over the last 20 years is likely to have impacted most of the target mammal species along the route.

Dr Simon Ward (Director of Species Conservation, DLRM Alice Springs) provided his unpublished survey methodology for detecting Northern Crested Shrike-tit in the area. Dr Ward has also worked on Gouldian Finch populations at Newry Station (near WA border, just south of Keep River NP); Yinberrie Hills (west of Nitmiluk NP, NE of Katherine); and Nathan River (in Limmen NP and adjoining stations), and provided an opinion on the likely impacts of pipeline construction and operation on the Gouldian Finch population in the Chambers River area.

Stephen Richards, Curator of Terrestrial Vertebrates at the Museum and Art Gallery of the Northern Territory confirmed that the Arnhem Land Egernia (*Bellatorias obiri*) is unlikely to occur in the survey area.

Dr Ben Hoffmann, research scientist at CSIRO, confirmed that there is very little risk of spreading introduced Yellow Crazy Ant (*Anoplolepis gracilipes*) unless soil was carted from the residual infestation at the Gove mine site.

The Australian Wildlife Conservancy operates a wildlife sanctuary at Wongalara Station, to the south of the Mainoru River close to the pipeline crossing at KP 120. Since its acquisition in 2007, programs on the station include ongoing biological surveys, fire management, feral animal and weed control, stock exclusion from some areas and research on conservation issues including the impact of feral cat exclusion. Dr Katherine Tuft, senior wildlife ecologist provided the current list of 262 vertebrate species recorded on the station.

The coordinator of the Beswick Ranger Group, Sammy Bush Jr, confirmed that Gouldian Finches were seen in the area, although rarely. Eastern Partridge Pigeon and Northern Crested Shrike-tits had not been seen in the area.

Minmal Rangers reported that Eastern Partridge Pigeons are sometimes seen at Emu Springs outstation (KP 300).

7.3 TARGET SPECIES

A list of species of interest was compiled based on the outcomes of the literature review, the 2004 surveys and consultation with experts and traditional owners. The 35 species identified by the desktop analysis (Table 9) were reviewed and narrowed down to a list of 10 target species for the 2012 survey. These species are likely to occur in the pipeline corridor, and may be impacted by construction or operation of the KGGP. Two of these species have been recorded in the vicinity of the pipeline corridor, two are likely to occur and six may possibly occur (Table 10). The KGGP project has the potential to have an impact on these species should they occur within the footprint of disturbance.

Table 10 Species of interest for the 2012 fauna survey

SPECIES	EPBC STATUS	NT STATUS	SURVEY METHODS
Birds			
Australasian Bittern (<i>Botaurus poiciloptilus</i>) (Possible)	Endangered	Not listed	Opportunistic wetland survey
Australian Painted Snipe (<i>Rostratula australis</i>) (Likely)	Vulnerable	Vulnerable	Opportunistic wetland survey
Eastern Partridge Pigeon (<i>Geophaps smithii smithii</i>) (Recorded)	Vulnerable	Vulnerable	Opportunistic
Gouldian Finch (<i>Erythrura gouldiae</i>) (Recorded)	Endangered, migratory	Vulnerable	Targeted waterhole surveys
Northern Crested Shrike-tit (<i>Falcunculus frontatus whitei</i>) (Recorded)	Vulnerable	Not listed	Broadcast surveys
Northern Masked Owl (<i>Tyto novaehollandiae kimberli</i>) (Possible)	Vulnerable	Vulnerable	Broadcast surveys
Mammals			
Brush-tailed Tree Rat (<i>Conilurus penicillatus</i>) (Possible)	Vulnerable	Endangered	Broad survey and spotlighting
Golden Bandicoot (<i>Isoodon auratus auratus</i>) (Possible)	Vulnerable	Endangered	Broad survey and spotlighting
Northern Brush-tailed Phascogale (<i>Phascogale pirata</i>) (Possible)	Vulnerable	Endangered	Broad survey and spotlighting
Northern Quoll (<i>Dasyurus hallucatus</i>) (Likely)	Endangered	Critically endangered	Broad survey and spotlighting

7.4 SELECTION OF SURVEY SITES

The 2012 survey was designed as a combination of:

- Broad surveys relying on remote cameras and hair tubes deployed across the pipeline corridor in association with late dry season water sources (10 sites, Figure 7).
- Targeted survey for threatened birds in the Beswick area using a combination of water hole observations (12 sites, Figure 8) and broadcast surveys (12 sites, Figure 9).

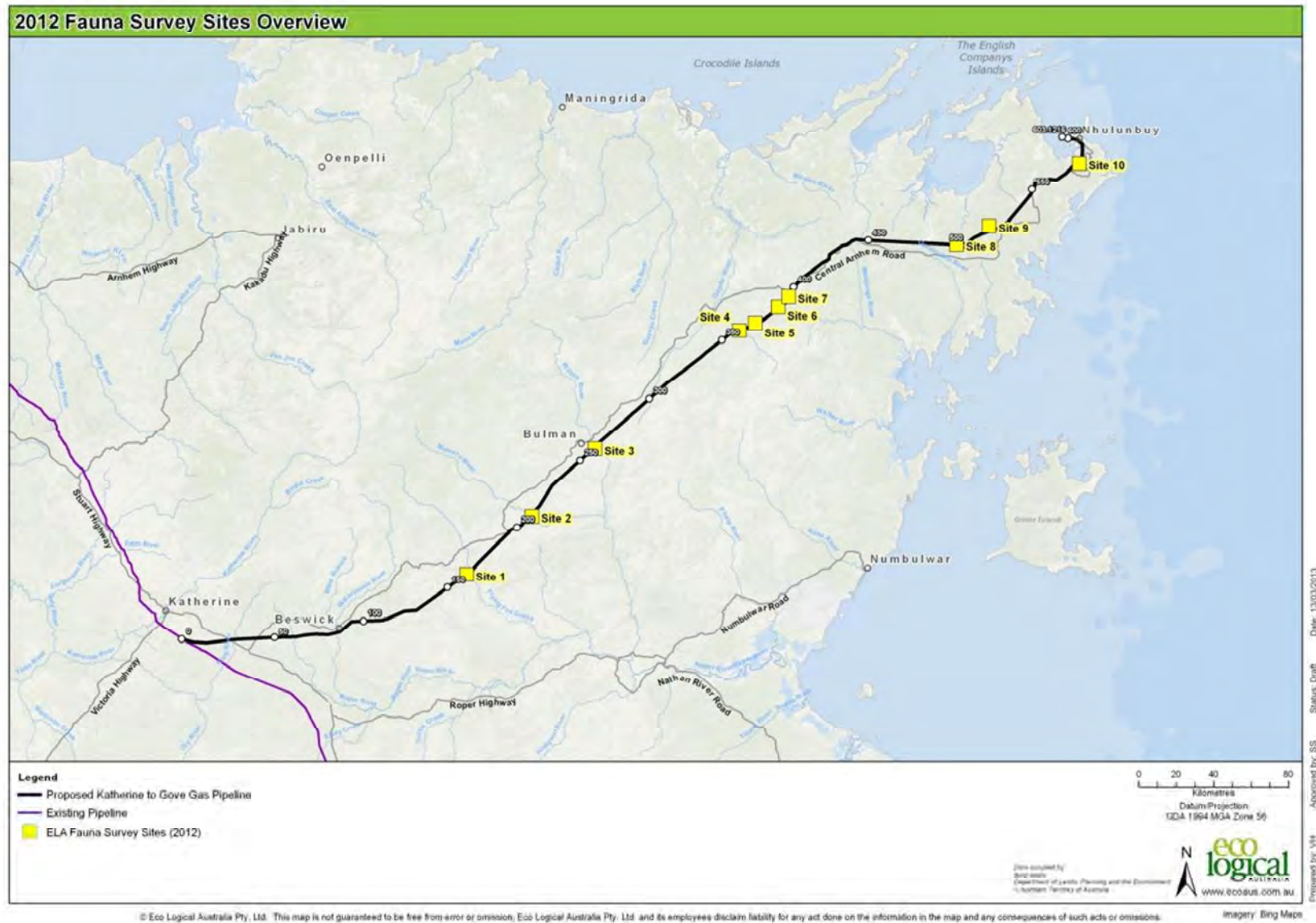


Figure 7: Broad survey sites, 2012 fauna survey

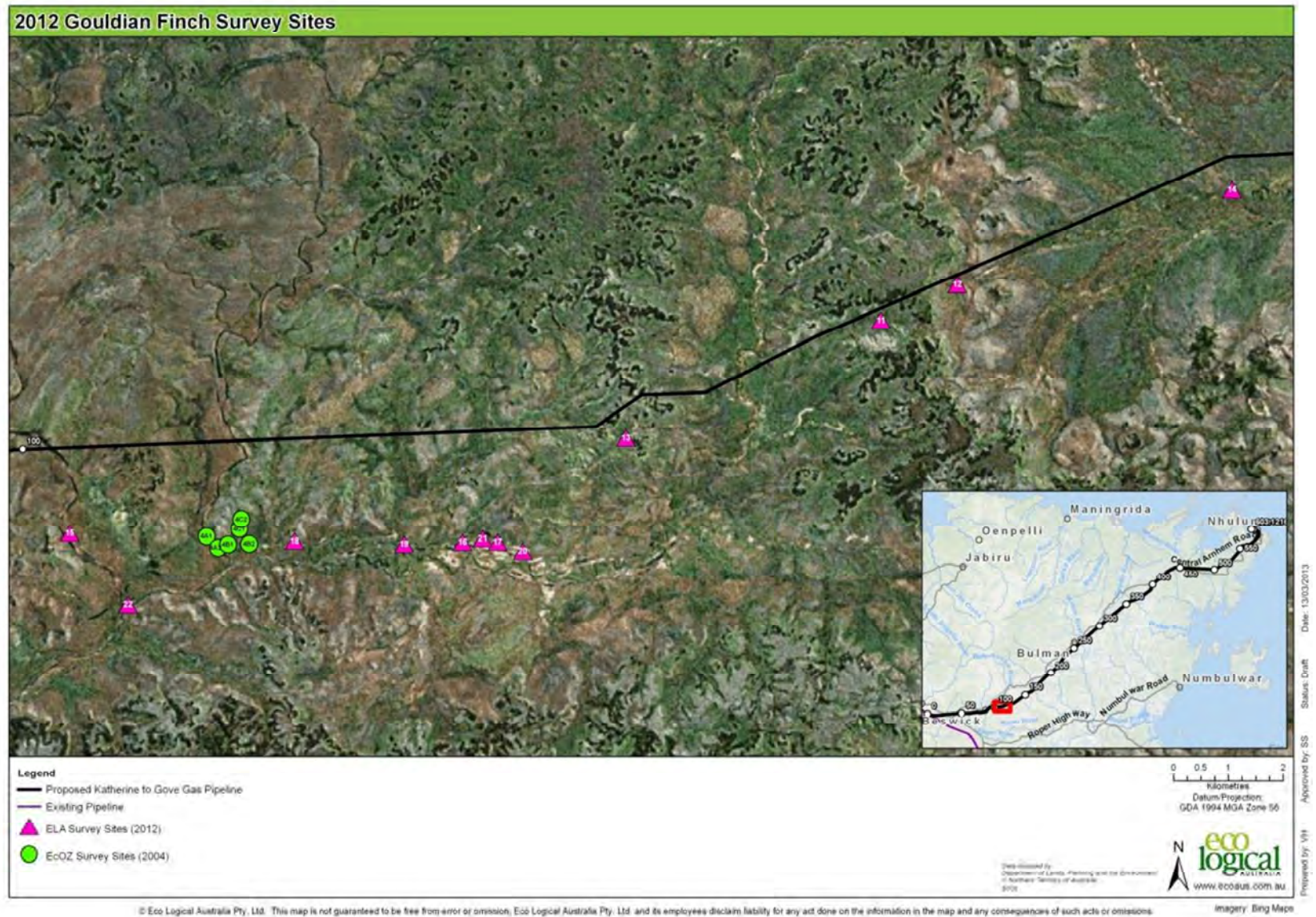


Figure 8: Waterhole survey sites, 2012 survey



Figure 9: Broadcast survey sites, 2012 fauna survey

7.4.1 Broad survey site selection

Habitat and vegetation stratification units based on maps from the TTP EIS Vegetation Report (EcOz 2004c), were used to identify sites. Ten sites spread along the KGGP route (including the three sites surveyed by EcOz 2004b) were surveyed (Figure 7). These sites were spread along the pipeline and represented common habitats. They were located to take advantage of the season importance of water sources in the late dry / early wet and to sample the Arafura Wetland catchment. A brief description of each site is provided in section 8.

Access to the Northern Mitchell Ranges was not granted by Traditional Owners prior to the survey and was excluded from site selection.

7.4.2 Site selection for Gouldian Finch and Northern Crested Shrike-tit surveys

Historical records indicate that Gouldian Finches occur in the Chambers River region (NT Fauna Atlas, EcOz 2004b). In the late wet / early dry season when the 2012 survey was conducted, Gouldian Finches are expected to be aggregated around suitable water sources, particularly small shallow pools. The occurrence of this habitat is difficult to predict, so survey sites were determined once in the field either by aerial survey or on-ground investigation (Figure 8).

Habitat consistent with that described by Ward (2008 and 2009) for Northern Crested Shrike-tit (*Eucalyptus tectifica*, *Corymbia latifolia* and *C. grandifolia*) was selected for broadcast surveys (recorded bird calls are broadcast to elicit calls in response). Surveys were conducted with 45 km of Beswick to the east and west (KPs 50 – 125, Figure 9). This included two areas in which Northern Crested Shrike-tit were previously recorded (Ward 2008).

7.5 FIELD SURVEY METHODOLOGY

Field surveys were undertaken from 5 to 23 November 2012 by ELA ecologists Dr Sarah Smith, Sarah Dalglish and Bruce Mullins, and sub-consultant ecologist Terry Mahoney. To indicate the climate conditions during the survey, total monthly rainfall data for the three months leading up to the survey are given for six weather stations along the pipeline route (Appendix C). Some rain was recorded across much of the route during September and October, although our on-ground observations suggested that little surface water was retained. Daily weather observations for Katherine and Gove are provided for the survey period in Appendix C.

Field survey methods were developed according to the techniques outlined in the EPBC survey guidelines (DEWHA 2008 and 2010) and tailored in consultation with local experts (see section 7.2 for details of consultation) to target subject species known or with potential to occur in the region. Broad surveys employed a range of “passive” survey techniques: remote infra-red camera survey, hair tubes, and incidental bird survey. Passive techniques were used due to the remoteness of the survey area, as they are less labour intensive and do not require the survey team to check/release and manage trapped animals. These techniques were deemed an efficient and reliable survey technique for detecting the species of interest along with other fauna.

Targeted survey for Gouldian Finches applied the techniques outlined in the DEWHA (2008) survey guidelines for the species, surveys for the Northern Crested Shrike-tit applied and adapted species specific methodology developed in the region by Ward (Ward 2009).

Surveys were conducted under Northern Territory Parks and Wildlife Commission “Permit to take wildlife for commercial purposes” number 46062.

7.5.1 Remote infra-red cameras

Remote infra-red cameras (remote cameras) provide a useful method of continuous survey for a range of small to large fauna (Meek et al., 2012), particularly for species that are trap shy, that occur in low to moderate densities (Vine et al 2009) or are elusive and nocturnal (Mace et al 2004, cited in DSEWPaC 2011). Cameras allow sites to be monitored for longer than is practical for intensive trapping surveys. This may be particularly important for species at low densities including the target mammal species that have undergone significant declines.

Four remote cameras were deployed per site at sites 1 to 9 along the pipeline route (Figure 7; site 10 near Gove was deemed a high risk of theft, due to the frequent use of the site by locals and was only surveyed using hair tubes).

At each site a combination of three Reconyx HC500 and/or HC600 (infra-red semi-covert and covert, respectively) remote cameras and one Reconyx HC550 (white flash) remote camera were set up at approximately 450 m intervals (measured with a hand held GPS, Figure 10). Remote cameras were deployed along transects which varied from linear to meandering depending on environmental features or landscapes targeted (Appendix D). The remote cameras used are motion activated. Each remote camera was set to capture five pictures at one second intervals when movement was detected by its sensors. Once the fifth picture was captured, the remote cameras were immediately able to be triggered again.

Remote cameras were deployed over three consecutive days commencing on the 5 November with sites 1 to 3 deployed on the first day, sites 4 to 7 on the second day and sites 8 and 9 on the third day. Remote cameras were collected in the same order in which they were deployed from the 19 to 21 November 2012. The survey effort for sites 1 to 9 was 56 remote camera nights per site (which is 504 remote camera nights across all sites).

Baits were used to attract fauna within the range of the sensors. Bait comprised a combination of peanut butter, oats and honey (at a ratio of 3:3:1), dried liver and dried cat food and were contained in a conical PVC tube that was secured to the ground or a tree with cable ties or a tent peg (Figure 11). Remote cameras were secured to a tree and aimed towards the bait-holder. Remote cameras were positioned in relatively open areas and aimed along tracks where they were present. In many instances, smaller vegetation within the range of the remote camera sensor was trimmed to avoid swaying vegetation triggering the sensor.

Remote camera images were analysed and species identified by Dr Sarah Smith and Terry Mahoney, with confirmation of some images sought from other members of the project team and government experts.

7.5.2 Hair tubes

Ten hair tubes were deployed at sites 1 to 10 (appendix D). Hair tubes were made of 90 mm PVC pipe, open at one end and a screw cap on the other, with two strips of double sided sticky tape inserted near the entrance. A bait of peanut butter, oats and honey (at a ratio of 3:3:1), dried liver and dried cat food was added to each hair tube, which is made inaccessible to attracted fauna by a metal grill inside the hair tube.

Hair tubes were deployed over three consecutive days commencing on the 5 November with sites 1 to 3 deployed on the first day, sites 4 to 7 on the second day and sites 8 to 10 on the third day (at the same time as the remote cameras). They were collected in the same order in which they were deployed from the 19 to 21 November 2012.

At each site, hair tubes were spaced along a transect at approximately 120 m intervals (the same transect as the remote cameras), and were secured to the ground or trees with tent pegs and/or cable ties (Figure 11). Four hair tubes at each site were deployed in conjunction with a remote camera. Hair tubes remained in the field for 14 days; this equates to an effort of 140 hair tube days per site and a total effort across all sites of 1,400 hair tubes days.

Hair samples were analysed by Barbara Triggs (Dead Finish, Genoa Vic).



Figure 10: Remote camera deployed on tree trunk



Figure 11: Bait holder (L) and hair tube (R) in place

7.5.3 Targeted Gouldian Finch surveys

Targeted early morning and late afternoon bird surveys were undertaken east of Beswick near the Chambers River from the 10 to 15 of November 2012 (Table 11, Figure 8). One or two morning and afternoon surveys were conducted per day. The first morning bird survey commenced before sunrise, with the second commencing approximately 1.5 to two hours after sunrise. Afternoon bird surveys commenced as early as 1600 hrs, with the second survey commencing approximately one hour before sunset.

Table 11: Gouldian Finch survey effort by site

SITE	DAWN SURVEY EFFORT (PERSON HOURS)	EVENING SURVEY EFFORT (PERSON HOURS)
11	4 hours	
12	7 hours	4 hours
13	1.5 hours	
14		2.6 hours
15	4 hours	2 hours
16	2.5 hours	
17	2.5 hours	
18	1.5 hours	
19	1.5 hours	
20	3 hours	
21	3 hours	
22	4 hours	
Total	34.5 hours	8.6 hours

Surveys targeted water sources as birds (particularly granivorous species) are attracted to these areas to drink and they are a limiting resource during the late dry and early wet seasons. The duration of bird surveys varied, depending on how long birds were using a given water source (depending on the weather, the degree of cover available and the habits of particular species). The average length of each bird survey was approximately one hour. One to four observers were present for each bird survey, depending on the size of the water source. All birds seen or heard were recorded. Observers employed both the point survey method (at small water bodies) and, more commonly, area surveys (at larger, more complex water bodies) with observers covering up to one hectare per site.

In the event that a threatened species was observed, additional notes were taken regarding:

- Approximate population size;

- Ratio of males/females/juveniles, if possible;
- Habitat use; and
- Inter-species interaction (eg. exhibiting or recipients of territorial behaviour).

An opportunistic survey of wetland bird species was conducted at site 22. In addition, all bird species seen or heard while deploying hair tubes and cameras (at sites 1 to 10) were recorded for each site.

7.5.4 Broadcast surveys

Broadcast surveys were undertaken for the Northern Crested Shrike-tit and the Masked Owl, since these species are known to respond to calls and are otherwise difficult to detect.

Surveys for Northern Crested Shrike-tit were undertaken generally in accordance with the unpublished survey methodology of Ward (2009). Broadcast surveys for Northern Crested Shrike-tits were conducted at 12 sites (broadcast survey sites 1 – 12) between the Stuart Highway/Central Arnhem Highway turnoff and about 35 km east of Beswick (Figure 12). Broadcast surveys 11 and 12 are in known Northern Crested Shrike-Tit habitat (Ward 2008).

Recorded Northern Crested Shrike-tit calls including territorial calls and chuckling or chattering calls (Plowright 2007) were broadcast from portable MP3 players via a loud hailer, small portable speakers or an amplifier/directional speaker combination.

At each site, two observers conducted surveys as follows:

- Broadcast the call of the Northern Crested Shrike-tit for five minutes.
- Listen for a response for at least two minutes following, and use binoculars to identify any active birds in the area.
- Move the player 100 m and repeat.
- Between four and eight repeats of the survey were conducted at each site, depending on the extent of suitable habitat.

Broadcast surveys were undertaken for Masked Owl at sites 11 and 15. Surveys began with a 5 minute broadcast from portable MP3 players via a loud hailer, followed by 5 – 10 minutes listening, then repeated.

7.5.5 Spotlighting

Spotlighting surveys were undertaken at night between the 10 and 14 of November. Spotlight surveys were conducted at water sources and creek beds identified during daytime bird surveys. Three to four observers completed the spotlight survey at each site with observers each using head-mounted LED (light emitting diode) torches and binoculars (at least 8 x 42 magnification). Spotlight surveys were conducted at six sites over five nights (Table 12). Each survey lasted for between one and 2.25 hours (a total of 25.5 person hours of effort).



Figure 12: Northern Crested Shrike-tit broadcast survey sites

Table 12: Nocturnal spotlighting surveys survey effort, 2012 survey

DATE	LOCATION	EFFORT
10/11/12	Incidental observations at KPs 113 and 114	4 people, 2.25 hours
11/11/12	Site 11	4 people, 1 hour
12/11/12	Site 12	4 people, 1 hour
13/11/12	Site 15	4 people, 1 hour
14/11/12	Site 22	3 people. 1.5 hours

7.5.6 Incidental observations

All fauna observed while travelling between sites outside of specific surveys were noted.

7.5.7 Compliance with EPBC survey guidelines

The Commonwealth Department of the Environment, Water, Heritage and the Arts guidelines for Australia's threatened fauna (2010 and 2008 for birds and mammals respectively) were incorporated into the survey design for the targeted species and followed as closely as possible, as permitted by the length of the pipeline and onset of wet season rains. Slight deviations are listed and discussed in Table 13.

Table 13: A comparison of the DSEWPac survey guidelines for the target species and the survey methods used in this survey

SPECIES	DSEWPAC GUIDELINES		ELA 2012 SURVEY	JUSTIFICATION FOR DEVIATION
	METHOD	EFFORT		
Bird species				
Australasian Bittern (<i>Botaurus poiciloptilus</i>)	Observation of targeted foraging habitat within wetlands in the early morning or early evening. Detection by sightings and unsolicited calls. Area searches in suitable habitat for sightings, nests, indicative footprints and feathers.	Not specified	None	No suitable densely vegetated wetlands were encountered during the 2012 field survey.

SPECIES	DSEWPAC GUIDELINES		ELA 2012 SURVEY	JUSTIFICATION FOR DEVIATION
	METHOD	EFFORT		
Eastern Partridge Pigeon (<i>Geophaps smithii smithii</i>)	Area searches or transect surveys	20 hours over five days per 50 ha	No specific area searches were conducted, although area searches for the Northern Crested Shrike-tit were undertaken in the Beswick region near waterholes and (approx. 32 person hours/5 days). Incidental observations whilst deploying remote cameras and hair tubes along a 1.5 km transect. Incidental observations occurred over approximately 20 hours (2 hours per site).	Survey effort focused on finding and watching waterholes as the most effective survey method in the late dry season. Incidental observations were undertaken to increase survey coverage
	Flushing surveys	15 hours over five days	No specific area searches were conducted, although a large area was traversed during the survey.	Survey effort focused on finding and watching waterholes as the most effective survey method in the late dry season.
	Targeted searches	20 hours over 10 days	Target searches and watches at waterholes late in the dry – 22 person hours over 6 days	Complies with guidelines for the area targeted.
Gouldian Finch (<i>Erythrura gouldiae</i>)	Target searches and watches at waterholes late in the dry	12 hours over four days	Target searches and watches at waterholes late in the dry – 22 person hours over 6 days	Complies with guidelines for the area targeted.

SPECIES	DSEWPAC GUIDELINES		ELA 2012 SURVEY	JUSTIFICATION FOR DEVIATION
	METHOD	EFFORT		
Gouldian Finch (<i>Erythrura gouldiae</i>)	Area searches	20 hours over five days per 50 ha	No specific area searches were conducted, although a large area was traversed while identifying late dry season waterholes, and conducting broadcast surveys for Northern Crested Shrike-tits.	Survey effort focused on finding and watching waterholes as the most effective survey method in the late dry season.
Northern Crested Shrike-tit (<i>Falcunculus frontatus whitei</i>)	Broadcast surveys	Four hours over three days	Total effort of 10.25 hours over 5 days.	Complies with guidelines for the area targeted.
Australian Painted Snipe (<i>Rostratula australis</i>)	Targeted stationary observations	10 hours over five days	Incidental observations along a 1.5 km transect whilst deploying remote cameras and hair tubes over six days. Bird survey around water holes in the Beswick region over five days. 22 person hours	Complies with guidelines for the area targeted, although habitat at many waterholes was marginal.
	Land-based area searches or line transects	10 hours over three days per 50 ha	Incidental observations along a 1.5 km transect whilst deploying remote cameras and hair tubes over six days Bird survey around water holes in the Beswick region. 22 person hours	Surveys were conducted over an area greater than 50 ha due to the size of the survey area and logistics.

SPECIES	DSEWPAC GUIDELINES		ELA 2012 SURVEY	JUSTIFICATION FOR DEVIATION
	METHOD	EFFORT		
Northern Masked Owl (<i>Tyto novaehollandiae kimberli</i>)	Broadcast surveys	8 hours over four days	Broadcast survey at sites 11 and 15 in the Beswick region. At each site the call of Masked Owl was broadcast for approximately 5 minutes, followed by 5-10 minutes listening, then repeated.	The Northern Masked Owl has not been recorded along the pipeline route. Nevertheless, some effort was applied to illicit a response from Northern Masked Owl, should they occur.
Mammal species				
Northern Quoll (<i>Dasyurus hallucatus</i>)	Cage trapping, Elliott trapping	Three nights (minimum of four cage traps)	None	Given the extent and remoteness of the site, use of cage and/or Elliott traps in suitable habitat was not possible. Effort was put into remote camera surveys instead.
	Additional or complementary techniques:			
	Daytime searches for suitable habitat resources, latrines and tracks. Sand traps.	Two hours for every one hectare stratified survey site within the area (for a five hectare site)	None	No areas of broadly suitable habitat (outcropping rock in association with permanent water with no evidence of recent fires) were visited during the surveys

SPECIES	DSEWPAC GUIDELINES		ELA 2012 SURVEY	JUSTIFICATION FOR DEVIATION
	METHOD	EFFORT		
Northern Quoll (<i>Dasyurus hallucatus</i>)	Spotlight surveys	Two 200 metre transects per 5 hectare site	Nocturnal spotlighting surveys were conducted at six sites over five nights. Each survey lasted for between one and two and a quarter hours (a total of 25.5 person hours of effort)	Complies with guidelines for the area targeted.
	Remote cameras	Approximately 10 cameras per hectare, set for at least 14 nights.	Four cameras at nine sites along a 1.5 km transect set for 14 consecutive nights	Remote cameras were used in combination with hair tubes. With only a limited amount of space available in the helicopter for equipment, we used a combination of techniques to increase the number of sites surveyed.
	Hair tubes	For a site up to 5 hectares, at least three sites should be used with 20 devices per site open for 14 consecutive nights.	10 traps each at 10 sites, set for 14 consecutive nights.	Hair tubes were used in combination with remote cameras. With only a limited amount of space available in the helicopter for equipment, we used a combination of techniques to increase the number of sites surveyed.
	Consultation	Consult with communities to locate the species	Consulted with ranger groups, government agencies and experts – no observations of the Northern Quoll were reported	Complies with guidelines for the area targeted.

SPECIES	DSEWPAC GUIDELINES		ELA 2012 SURVEY	JUSTIFICATION FOR DEVIATION
	METHOD	EFFORT		
Golden Bandicoot (<i>Isoodon auratus auratus</i>)	Daytime searches for suitable habitat, and signs of activity.	Two hours for every one hectare stratified survey site within the area (for a five hectare site)	Incidental observations along a 1.5 km transect whilst deploying remote cameras and hair tubes	Effort was put into spotlight surveys and remote cameras.
	Collection and analysis of predator scats	Two hours for every one hectare stratified survey site within the area (for a five hectare site)	None	Effort was put into spotlight surveys and remote cameras.
	Soil plot survey	Two hours for every one hectare stratified survey site within the area (for a five hectare site)	None	Effort was put into spotlight surveys and remote cameras.
	Spotlight survey	Two 200 metre transects per 5 hectare site	Nocturnal spotlighting surveys were conducted at six sites over five nights in the Beswick region. Each survey lasted for between one and two and a quarter hours (a total of 25.5 person hours of effort)	Complies with guidelines for the area targeted.
	Remote cameras	Approximately 10 cameras per hectare, set for at least 14 nights.	Four cameras at nine sites along a 1.5 km transect set for 14 consecutive nights	A combination of survey techniques were used.
Northern Brush-tailed Phascogale (<i>Phascogale pirata</i>)	Daytime searches for potential nest sites	Two hours for every one hectare stratified survey site within the area (for a five hectare site)	Incidental observations along a 1.5 km transect whilst deploying remote cameras and hair tubes	Effort was put into spotlight surveys and remote cameras.

SPECIES	DSEWPAC GUIDELINES		ELA 2012 SURVEY	JUSTIFICATION FOR DEVIATION
	METHOD	EFFORT		
Northern Brush-tailed Phascogale (<i>Phascogale pirata</i>)	Daytime searches for signs of activity	Two hours for every one hectare stratified survey site within the area (for a five hectare site)	Incidental observations along a 1.5 km transect whilst deploying remote cameras and hair tubes	Effort was put into spotlight surveys and remote cameras.
	Stagwatching surveys	Commence survey 30 minutes before dusk and continue 60 minutes after sunset.	None	Effort was put into spotlight surveys and remote cameras.
	Spotlight survey	Two 200 metre transects per 5 hectare site	Nocturnal spotlighting surveys were conducted at six sites over five nights in the Beswick region. Each survey lasted for between one and two and a quarter hours (a total of 25.5 person hours of effort)	Complies with guidelines for the area targeted.
	Hair sampling	For a site up to 5 hectares, at least three sites should be used with 20 devices per site open for 14 consecutive nights.	10 traps each at 10 sites, set for 14 consecutive nights.	Hair tubes were used in combination with remote cameras. With only a limited amount of space available in the helicopter for equipment, we used a combination of techniques to increase the number of sites surveyed.

SPECIES	DSEWPAC GUIDELINES		ELA 2012 SURVEY	JUSTIFICATION FOR DEVIATION
	METHOD	EFFORT		
Northern Brush-tailed Phascogale (<i>Phascogale pirata</i>)	Arboreal trapping – Elliott B traps	10 Elliott B traps oriented in two parallel lines of five traps, erected 2-4 m above the ground on a secure platform, and spaced at 50 m intervals. Traps set for four consecutive nights	None	Given the extent and remoteness of the site, use of or Elliott traps in suitable habitat was not possible. Effort was put into other survey techniques
	Remote cameras	10 cameras per hectare, set for at least 14 nights.	Four cameras at nine sites along a 1.5 km transect set for 14 consecutive nights	Remote cameras were used in combination with hair tubes. With only a limited amount of space available in the helicopter for equipment, we used a combination of techniques to increase the number of sites surveyed.
	Consultation	Consult with communities to locate the species	Consulted with ranger groups, government agencies and experts – no observations were reported	Complies with guidelines for the area targeted.
Brush-tailed Tree Rat (<i>Conilurus penicillatus</i>)	Daytime searches for potentially suitable habitat resources	Two hours for every one hectare stratified survey site within the area (for a five hectare site)	Incidental observations along a 1.5 km transect whilst deploying remote cameras and hair tubes	Effort was put into spotlight surveys.

SPECIES	DSEWPAC GUIDELINES		ELA 2012 SURVEY	JUSTIFICATION FOR DEVIATION
	METHOD	EFFORT		
Brush-tailed Tree Rat (<i>Conilurus penicillatus</i>)	Cage and Elliott trapping programs	Ten cage traps oriented in two parallel lines of five traps, spaced at 50 m intervals. Cages set for four consecutive nights 20 Elliott A traps oriented in two parallel lines of ten traps, spaced at 10 m intervals. Distance between the two parallel lines is 25 m. Traps set for four consecutive nights	None	Given the extent and remoteness of the site, use of cage and/or Elliott traps in suitable habitat was not possible.
	Spotlight surveys	Two 200 metre transects per 5 hectare site	Nocturnal spotlighting surveys were conducted at six sites over five nights. Each survey lasted for between one and two and a quarter hours (a total of 25.5 person hours of effort)	Complies with guidelines for the area targeted.

7.5.8 Gouldian Finch resource survey

To investigate habitat resources that may be important for the flocks of Gouldian Finches observed during the 2012 survey, helicopter transects were run over the area surrounding the observation. The helicopter survey flew nine, 10 km transects, 1 km apart with two observers estimating the location and size of waterholes and/or suitable breeding habitat patches. Nine transects were completed with the available fuel (results are resented in section 8.2.6).

7.6 SUMMARY OF FIELD SURVEY TECHNIQUES APPLIED AT SITES

Table 14 summarises the field survey techniques applied per site.

Table 14: Summary of survey techniques used at 2012 sites

SITE	KP	SURVEY TECHNIQUES
1	162.6	Remote cameras, hair tubes, incidental observations
2	210	Remote cameras, hair tubes, incidental observations
3	260	Remote cameras, hair tubes, incidental observations
4	360.9	Remote cameras, hair tubes, incidental observations
5	370.4	Remote cameras, hair tubes, incidental observations
6	385.5	Remote cameras, hair tubes, incidental observations
7	394	Remote cameras, hair tubes, incidental observations
8 (Site 2, 2004)	497.3	Remote cameras, hair tubes, incidental observations
9	518	Remote cameras, hair tubes, incidental observations
10 (Site 1, 2004)	581	Hair tubes, incidental observations
11	116	Dawn bird survey, spotlighting, Masked Owl broadcast survey
12	117.5	Dawn and evening bird surveys, spotlighting
13	110.7	Dawn bird survey
14	122.7	Evening bird survey
15	100.8	Dawn and evening bird surveys, spotlighting, Masked Owl broadcast survey
16	107.9	Dawn bird survey
17	108.6	Dawn bird survey
18	104.8	Dawn bird survey
19	106.8	Dawn bird survey

SITE	KP	SURVEY TECHNIQUES
20	109	Dawn bird survey
21	108.3	Dawn bird survey
22	101.8	Dawn bird survey, spotlighting
23	92	Daytime bird survey
Broadcast 1	114	Northern Crested Shrike-tit broadcast survey
Broadcast 2	112.6	Northern Crested Shrike-tit broadcast survey
Broadcast 3	119.7	Northern Crested Shrike-tit broadcast survey
Broadcast 4	121.4	Northern Crested Shrike-tit broadcast survey
Broadcast 5	101.7	Northern Crested Shrike-tit broadcast survey
Broadcast 6	103.7	Northern Crested Shrike-tit broadcast survey
Broadcast 7	94.5	Northern Crested Shrike-tit broadcast survey
Broadcast 8	93.5	Northern Crested Shrike-tit broadcast survey
Broadcast 9	92	Northern Crested Shrike-tit broadcast survey
Broadcast 10	101	Northern Crested Shrike-tit broadcast survey
Broadcast 11	41.5	Northern Crested Shrike-tit broadcast survey
Broadcast 12	40.3	Northern Crested Shrike-tit broadcast survey

7.7 LIMITATIONS

Most of the pipeline corridor was surveyed using passive methodology (remote cameras and hair tubes). Relying on passive techniques in remote sites has logistical advantages, but can bias the range of species recorded. Remote cameras can fail to record reptiles and amphibians at night when body temperatures are not sufficiently different from ambient temperatures, and cameras monitor only part of the environment. Species that occur outside of this space (e.g., birds that utilise tree tops) are not detected. Results from hair tube surveys are specialised, detecting only mammals of a particular size range with dietary preferences that lead them to investigate the bait.

Incidental observations of birds were made while deploying passive equipment. These observations were not targeted toward an optimal location and were not undertaken during peak activity periods of birds early morning and late afternoon.

8 2012 fauna survey results

8.1 VEGETATION COMMUNITIES AND FAUNA HABITAT

A brief description of the vegetation and habitat features at each site surveyed is provided in Table 15. Locations of sites are provided at Figure 7, Figure 8 and Figure 9.

Table 15: Vegetation communities at 2012 survey sites

SITE	KP	HABITAT DESCRIPTION
Site 1	162.6	<i>Eucalyptus phoenicea</i> woodland to 10m over grassland. Unburnt. 30% sandstone rock cover, 60% litter cover, 10% grass cover. Mid strata mostly dead from previous years fire. Site along plateau edge.
Site 2	210	Mainoru River. Ecotone between riparian corridor and low hills. Low hills with <i>Eucalyptus tectifica</i> and <i>Corymbia confertiflora</i> woodland over grassland. Patchily burnt. 50% bare, 20% small boulder cover, 20% litter, 10% grass cover. Riparian corridor with <i>Melaleuca cajuputi</i> and <i>M. viridiflora</i> open forest over mixed species shrubland with <i>Cathormion umbellatum</i> and <i>Barringtonia acutangula</i> .
Site 3	260	Wilton River. River levees with <i>Corymbia bella</i> and <i>Casuarina cunninghami</i> open forest over <i>Barringtonia acutangula</i> and <i>Flueggea virosa</i> shrubs. <i>Melaleuca leucadendra</i> and <i>Pandanus aquaticus</i> along river bank. Heavily grazed by buffalo. Clay loam soils.
Site 4	360.9	Goyder River. Ecotone between riparian corridor and woodland. Riparian corridor with <i>Melaleuca leucadendra</i> tall open forest over <i>Pandanus aquaticus</i> . Woodland with <i>Eucalyptus tetradonta</i> and <i>E. miniata</i> woodland with some <i>Callitris intratropica</i> .
Site 5	370.4	Woodland around billabong. <i>Eucalyptus tetradonta</i> , and <i>E. miniata</i> woodland over cycads and <i>Sorghum intrans</i> and <i>Chrysopogon fallax</i> grasses. Unburnt this year but evidence of previous hot fires. Deep sandy loam soils
Site 6	385.5	Billabong fringe. <i>Melaleuca viridiflora</i> , <i>M. cajuputi</i> and <i>Syzygium eucalyptoides</i> woodland over mixed species shrubland including <i>Grevillea pungens</i> and <i>Verticordia</i> sp over <i>Dapsilanthus</i> sedgeland. Deep sandy loam soil. Unburnt.
Site 7	394	Tall <i>E. tetradonta</i> woodland with some <i>E. miniata</i> , understory was dominated by emerging Eucalypt sp with some <i>Bossiaea bossiaeoidea</i> and <i>Pandanus spiralis</i>
Site 8 (Site 2, 2004)	497.3	<i>Eucalyptus tetradonta</i> and <i>E. miniata</i> woodland over <i>Livistonia inermis</i> open shrubland over <i>Sorghum</i> grassland. Unburnt. Sandy laterite soil.
Site 9	518	Stony laterite rises with <i>Eucalyptus tetradonta</i> woodland over <i>Livistonia inermis</i> shrubland. Margins of <i>Melaleuca viridiflora</i> open forest swamp and drainage line. Traps placed along boundary of recently burnt area.

SITE	KP	HABITAT DESCRIPTION
Site 10 (Site 1, 2004)	581	Riparian forest corridor along Latram River. Open forest with <i>Alphitonia excelsa</i> , <i>Syzygium</i> sp, and <i>Melaleuca</i> sp over mixed species vine thicket. Narrow corridor of riparian vegetation adjacent to recently burnt open woodland.
Site 11		Small waterhole in rocky creek bed.
Site 12	116	Woodland with water in creekline. <i>Lophostemon</i> and ghost gum. <i>Eucalyptus tectifica</i> , <i>Corymbia latifolia</i> and <i>C. clavigera</i> on hillsides. Mid strata <i>Terminalia canescens</i> and <i>T. carpenteriae</i> . Spinifex understory on hillsides, <i>Heteropogon contortus</i> burnt this year on flats. Red clay soils, stony hills.
Site 13	117.5	Mud pool near breakaways. <i>Acacia shirleyi</i> forest nearby and smooth barked <i>Corymbia</i> near pool.
Site 14	110.7	Creek and billabong with running water
Site 15	122.7	Large long waterhole with fringing vegetation consisting of <i>Eucalyptus camaldulensis</i> and scattered <i>Pandanus aquaticus</i> . Open <i>Eucalyptus tetradonta</i> and <i>E. miniata</i> woodland adjacent
Site 16	100.8	Scattered billabongs with <i>Melaleuca viridiflora</i> , <i>Pandanus aquaticus</i> and scattered <i>Eucalyptus camaldulensis</i> around billabongs and <i>Eucalyptus tectifica</i> woodlands on plains. Clay soil.
Site 17	107.9	Riparian <i>Melaleuca viridiflora</i> and <i>E. camaldulensis</i> open woodland
Site 18	108.6	Waterhole with dense <i>Pandanus</i> sp. border.
Site 19	104.8	Small pool on river bed riparian zone, dominated by <i>Barringtonia acutangula</i> with scattered <i>Eucalyptus camaldulensis</i> , <i>Melaleuca viridiflora</i> and <i>Pandanus aquaticus</i> .
Site 20	106.8	Large waterhole in bottom of depression and dry creek bed
Site 21	109	<i>Corymbia arafurica</i>
Site 22	108.3	Riparian <i>Melaleuca viridiflora</i> and <i>E. camaldulensis</i> open woodland with some <i>Pandanus</i> sp.
Site 23	92	Open wetland
Broadcast survey 1	114	<i>Eucalyptus tectifica</i> , <i>Corymbia latifolia</i> , <i>Melaleuca viridiflora</i> , <i>Erythrophleum chlorostachys</i> . <i>Petalostigma pubescens</i> understory. Burnt this year.
Broadcast survey 2	112.6	<i>Melaleuca viridiflora</i> and <i>Eucalyptus tectifica</i> woodland.
Broadcast survey 3	119.7	<i>Eucalyptus pruinosa</i> , <i>Erythrophleum chlorostachys</i> and <i>Corymbia latifolia</i> over patchy burnt grassland.
Broadcast survey 4	121.4	<i>Eucalyptus tectifica</i> and <i>Corymbia bella</i> woodland.
Broadcast survey 5	101.7	<i>Eucalyptus tectifica</i> and <i>Corymbia latifolia</i> woodland.

SITE	KP	HABITAT DESCRIPTION
Broadcast survey 6	103.7	<i>Eucalyptus tectifica</i> , <i>Corymbia latifolia</i> , <i>Erythrophleum chlorostachys</i> with some <i>Eucalyptus miniata</i> .
Broadcast survey 7	94.5	<i>Eucalyptus tectifica</i> woodland with <i>Corymbia bleeseri</i> , <i>C. latifolia</i> and <i>E. grandiflora</i> over patchy burnt grassland. Clay loam soil.
Broadcast survey 8	93.5	<i>Eucalyptus tectifica</i> , <i>Corymbia latifolia</i> and <i>Erythrophleum chlorostachys</i> woodland.
Broadcast survey 9	92	<i>Eucalyptus tectifica</i> woodland with <i>Corymbia latifolia</i> .
Broadcast survey 10	101	<i>Melaleuca viridiflora</i> , <i>Eucalyptus tectifica</i> , <i>Erythrophleum chlorostachys</i> and <i>Eucalyptus ferruginea</i> over <i>Petalostigma pubescens</i> .
Broadcast survey 11	41.5	<i>Eucalyptus tectifica</i> , <i>E. latifolia</i> and <i>Erythrophleum chlorostachys</i> woodland. Denser and older trees than other sites.
Broadcast survey 12	40.3	<i>Eucalyptus latifolia</i> and <i>Melaleuca viridiflora</i> woodland, and <i>Corymbia bleeseri</i> , <i>Eucalyptus tetrodonta</i> and <i>E. miniata</i> woodland.

8.2 FAUNA RECORDED

8.2.1 Remote cameras

Remote cameras recorded the presence of 22 species that could confidently be identified (one gecko and one skink could not be identified to species) across the 9 camera sites, including one EPBC listed migratory species (Cattle Egret), but no EPBC Act or NT listed threatened species (Table 16, Figure 13). Camera images of all species are presented in Appendix E. Vegetation and habitat type present at each site is provided in Table 15.

Table 16: Fauna recorded by remote cameras during 2012 survey.

Species (Threatened status)	Site								
	1	2	3	4	5	6	7	8	9
Birds									
Australian White Ibis (<i>Threskiornis molucca</i>)		X							
Bar-shouldered Dove (<i>Geopelia humeralis</i>)		X							
Blue-winged Kookaburra (<i>Dacelo leachii</i>)									X
Cattle Egret (<i>Ardea ibis</i>) - EPBC Act migratory									X
Pheasant Coucal (<i>Centropus phasianinus</i>)				X					
Straw-necked Ibis (<i>Threskiornis spinicollis</i>)									X



Figure 13: Cattle Egret (*Ardea ibis*) and Swamp Buffalo (*Bubalus bubalis*) captured by remote camera at site 9, a bait holder is attached to a tree trunk in the foreground

Species (Threatened status)	Site								
	1	2	3	4	5	6	7	8	9
Birds									
Torresian Crow (<i>Corvus orru</i>)		X	X		X	X		X	
Whistling Kite (<i>Haliastur sphenurus</i>)								X	
Mammals									
Agile Wallaby (<i>Macropus agilis</i>)		X	X	X	X			X	X
Antilopine Wallaroo (<i>Macropus antilopinus</i>)									X
Common Brush-tailed Possum (<i>Trichosurus vulpecula</i>)					X				
Common Wallaroo (<i>Macropus robustus</i>)	X								
Dingo (<i>Canis lupus dingo</i>)	X		X	X					X
Grassland Melomys (<i>Melomys burtoni</i>)						X			
Northern Brown Bandicoot (<i>Isodon macrourus</i>)				X		X			
Reptiles									
<i>Cryptoblepharus</i> sp.						X			
Gecko sp.		X							
Spotted Tree Monitor (<i>Varanus scalaris</i>)						X			
Introduced species									
Black Rat (<i>Rattus rattus</i>)			X						
Cane Toad (<i>Rhinella marina</i>)		X				X			
Cattle (<i>Bos taurus</i>)		X		X					
Feral Cat (<i>Felis catus</i>)		X	X	X	X	X	X	X	X
Feral Pig (<i>Sus scrofa</i>)		X		X	X			X	X
Swamp Buffalo (<i>Bubalus bubalis</i>)		X	X	X					X

All of the equipment functioned except one camera that only captured images between 2:00 and 3:00 am (site 2). All bird, mammal and amphibian images were confidently identified to species, one skink (*Cryptoblepharus* sp) and one gecko could not be identified.

8.2.2 Hair tubes

One hair tube (out of 100) secured a hair sample (site 10). It was identified as coming from a Northern Brown Bandicoot (*Isodon macrourus*).

8.2.3 Bird surveys

Targeted surveys and incidental observations identified 130 bird species, which included two species listed as threatened under the EPBC Act, eight EPBC migratory species and one species of NT conservation significance (Table 17). No introduced species were recorded. The full list of species recorded at each site is provided in Appendix F.

Table 17: Bird species of conservation significance recorded during 2012 surveys.

BIRD SPECIES RECORDED	EPBC ACT CLASSIFICATION	SITES
Cattle Egret (<i>Ardea ibis</i>)	Migratory	9
Derby White-browed Robin (<i>Poecilodryas superciliosa cerviniventris</i>)	Migratory	3
Eastern Great Egret (<i>Ardea modesta</i>)	Migratory	12, 14, 16, 22, 23
Glossy Ibis (<i>Plegadis falcinellus</i>)	Migratory	5, 23
Gouldian Finch (<i>Erythrura gouldiae</i>)	Endangered, migratory (NT vulnerable)	12
Melville Cicadabird (<i>Coracina tenuirostris melvillensis</i>)	Migratory	5, 7, 8, 11, 13
Northern Crested Shrike-tit (<i>Falcunculus frontatus whitei</i>)	Vulnerable, migratory	Broadcast survey 11
Rainbow Bee-eater (<i>Merops ornatus</i>)	Migratory	1, 5, 8, 12, 14, 15, 16, 17, 18, 19, 20, 22, 23. The species was also observed while conducting broadcast surveys 1, 2, 8, 9, 10, 11

The bird species most commonly recorded during the survey were species common throughout the Top End including: Blue-winged Kookaburra (*Dacelo leachii*), Little Friarbird (*Philemon citreogularis*), Peaceful Dove (*Geopelia striata*), Red-winged Parrot (*Aprosmictus erythropterus*), Silver-crowned Friarbird (*Philemon argenticeps*), Torresian Crow (*Corvus orru*) and White-throated Honeyeater (*Melithreptus albogularis*).

Gouldian Finches were observed at site 12 between six and seven am on 12 and 13 November. On 12 November the species was observed drinking from a small, shallow, muddy pool adjacent to a larger spring fed pool (the flock conservatively estimated to be 200 birds, Figure 14, Figure 15 and Figure 16). Gouldian Finches may also forage amongst grasses adjoining the waterhole.

On 13 November a flock of 400 individuals was observed drinking at the same pool (Figure 17) and another 100 were observed at another small pool ~100 m along the same creek line (Figure 18). Flocks were made up of approximately 60% immature/moulting individuals, 25% adult females and 15% adult males (Figure 19). On both days the Gouldian Finch was flighty, nervous and easily disturbed. Once they had finished drinking and feeding, flocks headed south east of the waterbody across a flat plain towards rocky hills. The birds did not all depart at once but in discrete flocks. The flock that departed the waterhole first was the largest, followed by diminishing flock sizes.

Other bird species drinking and perching alongside the Gouldian Finch at site 12 were - Masked Finch (*Poephila personata*), Long-tailed Finch (*Poephila acuticauda*), Double-barred Finch (*Taeniopygia bichenovii*), Banded Honeyeater (*Cissomela pectoralis*), Peaceful Dove (*Geopelia striata*) and White-winged triller (*Lalage sueurii*). In addition bird species observed in the area included Crimson Finch (*Neochmia ruficauda*), Rufous-throated Honeyeater (*Conopophila rufogularis*), Striated Pardalote (*Pardalotus striatus*), Little Friarbird (*Philemon citreogularis*), Blue-faced Honeyeater (*Entomyzon cyanotis*) and Hooded Parrot (*Psephotus dissimilis*) (Figure 20). No inter-species aggression was observed.

The two sites Gouldian Finches were recorded during the 2004 survey were re-visited, but no finches were observed (sites 4B1 and 4C1, EcOz 2004b). The sites were on a low rocky hill of *Eucalyptus tintinans* with suitable hollows, typical of Gouldian Finch breeding habitat (Figure 21 and Figure 22). Several small hollows were inspected for evidence of nesting activity, however, no evidence was found; although this does not preclude the possibility that the Gouldian Finch uses this habitat for breeding. The sites are typical breeding habitat and the 2004 survey was conducted during the breeding season (May), while the 2012 survey was outside the breeding season.



Figure 14: Shallow muddy pool where Gouldian Finches were observed drinking



Figure 15: Larger spring fed pool adjacent to pool used by Gouldian Finches



Figure 16: Adult and juvenile Gouldian Finch foraging in grass adjacent to muddy pool



Figure 17: Silhouette of large Gouldian Finch flock



Figure 18: Pool where a flock of approximately 100 Gouldian Finches were observed drinking



Figure 19: Flock of mixed adult and juvenile / moulting individuals

8.2.4 Broadcast surveys

Two Northern Crested Shrike-tit were heard calling in response to a call broadcast on 15 November. Despite searches in the vicinity of the response, the individuals were not seen. Both individuals were recorded in *Eucalyptus tectifica*, *Corymbia latifolia* and *Erythrophleum chlorostachys* woodland directly adjacent to the Central Arnhem Highway and a powerline easement (Figure 23, Figure 24). The Northern Crested Shrike-tit was recorded (broadcast survey site 11) in woodland that was denser and comprised of older trees compared to sites where the species was not recorded during this survey. No responses from Marked Owls were recorded.

8.2.5 Spotlight surveys

Spotlight surveys identified 10 amphibian species (including the introduced Cane Toad), five bird and 11 reptile species, none of which are threatened or migratory species (Table 18).

Table 18: Species recorded during nocturnal spotlighting surveys during the 2012 study.

CATEGORY	SPECIES RECORDED
Amphibian	Copland's Rock Frog (<i>Litoria coplandi</i>)
	Giant Frog (<i>Litoria australis</i>)
	Green Tree-frog (<i>Litoria caerulea</i>)
	Ornate Burrowing Frog (<i>Platyplectrum ornatus</i>)
	Northern Dwarf Tree-frog (<i>Litoria bicolor</i>)
	Red Tree-frog (<i>Litoria rubella</i>)
	Rockhole Frog (<i>Litoria meiriana</i>)
	Wotjulum Frog (<i>Litoria wotjulumensis</i>)
Bird	Australian Owlet-nightjar (<i>Aegotheles cristatus</i>)
	Bush Stone-curlew (<i>Burhinus grallarius</i>)
	Rufous Whistler (<i>Pachycephala rufiventris</i>)
	Southern Boobook (<i>Ninox novaeseelandiae</i>)
	Tawny Frogmouth (<i>Podargus strigoides</i>)
Reptile	Bynoe's Gecko (<i>Heteronotia binoe</i>)
	Children's Python (<i>Antaresia childreni</i>)
	Freshwater Crocodile (<i>Crocodylus johnstoni</i>)
	Gilbert's Dragon (<i>Lophognathus gilberti</i>)
	Green Tree Snake (<i>Dendrelaphis punctulata</i>)



Figure 20: Gouldian and Long-tailed Finches perching with White-winged Trillers



Figure 21: Rocky hillside with *Eucalyptus tintinans* (EcOz 2004b, site 4)



Figure 22: *Eucalyptus tintinans* with hollows suitable for Gouldian Finch nesting



Figure 23: *Eucalyptus tectifica*, *Corymbia latifolia* and *Erythrophleum chlorostachys* woodland



Figure 24: Powerline easement and Central Arnhem Highway (left) through Northern Crested Shrike-tit habitat

CATEGORY	SPECIES RECORDED
Reptile	Green Tree Snake (<i>Dendrelaphis punctulata</i>)
	Northern Dtella (<i>Gehyra australis</i>)
	Northern Spotted Rock Dtella (<i>Gehyra nana</i>)
	Olive Python (<i>Liasis olivaceus</i>)
	Smooth-Tailed Skink (<i>Glaphyromorphus isolepis</i>)
	Spotted Tree Monitor (<i>Varanus scalaris</i>)
	Two-Spined Rainbow Skink (<i>Carlia amax</i>)
Introduced species	Cane Toad (<i>Rhinella marina</i>)

Incidental observations

Several species were recorded during exploration of the survey area, outside of specific survey sites. Four bird species, four reptile and one amphibian species were recorded opportunistically that were not recorded in other surveys (Table 19). None of these species are listed under the EPBC Act or NT legislation.

Table 19: Species recorded opportunistically during 2012 survey.

CATEGORY	SPECIES RECORDED
Amphibian	Ornate Burrowing Frog (<i>Platyplectrum ornatus</i>)
Bird	Australian Owlet-nightjar (<i>Aegotheles cristatus</i>)
	Chestnut-backed Button-quail (<i>Turnix castanotus</i>)
	Tawny Frogmouth (<i>Podargus strigoides</i>)
Reptile	Plain Ctenotus (<i>Ctenotus inornatus</i>)
	Robust Dragon (<i>Diporiphora benetti</i>)
	Northern Ridge-tailed Monitor (<i>Varanus primordius</i>)

Introduced species

Introduced fauna were identified across the surveyed area either directly or via other evidence (Figure 25). These species were:

- Cane Toad (*Rhinella marina*).
- Black Rat (*Rattus rattus*).
- Cattle (*Bos taurus*).
- Donkey (*Equus asinus*).

- Feral Cat (*Felis catus*).
- Feral Pig (*Sus scrofa*).
- Swamp Buffalo (*Bubalus bubalis*).

Some of these species contribute to key threatening process that threatened the existence of native fauna via predation and habitat modification. Feral Cats were detected on 25% of remote cameras, and Cane Toad adults and larvae were common along the pipeline route.

8.2.6 Gouldian Finch resource survey

During aerial transect surveys, no flowing streams were observed although streambeds, had pools of water of various sizes. Scattered hilltops with salmon gums were observed, including a fairly extensive area to the south east of the waterhole at KP 104 (Figure 26).

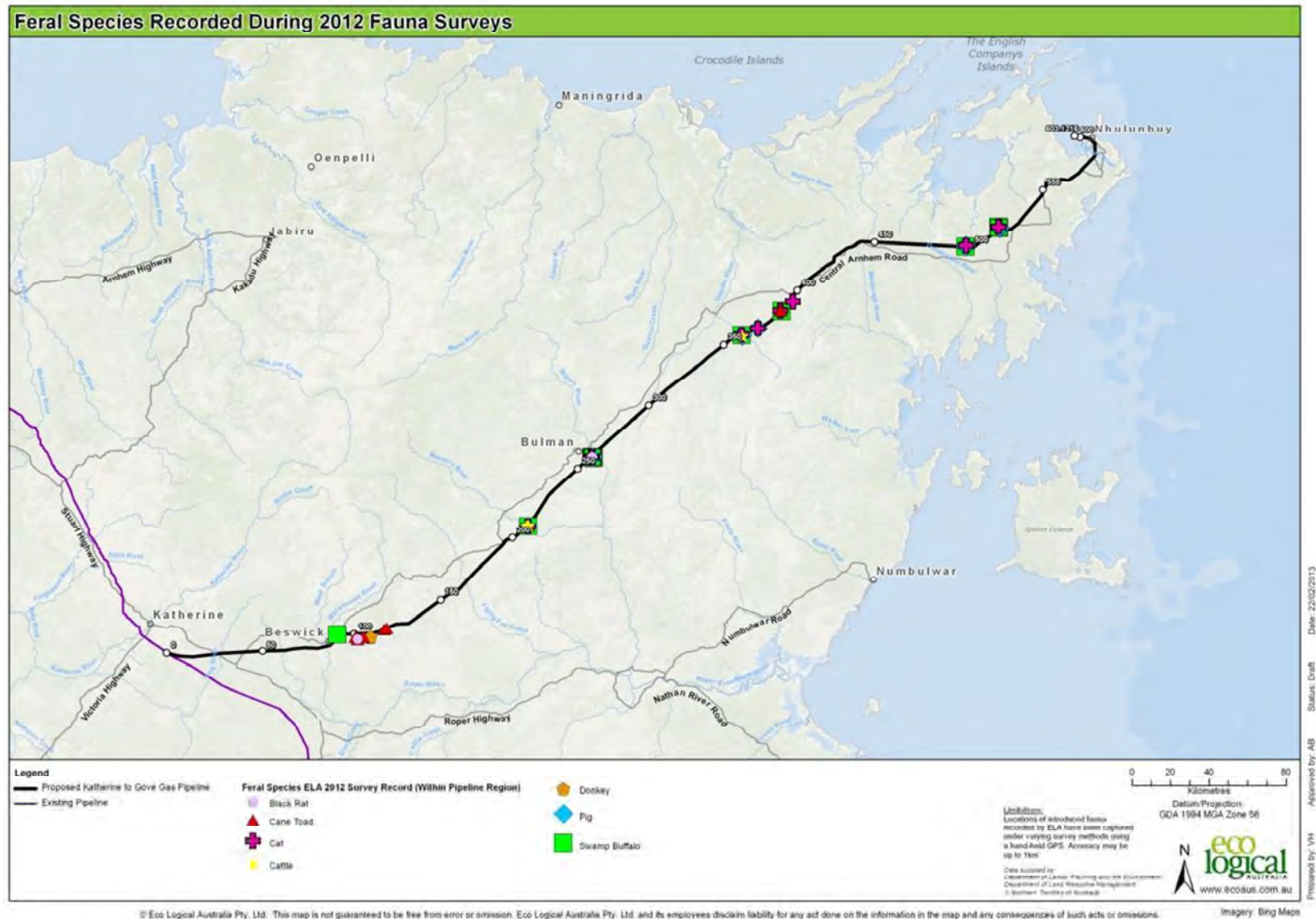


Figure 25: Introduced fauna recorded during the 2012 survey

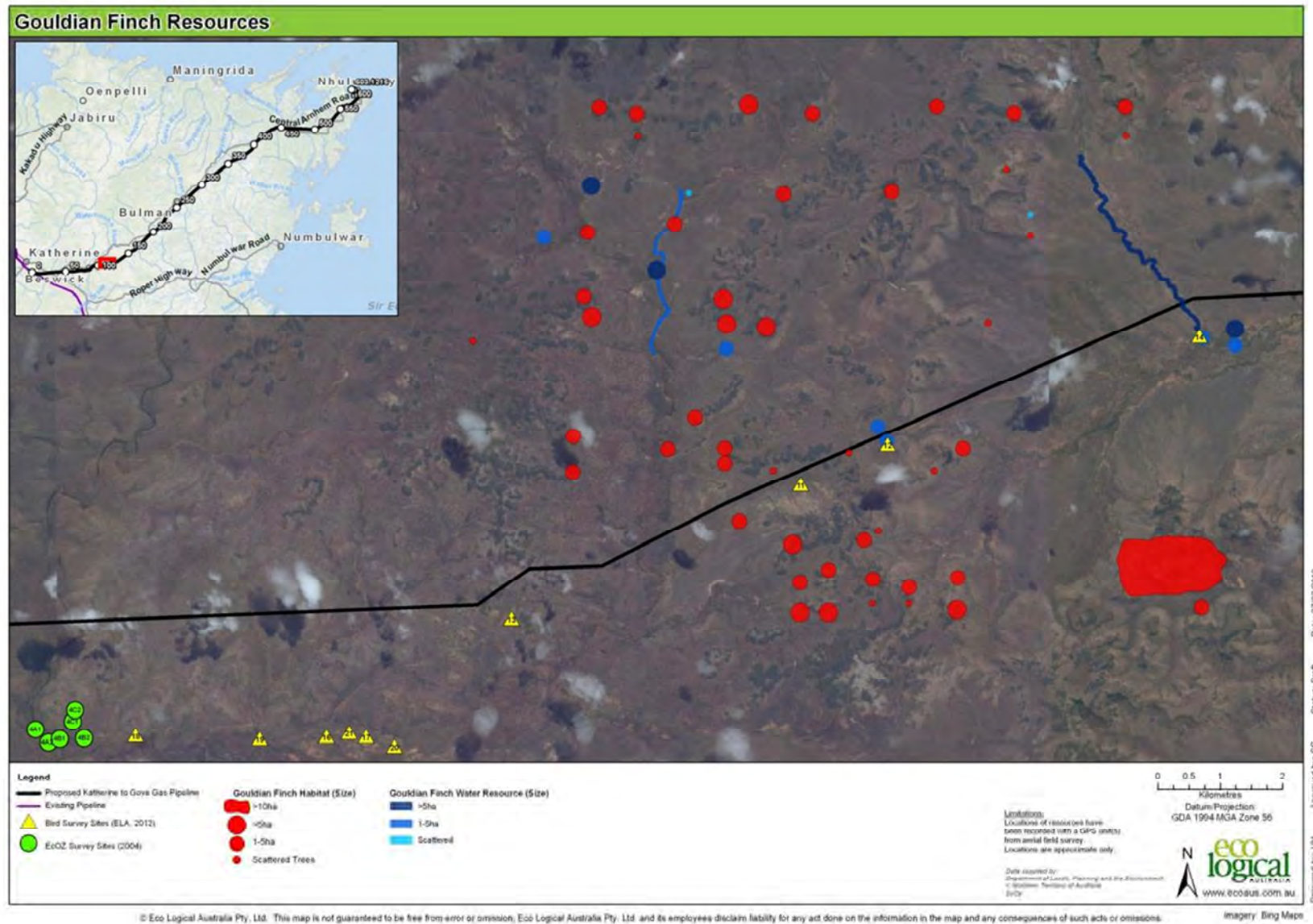


Figure 26: Gouldian Finch resources recorded during the 2012 survey

Section C: Synthesis of findings from 2004 and 2012 fauna surveys

9 Fauna conservation values of the KGGP corridor

The KGGP project was declared a “controlled action” under the EPBC Act on the basis of potential impacts to listed threatened species, ecological communities and migratory species. Terrestrial fauna surveys of the KGGP were conducted in 2004 (EcOz 2004b) and 2012 (Eco Logical Australia) to inform the EIS for the project.

The 2004 survey comprised an intensive trapping program implemented at three sites at the eastern- and western-most ends of the corridor (EcOz 2004b). The 2012 survey used less intensive methods over a longer period at 23 sites along the corridor and targeted surveys for specific threatened birds at the eastern end of the pipeline.

9.1 FAUNA SPECIES RECORDED

A combined total of 222 native fauna species (18 amphibians, 146 birds, 16 mammals, and 42 reptiles) and 9 feral species were recorded during the 2004 and 2012 fauna surveys (Appendix G). Ten EPBC Act listed endangered, vulnerable or migratory species and one NT listed species were recorded in the surveys (Table 20).

Table 20: EPBC listed threatened and migratory species recorded within the pipeline corridor

SPECIES	CONSERVATION STATUS	2004 SURVEY LOCATION	2012 SURVEY LOCATION
Gouldian Finch (<i>Erythrura gouldiae</i>)	EPBC endangered and migratory NT vulnerable	KPs 103, 104	KP 117
Northern Crested Shrike-tit (<i>Falcunculus frontatus whitei</i>)	EPBC vulnerable and migratory		KP 106
Cattle Egret (<i>Ardea ibis</i>)	EPBC migratory		KP 517
Derby White-browed Robin (<i>Poecilodryas superciliosa cerviniventris</i>)	EPBC migratory		KP 359
Eastern Great Egret (<i>Ardea modesta</i>)	EPBC migratory		KPs 92, 102, 108, 117, 123
Glossy Ibis (<i>Plegadis falcinellus</i>)	EPBC migratory		KPs 92, 370
Melville Cicadabird (<i>Coracina tenuirostris melvillensis</i>)	EPBC migratory		KPs 111, 116, 370, 393, 497

SPECIES	CONSERVATION STATUS	2004 SURVEY LOCATION	2012 SURVEY LOCATION
Rainbow Bee-eater (<i>Merops ornatus</i>)	EPBC migratory	KPs 104, 497, 498, 582	KPs 41, 92, 93, 101, 102, 105, 106, 108, 109, 112, 114, 117, 123, 163, 370, 518
Rufous Fantail (<i>Rhipidura rufifrons</i>)	EPBC migratory		KP 581
White Bellied Sea-eagle (<i>Haliaeetus leucogaster</i>)	EPBC migratory	KP 499	

9.2 FAUNA SPECIES LIKELY OR POSSIBLY OCCURRING IN THE KGGP CORRIDOR

An additional five species identified from desktop analysis were considered likely to occur within the project corridor, and 12 are considered “possibly occurring” within the corridor (Table 21).

Table 21: EPBC Act listed threatened and migratory terrestrial vertebrate species likely or possibly occurring within the pipeline corridor

EPBC ACT CONSERVATION STATUS	SPECIES
Species considered likely to occur within pipeline corridor	
Endangered	Northern Quoll (<i>Dasyurus hallucatus</i>) (NT vulnerable)
Vulnerable	Eastern Partridge Pigeon (<i>Geophaps smithii smithii</i>) (NT vulnerable) Red Goshawk (<i>Erythrotriorchis radiatus</i>) (NT vulnerable)
Species that possibly occur within pipeline corridor	
Endangered	Gove Crow Butterfly (<i>Euploea alcathoe enastri</i>) Australasian Bittern (<i>Botaurus poiciloptilus</i>)
Vulnerable	Australian Painted Snipe (<i>Rostratula australis</i>) (NT vulnerable) Golden-backed Tree-rat (<i>Mesembriomys macrurus</i>) (NT critically endangered) Brush-tailed Tree-rat (<i>Conilurus penicillatus</i>) (NT endangered) Northern Brush-tailed Phascogale (<i>Phascogale pirata</i>) (NT endangered) Northern Masked Owl (<i>Tyto novaehollandiae kimberli</i>) (NT vulnerable)
Migratory	Barn Swallow (<i>Hirundo rustica</i>)

EPBC ACT CONSERVATION STATUS	SPECIES
	Fork-tailed Swift (<i>Apus pacificus</i>)

10 References

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Appendix A: Map, 2004 survey sites

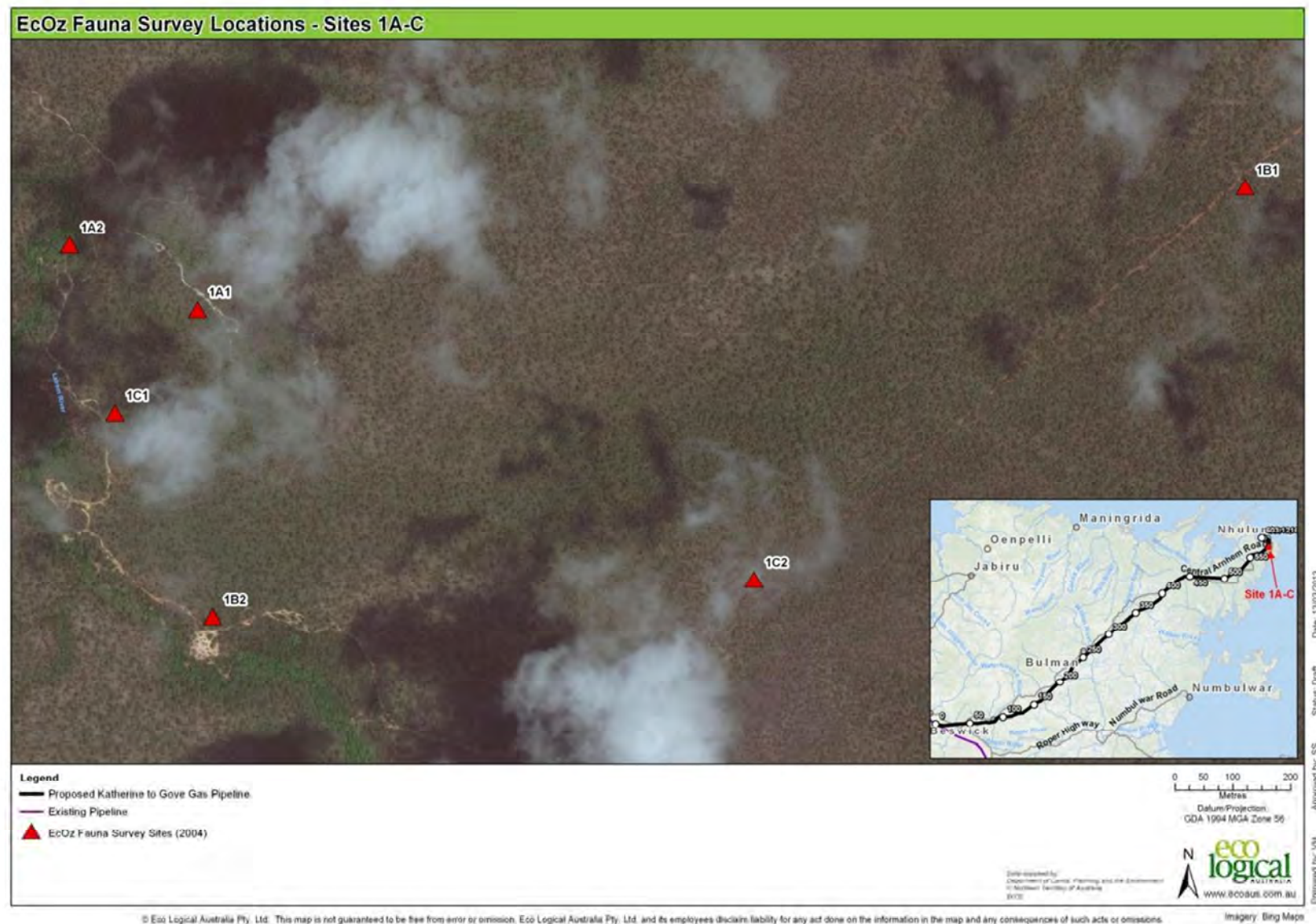


Figure 27 Sites 1 A-C, 2004 fauna survey (EcOz 2004b)

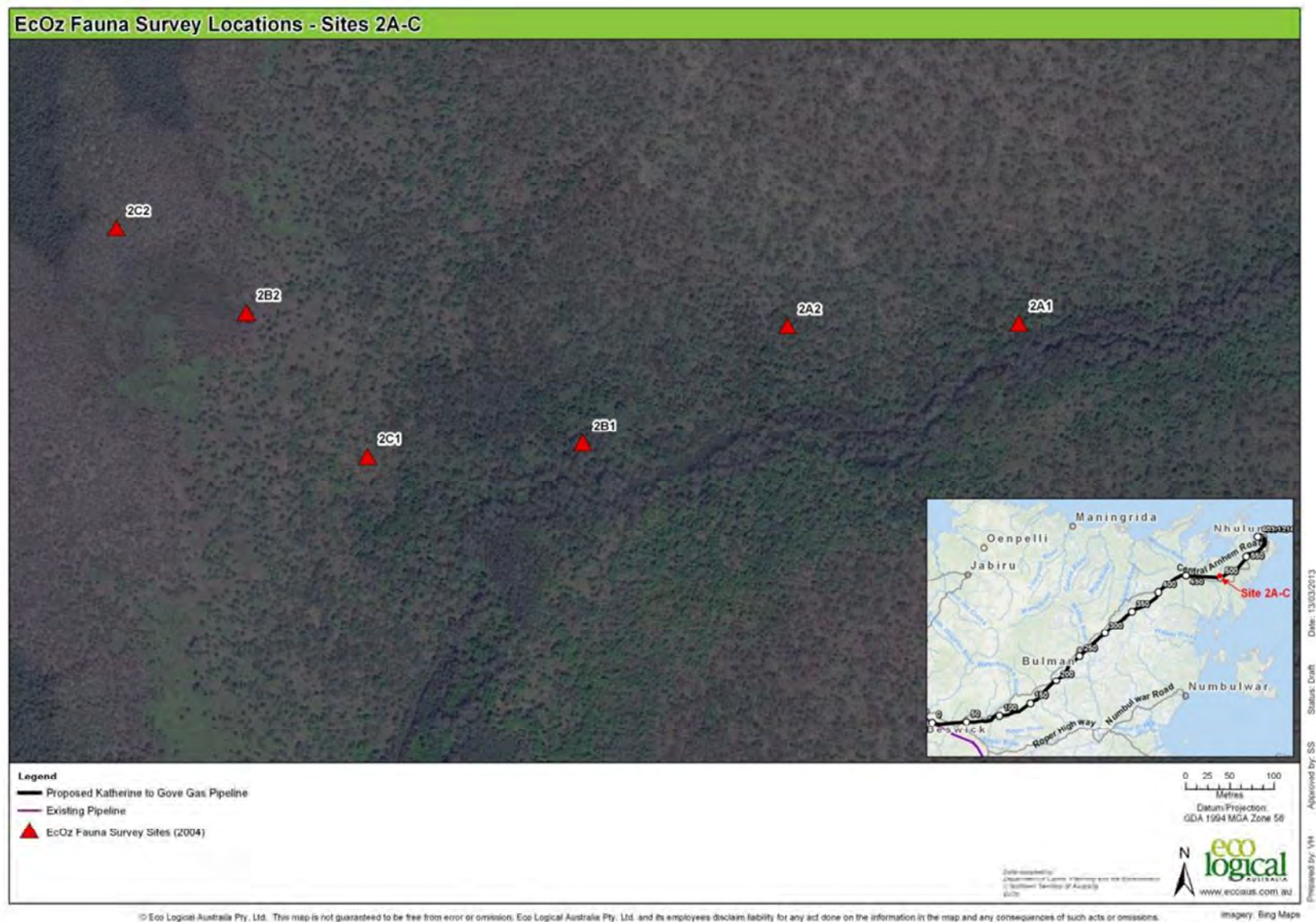


Figure 28 Sites 2 A-C, 2004 fauna survey (EcOz 2004b)



Figure 29 Sites 4 A-C, 2004 fauna survey (EcOz 2004b)

Appendix B: Species list, 2004 surveys

COMMON NAME	SPECIES	CONSERVATION SIGNIFICANCE	EPBC LISTING	CHAMBERS RIVER	GOROMURU RIVER	LATRAM RIVER
Amphibians						
Copland's Treefrog	<i>Litoria coplandi</i>			x		
Dwarf tree Frog	<i>Litoria bicolor</i>			x	x	x
Green tree Frog	<i>Litoria caerulea</i>			x		
Marbled Frog	<i>Limnodynastes convexiusculus</i>					x
Northern Spadefoot Toad	<i>Notaden melanoscaphus</i>			x		
Ornate Burrowing Frog	<i>Limnodynastes ornatus</i>			x		x
Peter's Frog	<i>Litoria inermis</i>			x		
Rocket Frog	<i>Litoria nasuta</i>			x	x	x
Pale Tree Frog	<i>Litoria pallida</i>			x		
Roth's Tree Frog	<i>Litoria rothii</i>					x
Red tree Frog	<i>Litoria rubella</i>			x	x	
Remote Froglet	<i>Crinia remota</i>			x		
Stonemason Toadlet	<i>Uperoleia lithomoda</i>			x	x	x

COMMON NAME	SPECIES	CONSERVATION SIGNIFICANCE	EPBC LISTING	CHAMBERS RIVER	GOROMURU RIVER	LATRAM RIVER
Tornier's Frog	<i>Litoria tornieri</i>			x	x	x
Wotjulum Frog	<i>Litoria wotjulumensis</i>			x		x
	<i>Crinia sp.</i>				x	
Birds						
Australasian Figbird	<i>Sphecotheres viridis</i>			x		
Australian Owlet-nightjar	<i>Aegotheles cristatus</i>					x
Azure Kingfisher	<i>Ceyx azurea</i>				x	x
Banded Honeyeater	<i>Certhionyx pectoralis</i>			x		
Bar-breasted Honeyeater	<i>Ramsayornis fasciatus</i>				x	
Bar-shouldered Dove	<i>Geopelia humeralis</i>				x	x
Beach-stone Curlew	<i>Esacus neglectus</i>				x	
Black Kite	<i>Milvus migrans</i>			x		
Black-breasted Buzzard	<i>Hamirostra melanosternon</i>				x	
Black-faced Cuckoo Shrike	<i>Coracina novaehollandiae</i>			x		

COMMON NAME	SPECIES	CONSERVATION SIGNIFICANCE	EPBC LISTING	CHAMBERS RIVER	GOROMURU RIVER	LATRAM RIVER
Black-faced Woodswallow	<i>Artamus cinereus</i>			x	x	
Black-tailed Treecreeper	<i>Climacteris melanura</i>				x	
Blue-faced Honeyeater	<i>Entomyzon cyanotis</i>			x		
Blue-winged Kookaburra	<i>Dacelo leachii</i>			x	x	x
Brown Falcon	<i>Falco berigora</i>			x		
Brown Goshawk	<i>Accipiter fasciatus</i>				x	
Brown Honeyeater	<i>Lichmera indistincta</i>			x	x	x
Brown Quail	<i>Coturnix ypsilophora</i>			x	x	
Chestnut-breasted Mannikin	<i>Lonchura castaneothorax</i>				x	
Cockatiel	<i>Nymphicus hollandicus</i>			x		
Common Bronzewing	<i>Phaps chalcoptera</i>			x		
Crimson Finch	<i>Neochmia phaeton</i>			x	x	
Darter	<i>Anhinga melanogaster</i>				x	
Diamond Dove	<i>Geopelia cuneata</i>			x		

COMMON NAME	SPECIES	CONSERVATION SIGNIFICANCE	EPBC LISTING	CHAMBERS RIVER	GOROMURU RIVER	LATRAM RIVER
Double-barred Finch	<i>Taeniopygia bichenovii</i>			x	x	
Dusky Honeyeater	<i>Myzomela obscura</i>				x	x
Forest Kingfisher	<i>Todiramphus macleayii</i>				x	
Galah	<i>Cacatua roseicapilla</i>			x		
Golden Headed Cristicola	<i>Cisticola exilis</i>				x	
Gouldian Finch	<i>Erythrura gouldiae</i>	NT Endangered	Endangered, Migratory	x		
Great Bowerbird	<i>Chlamydera nuchalis</i>			x	x	x
Grey Whistler	<i>Pachycephala simplex</i>					x
Grey-crowned Babbler	<i>Pomatostomus temporalis</i>			x		
Helmeted Friarbird	<i>Philemon buceroides</i>			x		
Hooded Parrot	<i>Psephotus dissimilis</i>	NT Near-threatened, Top End endemic		x		
Jacky Winter	<i>Microeca fascinans</i>			x		
Large-billed Gerygone	<i>Gerygone magnirostris</i>				x	
Leaden Flycatcher	<i>Myiagra rubecula</i>			x	x	x

COMMON NAME	SPECIES	CONSERVATION SIGNIFICANCE	EPBC LISTING	CHAMBERS RIVER	GOROMURU RIVER	LATRAM RIVER
Lemon-bellied Flycatcher	<i>Microeca flavigaster</i>				x	
Little Friarbird	<i>Philemon citreogularis</i>					x
Long-tailed Finch	<i>Poephila acuticauda</i>			x		
Magpie Goose	<i>Anseranas semipalmata</i>				x	
Masked Finch	<i>Poephila personata</i>			x		
Mistletoebird	<i>Dicaeum hirundinaceum</i>				x	x
Nankeen Kestrel	<i>Falco cenchroides</i>			x		
Northern Fantail	<i>Rhipidura rufiventris</i>				x	x
Northern Rosella	<i>Platycercus venustus</i>					x
Orange-footed Scrubfowl	<i>Megapodius reinwardt</i>					x
Peaceful Dove	<i>Geopelia striata</i>			x	x	x
Pheasant Coucal	<i>Centropus phasianinus</i>				x	
Pied Butcher Bird	<i>Cracticus nigrogularis</i>				x	
Rainbow bee-eater	<i>Merops ornatus</i>			x	x	x

COMMON NAME	SPECIES	CONSERVATION SIGNIFICANCE	EPBC LISTING	CHAMBERS RIVER	GOROMURU RIVER	LATRAM RIVER
Rainbow Lorikeet	<i>Trichoglossus haematodus</i>			x	x	x
Red-backed Fairy Wren	<i>Malurus melanocephalus</i>			x	x	x
Red-tailed Black Cockatoo	<i>Calyptorhynchus banksii</i>			x		
Red-winged Parrot	<i>Aprosmictus erythropterus</i>			x	x	x
Restless Flycatcher	<i>Myiagra inquieta</i>			x		
Rufous Fantail	<i>Rhipidura rufifrons</i>		Migratory			x
Rufous Whistler	<i>Pachycephala rufivenris</i>			x	x	
Rufous-banded Honeyeater	<i>Conopophila albogularis</i>			x	x	
Rufous-throated Honeyeater	<i>Conopophila rufogularis</i>			x	x	
Sacred Kingfisher	<i>Todiramphus sanctus</i>				x	
Shining Flycatcher	<i>Myiagra alecto</i>					x
Silver-crowned Friarbird	<i>Philemon argenteiceps</i>				x	x
Southern Boobook	<i>Ninox novaeseelandiae</i>				x	x

COMMON NAME	SPECIES	CONSERVATION SIGNIFICANCE	EPBC LISTING	CHAMBERS RIVER	GOROMURU RIVER	LATRAM RIVER
Spangled Drongo	<i>Dicrurus bracteatus</i>				x	x
Spotted Nightjar	<i>Eurostopodus argus</i>				x	
Striated Pardalote	<i>Pardalotus striatus</i>			x		x
Sulphur Crested Cockatoo	<i>Cacatua galerita</i>			x	x	x
Tawny Frogmouth	<i>Podargus strigoides</i>			x		
Tawny Grassbird	<i>Megalurus timoriensis</i>				x	
Tawny-breasted Honeyeater	<i>Xanthotis flaviventer</i>					x
Torresian Crow	<i>Corvus orru</i>			x	x	
Varied Lorikeet	<i>Psitteuteles versicolor</i>				x	x
Varied Sittella	<i>Daphoenositta chrysoptera leucoptera</i>			x		
Varied Triller	<i>Grallina cyanoleuca</i>			x		
Wandering Whistling-duck	<i>Dendrocygna arcuata</i>				x	
Wedge-tailed Eagle	<i>Aquila audax</i>			x		

COMMON NAME	SPECIES	CONSERVATION SIGNIFICANCE	EPBC LISTING	CHAMBERS RIVER	GOROMURU RIVER	LATRAM RIVER
Weebill	<i>Smicrornis brevirostris</i>			x	x	x
Whistling Kite	<i>Haliastur sphenurus</i>			x	x	
White-bellied Cuckoo Shrike	<i>Coracina papuensis</i>			x	x	x
White-bellied Sea Eagle	<i>Haliaeetus leucogaster</i>		Migratory		x	
White-gaped Honeyeater	<i>Lichenostomus unicolor</i>			x		
White-necked Heron	<i>Ardea pacifica</i>			x		
White-throated Gerygone	<i>Gerygone olivacea</i>				x	x
White-throated Honeyeater	<i>Melithreptus albogularis</i>			x	x	x
White-winged Triller	<i>Lalage sueurii</i>			x		
Willie Wagtail	<i>Rhipidura leucophrys</i>			x	x	
Yellow Oriole	<i>Oriolus flavocinctus</i>				x	
Yellow-rumped Mannikin	<i>Lonchura flaviprymna</i>	NT Near-threatened			x	
Yellow-throated Miner	<i>Manorina flavigula</i>				x	x

COMMON NAME	SPECIES	CONSERVATION SIGNIFICANCE	EPBC LISTING	CHAMBERS RIVER	GOROMURU RIVER	LATRAM RIVER
Mammals						
Agile Wallaby	<i>Macropus agilis</i>			x	x	x
Black Flying Fox	<i>Pteropus alecto</i>				x	x
Common Plantigale	<i>Planigale maculata</i>			x		
Common Rock Rat	<i>Zyzomys argurus</i>			x		
Delicate Mouse	<i>Pseudomys delicatulus</i>			x		
Dingo	<i>Canis lupus dingo</i>				x	
Grassland Melomys	<i>Melomys burtoni</i>				x	x
Kakadu Dunnart	<i>Smithopsis bindi</i>	Top End endemic		x		
Little-red Flying Fox	<i>Pteropus scapulatus</i>			x		
Northern Brown Bandicoot	<i>Isodon macrourus</i>			x		
Red-cheeked Dunnart	<i>Smithopsis virginiae</i>	Top End Endemic			x	
Wallaroo species (scats)	<i>Macropus sp.</i>				x	
Water Rat	<i>Hydromys chrysogaster</i>				x	

COMMON NAME	SPECIES	CONSERVATION SIGNIFICANCE	EPBC LISTING	CHAMBERS RIVER	GOROMURU RIVER	LATRAM RIVER
Reptiles						
Aboreal Snake-eyed Skink	<i>Cryptoblepharus plagiocephalus</i>			x	x	x
Bynoe's Gecko	<i>Heteronotia binoei</i>			x	x	x
Children's Python	<i>Antaresia childreni</i>			x		
Dark-tailed Skink	<i>Glaphyromorphus nigricaudis</i>	Top End endemic				x
Gilberts Dragon	<i>Lophognathus gilberti</i>			x		x
Green Tree Snake	<i>Dendrelaphis punctulata</i>				x	
Hill's Ctenotus	<i>Ctenotus hilli</i>			x	x	
Keelback	<i>Tropidonophis mairii</i>			x	x	
MacFarlane's Lerista	<i>Lygisaurus macfarlanei</i>	Top End endemic				x
Marbled Velvet Gecko	<i>Oedura marmorata</i>					x
Northern Dtella	<i>Gehyra australis</i>			x	x	
Northern Ridge-tailed Monitor	<i>Varanus primordius</i>	NT Near-threatened, Top End endemic				

COMMON NAME	SPECIES	CONSERVATION SIGNIFICANCE	EPBC LISTING	CHAMBERS RIVER	GOROMURU RIVER	LATRAM RIVER
Northern Shovel-nosed Snake	<i>Brachyuropsis roperi</i>			x		
Northern Small-eyed Snake	<i>Rhinoplocephalus pallidiceps</i>			x		
Northern Spiny tailed Gecko	<i>Strophurus ciliaris</i>			x		
Plain Ctenotus	<i>Ctenotus inornatus</i>			x		
Port Essington Ctenotus	<i>Ctenotus essingtonii</i>				x	x
Robust Rainbow Skink	<i>Carlia longipes</i>	Top End endemic			x	x
Scant-striped Ctenotus	<i>Ctenotus vertebralis</i>			x		
Skink	<i>Menetia sp.</i>			x		
Slender Rainbow Skink	<i>Carlia gracilis</i>				x	
Spalding's Ctenotus	<i>Ctenotus spaldingi</i>			x		
Spotted Tree Monitor	<i>Varanus scalaris</i>				x	x
Storr's Snake-eyed Skink	<i>Morethia storri</i>	Top End endemic		x		
Striped Rainbow Skink	<i>Carlia munda</i>			x	x	x

COMMON NAME	SPECIES	CONSERVATION SIGNIFICANCE	EPBC LISTING	CHAMBERS RIVER	GOROMURU RIVER	LATRAM RIVER
Ten-Lined Ctenotus	<i>Ctenotus decaneurus</i>			x		
Two-Lined Dragon	<i>Diporiphorabilineata</i>			x	x	
Two-spined Rainbow Skink	<i>Carlia amax</i>			x		x
Water Python	<i>Liasis mackloti</i>				x	
White-lipped Dragon	<i>Diporiphora albilabris sobria</i>	Top End endemic		x		
Zig-zag Gecko	<i>Oedura rhombifer</i>			x	x	x
	<i>Varanus sp.</i>					x
Introduced species						
Cane Toad	<i>Bufo marinus</i>			x	x	x
Water Buffalo	<i>Bubalus bubalis</i>				x	x
House Mouse	<i>Mus musculus</i>					x

Appendix C: Weather and climate, 2012 survey

Table 22 Monthly rainfall data leading up to and through the 2012 survey period

LOCATION (STATION NUMBER)	AUGUST	SEPTEMBER	OCTOBER	1 – 23 NOVEMBER	NOVEMBER TOTAL
Tindal RAAF 014932	0 mm	3.6 mm	0.2 mm	38 mm	92.4 mm
Conways 014653	0 mm	18.4 mm	unavailable	8.8 mm	49.0 mm
Mainoru Outstation Store 014600	0 mm	75.3 mm	2.7 mm	77.8 mm	89.2 mm
Bulman AWS 014627	0 mm	35.8 mm	28.4 mm	1.4 mm	5.6 mm
Lake Evella 014515	0 mm	0 mm	0 mm	0 mm	0 mm
Gove airport 014508	1.4 mm	0 mm	7.8 mm	0 mm	0 mm

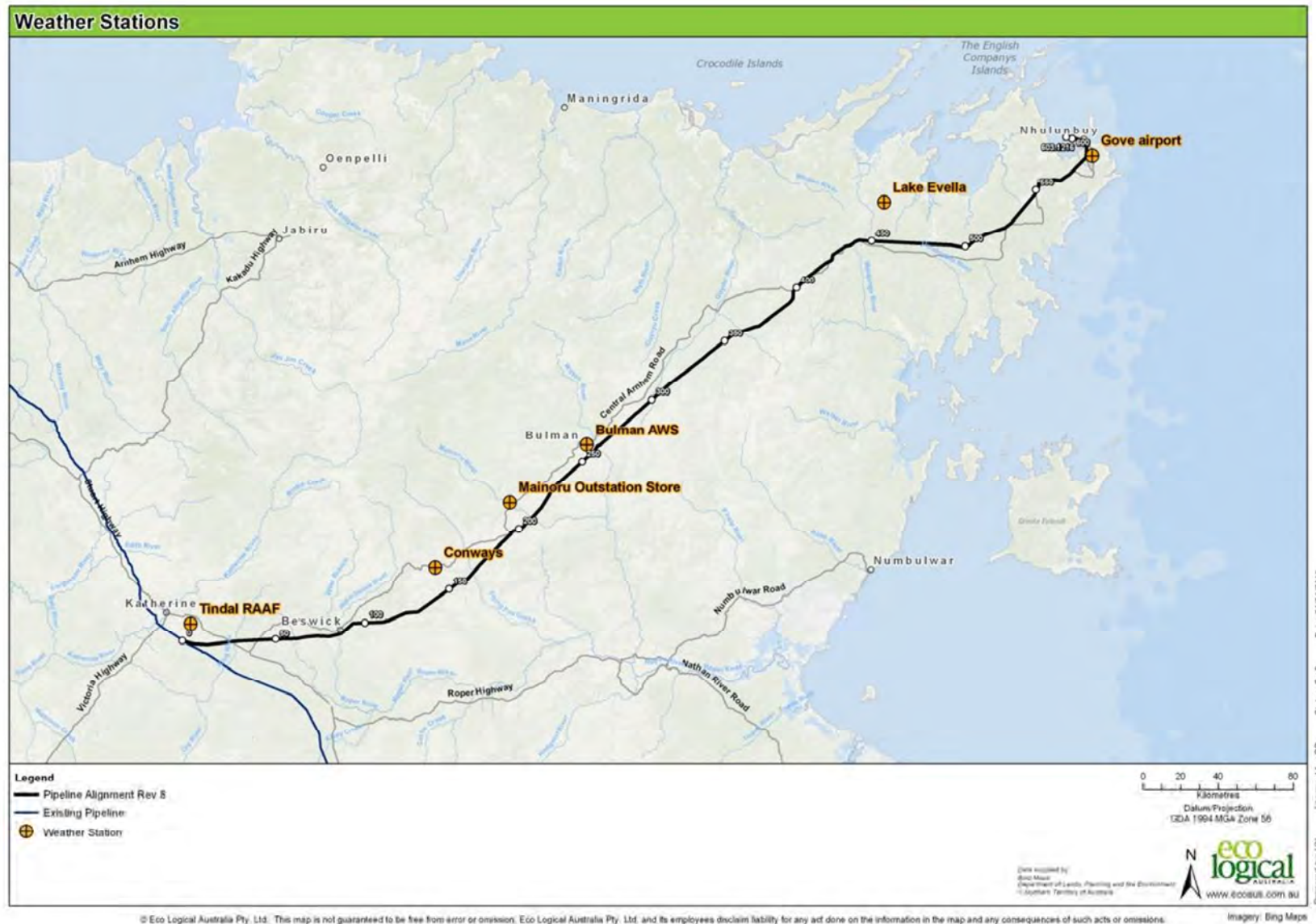


Figure 30 Weather stations along the KGGP route

Table 23 Weather data leading up to and during the survey period

DATE	TINDAL RAAF			GOVE AIRPORT		
	MIN TEMP °C	MAX TEMP °C	RAINFALL mm	MIN TEMP °C	MAX TEMP °C	RAINFALL mm
1 Nov	27.3	41	0	22.6	33	0
2 Nov	27.1	39.3	0	21.5	32.2	0
3 Nov	24.2	36.1	5.8	22	34.3	0
4 Nov	23	39.5	0	22.3	33	0
5 Nov	25	38.2	0	21.7	32.2	0
6 Nov	25.7	35.9	0	22	31.9	0
7 Nov	25.6	36.3	0	21.3	32.4	0
8 Nov	26.2	37.6	0	21.6	31.8	0
9 Nov	23.6	33.5	4.6	20.8	33	0
10 Nov	23.3	36.4	0.2	23.6	33.2	0
11 Nov	22.9	39.1	0	24.6	33.2	0
12 Nov	25.4	39.9	0	24.5	32.9	0
13 Nov	26.9	40	0	23.2	32.2	0
14 Nov	25.1	39.4	0	21.2	32.4	0
15 Nov	26	37.7	0	21.6	33.1	0
16 Nov	27.9	38.3	0	22.5	32.7	0
17 Nov	26.7	38.3	0	23	33.4	0
18 Nov	24.1	36.4	1.4	22.9	33.3	0
19 Nov	23.6	37.2	8.6	23.5	33.7	0
20 Nov	23.8	38.4	13.4	23	34.2	0
21 Nov	25.7	39.8	2.8	23.6	35.3	0
22 Nov	26	39.4	0	24.5	34.5	0
23 Nov	25.8	33.9	1.2	26.8	33.5	0

Appendix D: Maps, 2012 fauna survey

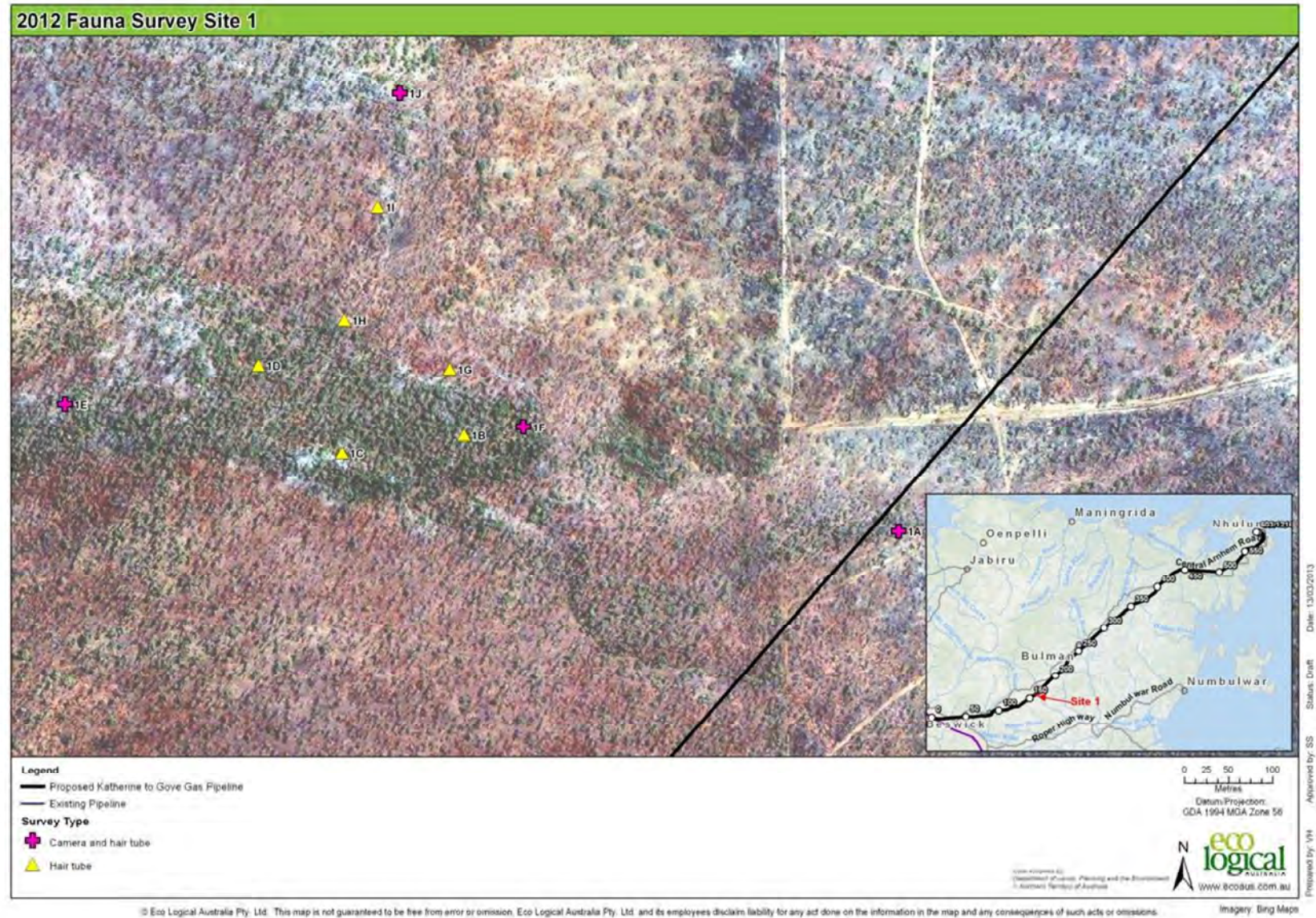


Figure 31 Sites 1 A-J, 2012 fauna survey

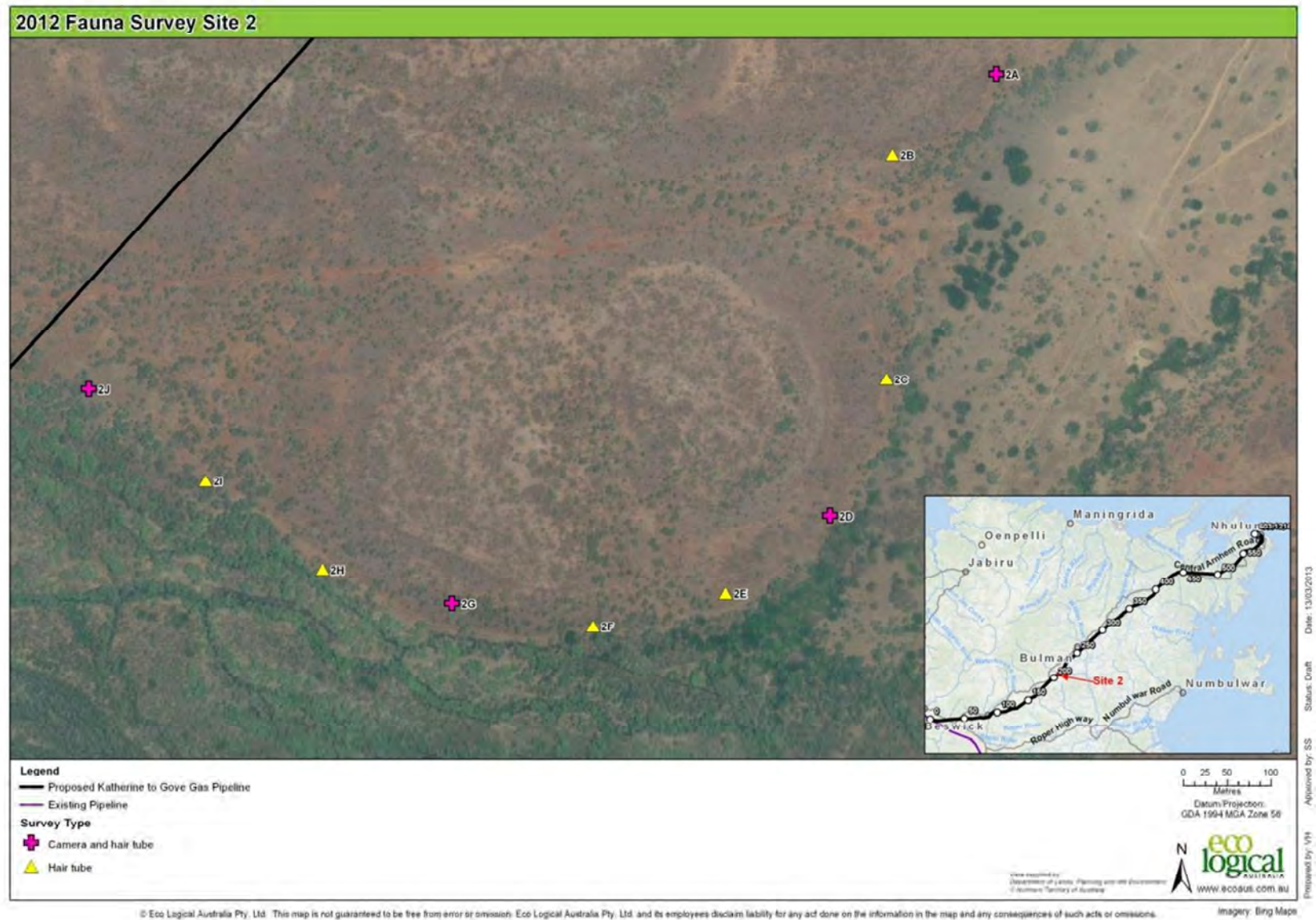


Figure 32 Sites 2 A-J, 2012 fauna survey



Figure 33 Sites 3 A-J, 2012 fauna survey

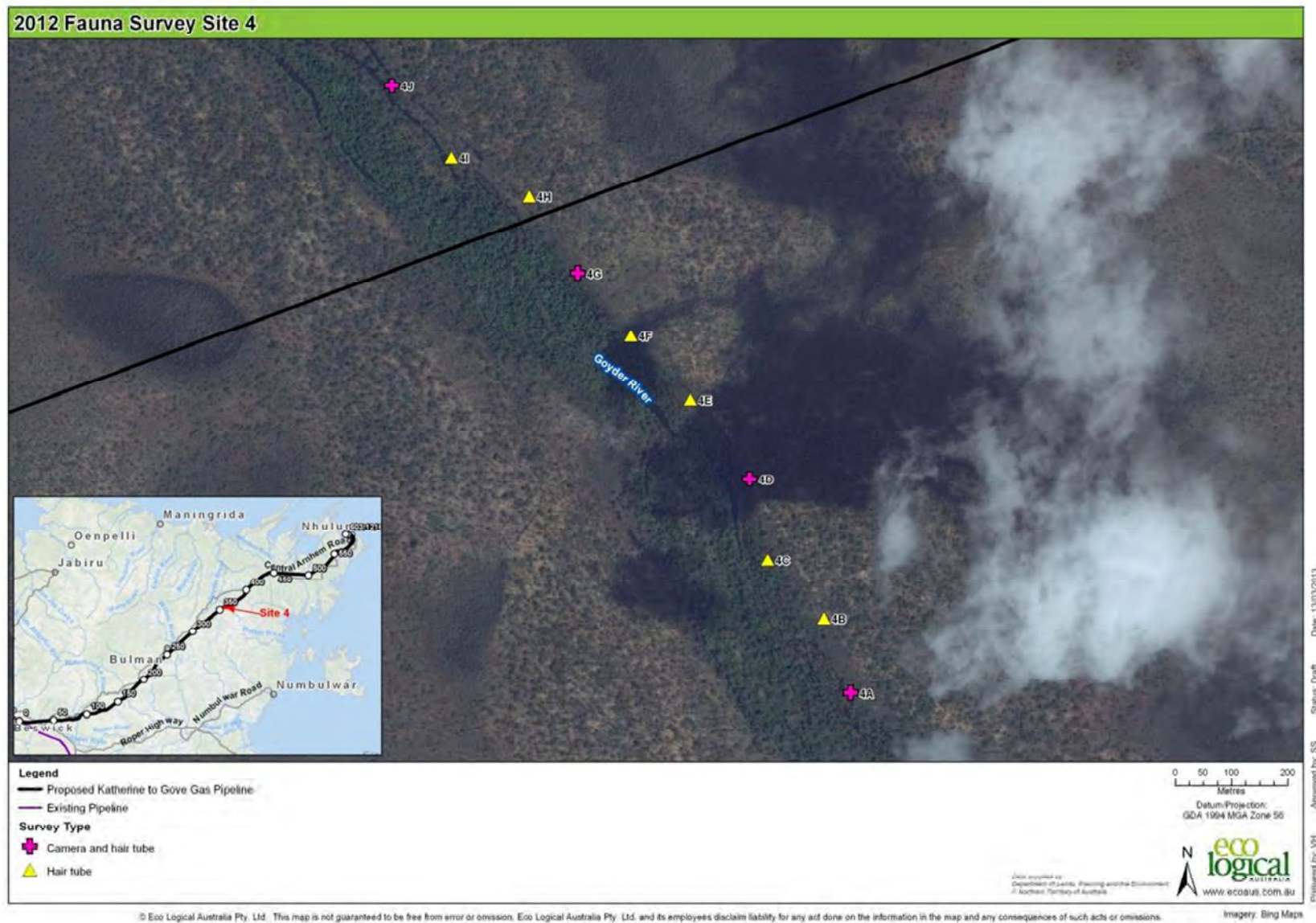


Figure 34 Sites 4 A-J, 2012 fauna survey



Figure 35 Sites 5 A-J, 2012 fauna survey

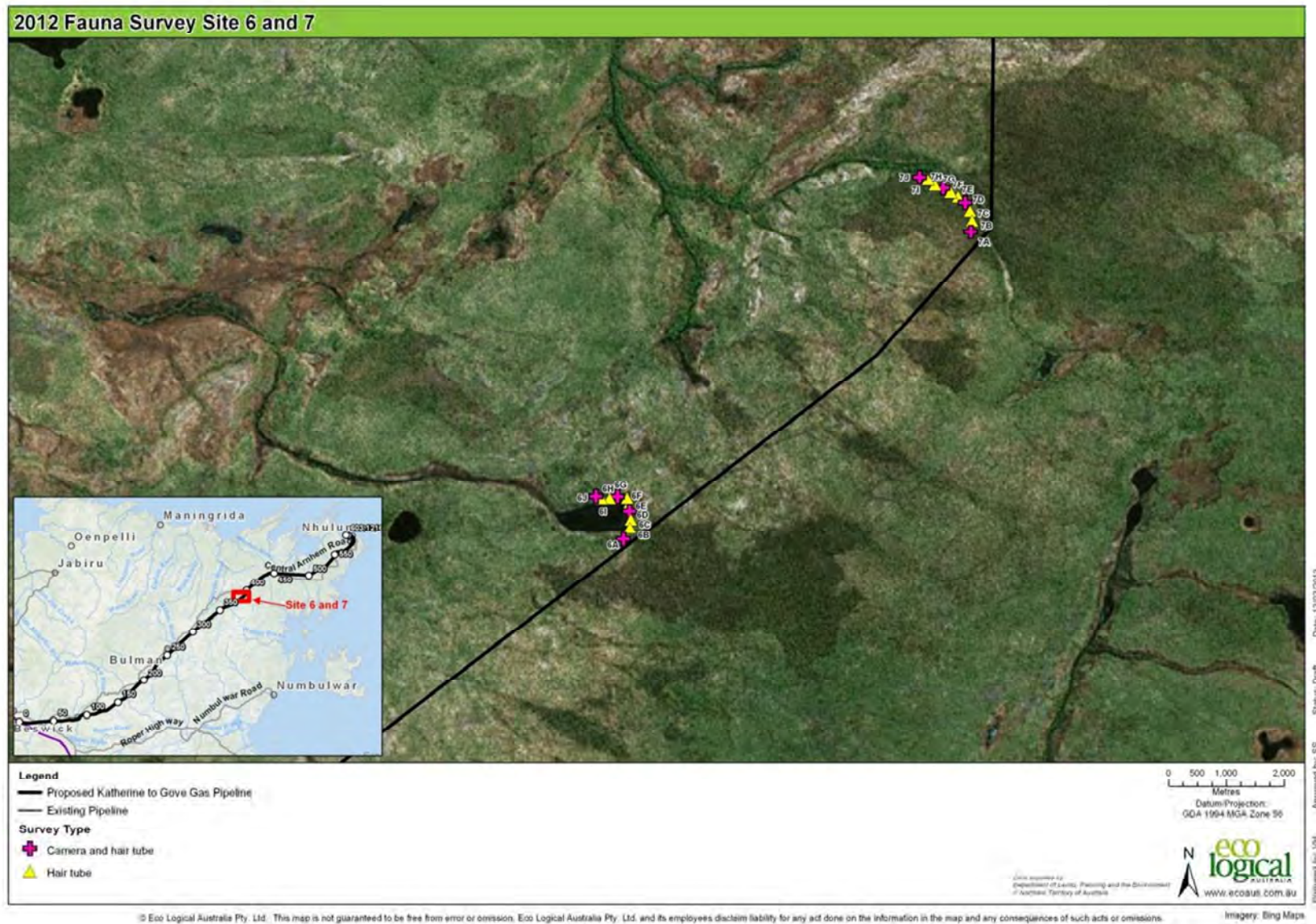


Figure 36 Sites 6 A-J and 7 A-J, 2012 fauna survey

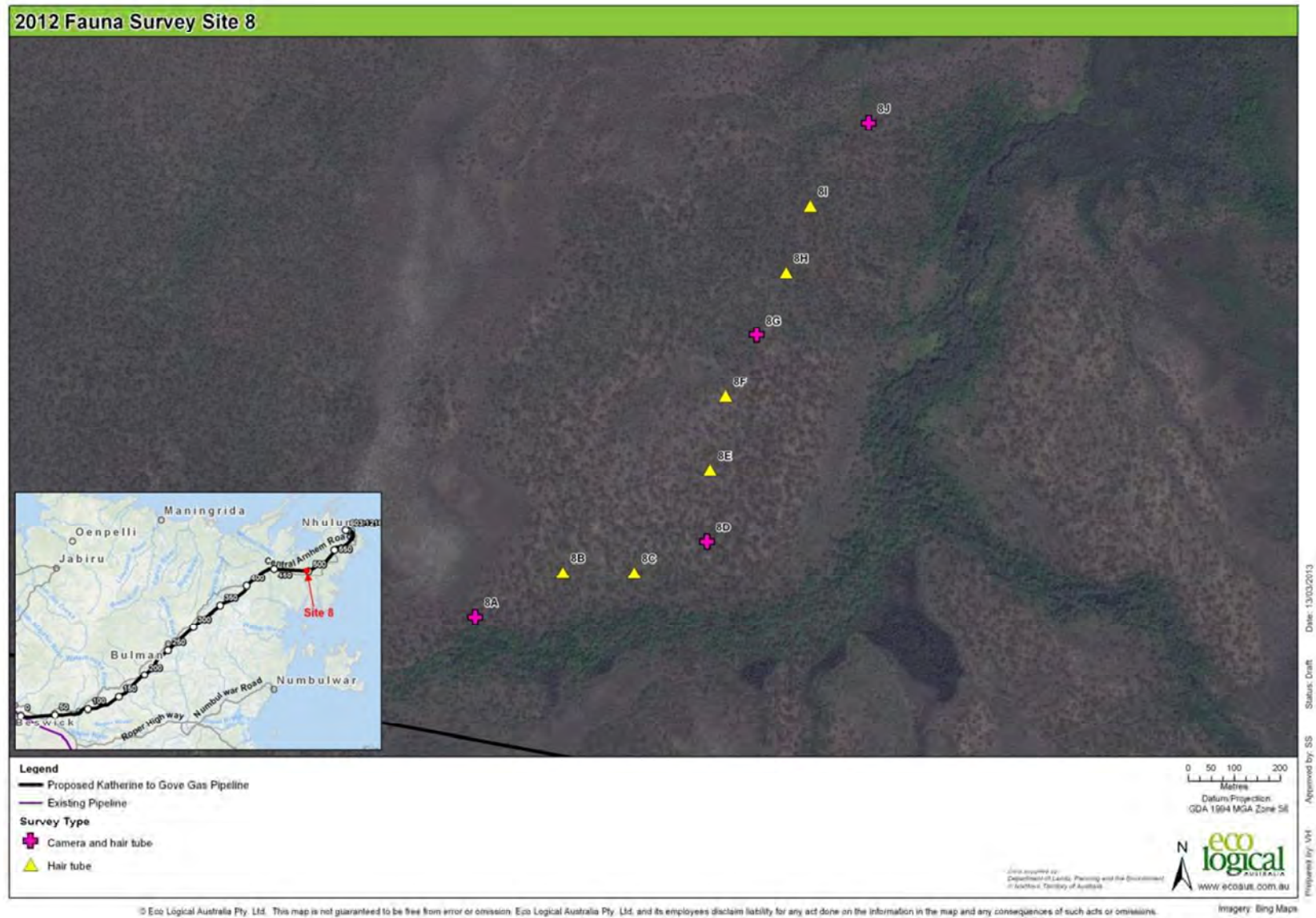


Figure 37 Sites 8 A-J, 2012 fauna survey

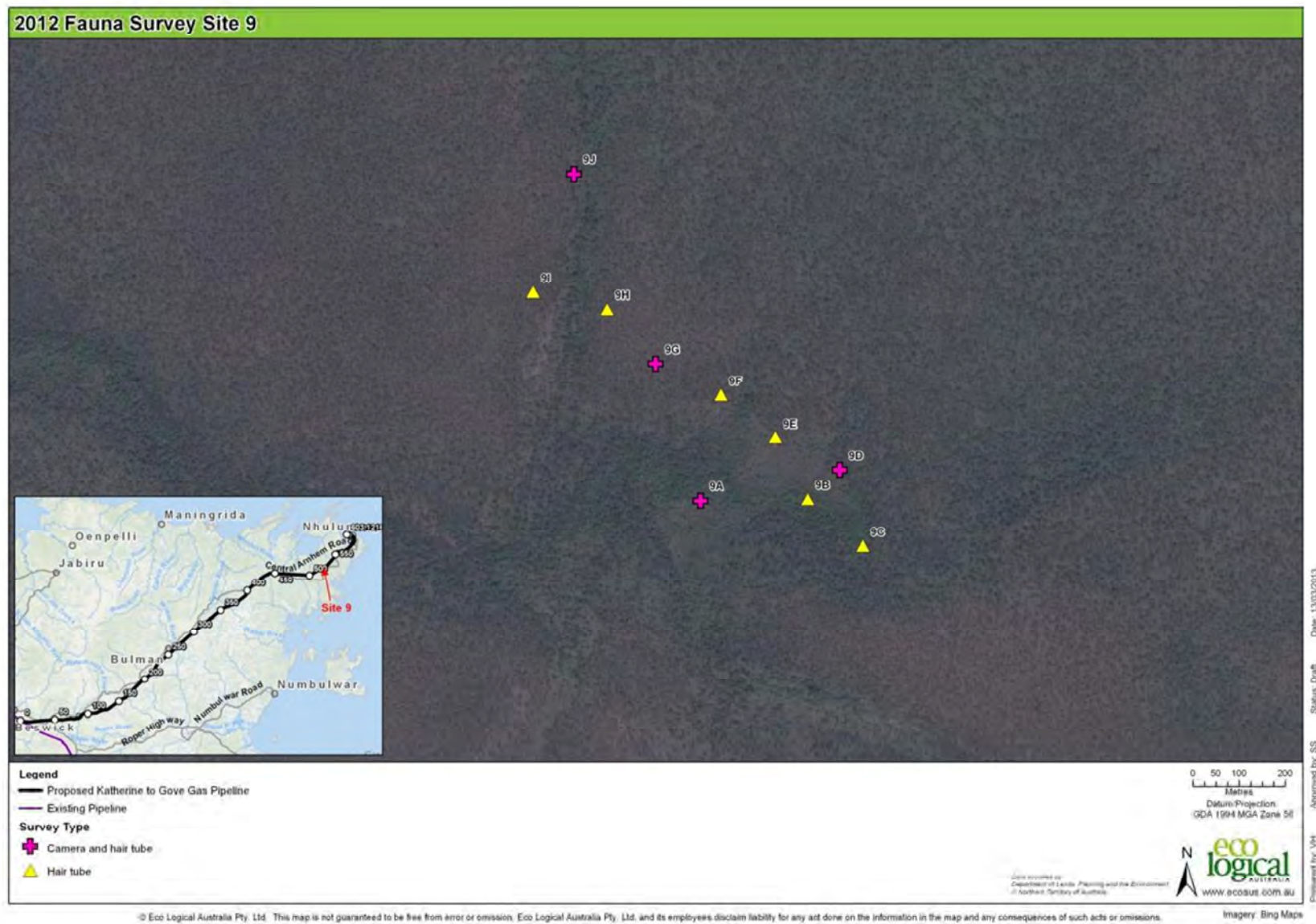


Figure 38 Sites 9 A-J, 2012 fauna survey

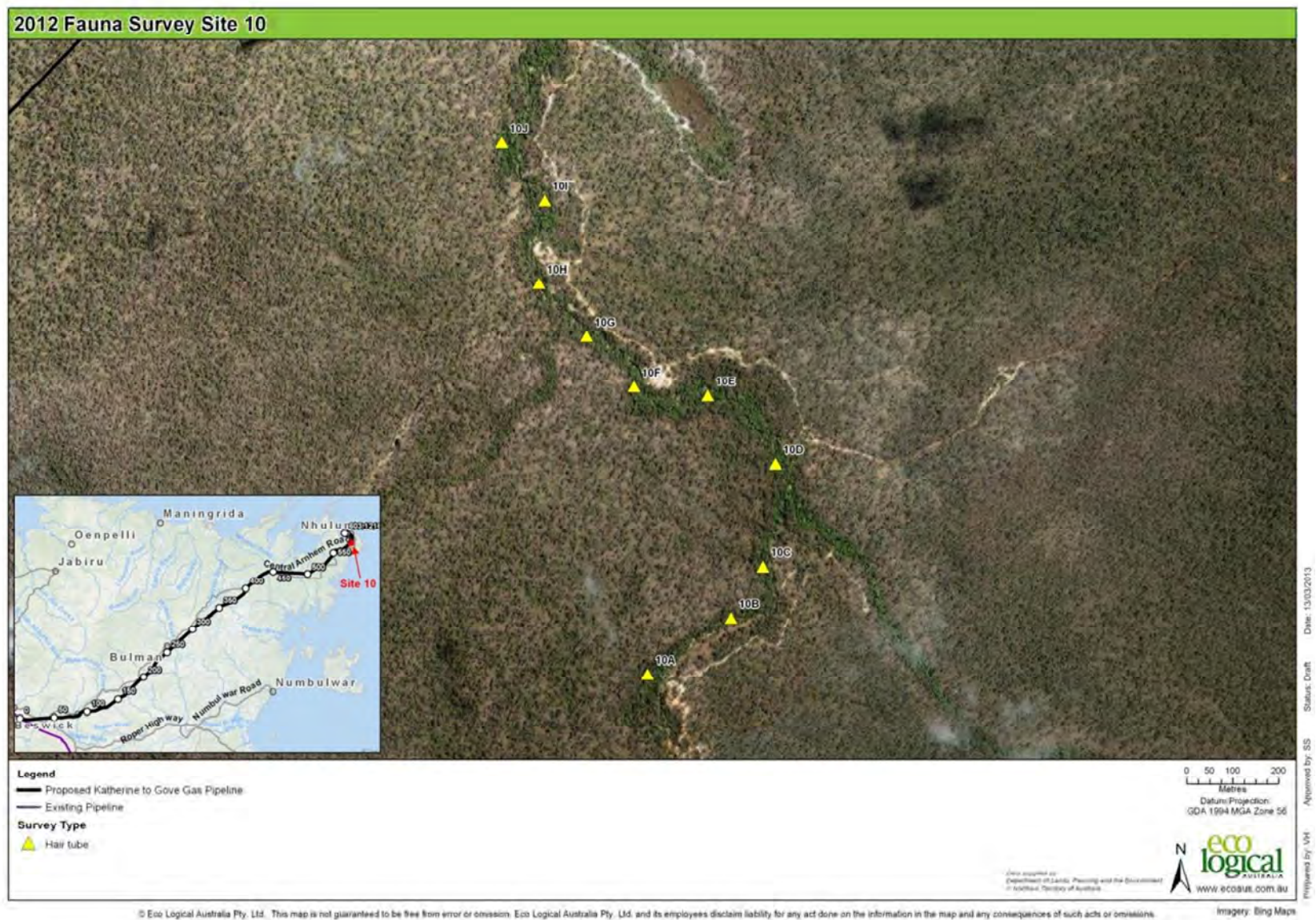


Figure 39 Sites 10 A-J, 2012 fauna survey

Appendix E: Remote camera images



Figure 40 Australian White Ibis (*Threskiornis molucca*) site 2



Figure 41 Bar-shouldered Dove (*Geopelia humeralis*) site 2



Figure 42 Blue-winged Kookaburra (*Dacelo leachii*) site 9



Figure 43 Cattle Egret (*Ardea ibis* - EPBC migratory) site 9



Figure 44 Pheasant Coucal (*Centropus phasianinus*) site 4



Figure 45 Straw-necked Ibis (*Threskiornis spinicollis*) site 9



Figure 46 Torresian Crow (*Corvus orru*) site 3



Figure 47 Whistling Kite (*Haliastur sphenurus*) site 8



Figure 48 Agile Wallaby (*Macropus agilis*) site 9



Figure 49 Antilopine Wallaroo (*Macropus antilopinus*) site 9



Figure 50 Common Brush-tailed Possum (*Trichosurus vulpecula*) site 5



Figure 51 Common Wallaroo (*Macropus robustus*) site 1



Figure 52 Dingo (*Canis lupus dingo*) site 3



Figure 53 Grassland Melomys (*Melomys burtoni*) site 6



Figure 54 Northern Brown Bandicoot (*Isodon macrourus*) and Cane Toad (*Rhinella marina*) site 6



Figure 55 Spotted Tree Monitor (*Varanus scalaris*) site 6



Figure 56 Black Rat (*Rattus rattus*) site 3



Figure 57 Cattle (*Bos taurus*) site 2



Figure 58 Feral Cat (*Felis catus*) site 7



Figure 59 Feral Pig (*Sus scrofa*) site 5



Figure 60 Swamp Buffalo (*Bubalus bubalis*) site 4

Appendix F: Species lists, 2012 fauna survey

Site 1

Location: -14.302669, 133.752506

Survey effort: 4 cameras x 14 nights
10 hair tubes x 14 nights
Incidental bird observations

Dates: November 6 – 20, 2012

Habitat: *Eucalyptus phoenicea* woodland to 10m over grassland. Unburnt. 30% sandstone rock cover, 60% litter cover, 10% grass cover. Mid strata mostly dead from previous years fire. Site along plateau edge.

Species recorded:

Category	Scientific name	Common name	Detection method
Bird	<i>Artamus cinereus</i>	Black-faced Woodswallow	Observation
	<i>Artamus minor</i>	Little Woodswallow	Observation
	<i>Artamus personatus</i>	Masked Woodswallow	Observation
	<i>Calyptrorhynchus banksii</i>	Red-tailed Black-cockatoo	Observation
	<i>Colluricincla harmonica</i>	Grey Shrike-thrush	Observation
	<i>Coracina novaehollandiae</i>	Black-faced Cuckoo-shrike	Observation
	<i>Coracina papuensis</i>	White-bellied Cuckoo-shrike	Observation
	<i>Cracticus nigrogularis</i>	Pied Butcherbird	Observation
	<i>Dacelo leachii</i>	Blue-winged Kookaburra	Observation
	<i>Dicaeum hirundinaceum</i>	Mistletoebird	Observation
	<i>Eurystomus orientalis</i>	Dollarbird	Observation
	<i>Falco berigora</i>	Brown Falcon	Observation
	<i>Haliastur sphenurus</i>	Whistling Kite	Observation
	<i>Lalage sueurii</i>	White-winged Triller	Observation
	<i>Merops ornatus</i>	Rainbow Bee-eater	Observation
	EPBC migratory		
	<i>Milvus migrans</i>	Black Kite	Observation
	<i>Myiagra rubecula</i>	Leaden Flycatcher	Observation
	<i>Pachycephala rufiventris</i>	Rufous Whistler	Observation
	<i>Philemon citreogularis</i>	Little Friarbird	Observation
	<i>Pomatostomus temporalis</i>	Grey-crowned Babbler	Observation
	<i>Psephotus dissimilis</i>	Hooded Parrot	Observation

Category	Scientific name	Common name	Detection method
Bird	<i>Smicrornis brevirostris</i>	Weebill	Observation
	<i>Taeniopygia bichenovii</i>	Double-barred Finch	Observation
	<i>Todiramphus sanctus</i>	Sacred Kingfisher	Observation
Mammal	<i>Canis lupus</i>	Dingo	Remote camera
	<i>Macropus robustus</i>	Common Wallaroo	Remote camera

Site 2

Location: -14.022818, 134.077588

Survey effort: 4 cameras x 14 nights
10 hair tubes x 14 nights
Incidental bird observations

Dates: November 6 – 20, 2012

Habitat: Mainoru River. Ecotone between riparian corridor and low hills.
Low hills with *Eucalyptus tectifica* and *Corymbia confertiflora* woodland over grassland. Patchily burnt. 50% bare, 20% small boulder cover, 20% litter, 10% grass cover.
Riparian corridor with *Melaleuca cajuputi* and *M. viridiflora* open forest over mixed species shrubland with *Cathormion umbellatum* and *Barringtonia acutangula*.

Species recorded:

Category	Scientific name	Common name	Detection method
Bird	<i>Corvus orru</i>	Torresian Crow	Observation, Remote camera
	<i>Cracticus nigrogularis</i>	Pied Butcherbird	Observation
	<i>Dacelo leachii</i>	Blue-winged Kookaburra	Observation
	<i>Eurystomus orientalis</i>	Dollarbird	Observation
	<i>Geopelia humeralis</i>	Bar-shouldered Dove	Observation, Remote camera
	<i>Haliastur sphenurus</i>	Whistling Kite	Observation
	<i>Lalage sueurii</i>	White-winged Triller	Observation
	<i>Lichenostomus unicolor</i>	White-gaped Honeyeater	observation
	<i>Lichmera indistincta</i>	Brown Honeyeater	Observation
	<i>Melithreptus albogularis</i>	White-throated Honeyeater	Observation
	<i>Philemon argenticeps</i>	Silver-crowned Friarbird	Observation
	<i>Philemon citreogularis</i>	Little Friarbird	Observation
	<i>Pomatostomus temporalis</i>	Grey-crowned Babbler	Observation
	<i>Rhipidura rufiventris</i>	Northern Fantail	Observation
	<i>Smicrornis brevirostris</i>	Weebill	Observation

Category	Scientific name	Common name	Detection method
Bird	<i>Threskiornis molucca</i>	Australian White Ibis	Remote camera
	<i>Todiramphus macleayii</i>	Forest Kingfisher	Observation
	<i>Trichoglossus haematodus</i>	Rainbow Lorikeet	Observation
Mammal	<i>Macropus agilis</i>	Agile Wallaby	Remote camera
	<i>Macropus antilopinus</i>	Antilopine Wallaroo	Observation
Introduced species	<i>Bos taurus</i>	Cattle	Remote camera
	<i>Bubalus bubalis</i>	Swamp Buffalo	Remote camera
	<i>Felis catus</i>	Cat	Remote camera
	<i>Rhinella marina</i>	Cane Toad	Remote camera
	<i>Sus scrofa</i>	Pig	Remote camera

Site 3

Location: -13.696158, 134.390938

Survey effort: 4 cameras x 14 nights
10 hair tubes x 14 nights
Incidental bird observations

Dates: November 6 – 20, 2012

Habitat: Wilton River. River levees with *Corymbia bella* and *Casuarina cunninghami* open forest over *Barringtonia acutangula* and *Flueggea virosa* shrubs. *Melaleuca leucadendra* and *Pandanus aquaticus* along river bank. Heavily grazed by buffalo. Clay loam soils.

Species recorded:

Category	Scientific name	Common name	Detection method
Bird	<i>Aprosmictus erythropterus</i>	Red-winged Parrot	Observation
	<i>Cacatua galerita</i>	Sulphur-crested Cockatoo	Observation
	<i>Cacomantis variolosus</i>	Brush Cuckoo	Observation
	<i>Calyptorhynchus banksii</i>	Red-tailed Black-cockatoo	Observation
	<i>Cissomela pectoralis</i>	Banded Honeyeater	Observation
	<i>Coracina novaehollandiae</i>	Black-faced Cuckoo-shrike	Observation
	<i>Coracina papuensis</i>	White-bellied Cuckoo-shrike	Observation
	<i>Corvus orru</i>	Torresian Crow	Observation, Remote camera
	<i>Cracticus torquatus</i>	Grey Butcherbird	Observation
	<i>Dacelo leachii</i>	Blue-winged Kookaburra	Observation
	<i>Dicaeum hirundinaceum</i>	Mistletoebird	Observation
	<i>Egretta novaehollandiae</i>	White-faced Heron	Observation
	<i>Eudynamys orientalis</i>	Eastern Koel	Observation
	<i>Eurystomus orientalis</i>	Dollarbird	Observation
	<i>Geopelia humeralis</i>	Bar-shouldered Dove	Observation
	<i>Geopelia striata</i>	Peaceful Dove	Observation
	<i>Haliastur sphenurus</i>	Whistling Kite	Observation
	<i>Hamirostra melanosternon</i>	Black-breasted Buzzard	Observation
	<i>Lalage sueurii</i>	White-winged Triller	Observation
	<i>Lichenostomus unicolor</i>	White-gaped Honeyeater	Observation

Category	Scientific name	Common name	Detection method
Bird	<i>Melithreptus albogularis</i>	White-throated Honeyeater	Observation
	<i>Myiagra alecto</i>	Shining Flycatcher	Observation
	<i>Myiagra rubecula</i>	Leaden Flycatcher	Observation
	<i>Myzomela obscura</i>	Dusky Honeyeater	Observation
	<i>Ninox rufa</i>	Rufous Owl	Observation
	<i>Nycticorax caledonicus</i>	Nankeen Night Heron	Observation
	<i>Pachycephala rufiventris</i>	Rufous Whistler	Observation
	<i>Pardalotus striatus</i>	Striated Pardalote	Observation
	<i>Philemon argenticeps</i>	Silver-crowned Friarbird	Observation
	<i>Philemon citreogularis</i>	Little Friarbird	Observation
	<i>Poecilodryas superciliosa cerviniventris</i> – EPBC migratory	Derby White-browed Robin	Observation
	<i>Psitteuteles versicolor</i>	Varied Lorikeet	Observation
	<i>Ptilonorhynchus nuchalis</i>	Great Bowerbird	Observation
	<i>Ramsayornis fasciatus</i>	Bar-breasted Honeyeater	Observation
	<i>Rhipidura rufiventris</i>	Northern Fantail	Observation
	<i>Taeniopygia bichenovii</i>	Double-barred Finch	Observation
	<i>Todiramphus macleayi</i>	Forest Kingfisher	Observation
	<i>Todiramphus sanctus</i>	Sacred Kingfisher	Observation
	<i>Trichoglossus haematodus</i>	Rainbow Lorikeet	Observation
Mammal	<i>Canis lupus</i>	Dingo	Remote camera
	<i>Macropus agilis</i>	Agile Wallaby	Remote camera
Reptile	<i>Dendrelaphis punctulata</i>	Green Tree Snake	Observation
Introduced species	<i>Bubalus bubalis</i>	Swamp Buffalo	Observation, Remote camera
	<i>Felis catus</i>	Cat	Remote camera
	<i>Rattus rattus</i>	Black Rat	Remote camera
	<i>Sus scrofa</i>	Pig	Observation

Site 4

Location: -13.124647, 135.104323

Survey effort: 4 cameras x 14 nights
10 hair tubes x 14 nights
Incidental bird observations

Dates: November 7 – 21, 2012

Habitat: Goyder River. Ecotone between riparian corridor and woodland.
Riparian corridor with *Melaleuca leucadendra* tall open forest over *Pandanus aquaticus*.
Woodland with *Eucalyptus tetrodonta* and *E. miniata* woodland with some *Callitris intratropica*.

Species recorded:

Category	Scientific name	Common name	Detection method
Bird	<i>Accipiter fasciatus</i>	Brown Goshawk	Observation
	<i>Cacatua galerita</i>	Sulphur-crested Cockatoo	Observation
	<i>Cacomantis variolosus</i>	Brush Cuckoo	Observation
	<i>Centropus phasianinus</i>	Pheasant Coucal	Remote camera
	<i>Conopophila rufogularis</i>	Rufous-throated Honeyeater	Observation
	<i>Corvus orru</i>	Torresian Crow	Observation
	<i>Dacelo leachii</i>	Blue-winged Kookaburra	Observation
	<i>Dicaeum hirundinaceum</i>	Mistletoebird	Observation
	<i>Eurystomus orientalis</i>	Dollarbird	Observation
	<i>Haliastur sphenurus</i>	Whistling Kite	Observation
	<i>Lichmera indistincta</i>	Brown Honeyeater	Observation
	<i>Myiagra alecto</i>	Shining Flycatcher	Observation
	<i>Neochmia phaeton</i>	Crimson Finch	Observation
	<i>Oriolus flavocinctus</i>	Yellow Oriole	Observation
	<i>Pachycephala rufiventris</i>	Rufous Whistler	Observation
	<i>Phalacrocorax sulcirostris</i>	Little Black Cormorant	Observation
	<i>Philemon argenticeps</i>	Silver-crowned Friarbird	Observation
	<i>Philemon citreogularis</i>	Little Friarbird	Observation
	<i>Ramsayornis fasciatus</i>	Bar-breasted Honeyeater	Observation

Category	Scientific name	Common name	Detection method
Bird	<i>Threskiornis molucca</i>	Australian White Ibis	Observation
	<i>Threskiornis spinicollis</i>	Straw-necked Ibis	Observation
	<i>Trichoglossus haematodus</i>	Rainbow Lorikeet	Observation
Mammal	<i>Canis lupus</i>	Dingo	Remote camera
	<i>Isodon macrourus</i>	Northern Brown Bandicoot	Remote camera
	<i>Macropus agilis</i>	Agile Wallaby	Remote camera
Reptile	<i>Carlia gracilis</i>	Slender Rainbow Skink	Observation
Introduced species	<i>Bos taurus</i>	Cattle	Remote camera
	<i>Bubalus bubalis</i>	Swamp Buffalo	Remote camera
	<i>Felis catus</i>	Cat	Remote camera
	<i>Sus scrofa</i>	Pig	Remote camera

Site 5

Location: -13.089516, 135.182303

Survey effort: 4 cameras x 14 nights
10 hair tubes x 14 nights
Incidental bird observations

Dates: November 7 – 21, 2012

Habitat: Woodland around billabong. *Eucalyptus tetradonta*, and *E. miniata* woodland over cycads and *Sorghum intrans* and *Chrysopogon fallax* grasses. Unburnt this year but evidence of previous hot fires. Deep sandy loam soils.

Species recorded:

Category	Scientific name	Common name	Detection method
Bird	<i>Anhinga novaehollandiae</i>	Australasian Darter	Observation
	<i>Aprosmictus erythropterus</i>	Red-winged Parrot	Observation
	<i>Cacatua galerita</i>	Sulphur-crested Cockatoo	Observation
	<i>Cacomantis variolosus</i>	Brush Cuckoo	Observation
	<i>Cincloramphus mathewsi</i>	Rufous Songlark	Observation
	<i>Cissomela pectoralis</i>	Banded Honeyeater	Observation
	<i>Coracina papuensis</i>	White-bellied Cuckoo-shrike	Observation
	<i>Coracina tenuirostris</i>	Melville Cicadabird	Observation
	<i>Corvus orru</i>	Torresian Crow	Observation, Remote camera
	<i>Coturnix ypsilophora</i>	Brown Quail	Observation
	<i>Dacelo leachii</i>	Blue-winged Kookaburra	Observation
	<i>Dicaeum hirundinaceum</i>	Mistletoebird	Observation
	<i>Ephippiorhynchus asiaticus</i>	Black-necked Stork	Observation
	<i>Eudynamys orientalis</i>	Eastern Koel	Observation
	<i>Eurystomus orientalis</i>	Dollarbird	Observation
	<i>Geopelia humeralis</i>	Bar-shouldered Dove	Observation
	<i>Geopelia striata</i>	Peaceful Dove	Observation
	<i>Grallina cyanoleuca</i>	Magpie-lark	Observation
	<i>Haliastur sphenurus</i>	Whistling Kite	Observation
	<i>Lalage sueurii</i>	White-winged Triller	Observation

Category	Scientific name	Common name	Detection method
Bird	<i>Lichenostomus unicolor</i>	White-gaped Honeyeater	Observation
	<i>Lichmera indistincta</i>	Brown Honeyeater	Observation
	<i>Melithreptus albogularis</i>	White-throated Honeyeater	Observation
	<i>Merops ornatus</i>	Rainbow Bee-eater	Observation
	EPBC migratory		
	<i>Microeca flavigaster</i>	Lemon-bellied Flycatcher	Observation
	<i>Pachycephala rufiventris</i>	Rufous Whistler	Observation
	<i>Phalacrocorax sulcirostris</i>	Little Black Cormorant	Observation
	<i>Philemon argenticeps</i>	Silver-crowned Friarbird	Observation
	<i>Philemon citreogularis</i>	Little Friarbird	Observation
	<i>Platycercus venustus</i>	Northern Rosella	Observation
	<i>Plegadis falcinellus</i>	Glossy Ibis	Observation
	EPBC migratory		
	<i>Podargus strigoides</i>	Tawny Frogmouth	Observation
	<i>Poephila personata</i>	Masked Finch	Observation
	<i>Ptilonorhynchus nuchalis</i>	Great Bowerbird	Observation
	<i>Threskiornis molucca</i>	Australian White Ibis	Observation
	<i>Todiramphus macleayii</i>	Forest Kingfisher	Observation
	<i>Todiramphus sanctus</i>	Sacred Kingfisher	Observation
	<i>Trichoglossus haematodus</i>	Rainbow Lorikeet	Observation
	<i>Vanellus miles</i>	Masked Lapwing	Observation
Mammal	<i>Macropus agilis</i>	Agile Wallaby	Remote camera
	<i>Trichosurus vulpecula</i>	Common Brushtail Possum	Remote camera
Introduced species	<i>Felis catus</i>	Cat	Remote camera
	<i>Sus scrofa</i>	Pig	Remote camera

Site 6

Location: -13.010685, 135.295208

Survey effort: 4 cameras x 14 nights
10 hair tubes x 14 nights
Incidental bird observations

Dates: November 7 – 21, 2012

Habitat: Billabong fringe. *Melaleuca viridiflora*, *M. cajuputi* and *Syzygium eucalyptoides* woodland over mixed species shrubland including *Grevillea pungens* and *Verticordia* sp over *Dapsilanthes* sedgeland. Deep sandy loam soil. Unburnt.

Species recorded:

Category	Scientific name	Common name	Detection method
Bird	<i>Anhinga novaehollandiae</i>	Australasian Darter	Observation
	<i>Aprosmictus erythropterus</i>	Red-winged Parrot	Observation
	<i>Ardea pacifica</i>	White-necked Heron	Observation
	<i>Coracina papuensis</i>	White-bellied Cuckoo-shrike	Observation
	<i>Corvus orru</i>	Torresian Crow	Remote camera
	<i>Cracticus nigrogularis</i>	Pied Butcherbird	Observation
	<i>Cracticus torquatus</i>	Grey Butcherbird	Observation
	<i>Dacelo leachii</i>	Blue-winged Kookaburra	Observation
	<i>Dromaius novaehollandiae</i>	Emu	Observation
	<i>Entomyzon cyanotis</i>	Blue-faced Honeyeater	Observation
	<i>Eurystomus orientalis</i>	Dollarbird	Observation
	<i>Geopelia striata</i>	Peaceful Dove	Observation
	<i>Grallina cyanoleuca</i>	Magpie-lark	Observation
	<i>Lalage leucomela</i>	Varied Triller	Observation
	<i>Lalage sueurii</i>	White-winged Triller	Observation
	<i>Lichmera indistincta</i>	Brown Honeyeater	Observation
	<i>Melithreptus albogularis</i>	White-throated Honeyeater	Observation
	<i>Myzomela obscura</i>	Dusky Honeyeater	Observation
	<i>Nycticorax caledonicus</i>	Nankeen Night Heron	Observation
	<i>Oriolus flavocinctus</i>	Yellow Oriole	Observation
	<i>Pachycephala rufiventris</i>	Rufous Whistler	Observation
	<i>Philemon argenteiceps</i>	Silver-crowned Friarbird	Observation

Category	Scientific name	Common name	Detection method
Bird	<i>Philemon citreogularis</i>	Little Friarbird	Observation
	<i>Platycercus venustus</i>	Northern Rosella	Observation
	<i>Ramsayornis fasciatus</i>	Bar-breasted Honeyeater	Observation
	<i>Threskiornis molucca</i>	Australian White Ibis	Observation
	<i>Trichoglossus haematodus</i>	Rainbow Lorikeet	Observation
	<i>Vanellus miles</i>	Masked Lapwing	Observation
Mammal	<i>Isodon macrourus</i>	Northern Brown Bandicoot	Remote camera
	<i>Melomys burtoni</i>	Grassland Melomys	Remote camera
Reptile	<i>Ctenotus inornatus</i>	Plain Ctenotus	Observation
	<i>Varanus scalaris</i>	Spotted Tree Monitor	Remote camera
Introduced species	<i>Bubalus bubalis</i>	Swamp Buffalo	Observation
	<i>Felis catus</i>	Cat	Remote camera
	<i>Rhinella marina</i>	Cane Toad	Remote camera

Site 7

Location: -12.962414, 135.34668

Survey effort: 4 cameras x 14 nights
10 hair tubes x 14 nights
Incidental bird observations

Dates: November 7 – 21, 2012

Habitat: Tall *E. tetradonta* woodland with some *E. miniata*, understory was dominated by emerging Eucalypt sp with some *Bossiaea bossiaeoides* and *Pandanus spiralis*

Species recorded:

Category	Scientific name	Common name	Detection method
Bird	<i>Aprosmictus erythropterus</i>	Red-winged Parrot	Observation
	<i>Centropus phasianinus</i>	Pheasant Coucal	Observation
	<i>Coracina papuensis</i>	White-bellied Cuckoo-shrike	Observation
	<i>Coracina tenuirostris</i>	Melville Cicadabird	Observation
	<i>Cracticus nigrogularis</i>	Pied Butcherbird	Observation
	<i>Eurystomus orientalis</i>	Dollarbird	Observation
	<i>Falco berigora</i>	Brown Falcon	Observation
	<i>Manorina flavigula</i>	Yellow-throated Miner	Observation
	<i>Melithreptus albogularis</i>	White-throated Honeyeater	Observation
	<i>Microeca flavigaster</i>	Lemon-bellied Flycatcher	Observation
	<i>Pachycephala rufiventris</i>	Rufous Whistler	Observation
	<i>Philemon argenticeps</i>	Silver-crowned Friarbird	Observation
	<i>Philemon citreogularis</i>	Little Friarbird	Observation
	<i>Smicrornis brevirostris</i>	Weebill	Observation
Introduced species	<i>Felis catus</i>	Cat	Remote camera

Site 8

Location: -12.705875, 136.174073

Survey effort: 4 cameras x 14 nights
10 hair tubes x 14 nights
Incidental bird observations

Dates: November 8 – 22, 2012

Habitat: *Eucalyptus tetrodonta* and *E. miniata* woodland over *Livistona inermis* open shrubland over Sorghum grassland. Unburnt. Sandy laterite soil.

Species recorded:

Category	Scientific name	Common name	Detection method
Bird	<i>Aprosmictus erythropterus</i>	Red-winged Parrot	Observation
	<i>Cacatua galerita</i>	Sulphur-crested Cockatoo	Observation
	<i>Cacomantis variolosus</i>	Brush Cuckoo	Observation
	<i>Centropus phasianinus</i>	Pheasant Coucal	Observation
	<i>Climacteris melanura</i>	Black-tailed Treecreeper	Observation
	<i>Colluricincla harmonica</i>	Grey Shrike-thrush	Observation
	<i>Coracina novaehollandiae</i>	Black-faced Cuckoo-shrike	Observation
	<i>Coracina papuensis</i>	White-bellied Cuckoo-shrike	Observation
	<i>Coracina tenuirostris</i>	Melville Cicadabird	Observation
	<i>Corvus orru</i>	Torresian Crow	Observation, Remote camera
	<i>Cracticus nigrogularis</i>	Pied Butcherbird	Observation
	<i>Dacelo leachii</i>	Blue-winged Kookaburra	Observation
	<i>Dicrurus bracteatus</i>	Spangled Drongo	Observation
	<i>Geopelia humeralis</i>	Bar-shouldered Dove	Observation
	<i>Geopelia striata</i>	Peaceful Dove	Observation
	<i>Gerygone albogularis</i>	White-throated Gerygone	Observation
	<i>Haliastur sphenurus</i>	Whistling Kite	Remote camera
	<i>Lichmera indistincta</i>	Brown Honeyeater	Observation
	<i>Malurus melanocephalus</i>	Red-backed Fairy-wren	Observation
	<i>Melithreptus albogularis</i>	White-throated Honeyeater	Observation
	<i>Merops ornatus</i>	Rainbow Bee-eater	Observation
	EPBC migratory		

Category	Scientific name	Common name	Detection method
Bird	<i>Microeca flavigaster</i>	Lemon-bellied Flycatcher	Observation
	<i>Myiagra rubecula</i>	Leaden Flycatcher	Observation
	<i>Oriolus flavocinctus</i>	Yellow Oriole	Observation
	<i>Pachycephala rufiventris</i>	Rufous Whistler	Observation
	<i>Smicrornis brevirostris</i>	Weebill	Observation
	<i>Todiramphus macleayii</i>	Forest Kingfisher	Observation
	<i>Trichoglossus haematodus</i>	Rainbow Lorikeet	Observation
Mammal	<i>Macropus agilis</i>	Agile Wallaby	Remote camera
Reptile	<i>Carlia amax</i>	Two-Spined Rainbow Skink	Observation
	<i>Cryptoblepharus metallicus</i>	Metallic Snake-eyed Skink	Observation
Introduced species	<i>Bubalus bubalis</i>	Swamp Buffalo	Observation
	<i>Felis catus</i>	Cat	Remote camera
	<i>Sus scrofa</i>	Pig	Remote camera

Site 9

Location: -12.614325, 136.333484

Survey effort: 4 cameras x 14 nights
10 hair tubes x 14 nights
Incidental bird observations

Dates: November 8 – 22, 2012

Habitat: Stony laterite rises with *Eucalyptus tetrodonta* woodland over *Livistona inermis* shrubland. Margins of *Melaleuca viridiflora* open forest swamp and drainage line. Traps place along boundary of recently burnt area.

Species recorded:

Category	Scientific name	Common name	Detection method
Bird	<i>Aprosmictus erythropterus</i>	Red-winged Parrot	Observation
	<i>Ardea ibis</i>	Cattle Egret	Remote camera
	EPBC migratory		
	<i>Cacatua galerita</i>	Sulphur-crested Cockatoo	Observation
	<i>Cacomantis variolosus</i>	Brush Cuckoo	Observation
	<i>Centropus phasianinus</i>	Pheasant Coucal	Observation
	<i>Coracina papuensis</i>	White-bellied Cuckoo-shrike	Observation
	<i>Dacelo leachii</i>	Blue-winged Kookaburra	Remote camera
	<i>Dicaeum hirundinaceum</i>	Mistletoebird	Observation
	<i>Dromaius novaehollandiae</i>	Emu	Observation
	<i>Eurystomus orientalis</i>	Dollarbird	Observation
	<i>Gerygone albogularis</i>	White-throated Gerygone	Observation
	<i>Haliastur sphenurus</i>	Whistling Kite	Observation
	<i>Malurus melanocephalus</i>	Red-backed Fairy-wren	Observation
	<i>Melithreptus albogularis</i>	White-throated Honeyeater	Observation
	<i>Myiagra rubecula</i>	Leaden Flycatcher	Observation
	<i>Pachycephala rufiventris</i>	Rufous Whistler	Observation
	<i>Pardalotus striatus</i>	Striated Pardalote	Observation
	<i>Philemon argenticeps</i>	Silver-crowned Friarbird	Observation
	<i>Smicrornis brevirostris</i>	Weebill	Observation
	<i>Threskiornis spinicollis</i>	Straw-necked Ibis	Observation, Remote camera

Category	Scientific name	Common name	Detection method
Mammal	<i>Canis lupus</i>	Dingo	Remote camera
	<i>Isoodon macrourus</i>	Northern Brown Bandicoot	Remote camera
	<i>Macropus agilis</i>	Agile Wallaby	Remote camera, Observation
	<i>Macropus antilopinus</i>	Antilopine Wallaroo	Remote camera
Reptile	<i>Carlia longipes</i>	Robust Rainbow Skink	Observation
Introduced species	<i>Bubalus bubalis</i>	Swamp Buffalo	Remote camera
	<i>Felis catus</i>	Cat	Remote camera
	<i>Sus scrofa</i>	Pig	Remote camera

Site 10

Location:	-12.309212, 136.774188
Survey effort:	10 hair tubes x 14 nights Incidental bird observations
Dates:	November 8 – 22, 2012
Habitat:	Riparian forest corridor along Latram River. Open forest with <i>Alphitonia excelsa</i> , <i>Syzygium</i> sp, and <i>Melaleuca</i> sp over mixed species vine thicket. Narrow corridor of riparian vegetation adjacent to recently burnt open woodland.

Species recorded:

Category	Scientific name	Common name	Detection method
Bird	<i>Aprosmictus erythropterus</i>	Red-winged Parrot	Observation
	<i>Cacatua galerita</i>	Sulphur-crested Cockatoo	Observation
	<i>Ceyx azureus</i>	Azure Kingfisher	Observation
	<i>Chalcophaps indica</i>	Emerald Dove	Observation
	<i>Coracina papuensis</i>	White-bellied Cuckoo-shrike	Observation
	<i>Corvus orru</i>	Torresian Crow	Observation
	<i>Dacelo leachii</i>	Blue-winged Kookaburra	Observation
	<i>Dicaeum hirundinaceum</i>	Mistletoebird	Observation
	<i>Dicrurus bracteatus</i>	Spangled Drongo	Observation
	<i>Ducula bicolor</i>	Pied Imperial-Pigeon	Observation
	<i>Eudynamys orientalis</i>	Eastern Koel	Observation
	<i>Geopelia humeralis</i>	Bar-shouldered Dove	Observation
	<i>Geopelia striata</i>	Peaceful Dove	Observation
	<i>Gerygone chloronota</i>	Green-backed Gerygone	Observation
	<i>Haliastur indus</i>	Brahminy Kite	Observation
	<i>Lichenostomus unicolor</i>	White-gaped Honeyeater	Observation
	<i>Megapodius reinwardt</i>	Orange-footed Scrubfowl	Observation
	<i>Melithreptus albogularis</i>	White-throated Honeyeater	Observation
	<i>Microeca flavigaster</i>	Lemon-bellied Flycatcher	Observation
	<i>Myzomela obscura</i>	Dusky Honeyeater	Observation
	<i>Nycticorax caledonicus</i>	Nankeen Night Heron	Observation
	<i>Oriolus flavocinctus</i>	Yellow Oriole	Observation
	<i>Pachycephala rufiventris</i>	Rufous Whistler	Observation

Category	Scientific name	Common name	Detection method
Bird	<i>Platycercus venustus</i>	Northern Rosella	Observation
	<i>Ptilinopus regina</i>	Rose-crowned Fruit-dove	Observation
	<i>Ptilonorhynchus nuchalis</i>	Great Bowerbird	Observation
	<i>Rhipidura rufiventris</i>	Northern Fantail	Observation
	<i>Smicrornis brevirostris</i>	Weebill	Observation
	<i>Threskiornis molucca</i>	Australian White Ibis	Observation
	<i>Trichoglossus haematodus</i>	Rainbow Lorikeet	Observation
Mammal	<i>Isodon macrourus</i>	Northern Brown Bandicoot	Hair sample
Reptile	<i>Demansia vestigiata</i>	Black Whip Snake	Observation
	<i>Lophognathus temporalis</i>	Northern Water Dragon	observation

Site 11

Location: -14.502195, 133.383644

Survey effort: Dawn bird survey – 4 people, 1 hour
Spotlighting – 4 people 1.5 hours
Masked Owl broadcast survey – 2 playback repeats

Dates: November 11, 2012

Habitat: Small waterhole in rocky creek bed.

Species recorded:

Category	Scientific name	Common name	Detection method
Amphbian	<i>Platyplectrum ornatus</i>	Ornate Burrowing Frog	Observation
	<i>Litoria caerulea</i>	Green Tree-frog	Observation
Bird	<i>Accipiter cirrocephalus</i>	Collared Sparrowhawk	Observation
	<i>Aprosmictus erythropterus</i>	Red-winged Parrot	Observation
	<i>Artamus cinereus</i>	Black-faced Woodswallow	Observation
	<i>Burhinus grallarius</i>	Bush Stone-curlew	Observation
	<i>Cacatua galerita</i>	Sulphur-crested Cockatoo	Observation
	<i>Cacomantis variolosus</i>	Brush Cuckoo	Observation
	<i>Calyptorhynchus banksii</i>	Red-tailed Black-cockatoo	Observation
	<i>Cissomela pectoralis</i>	Banded Honeyeater	Observation
	<i>Colluricincla harmonica</i>	Grey Shrike-thrush	Observation
	<i>Conopophila rufogularis</i>	Rufous-throated Honeyeater	Observation
	<i>Coracina papuensis</i>	White-bellied Cuckoo-shrike	Observation
	<i>Coracina tenuirostris</i>	Melville Cicadabird	Observation
	<i>Corvus orru</i>	Torresian Crow	Observation
	<i>Cracticus nigrogularis</i>	Pied Butcherbird	Observation
	<i>Cracticus torquatus</i>	Grey Butcherbird	Observation
	<i>Dacelo leachii</i>	Blue-winged Kookaburra	Observation
	<i>Dicaeum hirundinaceum</i>	Mistletoebird	Observation
	<i>Geopelia cuneata</i>	Diamond Dove	Observation
	<i>Geopelia humeralis</i>	Bar-shouldered Dove	Observation
	<i>Geopelia striata</i>	Peaceful Dove	Observation
	<i>Gerygone albogularis</i>	White-throated Gerygone	Observation
	<i>Grallina cyanoleuca</i>	Magpie-lark	Observation

Category	Scientific name	Common name	Detection method
	<i>Lalage sueurii</i>	White-winged Triller	Observation
Bird	<i>Lichmera indistincta</i>	Brown Honeyeater	Observation
	<i>Melithreptus albogularis</i>	White-throated Honeyeater	Observation
	<i>Microeca fascinans</i>	Jacky Winter	Observation
	<i>Microeca flavigaster</i>	Lemon-bellied Flycatcher	Observation
	<i>Myiagra inquieta</i>	Restless Flycatcher	Observation
	<i>Myzomela obscura</i>	Dusky Honeyeater	Observation
	<i>Nymphicus hollandicus</i>	Cockatiel	Observation
	<i>Pachycephala rufiventris</i>	Rufous Whistler	Observation
	<i>Pardalotus striatus</i>	Striated Pardalote	Observation
	<i>Phaps chalcoptera</i>	Common Bronzewing	Observation
	<i>Philemon argenteiceps</i>	Silver-crowned Friarbird	Observation
	<i>Poephila acuticauda</i>	Long-tailed Finch	Observation
	<i>Poephila personata</i>	Masked Finch	Observation
	<i>Pomatostomus temporalis</i>	Grey-crowned Babbler	Observation
	<i>Psephotus dissimilis</i>	Hooded Parrot	Observation
	<i>Psitteuteles versicolor</i>	Varied Lorikeet	Observation
	<i>Ptilonorhynchus nuchalis</i>	Great Bowerbird	Observation
	<i>Rhipidura leucophrys</i>	Willie Wagtail	Observation
	<i>Smicrornis brevirostris</i>	Weebill	Observation
	<i>Struthidea cinerea</i>	Apostlebird	Observation
	<i>Taeniopygia bichenovii</i>	Double-barred Finch	Observation
	<i>Malurus melanocephalus</i>	Red-backed Fairy-wren	Observation
Reptile	<i>Carlia amax</i>	Two-Spined Rainbow Skink	Observation
	<i>Gehyra australis</i>	Northern Dtella	Observation
	<i>Gehyra nana</i>	Northern Spotted Rock Dtella	Observation
	<i>Glaphyromorphus isolepis</i>	Smooth-Tailed Skink	Observation
	<i>Heteronotia binoei</i>	Bynoe's Gecko	Observation
	<i>Varanus scalaris</i>	Spotted Tree Monitor	Observation
Introduced species	<i>Rhinella marina</i>	Cane Toad	Observation

Site 12

Location: -14.496399, 133.396641

Survey effort: Dawn bird survey – 3 people, 1 hour; 2 people, 2 hours
Evening bird survey – 4 people, 1 hour
Spotlighting – 4 people, 1 hour

Dates: November 11-13, 2012

Habitat: Woodland with water in creekline. *Lophostemon* and ghost gum. *E. tectifica*, *C. latifolia* and *C. clavigera* on hillsides. Mid-story *Terminalia canescens* and *T. carpenteriae*. Spinifex understory on hillsides, *Heteropogon contortus* burnt this year on flats. Red clay soils, stony hills.

Species recorded:

Category	Scientific name	Common name	Detection method
Amphibian	<i>Limnodynastes convexiusculus</i>	Marbled Frog	Observation
	<i>Litoria caerulea</i>	Green Tree-frog	Observation
	<i>Litoria coplandi</i>	Copland's Rock Frog	Observation
	<i>Litoria meiriana</i>	Rockhole Frog	Observation
	<i>Litoria nasuta</i>	Rocket Frog	Observation
	<i>Litoria wotjulumensis</i>	Wotjulum Frog	Observation
Bird	<i>Aprosmictus erythropterus</i>	Red-winged Parrot	Observation
	<i>Aquila audax</i>	Wedge-tailed Eagle	Observation
	<i>Ardea modesta</i>	Eastern Great Egret	Observation
	EBPC migratory		
	<i>Ardea pacifica</i>	White-necked Heron	Observation
	<i>Cacatua galerita</i>	Sulphur-crested Cockatoo	Observation
	<i>Cacomantis variolosus</i>	Brush Cuckoo	Observation
	<i>Calyptrorhynchus banksii</i>	Red-tailed Black-cockatoo	Observation
	<i>Centropus phasianinus</i>	Pheasant Coucal	Observation
	<i>Cissomela pectoralis</i>	Banded Honeyeater	Observation
	<i>Cisticola exilis</i>	Golden-headed Cisticola	Observation
	<i>Conopophila rufogularis</i>	Rufous-throated Honeyeater	Observation
	<i>Coracina novaehollandiae</i>	Black-faced Cuckoo-shrike	Observation
	<i>Entomyzon cyanotis</i>	Blue-faced Honeyeater	Observation

Category	Scientific name	Common name	Detection method
Bird	<i>Erythrura gouldiae</i>	Gouldian Finch	Observation
	EPBC endangered, migratory; NT vulnerable		
	<i>Eulophus roseicapilla</i>	Galah	Observation
	<i>Eurystomus orientalis</i>	Dollarbird	Observation
	<i>Geopelia striata</i>	Peaceful Dove	Observation
	<i>Grallina cyanoleuca</i>	Magpie-lark	Observation
	<i>Lalage sueurii</i>	White-winged Triller	Observation
	<i>Lichenostomus flavescens</i>	Yellow-tinted Honeyeater	Observation
	<i>Lichmera indistincta</i>	Brown Honeyeater	Observation
	<i>Malurus melanocephalus</i>	Red-backed Fairy-wren	Observation
	<i>Melithreptus albogularis</i>	White-throated Honeyeater	Observation
	<i>Melopsittacus undulatus</i>	Budgerigar	Observation
	<i>Merops ornatus</i>	Rainbow Bee-eater	Observation
	EPBC migratory		
	<i>Myiagra inquieta</i>	Restless Flycatcher	Observation
	<i>Neochmia phaeton</i>	Crimson Finch	Observation
	<i>Nycticorax caledonicus</i>	Nankeen Night Heron	Observation
	<i>Oriolus sagittatus</i>	Olive-backed Oriole	Observation
	<i>Pachycephala rufiventris</i>	Rufous Whistler	Observation
	<i>Phalacrocorax varius</i>	Pied Cormorant	Observation
	<i>Phaps chalcoptera</i>	Common Bronzewing	Observation
	<i>Philemon argenticeps</i>	Silver-crowned Friarbird	Observation
	<i>Philemon citreogularis</i>	Little Friarbird	Observation
	<i>Poephila acuticauda</i>	Long-tailed Finch	Observation
	<i>Poephila personata</i>	Masked Finch	Observation
	<i>Psephotus dissimilis</i>	Hooded Parrot	Observation
	<i>Ptilonorhynchus nuchalis</i>	Great Bowerbird	Observation
	<i>Ramsayornis fasciatus</i>	Bar-breasted Honeyeater	Observation
	<i>Taeniopygia bichenovii</i>	Double-barred Finch	Observation
	<i>Threskiornis spinicollis</i>	Straw-necked Ibis	Observation
	<i>Todiramphus sanctus</i>	Sacred Kingfisher	Observation
	<i>Trichoglossus haematodus</i>	Rainbow Lorikeet	Observation

Category	Scientific name	Common name	Detection method
Reptile	<i>Demansia papuensis</i>	Papuan Whip Snake	Observation
	<i>Demansia vestigiata</i>	Black Whip Snake	Observation
	<i>Lophognathus gilberti</i>	Gilbert's Dragon	Observation
Reptile	<i>Tropidonophis mairii</i>	Keelback	Observation
Introduced species	<i>Rhinella marina</i>	Cane Toad	Observation

Site 13

Location: -14.52128,133.34037

Survey effort: Dawn bird survey – one person, 1.5 hours

Habitat: Mud pool near breakaways. *Acacia shirleyi* forest nearby and smooth barked *Corymbia* near pool.

Species recorded:

Category	Scientific name	Common name	Detection method
Bird	<i>Aprosmictus erythropterus</i>	Red-winged Parrot	Observation
	<i>Ardea pacifica</i>	White-necked Heron	Observation
	<i>Climacteris melanura</i>	Black-tailed Treecreeper	Observation
	<i>Colluricincla harmonica</i>	Grey Shrike-thrush	Observation
	<i>Conopophila rufogularis</i>	Rufous-throated Honeyeater	Observation
	<i>Coracina tenuirostris</i>	Melville Cicadabird	Observation
	<i>Cracticus nigrogularis</i>	Pied Butcherbird	Observation
	<i>Cracticus torquatus</i>	Grey Butcherbird	Observation
	<i>Dacelo leachii</i>	Blue-winged Kookaburra	Observation
	<i>Eulophus roseicapilla</i>	Galah	Observation
	<i>Geopelia cuneata</i>	Diamond Dove	Observation
	<i>Gerygone albogularis</i>	White-throated Gerygone	Observation
	<i>Lalage sueurii</i>	White-winged Triller	Observation
	<i>Microeca flavigaster</i>	Lemon-bellied Flycatcher	Observation
	<i>Myiagra rubecula</i>	Leaden Flycatcher	Observation
	<i>Nycticorax caledonicus</i>	Nankeen Night Heron	Observation
	<i>Oriolus sagittatus</i>	Olive-backed Oriole	Observation
	<i>Philemon argenteiceps</i>	Silver-crowned Friarbird	Observation
	<i>Philemon citreogularis</i>	Little Friarbird	Observation
	<i>Poephila acuticauda</i>	Long-tailed Finch	Observation
	<i>Pomatostomus superciliosus</i>	White-browed Babbler	Observation
	<i>Psephotus dissimilis</i>	Hooded Parrot	Observation
	<i>Ptilonorhynchus nuchalis</i>	Great Bowerbird	Observation
	<i>Rhipidura leucophrys</i>	Willie Wagtail	Observation
	<i>Smicrornis brevirostris</i>	Weebill	Observation
	<i>Struthidea cinerea</i>	Apostlebird	Observation

Category	Scientific name	Common name	Detection method
Bird	<i>Taeniopygia bichenovii</i>	Double-barred Finch	Observation
Mammal	<i>Macropus antilopinus</i>	Antilopine Wallaroo	Observation
Introduced species	<i>Bubalus bubalis</i>	Swamp Buffalo	Observation

Site 14

Location: -14.481012, 133.443203
Survey effort: Evening bird survey – 4 people 40 minutes
Date: November 12, 2012
Habitat: Creek and billabong with running water

Species recorded:

Category	Scientific name	Common name	Detection method
Amphibian	<i>Litoria caerulea</i>	Green Tree-frog	Observation
Bird	<i>Aprosmictus erythropterus</i>	Red-winged Parrot	Observation
	<i>Ardea modesta</i>	Eastern Great Egret	Observation
	EPBC migratory		
	<i>Ardea pacifica</i>	White-necked Heron	Observation
	<i>Cacatua galerita</i>	Sulphur-crested Cockatoo	Observation
	<i>Cissomela pectoralis</i>	Banded Honeyeater	Observation
	<i>Conopophila rufogularis</i>	Rufous-throated Honeyeater	Observation
	<i>Corvus orru</i>	Torresian Crow	Observation
	<i>Dacelo leachii</i>	Blue-winged Kookaburra	Observation
	<i>Dendrocygna eytoni</i>	Plumed Whistling-Duck	Observation
	<i>Egretta garzetta</i>	Little Egret	Observation
	<i>Entomyzon cyanotis</i>	Blue-faced Honeyeater	Observation
	<i>Eurystomus orientalis</i>	Dollarbird	Observation
	<i>Geopelia cuneata</i>	Diamond Dove	Observation
	<i>Geopelia humeralis</i>	Bar-shouldered Dove	Observation
	<i>Geopelia striata</i>	Peaceful Dove	Observation
	<i>Gerygone albogularis</i>	White-throated Gerygone	Observation
	<i>Grallina cyanoleuca</i>	Magpie-lark	Observation
	<i>Haliastur sphenurus</i>	Whistling Kite	Observation
	<i>Lalage sueurii</i>	White-winged Triller	Observation
	<i>Lichmera indistincta</i>	Brown Honeyeater	Observation
	<i>Malurus melanocephalus</i>	Red-backed Fairy-wren	Observation
	<i>Merops ornatus</i>	Rainbow Bee-eater	Observation
	EPBC migratory		
	<i>Milvus migrans</i>	Black Kite	Observation

Category	Scientific name	Common name	Detection method
Bird	<i>Myiagra inquieta</i>	Restless Flycatcher	Observation
	<i>Neochmia phaeton</i>	Crimson Finch	Observation
	<i>Nycticorax caledonicus</i>	Nankeen Night Heron	Observation
	<i>Nymphicus hollandicus</i>	Cockatiel	Observation
	<i>Oriolus sagittatus</i>	Olive-backed Oriole	Observation
	<i>Phalacrocorax varius</i>	Pied Cormorant	Observation
	<i>Philemon argenticeps</i>	Silver-crowned Friarbird	Observation
	<i>Philemon citreogularis</i>	Little Friarbird	Observation
	<i>Platycercus venustus</i>	Northern Rosella	Observation
	<i>Poephila personata</i>	Masked Finch	Observation
	<i>Psephotus dissimilis</i>	Hooded Parrot	Observation
	<i>Psittuteles versicolor</i>	Varied Lorikeet	Observation
	<i>Rhipidura leucophrys</i>	Willie Wagtail	Observation
	<i>Smicrornis brevirostris</i>	Weebill	Observation
	<i>Struthidea cinerea</i>	Apostlebird	Observation
	<i>Threskiornis spinicollis</i>	Straw-necked Ibis	Observation
	<i>Todiramphus sanctus</i>	Sacred Kingfisher	Observation
	<i>Trichoglossus haematodus</i>	Rainbow Lorikeet	Observation
Mammal	<i>Canis lupus</i>	Dingo	Observation
Reptile	<i>Lophognathus gilberti</i>	Gilbert's Dragon	Observation

Site 15

Location: -14.536348, 133.246201

Survey effort: Dawn bird survey – 2 people, 2 hours
 Evening bird survey – 2 people, 1 hour
 Spotlighting - 4 people 1 hour
 Masked Owl broadcast survey – 2 playback repeats

Dates: November 13, 14, 16, 2012

Habitat: Large long waterhole with fringing vegetation consisting of *Eucalyptus camaldulensis* and scattered *Pandanus aquaticus*. Open *Eucalyptus tetrodonta* and *E. miniata* woodland adjacent.

Species recorded:

Category	Scientific name	Common name	Detection method
Amphibian	<i>Litoria australis</i>	Giant Frog	Observation
	<i>Litoria caerulea</i>	Green Tree-frog	Observation
	<i>Litoria coplandi</i>	Copland's Rock Frog	Observation
	<i>Litoria wotjulumensis</i>	Wotjulum Frog	Observation
Bird	<i>Aprosmictus erythropterus</i>	Red-winged Parrot	Observation
	<i>Burhinus grallarius</i>	Bush Stone-curlew	Observation
	<i>Cacatua galerita</i>	Sulphur-crested Cockatoo	Observation
	<i>Cacomantis variolosus</i>	Brush Cuckoo	Observation
	<i>Calyptorhynchus banksii</i>	Red-tailed Black-cockatoo	Observation
	<i>Ceyx azureus</i>	Azure Kingfisher	Observation
	<i>Coracina novaehollandiae</i>	Black-faced Cuckoo-shrike	Observation
	<i>Corvus orru</i>	Torresian Crow	Observation
	<i>Cracticus nigrogularis</i>	Pied Butcherbird	Observation
	<i>Dacelo leachii</i>	Blue-winged Kookaburra	Observation
	<i>Entomyzon cyanotis</i>	Blue-faced Honeyeater	Observation
	<i>Eulophus roseicapilla</i>	Galah	Observation
	<i>Eurystomus orientalis</i>	Dollarbird	Observation
	<i>Geopelia cuneata</i>	Diamond Dove	Observation
	<i>Geopelia striata</i>	Peaceful Dove	Observation
	<i>Gerygone albogularis</i>	White-throated Gerygone	Observation
	<i>Grallina cyanoleuca</i>	Magpie-lark	Observation
	<i>Haliastur sphenurus</i>	Whistling Kite	Observation

Category	Scientific name	Common name	Detection method
Bird	<i>Lichenostomus unicolor</i>	White-gaped Honeyeater	Observation
	<i>Lichmera indistincta</i>	Brown Honeyeater	Observation
	<i>Malurus melanocephalus</i>	Red-backed Fairy-wren	Observation
	<i>Melopsittacus undulatus</i>	Budgerigar	Observation
	<i>Merops ornatus</i>	Rainbow Bee-eater	Observation
	EPBC migratory		
	<i>Microcarbo melanoleucos</i>	Little Pied Cormorant	Observation
	<i>Milvus migrans</i>	Black Kite	Observation
	<i>Myiagra inquieta</i>	Restless Flycatcher	Observation
	<i>Neochmia phaeton</i>	Crimson Finch	Observation
	<i>Ninox novaeseelandiae</i>	Southern Boobook	Observation
	<i>Oriolus sagittatus</i>	Olive-backed Oriole	Observation
	<i>Phaps chalcoptera</i>	Common Bronzewing	Observation
	<i>Philemon argenticeps</i>	Silver-crowned Friarbird	Observation
	<i>Philemon citreogularis</i>	Little Friarbird	Observation
	<i>Platycercus venustus</i>	Northern Rosella	Observation
	<i>Podargus strigoides</i>	Tawny Frogmouth	Observation
	<i>Pomatostomus temporalis</i>	Grey-crowned Babbler	Observation
	<i>Ptilonorhynchus nuchalis</i>	Great Bowerbird	Observation
	<i>Struthidea cinerea</i>	Apostlebird	Observation
	<i>Taeniopygia bichenovii</i>	Double-barred Finch	Observation
	<i>Trichoglossus haematodus</i>	Rainbow Lorikeet	Observation
Reptile	<i>Antaresia childreni</i>	Children's Python	Observation
	<i>Ctenotus spaldingi</i>	Spalding's Ctenotus	Observation
	<i>Dendrelaphis punctulata</i>	Green Tree Snake	Observation
Introduced species	<i>Rhinella marina</i>	Cane Toad	Observation

Site 16

Location: -14.538322, 133.312657

Survey effort: Dawn bird survey – 2 people, 1.25 hours

Date: November 14, 2012

Habitat: Scattered billabongs with *Melaleuca viridiflora*, *Pandanus aquaticus* and scattered *Eucalyptus camaldulensis* around billabongs and *Eucalyptus tectifica* woodlands on plains. Clay soil.

Species recorded:

Category	Scientific name	Common name	Detection method
Bird	<i>Aprosmictus erythropterus</i>	Red-winged Parrot	Observation
	<i>Ardea modesta</i>	Eastern Great Egret	Observation
	EPBC migratory		
	<i>Ardea pacifica</i>	White-necked Heron	Observation
	<i>Artamus cinereus</i>	Black-faced Woodswallow	Observation
	<i>Cacomantis variolosus</i>	Brush Cuckoo	Observation
	<i>Cissomela pectoralis</i>	Banded Honeyeater	Observation
	<i>Conopophila rufogularis</i>	Rufous-throated Honeyeater	Observation
	<i>Coracina novaehollandiae</i>	Black-faced Cuckoo-shrike	Observation
	<i>Coracina papuensis</i>	White-bellied Cuckoo-shrike	Observation
	<i>Corvus orru</i>	Torresian Crow	Observation
	<i>Cracticus nigrogularis</i>	Pied Butcherbird	Observation
	<i>Cracticus torquatus</i>	Grey Butcherbird	Observation
	<i>Dacelo leachii</i>	Blue-winged Kookaburra	Observation
	<i>Dendrocygna eytoni</i>	Plumed Whistling-Duck	Observation
	<i>Egretta garzetta</i>	Little Egret	Observation
	<i>Euseiornis melanops</i>	Black-fronted Dotterel	Observation
	<i>Entomyzon cyanotis</i>	Blue-faced Honeyeater	Observation
	<i>Eurystomus orientalis</i>	Dollarbird	Observation
	<i>Geopelia humeralis</i>	Bar-shouldered Dove	Observation
	<i>Geopelia striata</i>	Peaceful Dove	Observation
	<i>Grallina cyanoleuca</i>	Magpie-lark	Observation
	<i>Haliastur sphenurus</i>	Whistling Kite	Observation
	<i>Lalage sueurii</i>	White-winged Triller	Observation
	<i>Lichmera indistincta</i>	Brown Honeyeater	Observation

Category	Scientific name	Common name	Detection method
Bird	<i>Malurus melanocephalus</i>	Red-backed Fairy-wren	Observation
	<i>Melithreptus albogularis</i>	White-throated Honeyeater	Observation
	<i>Merops ornatus</i>	Rainbow Bee-eater	Observation
	EPBC migratory		
	<i>Myiagra inquieta</i>	Restless Flycatcher	Observation
	<i>Myiagra rubecula</i>	Leaden Flycatcher	Observation
	<i>Neochmia phaeton</i>	Crimson Finch	Observation
	<i>Philemon argenticeps</i>	Silver-crowned Friarbird	Observation
	<i>Philemon citreogularis</i>	Little Friarbird	Observation
	<i>Platalea regia</i>	Royal Spoonbill	Observation
	<i>Poephila acuticauda</i>	Long-tailed Finch	Observation
	<i>Poephila personata</i>	Masked Finch	Observation
	<i>Psephotus dissimilis</i>	Hooded Parrot	Observation
	<i>Ramsayornis fasciatus</i>	Bar-breasted Honeyeater	Observation
	<i>Todiramphus sanctus</i>	Sacred Kingfisher	Observation
	<i>Vanellus miles</i>	Masked Lapwing	Observation
Reptile	<i>Tropidonophis mairii</i>	Keelback	Observation

Site 17

Location: -14.538363, 133.318558

Survey effort: Dawn bird survey - 2 people 1.25 hours

Date: November 14, 2012

Habitat: Riparian *Melaleuca viridiflora* and *E. camaldulensis* open woodland

Species recorded:

Category	Scientific name	Common name	Detection method
Bird	<i>Aprosmictus erythropterus</i>	Red-winged Parrot	Observation
	<i>Ardea pacifica</i>	White-necked Heron	Observation
	<i>Artamus personatus</i>	Masked Woodswallow	Observation
	<i>Cacomantis variolosus</i>	Brush Cuckoo	Observation
	<i>Ceyx azureus</i>	Azure Kingfisher	Observation
	<i>Conopophila rufogularis</i>	Rufous-throated Honeyeater	Observation
	<i>Coracina novaehollandiae</i>	Black-faced Cuckoo-shrike	Observation
	<i>Coracina papuensis</i>	White-bellied Cuckoo-shrike	Observation
	<i>Corvus orru</i>	Torresian Crow	Observation
	<i>Cracticus nigrogularis</i>	Pied Butcherbird	Observation
	<i>Dacelo leachii</i>	Blue-winged Kookaburra	Observation
	<i>Dendrocygna eytoni</i>	Plumed Whistling-Duck	Observation
	<i>Entomyzon cyanotis</i>	Blue-faced Honeyeater	Observation
	<i>Eulophus roseicapilla</i>	Galah	Observation
	<i>Eurystomus orientalis</i>	Dollarbird	Observation
	<i>Geopelia cuneata</i>	Diamond Dove	Observation
	<i>Geopelia humeralis</i>	Bar-shouldered Dove	Observation
	<i>Geopelia striata</i>	Peaceful Dove	Observation
	<i>Grallina cyanoleuca</i>	Magpie-lark	Observation
	<i>Lichenostomus unicolor</i>	White-gaped Honeyeater	Observation
	<i>Lichmera indistincta</i>	Brown Honeyeater	Observation
	<i>Melithreptus albogularis</i>	White-throated Honeyeater	Observation
	<i>Merops ornatus</i>	Rainbow Bee-eater	Observation
	EPBC migratory		
	<i>Myiagra inquieta</i>	Restless Flycatcher	Observation
	<i>Nymphicus hollandicus</i>	Cockatiel	Observation

Category	Scientific name	Common name	Detection method
Bird	<i>Ocyphaps lophotes</i>	Crested Pigeon	Observation
	<i>Phaps chalcoptera</i>	Common Bronzewing	Observation
	<i>Philemon argenticeps</i>	Silver-crowned Friarbird	Observation
	<i>Philemon citreogularis</i>	Little Friarbird	Observation
	<i>Platycercus venustus</i>	Northern Rosella	Observation
	<i>Psephotus dissimilis</i>	Hooded Parrot	Observation
	<i>Ramsayornis fasciatus</i>	Bar-breasted Honeyeater	Observation
	<i>Rhipidura leucophrys</i>	Willie Wagtail	Observation
	<i>Smicrornis brevirostris</i>	Weebill	Observation
	<i>Threskiornis molucca</i>	Australian White Ibis	Observation
	<i>Trichoglossus haematodus</i>	Rainbow Lorikeet	Observation
Introduced species	<i>Equus asinus</i>	Donkey	Observation

Site 18

Location: -14.537932, 133.284201
Survey effort: Dawn bird survey – one person 1.5 hours
Date: November 15, 2012
Habitat: Waterhole with dense *Pandanus* sp. Border.

Species recorded:

Category	Scientific name	Common name	Detection method
Amphibian	<i>Litoria bicolor</i>	Northern Dwarf Tree-frog	Observation
Bird	<i>Aprosmictus erythropterus</i>	Red-winged Parrot	Observation
	<i>Corvus orru</i>	Torresian Crow	Observation
	<i>Dacelo leachii</i>	Blue-winged Kookaburra	Observation
	<i>Eudynamys orientalis</i>	Eastern Koel	Observation
	<i>Geopelia humeralis</i>	Bar-shouldered Dove	Observation
	<i>Geopelia striata</i>	Peaceful Dove	Observation
	<i>Grallina cyanoleuca</i>	Magpie-lark	Observation
	<i>Lichenostomus unicolor</i>	White-gaped Honeyeater	Observation
	<i>Lichmera indistincta</i>	Brown Honeyeater	Observation
	<i>Malurus melanocephalus</i>	Red-backed Fairy-wren	Observation
	<i>Melithreptus albogularis</i>	White-throated Honeyeater	Observation
	<i>Merops ornatus</i>	Rainbow Bee-eater	Observation
	EPBC migratory		
	<i>Milvus migrans</i>	Black Kite	Observation
	<i>Myiagra inquieta</i>	Restless Flycatcher	Observation
	<i>Neochmia phaeton</i>	Crimson Finch	Observation
	<i>Nycticorax caledonicus</i>	Nankeen Night Heron	Observation
	<i>Nymphicus hollandicus</i>	Cockatiel	Observation
	<i>Phaps chalcoptera</i>	Common Bronzewing	Observation
	<i>Philemon argenticeps</i>	Silver-crowned Friarbird	Observation
	<i>Poephila acuticauda</i>	Long-tailed Finch	Observation
	<i>Rhipidura rufiventris</i>	Northern Fantail	Observation
	<i>Smicrornis brevirostris</i>	Weebill	Observation
	<i>Taeniopygia bichenovii</i>	Double-barred Finch	Observation
Mammal	<i>Onychogalea unguifera</i>	Northern Nailtail Wallaby	Observation

Category	Scientific name	Common name	Detection method
Reptile	<i>Acrochordus arafurae</i>	Arafura File Snake	Observation
	<i>Dendrelaphis punctulata</i>	Green Tree Snake	Observation
	<i>Heteronotia binoei</i>	Bynoe's Gecko	Observation
Introduced species	<i>Rhinella marina</i>	Cane Toad	Observation

Site 19

Location: -14.538560, 133.302730

Survey effort: Dawn bird survey – one person, 1.5 hours

Date: November 15, 2012

Habitat: Small pool on river bed riparian zone, dominated by *Barringtonia acutangula* with scattered *Eucalyptus camaldulensis*, *Melaleuca viridiflora* and *Pandanus aquaticus*.

Species recorded:

Category	Scientific name	Common name	Detection method
Bird	<i>Aprosmictus erythropterus</i>	Red-winged Parrot	Observation
	<i>Cacatua galerita</i>	Sulphur-crested Cockatoo	Observation
	<i>Coracina novaehollandiae</i>	Black-faced Cuckoo-shrike	Observation
	<i>Eulophus roseicapilla</i>	Galah	Observation
	<i>Geopelia striata</i>	Peaceful Dove	Observation
	<i>Grallina cyanoleuca</i>	Magpie-lark	Observation
	<i>Haliastur sphenurus</i>	Whistling Kite	Observation
	<i>Lichenostomus unicolor</i>	White-gaped Honeyeater	Observation
	<i>Lichmera indistincta</i>	Brown Honeyeater	Observation
	<i>Melithreptus albogularis</i>	White-throated Honeyeater	Observation
	<i>Merops ornatus</i>	Rainbow Bee-eater	Observation
	EPBC migratory		
	<i>Philemon argenticeps</i>	Silver-crowned Friarbird	Observation
	<i>Philemon citreogularis</i>	Little Friarbird	Observation
	<i>Pomatostomus temporalis</i>	Grey-crowned Babbler	Observation
	<i>Smicrornis brevirostris</i>	Weebill	Observation
	<i>Trichoglossus haematodus</i>	Rainbow Lorikeet	Observation

Site 20

Location: -14.539850, 133.322781
Survey effort: Dawn bird survey – 2 people, 1.5 hours
Date: November 15, 2012
Habitat: Large waterhole in bottom of depression and dry creek bed

Species recorded:

Category	Scientific name	Common name	Detection method
Bird	<i>Aprosmictus erythropterus</i>	Red-winged Parrot	Observation
	<i>Calyptorhynchus banksii</i>	Red-tailed Black-cockatoo	Observation
	<i>Coracina novaehollandiae</i>	Black-faced Cuckoo-shrike	Observation
	<i>Dacelo leachii</i>	Blue-winged Kookaburra	Observation
	<i>Entomyzon cyanotis</i>	Blue-faced Honeyeater	Observation
	<i>Eulophus roseicapilla</i>	Galah	Observation
	<i>Eurystomus orientalis</i>	Dollarbird	Observation
	<i>Grallina cyanoleuca</i>	Magpie-lark	Observation
	<i>Lichenostomus unicolor</i>	White-gaped Honeyeater	Observation
	<i>Merops ornatus</i>	Rainbow Bee-eater	Observation
	EPBC migratory		
	<i>Nymphicus hollandicus</i>	Cockatiel	Observation
	<i>Ocyphaps lophotes</i>	Crested Pigeon	Observation
	<i>Oriolus sagittatus</i>	Olive-backed Oriole	Observation
	<i>Philemon argenticeps</i>	Silver-crowned Friarbird	Observation
	<i>Philemon citreogularis</i>	Little Friarbird	Observation
	<i>Platycercus venustus</i>	Northern Rosella	Observation
	<i>Poephila personata</i>	Masked Finch	Observation
	<i>Psephotus dissimilis</i>	Hooded Parrot	Observation
	<i>Smicrornis brevirostris</i>	Weebill	Observation
	<i>Trichoglossus haematodus</i>	Rainbow Lorikeet	Observation
Introduced species	<i>Equus caballus</i>	Horse	Observation

Site 21

Location: -14.537764, 133.316038
Survey effort: Dawn bird survey - 2 people 1.5 hours
Date: November 15, 2012
Habitat: *Corymbia arafurica*

Species recorded:

Category	Scientific name	Common name	Detection method
Bird	<i>Aprosmictus erythropterus</i>	Red-winged Parrot	Observation
	<i>Artamus leucorhynchus</i>	White-breasted Woodswallow	Observation
	<i>Conopophila rufogularis</i>	Rufous-throated Honeyeater	Observation
	<i>Coturnix ypsilophora</i>	Brown Quail	Observation
	<i>Eulophus roseicapilla</i>	Galah	Observation
	<i>Falco berigora</i>	Brown Falcon	Observation
	<i>Lalage sueurii</i>	White-winged Triller	Observation
	<i>Nymphicus hollandicus</i>	Cockatiel	Observation
	<i>Philemon argenticeps</i>	Silver-crowned Friarbird	Observation
	<i>Philemon citreogularis</i>	Little Friarbird	Observation
	<i>Psephotus dissimilis</i>	Hooded Parrot	Observation
	<i>Trichoglossus haematodus</i>	Rainbow Lorikeet	Observation

Site 22

Location: -14.548130, 133.255970

Survey effort: Dawn bird survey – 2 people, 2 hours
Spotlighting – 4 people, 1 hour

Date: November 15 - 16, 2012

Habitat: Riparian *Melaleuca viridiflora* and *E. camaldulensis* open woodland with some *Pandanus* sp.

Species recorded:

Category	Scientific name	Common name	Detection method
Amphibian	<i>Litoria bicolor</i>	Northern Dwarf Tree-frog	Observation
	<i>Litoria meiriana</i>	Rockhole Frog	Observation
	<i>Litoria rubella</i>	Red Tree-frog	Observation
	<i>Litoria wotjulumensis</i>	Wotjulum Frog	Observation
Bird	<i>Accipiter cirrocephalus</i>	Collared Sparrowhawk	Observation
	<i>Anhinga novaehollandiae</i>	Australasian Darter	Observation
	<i>Aprosmictus erythropterus</i>	Red-winged Parrot	Observation
	<i>Ardea modesta</i>	Eastern Great Egret	Observation
	EBPC migratory		
	<i>Cacatua galerita</i>	Sulphur-crested Cockatoo	Observation
	<i>Cacomantis variolosus</i>	Brush Cuckoo	Observation
	<i>Calyptorhynchus banksii</i>	Red-tailed Black-cockatoo	Observation
	<i>Centropus phasianinus</i>	Pheasant Coucal	Observation
	<i>Conopophila rufogularis</i>	Rufous-throated Honeyeater	Observation
	<i>Coracina novaehollandiae</i>	Black-faced Cuckoo-shrike	Observation
	<i>Corvus orru</i>	Torresian Crow	Observation
	<i>Cracticus nigrogularis</i>	Pied Butcherbird	Observation
	<i>Dacelo leachii</i>	Blue-winged Kookaburra	Observation
	<i>Dendrocygna eytoni</i>	Plumed Whistling-Duck	Observation
	<i>Entomyzon cyanotis</i>	Blue-faced Honeyeater	Observation
	<i>Eulophus roseicapilla</i>	Galah	Observation
	<i>Eurystomus orientalis</i>	Dollarbird	Observation
	<i>Falco berigora</i>	Brown Falcon	Observation
	<i>Geopelia humeralis</i>	Bar-shouldered Dove	Observation

Category	Scientific name	Common name	Detection method
Bird	<i>Geopelia striata</i>	Peaceful Dove	Observation
	<i>Gerygone albogularis</i>	White-throated Gerygone	Observation
	<i>Grallina cyanoleuca</i>	Magpie-lark	Observation
	<i>Lichenostomus unicolor</i>	White-gaped Honeyeater	Observation
	<i>Melithreptus albogularis</i>	White-throated Honeyeater	Observation
	<i>Melopsittacus undulatus</i>	Budgerigar	Observation
	<i>Merops ornatus</i>	Rainbow Bee-eater	Observation
	EPBC migratory		
	<i>Myiagra inquieta</i>	Restless Flycatcher	Observation
	<i>Neochmia phaeton</i>	Crimson Finch	Observation
	<i>Ninox novaeseelandiae</i>	Southern Boobook	Observation
	<i>Nycticorax caledonicus</i>	Nankeen Night Heron	Observation
	<i>Nymphicus hollandicus</i>	Cockatiel	Observation
	<i>Oriolus sagittatus</i>	Olive-backed Oriole	Observation
	<i>Phalacrocorax varius</i>	Pied Cormorant	Observation
	<i>Phaps chalcoptera</i>	Common Bronzewing	Observation
	<i>Philemon argenticeps</i>	Silver-crowned Friarbird	Observation
	<i>Philemon citreogularis</i>	Little Friarbird	Observation
	<i>Platalea regia</i>	Royal Spoonbill	Observation
	<i>Platycercus venustus</i>	Northern Rosella	Observation
	<i>Pomatostomus temporalis</i>	Grey-crowned Babbler	Observation
	<i>Psephotus dissimilis</i>	Hooded Parrot	Observation
	<i>Psitteuteles versicolor</i>	Varied Lorikeet	Observation
	<i>Rhipidura rufiventris</i>	Northern Fantail	Observation
	<i>Smicrornis brevirostris</i>	Weebill	Observation
	<i>Taeniopygia bichenovii</i>	Double-barred Finch	Observation
	<i>Todiramphus sanctus</i>	Sacred Kingfisher	Observation
	<i>Trichoglossus haematodus</i>	Rainbow Lorikeet	Observation
Reptile	<i>Crocodylus johnstoni</i>	Freshwater Crocodile	Observation
	<i>Dendrelaphis punctulata</i>	Green Tree Snake	Observation
Introduced species	<i>Rattus rattus</i>	Black Rat	Observation
	<i>Rhinella marina</i>	Cane Toad	Observation

Site 23

Location: -14.523392, 133.158002
Survey effort: Daytime bird survey – 4 people, 1 hour
Date: November 14, 2012
Habitat: Wetland

Species recorded:

Category	Scientific name	Common name	Detection method
Bird	<i>Anas gracilis</i>	Grey Teal	Observation
	<i>Anas superciliosa</i>	Pacific Black Duck	Observation
	<i>Ardea intermedia</i>	Intermediate Egret	Observation
	<i>Ardea modesta</i>	Eastern Great Egret	Observation
	<i>EPBC migratory</i>		
	<i>Ardea pacifica</i>	White-necked Heron	Observation
	<i>EPBC migratory</i>		
	<i>Aythya australis</i>	Hardhead	Observation
	<i>Corvus orru</i>	Torresian Crow	Observation
	<i>Elseyaornis melanops</i>	Black-fronted Dotterel	Observation
	<i>Erythronyctes cinctus</i>	Red-kneed Dotterel	Observation
	<i>Eurystomus orientalis</i>	Dollarbird	Observation
	<i>Himantopus himantopus</i>	Black-winged Stilt	Observation
	<i>Lichenostomus flavescens</i>	Yellow-tinted Honeyeater	Observation
	<i>Merops ornatus</i>	Rainbow Bee-eater	Observation
	<i>EPBC migratory</i>		
	<i>Phalacrocorax sulcirostris</i>	Little Black Cormorant	Observation
	<i>Platalea regia</i>	Royal Spoonbill	Observation
	<i>Plegadis falcinellus</i>	Glossy Ibis	Observation
	<i>EPBC migratory</i>		
	<i>Poephila acuticauda</i>	Long-tailed Finch	Observation
	<i>Poephila personata</i>	Masked Finch	Observation
	<i>Ramsayornis fasciatus</i>	Bar-breasted Honeyeater	Observation

Category	Scientific name	Common name	Detection method
Bird	<i>Tachybaptus novaehollandiae</i>	Australasian Grebe	Observation
	<i>Tadorna radjah</i>	Radjah Shelduck	Observation
	<i>Threskiornis molucca</i>	Australian White Ibis	Observation
	<i>Threskiornis spinicollis</i>	Straw-necked Ibis	Observation
	<i>Vanellus miles</i>	Masked Lapwing	Observation
Introduced species	<i>Bubalus bubalis</i>	Swamp Buffalo	Observation

Broadcast survey 1

Location: -14.51277, 133.36824

Survey effort: 6 playback repeats

Date: November 11, 2012

Habitat: *Eucalyptus tectifica*, *Corymbia latifolia*, *Melaleuca viridiflora*,
Erythrophleum chlorostachys. *Petalostigma pubescens* understory.
 Burnt this year.

Species recorded:

Category	Scientific name	Common name	Detection method
Bird	<i>Climacteris melanura</i>	Black-tailed Treecreeper	Observation
	<i>Dacelo leachii</i>	Blue-winged Kookaburra	Observation
	<i>Geopelia cuneata</i>	Diamond Dove	Observation
	<i>Gerygone albogularis</i>	White-throated Gerygone	Observation
	<i>Grallina cyanoleuca</i>	Magpie-lark	Observation
	<i>Merops ornatus</i>	Rainbow Bee-eater	Observation
	<i>Microeca fascinans</i>	Jacky Winter	Observation
	<i>Milvus migrans</i>	Black Kite	Observation
	<i>Pachycephala rufiventris</i>	Rufous Whistler	Observation
	<i>Rhipidura leucophrys</i>	Willie Wagtail	Observation
	<i>Todiramphus sanctus</i>	Sacred Kingfisher	Observation

Broadcast survey 2

Location: -14.518865, 133.354977

Survey effort: 6 playback repeats

Date: November 11, 2012

Habitat: *Melaleuca viridiflora* and *Eucalyptus tectifica* woodland.

Species recorded:

Category	Scientific name	Common name	Detection method
Bird	<i>Aegotheles cristatus</i>	Australian Owlet-nightjar	Observation
	<i>Cracticus nigrogularis</i>	Pied Butcherbird	Observation
	<i>Merops ornatus</i>	Rainbow Bee-eater	Observation
	EPBC migratory		
	<i>Pachycephala rufiventris</i>	Rufous Whistler	Observation
	<i>Philemon argenticeps</i>	Silver-crowned Friarbird	Observation

Broadcast survey 3

Location: -14.489911, 133.415389

Survey effort: 8 playback repeats

Date: November 12, 2012

Habitat: *Eucalyptus pruinosa*, *Erythrophleum chlorostachys* and *Corymbia latifolia* over patchy burnt grassland.

Species recorded:

Category	Scientific name	Common name	Detection method
Bird	<i>Cracticus nigrogularis</i>	Pied Butcherbird	Observation
	<i>Dacelo leachii</i>	Blue-winged Kookaburra	Observation
	<i>Lalage sueurii</i>	White-winged Triller	Observation
	<i>Nymphicus hollandicus</i>	Cockatiel	Observation
	<i>Pomatostomus temporalis</i>	Grey-crowned Babbler	Observation

Broadcast survey 4

Location: -14.485652, 133.430016

Survey effort: 8 playback repeats

Date: November 12, 2012

Habitat: *Eucalyptus tectifica* and *Corymbia bella* woodland.

Species recorded:

Category	Scientific name	Common name	Detection method
Bird	<i>Cacatua galerita</i>	Sulphur-crested Cockatoo	Observation
	<i>Conopophila rufogularis</i>	Rufous-throated Honeyeater	Observation
	<i>Coracina novaehollandiae</i>	Black-faced Cuckoo-shrike	Observation
	<i>Coracina papuensis</i>	White-bellied Cuckoo-shrike	Observation
	<i>Corvus orru</i>	Torresian Crow	Observation
	<i>Dacelo leachii</i>	Blue-winged Kookaburra	Observation
	<i>Eulophus roseicapilla</i>	Galah	Observation
	<i>Eurystomus orientalis</i>	Dollarbird	Observation
	<i>Gerygone albogularis</i>	White-throated Gerygone	Observation
	<i>Grallina cyanoleuca</i>	Magpie-lark	Observation
	<i>Haliastur sphenurus</i>	Whistling Kite	Observation
	<i>Lalage sueurii</i>	White-winged Triller	Observation
	<i>Malurus melanocephalus</i>	Red-backed Fairy-wren	Observation
	<i>Pachycephala rufiventris</i>	Rufous Whistler	Observation
	<i>Philemon argenticeps</i>	Silver-crowned Friarbird	Observation
	<i>Smicrornis brevirostris</i>	Weebill	Observation

Broadcast survey 5

Location: -14.534045, 133.255009

Survey effort: 4 playback repeats

Date: November 13, 2012

Habitat: *Eucalyptus tectifica* and *Corymbia latifolia* woodland.

Species recorded:

Category	Scientific name	Common name	Detection method
Bird	<i>Dacelo leachii</i>	Blue-winged Kookaburra	Observation
	<i>Daphoenositta chrysoptera</i>	Varied Sittella	Observation
	<i>Eulophus roseicapilla</i>	Galah	Observation
	<i>Haliastur sphenurus</i>	Whistling Kite	Observation
	<i>Microeca fascinans</i>	Jacky Winter	Observation
	<i>Philemon argenticeps</i>	Silver-crowned Friarbird	Observation
	<i>Struthidea cinerea</i>	Apostlebird	Observation

Broadcast survey 6

Location: -14.538183, 133.273677

Survey effort: 4 playback repeats

Date: November 13, 2012

Habitat: *Eucalyptus tectifica*, *Corymbia latifolia*, *Erythrophleum chlorostachys* with some *Eucalyptus miniata*.

Species recorded:

Category	Scientific name	Common name	Detection method
Bird	<i>Aprosmictus erythropterus</i>	Red-winged Parrot	Observation
	<i>Cacatua galerita</i>	Sulphur-crested Cockatoo	Observation
	<i>Corvus orru</i>	Torresian Crow	Observation
	<i>Cracticus tibicen</i>	Australian Magpie	Observation
	<i>Eulophus roseicapilla</i>	Galah	Observation
	<i>Eurystomus orientalis</i>	Dollarbird	Observation
	<i>Geopelia striata</i>	Peaceful Dove	Observation
	<i>Haliastur sphenurus</i>	Whistling Kite	Observation
	<i>Pachycephala rufiventris</i>	Rufous Whistler	Observation
	<i>Philemon argenticeps</i>	Silver-crowned Friarbird	Observation
	<i>Trichoglossus haematodus</i>	Rainbow Lorikeet	Observation

Broadcast survey 7

Location: -14.521068, 133.187345

Survey effort: 8 playback repeats

Date: November 14, 2012

Habitat: *Eucalyptus tectifica* woodland with *Corymbia bleeseri*, *C. latifolia* and *E. grandiflora* over patchy burnt grassland. Clay loam soil.

Species recorded:

Category	Scientific name	Common name	Detection method
Bird	<i>Climacteris melanura</i>	Black-tailed Treecreeper	Observation
	<i>Coracina novaehollandiae</i>	Black-faced Cuckoo-shrike	Observation
	<i>Corvus orru</i>	Torresian Crow	Observation
	<i>Cracticus nigrogularis</i>	Pied Butcherbird	Observation
	<i>Geopelia cuneata</i>	Diamond Dove	Observation
	<i>Grallina cyanoleuca</i>	Magpie-lark	Observation
	<i>Grus rubicunda</i>	Brolga	Observation
	<i>Haliastur sphenurus</i>	Whistling Kite	Observation
	<i>Lalage sueurii</i>	White-winged Triller	Observation
	<i>Lichenostomus flavescens</i>	Yellow-tinted Honeyeater	Observation
	<i>Lichmera indistincta</i>	Brown Honeyeater	Observation
	<i>Malurus melanocephalus</i>	Red-backed Fairy-wren	Observation
	<i>Melithreptus albogularis</i>	White-throated Honeyeater	Observation
	<i>Microeca fascinans</i>	Jacky Winter	Observation
	<i>Philemon argenticeps</i>	Silver-crowned Friarbird	Observation
	<i>Philemon citreogularis</i>	Little Friarbird	Observation
	<i>Smicrornis brevirostris</i>	Weebill	Observation
	<i>Struthidea cinerea</i>	Apostlebird	Observation
	<i>Todiramphus sanctus</i>	Sacred Kingfisher	Observation
	<i>Trichoglossus haematodus</i>	Rainbow Lorikeet	Observation
Reptile	<i>Carlia munda</i>	Striped Rainbow Skink	Observation

Broadcast survey 8

Location: -14.521213, 133.173936

Survey effort: 8 playback repeats

Date: November 14, 2012

Habitat: *Eucalyptus tectifica*, *Corymbia latifolia* and *Erythrophleum chlorostachys* woodland.

Species recorded:

Category	Scientific name	Common name	Detection method
Bird	<i>Artamus minor</i>	Little Woodswallow	Observation
	<i>Cacomantis variolosus</i>	Brush Cuckoo	Observation
	<i>Colluricincla harmonica</i>	Grey Shrike-thrush	Observation
	<i>Cracticus nigrogularis</i>	Pied Butcherbird	on nest
	<i>Dicaeum hirundinaceum</i>	Mistletoebird	Observation
	<i>Entomyzon cyanotis</i>	Blue-faced Honeyeater	Observation
	<i>Geopelia striata</i>	Peaceful Dove	Observation
	<i>Haliastur sphenurus</i>	Whistling Kite	Observation
	<i>Lalage sueurii</i>	White-winged Triller	Observation
	<i>Melithreptus albogularis</i>	White-throated Honeyeater	Observation
	<i>Merops ornatus</i>	Rainbow Bee-eater	Observation
	<i>Myiagra inquieta</i>	Restless Flycatcher	Observation
	<i>Pachycephala rufiventris</i>	Rufous Whistler	Observation
	<i>Philemon argenticeps</i>	Silver-crowned Friarbird	Observation
	<i>Philemon citreogularis</i>	Little Friarbird	Observation
	<i>Todiramphus sanctus</i>	Sacred Kingfisher	Observation

Broadcast survey 9

Location: -14.524567, 133.158399

Survey effort: 8 playback repeats

Date: November 14, 2012

Habitat: *Eucalyptus tectifica* woodland with *Corymbia latifolia*.

Species recorded:

Category	Scientific name	Common name	Detection method
Bird	<i>Accipiter cirrocephalus</i>	Collared Sparrowhawk	Observation
	<i>Cacomantis variolosus</i>	Brush Cuckoo	Observation
	<i>Cissomela pectoralis</i>	Banded Honeyeater	Observation
	<i>Climacteris melanura</i>	Black-tailed Treecreeper	Observation
	<i>Conopophila rufogularis</i>	Rufous-throated Honeyeater	Observation
	<i>Coracina papuensis</i>	White-bellied Cuckoo-shrike	Observation
	<i>Corvus orru</i>	Torresian Crow	Observation
	<i>Dacelo leachii</i>	Blue-winged Kookaburra	Observation
	<i>Entomyzon cyanotis</i>	Blue-faced Honeyeater	Observation
	<i>Grallina cyanoleuca</i>	Magpie-lark	Observation
	<i>Lalage sueurii</i>	White-winged Triller	Observation
	<i>Lichenostomus flavescens</i>	Yellow-tinted Honeyeater	Observation
	<i>Lichmera indistincta</i>	Brown Honeyeater	Observation
	<i>Malurus melanocephalus</i>	Red-backed Fairy-wren	Observation
	<i>Melithreptus albogularis</i>	White-throated Honeyeater	Observation
	<i>Merops ornatus</i>	Rainbow Bee-eater	Observation
	<i>Milvus migrans</i>	Black Kite	Observation
	<i>Pachycephala rufiventris</i>	Rufous Whistler	Observation
	<i>Philemon argenticeps</i>	Silver-crowned Friarbird	Observation
	<i>Smicrornis brevirostris</i>	Weebill	Observation
	<i>Todiramphus sanctus</i>	Sacred Kingfisher	Observation
Mammal	<i>Macropus antilopinus</i>	Antilopine Wallaroo	Observation

Broadcast survey 10

Location:
Survey effort: 6 playback repeats

Date: November 15, 2012

Habitat: *Melaleuca viridiflora*, *Eucalyptus tectifica*, *Erythrophleum chlorostachys* and *Eucalyptus ferruginea* over *Petalostigma pubescens*.

Species recorded:

Category	Scientific name	Common name	Detection method
Bird	<i>Cacatua galerita</i>	Sulphur-crested Cockatoo	Observation
	<i>Calyptrorhynchus banksii</i>	Red-tailed Black-cockatoo	Observation
	<i>Corvus orru</i>	Torresian Crow	Observation
	<i>Cracticus nigrogularis</i>	Pied Butcherbird	Observation
	<i>Dacelo leachii</i>	Blue-winged Kookaburra	Observation
	<i>Geopelia striata</i>	Peaceful Dove	Observation
	<i>Melithreptus albogularis</i>	White-throated Honeyeater	Observation
	<i>Merops ornatus</i>	Rainbow Bee-eater	Observation
	<i>Milvus migrans</i>	Black Kite	Observation
	<i>Nymphicus hollandicus</i>	Cockatiel	Observation
	<i>Phaps chalcoptera</i>	Common Bronzewing	Observation
	<i>Philemon argenticeps</i>	Silver-crowned Friarbird	Observation
	<i>Pomatostomus temporalis</i>	Grey-crowned Babbler	Observation
	<i>Smicrornis brevirostris</i>	Weebill	Observation
	<i>Todiramphus sanctus</i>	Sacred Kingfisher	Observation
	<i>Trichoglossus haematodus</i>	Rainbow Lorikeet	Observation

Broadcast survey 11

Location: -14.594465, 132.717204

Survey effort: 8 playback repeats
4 people conducting playback and triangulating location of calling individuals, 1 hour

Date: November 15, 2012

Habitat: *Eucalyptus tectifica*, *E. latifolia* and *Erythrophleum chlorostachys* woodland. Denser and older trees than other sites.

Species recorded:

Category	Scientific name	Common name	Detection method
Bird	<i>Artamus cinereus</i>	Black-faced Woodswallow	Observation
	<i>Artamus minor</i>	Little Woodswallow	Observation
	<i>Climacteris melanura</i>	Black-tailed Treecreeper	Observation
	<i>Colluricincla harmonica</i>	Grey Shrike-thrush	Observation
	<i>Conopophila rufogularis</i>	Rufous-throated Honeyeater	Observation
	<i>Cracticus nigrogularis</i>	Pied Butcherbird	Observation
	<i>Eurystomus orientalis</i>	Dollarbird	Observation
	<i>Falcunculus frontatus whitei</i>	Northern Crested Shrike-tit	Call recognition
	EPBC vulnerable, migratory.		
	<i>Grallina cyanoleuca</i>	Magpie-lark	Observation
	<i>Lalage sueurii</i>	White-winged Triller	Observation
	<i>Lichenostomus flavescens</i>	Yellow-tinted Honeyeater	Observation
	<i>Lichmera indistincta</i>	Brown Honeyeater	Observation
	<i>Melopsittacus undulatus</i>	Budgerigar	Observation
	<i>Merops ornatus</i>	Rainbow Bee-eater	Observation
	EPBC migratory		
	<i>Microeca fascinans</i>	Jacky Winter	Observation
	<i>Myiagra inquieta</i>	Restless Flycatcher	Observation
	<i>Pachycephala rufiventris</i>	Rufous Whistler	Observation
	<i>Philemon citreogularis</i>	Little Friarbird	Observation
	<i>Rhipidura leucophrys</i>	Willie Wagtail	Observation
	<i>Todiramphus sanctus</i>	Sacred Kingfisher	Observation

Broadcast survey 12

Location: -14.608617, 132.706471

Survey effort: 8 playback transects

Date: November 15, 2012

Habitat: *Eucalyptus latifolia* and *Melaleuca viridiflora* woodland, and *Corymbia bleeseri*, *Eucalyptus tetradonta* and *E. miniata* woodland.

Species recorded:

Category	Scientific name	Common name	Detection method
Bird	<i>Climacteris melanura</i>	Black-tailed Treecreeper	Observation
	<i>Geopelia cuneata</i>	Diamond Dove	Observation
	<i>Lichenostomus flavescens</i>	Yellow-tinted Honeyeater	Observation
	<i>Lichmera indistincta</i>	Brown Honeyeater	Observation
	<i>Microeca fascinans</i>	Jacky Winter	Observation
	<i>Pachycephala rufiventris</i>	Rufous Whistler	Observation
	<i>Rhipidura leucophrys</i>	Willie Wagtail	Observation
	<i>Smicronis brevirostris</i>	Weebill	Observation
	<i>Todiramphus sanctus</i>	Sacred Kingfisher	Observation

Incidental records

Site: Incidental 1
Location: -14.5393, 133.27485
Date: November 14, 2012
Habitat: *Eucalyptus tintinans* on rocky hillside.

Species recorded:

Category	Scientific name	Common name	Detection method
Bird	<i>Turnix castanotus</i>	Chestnut-backed Button-quail	Observation

Site: Incidental 2
Location: -14.51809, 133.34552
Date: November 10
Habitat: Open woodland adjacent to *Acacia shirleyi* forest

Species recorded:

Category	Scientific name	Common name	Detection method
Reptile	<i>Ctenotus inornatus</i>	Plain Ctenotus	Observation
	<i>Diporiphora benetti</i>	Robust Dragon	Observation
	<i>Varanus primordius</i>	Northern Ridge-tailed Monitor	Observation

Site: Incidental 3
Location: -14.50912, 133.37299
Date: November 10, 2012
Survey effort: Spotlighting – 4 people, 1.25 hours
Habitat: Dry rocky creek bed

Species recorded:

Category	Scientific name	Common name	Detection method
Amphibian	<i>Platyplectrum ornatus</i>	Ornate Burrowing Frog	Observation
Bird	<i>Aegotheles cristatus</i>	Australian Owlet-nightjar	Observation
	<i>Pachycephala rufiventris</i>	Rufous Whistler	Observation

Site: Incidental 4
Location: -14.51374, 133.36726
Date: November 10, 2012
Habitat: Open woodland

Species recorded:

Category	Scientific name	Common name	Detection method
Bird	<i>Podargus strigoides</i>	Tawny Frogmouth	Call recognition

Site: Incidental 5
Location: -14.51576, 133.36292
Date: November 10, 2012
Survey effort: Spotlighting – 4 people, 1 hour
Habitat: Dry sandy creek bed

Species recorded:

Category	Scientific name	Common name	Detection method
Amphibian	<i>Platyplectrum ornatus</i>	Ornate Burrowing Frog	Observation
Reptile	<i>Antaresia childreni</i>	Children's Python	Observation
	<i>Liasis olivaceus</i>	Olive Python	1 adult, 1 juvenile

Appendix G: Species list, 2004 and 2012 surveys

CATEGORY	SPECIES RECORDED	2004	2012
Amphibian	<i>Crinia</i> sp.	x	
	Copland's Rock Frog (<i>Litoria coplandi</i>)	x	x
	Giant Frog (<i>Litoria australis</i>)		x
	Green Tree-frog (<i>Litoria caerulea</i>)	x	x
	Marbled Frog (<i>Limnodynastes convexiusculus</i>)	x	x
	Northern Dwarf Tree-frog (<i>Litoria bicolor</i>)	x	x
	Northern Spadefoot Toad (<i>Notaden melanoscaphus</i>)	x	
	Ornate Burrowing Frog (<i>Platyplectrum ornatus</i>)	x	x
	Pale Tree-frog (<i>Litoria pallida</i>)	x	
	Peter's Frog (<i>Litoria inermis</i>)	x	
	Red Tree-frog (<i>Litoria rubella</i>)	x	x
	Remote Froglet (<i>Crinia remota</i>)	x	
	Rocket Frog (<i>Litoria nasuta</i>)	x	x
	Rockhole Frog (<i>Litoria meiriana</i>)		x
	Roth's Tree Frog (<i>Litoria rothii</i>)	x	
	Stonemason Toadlet (<i>Uperoleia lithomoda</i>)	x	
	Tornier's Frog (<i>Litoria tornieri</i>)	x	
	Wotjulum Frog (<i>Litoria wotjulumensis</i>)	x	x
Bird	Apostlebird (<i>Struthidea cinerea</i>)		x
	Australasian Darter (<i>Anhinga novaehollandiae</i>)	x	x
	Australasian Figbird (<i>Sphecotheres viridis</i>)	x	
	Australasian Grebe (<i>Tachybaptus novaehollandiae</i>)		x

CATEGORY	SPECIES RECORDED	2004	2012
Bird	Australian Magpie (<i>Cracticus tibicen</i>)		x
	Australian Owlet-nightjar (<i>Aegotheles cristatus</i>)	x	x
	Australian White Ibis (<i>Threskiornis molucca</i>)		x
	Azure Kingfisher (<i>Ceyx azureus</i>)	x	x
	Banded Honeyeater (<i>Cissomela pectoralis</i>)	x	x
	Bar-breasted Honeyeater (<i>Ramsayornis fasciatus</i>)	x	x
	Bar-shouldered Dove (<i>Geopelia humeralis</i>)	x	x
	Beach-stone Curlew (<i>Esacus neglectus</i>)	x	
	Black Kite (<i>Milvus migrans</i>)	x	x
	Black-breasted Buzzard (<i>Hamirostra melanosternon</i>)	x	x
	Black-faced Cuckoo-shrike (<i>Coracina novaehollandiae</i>)	x	x
	Black-faced Woodswallow (<i>Artamus cinereus</i>)	x	x
	Black-fronted Dotterel (<i>Elseyaornis melanops</i>)		x
	Black-necked Stork (<i>Ephippiorhynchus asiaticus</i>)		x
	Black-tailed Treecreeper (<i>Climacteris melanura</i>)	x	x
	Black-winged Stilt (<i>Himantopus himantopus</i>)		x
	Blue-faced Honeyeater (<i>Entomyzon cyanotis</i>)	x	x
	Blue-winged Kookaburra (<i>Dacelo leachii</i>)	x	x
	Brahminy Kite (<i>Haliastur indus</i>)		x
	Brolga (<i>Grus rubicunda</i>)		x
	Brown Falcon (<i>Falco berigora</i>)	x	x
	Brown Goshawk (<i>Accipiter fasciatus</i>)	x	x
	Brown Honeyeater (<i>Lichmera indistincta</i>)	x	x
	Brown Quail (<i>Coturnix ypsilophora</i>)	x	x
	Brush Cuckoo (<i>Cacomantis variolosus</i>)	x	x
	Budgerigar (<i>Melopsittacus undulatus</i>)		x
Bird	Bush Stone-curlew (<i>Burhinus grallarius</i>)		x

CATEGORY	SPECIES RECORDED	2004	2012
Bird	Cattle Egret (<i>Ardea ibis</i>) – EPBC migratory		x
	Chestnut-backed Button-quail (<i>Turnix castanotus</i>)		x
	Chestnut-breasted Mannikin (<i>Lonchura castaneothorax</i>)	x	
	Cockatiel (<i>Nymphicus hollandicus</i>)	x	x
	Collared Sparrowhawk (<i>Accipiter cirrocephalus</i>)		x
	Common Bronzewing (<i>Phaps chalcoptera</i>)	x	x
	Crested Pigeon (<i>Ocyphaps lophotes</i>)		x
	Crimson Finch (<i>Neochmia phaeton</i>)	x	x
	Diamond Dove (<i>Geopelia cuneata</i>)	x	x
	Dollarbird (<i>Eurystomus orientalis</i>)		x
	Double-barred Finch (<i>Taeniopygia bichenovii</i>)	x	x
	Derby White-Browed Robin (<i>Poecilodryas superciliosa cerviniventris</i>) – EPBC migratory		x
	Dusky Honeyeater (<i>Myzomela obscura</i>)	x	x
	Eastern Great Egret (<i>Ardea modesta</i>) – EPBC migratory		x
	Eastern Koel (<i>Eudynamis orientalis</i>)		x
	Emerald Dove (<i>Chalcophaps indica</i>)		x
	Emu (<i>Dromaius novaehollandiae</i>)		x
	Forest Kingfisher (<i>Todiramphus macleayi</i>)	x	x
	Galah (<i>Eulophus roseicapilla</i>)	x	x
	Glossy Ibis (<i>Plegadis falcinellus</i>)		x
	Golden-headed Cisticola (<i>Cisticola exilis</i>)	x	x
	Gouldian Finch (<i>Erythrura gouldiae</i>) - EPBC endangered, migratory; NT vulnerable	x	x
	Great Bowerbird (<i>Ptilonorhynchus nuchalis</i>)	x	x
	Green-backed Gerygone (<i>Gerygone chloronota</i>)		x
	Grey Butcherbird (<i>Cracticus torquatus</i>)		x
	Grey Shrike-thrush (<i>Colluricincla harmonica</i>)		x

CATEGORY	SPECIES RECORDED	2004	2012
Bird	Grey Teal (<i>Anas gracilis</i>)		x
	Grey Whistler (<i>Pachycephala simplex</i>)	x	
	Grey-crowned Babbler (<i>Pomatostomus temporalis</i>)	x	x
	Hardhead (<i>Aythya australis</i>)		x
	Helmeted Friarbird (<i>Philemon buceroides</i>)	x	
	Hooded Parrot (<i>Psephotus dissimilis</i>)	x	x
	Intermediate Egret (<i>Ardea intermedia</i>)		x
	Jacky Winter (<i>Microeca fascians</i>)	x	x
	Large-billed Gerygone (<i>Gerygone magnirostris</i>)	x	
	Leaden Flycatcher (<i>Myiagra rubecula</i>)	x	x
	Lemon-bellied Flycatcher (<i>Microeca flavigaster</i>)	x	x
	Little Black Cormorant (<i>Phalacrocorax sulcirostris</i>)		x
	Little Egret (<i>Egretta garzetta</i>)		x
	Little Friarbird (<i>Philemon citreogularis</i>)	x	x
	Little Pied Cormorant (<i>Microcarbo melanoleucos</i>)		x
	Little Woodswallow (<i>Artamus minor</i>)		x
	Long-tailed Finch (<i>Poephila acuticauda</i>)	x	x
	Magpie Goose (<i>Anseranas semipalmata</i>)	x	
	Magpie-lark (<i>Grallina cyanoleuca</i>)		x
	Masked Finch (<i>Poephila personata</i>)	x	x
	Masked Lapwing (<i>Vanellus miles</i>)		x
	Masked Woodswallow (<i>Artamus personatus</i>)		x
	Melville Cicadabird (<i>Coracina tenuirostris melvillensis</i>)		x
	Mistletoebird (<i>Dicaeum hirundinaceum</i>)	x	x
	Nankeen Kestrel (<i>Falco cenchroides</i>)	x	
	Nankeen Night Heron (<i>Nycticorax caledonicus</i>)		x
	Northern Crested Shrike-tit (<i>Falcunculus frontatus whitei</i>) - EPBC vulnerable, migratory		x

CATEGORY	SPECIES RECORDED	2004	2012
Bird	Northern Fantail (<i>Rhipidura rufiventris</i>)	x	x
	Northern Rosella (<i>Platycercus venustus</i>)	x	x
	Olive-backed Oriole (<i>Oriolus sagittatus</i>)		x
	Orange-footed Scrubfowl (<i>Megapodius reinwardt</i>)	x	x
	Pacific Black Duck (<i>Anas superciliosa</i>)		x
	Peaceful Dove (<i>Geopelia striata</i>)	x	x
	Pheasant Coucal (<i>Centropus phasianinus</i>)	x	x
	Pied Butcherbird (<i>Cracticus nigrogularis</i>)	x	x
	Pied Cormorant (<i>Phalacrocorax varius</i>)		x
	Pied Imperial-Pigeon (<i>Ducula bicolor</i>)		x
	Plumed Whistling-Duck (<i>Dendrocygna eytoni</i>)		x
	Radjah Shelduck (<i>Tadorna radjah</i>)		x
	Rainbow Bee-eater (<i>Merops ornatus</i>) – EPBC migratory	x	x
	Rainbow Lorikeet (<i>Trichoglossus haematodus</i>)	x	x
	Red-backed Fairy-wren (<i>Malurus melanocephalus</i>)	x	x
	Red-kneed Dotterel (<i>Erythronyctes alba</i>)		x
	Red-tailed Black-cockatoo (<i>Calyptorhynchus banksii</i>)	x	x
	Red-winged Parrot (<i>Aprosmictus erythropterus</i>)	x	x
	Restless Flycatcher (<i>Myiagra inquieta</i>)	x	x
	Rose-crowned Fruit-dove (<i>Ptilinopus regina</i>)		x
	Royal Spoonbill (<i>Platalea regia</i>)		x
	Rufous Fantail (<i>Rhipidura rufifrons</i>)	x	
	Rufous Owl (<i>Ninox rufa</i>)		x
	Rufous Songlark (<i>Cincloramphus mathewsi</i>)		x
	Rufous Whistler (<i>Pachycephala rufiventris</i>)	x	x
	Rufous-banded Honeyeater (<i>Conopophila albogularis</i>)	x	
	Rufous-throated Honeyeater (<i>Conopophila rufogularis</i>)	x	x

CATEGORY	SPECIES RECORDED	2004	2012
Bird	Sacred Kingfisher (<i>Todiramphus sanctus</i>)	x	x
	Shining Flycatcher (<i>Myiagra alecto</i>)	x	x
	Silver-crowned Friarbird (<i>Philemon argenticeps</i>)	x	x
	Southern Boobook (<i>Ninox novaeseelandiae</i>)	x	x
	Spangled Drongo (<i>Dicrurus bracteatus</i>)	x	x
	Spotted Nightjar (<i>Eurostopodus argus</i>)	x	
	Straw-necked Ibis (<i>Threskiornis spinicollis</i>)		x
	Striated Pardalote (<i>Pardalotus striatus</i>)	x	x
	Sulphur-crested Cockatoo (<i>Cacatua galerita</i>)	x	x
	Tawny Frogmouth (<i>Podargus strigoides</i>)	x	x
	Tawny Grassbird (<i>Megalurus timoriensis</i>)	x	
	Tawny-breasted Honeyeater (<i>Xanthotis flaviventer</i>)	x	
	Torresian Crow (<i>Corvus orru</i>)	x	x
	Varied Lorikeet (<i>Psitteuteles versicolor</i>)	x	x
	Varied Sittella (<i>Daphoenositta chrysoptera</i>)	x	x
	Varied Triller (<i>Lalage leucomela</i>)	x	x
	Wandering Whistling-Duck (<i>Dendrocygna arcuata</i>)	x	
	Wedge-tailed Eagle (<i>Aquila audax</i>)	x	x
	Weebill (<i>Smicrornis brevirostris</i>)	x	x
	Whistling Kite (<i>Haliastur sphenurus</i>)	x	x
	White-bellied Cuckoo-shrike (<i>Coracina papuensis</i>)	x	x
	White-bellied Sea Eagle (<i>Haliaeetus leucogaster</i>)	x	
	White-breasted Woodswallow (<i>Artamus leucorhynchus</i>)		x
	White-browed Babbler (<i>Pomatostomus superciliosus</i>)		x
	White-faced Heron (<i>Egretta novaehollandiae</i>)		x
	White-gaped Honeyeater (<i>Lichenostomus unicolor</i>)	x	x
	White-necked Heron (<i>Ardea pacifica</i>)	x	x

CATEGORY	SPECIES RECORDED	2004	2012
Bird	White-throated Gerygone (<i>Gerygone albogularis</i>)	x	x
	White-throated Honeyeater (<i>Melithreptus albogularis</i>)	x	x
	White-winged Triller (<i>Lalage sueurii</i>)	x	x
	Willie Wagtail (<i>Rhipidura leucophrys</i>)	x	x
	Yellow Oriole (<i>Oriolus flavocinctus</i>)	x	x
	Yellow-rumped Mannikin (<i>Lonchura flaviprymna</i>)	x	
	Yellow-throated Miner (<i>Manorina flavigula</i>)	x	x
	Yellow-tinted Honeyeater (<i>Lichenostomus flavescens</i>)		x
Mammal	Agile Wallaby (<i>Macropus agilis</i>)	x	x
	Antilopine Wallaroo (<i>Macropus antilopinus</i>)		x
	Black Flying Fox (<i>Pteropus alecto</i>)	x	
	Common Brushtail Possum (<i>Trichosurus vulpecula</i>)		x
	Common Planigale (<i>Planigale maculata</i>)	x	
	Common Rock Rat (<i>Zyzomys argurus</i>)	x	
	Common Wallaroo (<i>Macropus robustus</i>)		x
	Delicate Mouse (<i>Pseudomys delicatulus</i>)	x	
	Dingo (<i>Canis lupus</i>)	x	x
	Grassland Melomys (<i>Melomys burtoni</i>)	x	x
	Kakadu Dunnart (<i>Smithopsis bindi</i>)	x	
	Little-red Flying Fox (<i>Pteropus scapulatus</i>)	x	
	Northern Brown Bandicoot (<i>Isodon macrourus</i>)	x	x
	Northern Nailtail Wallaby (<i>Onychogalea unguifera</i>)		x
	Red-cheeked Dunnart (<i>Smithopsis virginiae</i>)	x	
	Water Rat (<i>Hydromys chrysogaster</i>)	x	
Reptile	Arboreal Snake-eyed Skink (<i>Cryptoblepharus plagiocephalus</i>)	x	
	Arafura File Snake (<i>Acrochordus arafurae</i>)		x
	Black Whip Snake (<i>Demansia vestigiata</i>)		x

CATEGORY	SPECIES RECORDED	2004	2012
Reptile	Bynoe's Gecko (<i>Heteronotia binoei</i>)	x	x
	Children's Python (<i>Antaresia childreni</i>)	x	x
	Dark-tailed Skink (<i>Glaphyromorphus nigricaudis</i>)	x	
	Freshwater Crocodile (<i>Crocodylus johnstoni</i>)		x
	Gilbert's Dragon (<i>Lophognathus gilberti</i>)	x	x
	Green Tree Snake (<i>Dendrelaphis punctulata</i>)	x	x
	Hill's Ctenotus (<i>Ctenotus hilli</i>)	x	
	House Gecko (<i>Gehyra australis</i>)	x	
	Keelback (<i>Tropidonophis mairii</i>)	x	x
	MacFarlane's Lerista (<i>Lygisaurus macfarlanei</i>)	x	
	Marbled Velvet Gecko (<i>Oedura marmorata</i>)	x	
	Metallic Snake-eyed Skink (<i>Cryptoblepharus metallicus</i>)		x
	Northern Dtella (<i>Gehyra australis</i>)		x
	Northern Ridge-tailed Monitor (<i>Varanus primordius</i>)	x	x
	Northern Shovel-nosed Snake (<i>Brachyuophis roperi</i>)	x	
	Northern Small-nosed Snake (<i>Rhinoplocephalus pallidiceps</i>)	x	
	Northern Spiny tailed Gecko (<i>Strophurus ciliaris</i>)	x	
	Northern Spotted Rock Dtella (<i>Gehyra nana</i>)		x
	Northern Water Dragon (<i>Lophognathus temporalis</i>)		x
	Olive Python (<i>Liasis olivaceus</i>)		x
	Papuan Whip Snake (<i>Demansia papuensis</i>)		x
	Plain Ctenotus (<i>Ctenotus inornatus</i>)	x	x
	Port-Essington Ctenotus (<i>Ctenotus essingtonii</i>)	x	
	Robust Dragon (<i>Diporiphora benetti</i>)		x
	Robust Rainbow Skink (<i>Carlia longipes</i>)	x	x
	Scant-striped Ctenotus (<i>Ctenotus vertebralis</i>)	x	
	Skink (<i>Menetia</i> sp.)	x	

CATEGORY	SPECIES RECORDED	2004	2012
Reptile	Slender Rainbow Skink (<i>Carlia gracilis</i>)	x	x
	Smooth-Tailed Skink (<i>Glaphyromorphus isolepis</i>)		x
	Spalding's Ctenotus (<i>Ctenotus spaldingi</i>)	x	x
	Spotted Tree Monitor (<i>Varanus scalaris</i>)	x	x
	Storr's Snake-eyed Skink (<i>Morethia storri</i>)	x	
	Striped Rainbow Skink (<i>Carlia munda</i>)	x	x
	Ten-Lined Ctenotus (<i>Ctenotus decaneurus</i>)	x	
	Two-Lined Dragon (<i>Diporiphora bilineata</i>)	x	
	Two-Spined Rainbow Skink (<i>Carlia amax</i>)	x	x
	Water Python (<i>Liasis mackloti</i>)	x	
	White-lipped Dragon (<i>Diporiphora albilabris sobria</i>)	x	
	Zig-zag Gecko (<i>Oedura rhombifer</i>)	x	
Introduced species	Black Rat (<i>Rattus rattus</i>)		x
	Cane Toad (<i>Rhinella marina</i>)	x	x
	Cat (<i>Felis catus</i>)		x
	Cattle (<i>Bos taurus</i>)		x
	Donkey (<i>Equus asinus</i>)		x
	Horse (<i>Equus caballus</i>)		x
	House Mouse (<i>Mus musculus</i>)	x	
	Pig (<i>Sus scrofa</i>)		x
	Swamp Buffalo (<i>Bubalus bubalis</i>)	x	x

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