Opportunistic Sampling Methods

The opportunistic sampling methods used during the fauna surveys are provided below.

- Nocturnal Searching
    - Combination of road transects and opportunistic ground searches using head torches and hand held spotlights to uncover nocturnal species.
- Diurnal Searching
    - Trapping and opportunistic sites were searched by hand for cryptic species, which comprised searching beneath the bark of dead trees, breaking open old logs, stumps and dead free-standing trees, investigating burrows and over-turning logs and stones. Sites were selected on the basis of fauna habitat (targeting uncommon habitats or habitats poorly represented by trapping sites) and their possibility of harbouring conservation significant fauna.
    - Fauna were also recorded while searching, travelling and during trap establishment within the study area during the day and night. Tracks, diggings, scats, burrows and nests were recorded where possible.
    - Bird species were also recorded during active searches during the day and close to dusk
    - Bird point counts were conducted at water points.
- Camera Trapping
    - Motion sensor cameras used in areas with a high likelihood of animal activity such as burrows or crevices, recording day and night taking either video footage or photos.
- Targeted Conservation Significant Fauna Surveying
    - Preferred habitat of the conservation significant species that potentially occur in the study were identified during the desktop review and targeted during survey activities using both systematic survey sites and opportunistic surveys.
    - On the basis of the habitats observed during surveying, specific opportunistic searches as well as motion camera trapping were also undertaken to determine the presence of potential conservation significant species.
    - Species targeted included:
        - Greater Bilby (*Macrotis lagotis*)
        - Gouldian Finch (*Erythrura gouldiae*)
        - Rainbow Bee-eater (*Merops ornatus*)
        - Australian Bustard (*Ardeotis australis*)
        - Dampierland Burrowing Snake (*Simoselaps minimus*)
        - *Lerista separanda*.

Fauna Habitat Mapping

Fauna habitat types were identified, described and mapped during the surveys using the following methods:

- Review of desktop information:
    - IBRA subregions;

- Aerial photography; and
- Beard vegetation associations (Shepherd et al. 2001).

- Collected of site specific information:
  - Landform;
  - Vegetation type and structure; and
  - Composition of terrestrial fauna community.

Targeted Bilby Survey

The targeted survey for the Greater Bilby (*Macrotis* lagotis) undertaken in 2015 (Ecologia 2015) was conducted by walking systematically spaced transects within their preferred habitat within the Thunderbird area, the pindan shrubland habitat. Camera traps were also used during this targeted survey.

The number of sites surveyed by each method during the three surveys is summarised in Table 13 and shown on Figure 6.9.

Table 13: Summary of survey methods for terrestrial fauna surveys

Site Type	Number of Sites				
	Level 1 Survey	Level 2 Survey	Haul Road Survey	Targeted Greater Bilby Survey	Total
Systematic Methods					
Trapping Site	0	7	0	0	7
Transects (width)	-	-	-	500 m	-
Opportunistic Methods					
Camera trap	0	9	6	5	15
Bat Recorder	0	1	2	0	3
Bird Point Count	0	0	2	0	2
Diurnal Active Search	16	19	28	0	63

6.2.2.2 Desktop Results

Desktop assessments were conducted prior to field surveys to identify terrestrial fauna species of conservation significance likely to occur in the area. The assessment included review of the DPAW Threatened and Priority Fauna Database, the DotE EPBC Protected Matters Database and a literature review of previous projects within the vicinity.

The desktop search results recorded a total of 68 conservation significant vertebrate fauna species potentially occurring within the vicinity of the Proposal Area. This includes eight mammal species, 57 bird species and three reptile species. These records of conservation significant fauna previously recorded in the region are mapped on Figure 6.10 and Figure 6.11.

A total of 44 of the 57 potential conservation significant bird species identified from the desktop review are restricted to wetland or coastal habitats. A number of these species may occur at nearby Mount Jowlaenga homestead, but will not utilise the Proposal Area directly. These wetland and coastal restricted bird species are shown separately in Table 15. These species are therefore not discussed in further detail as they are not expected to utilise the study area directly.

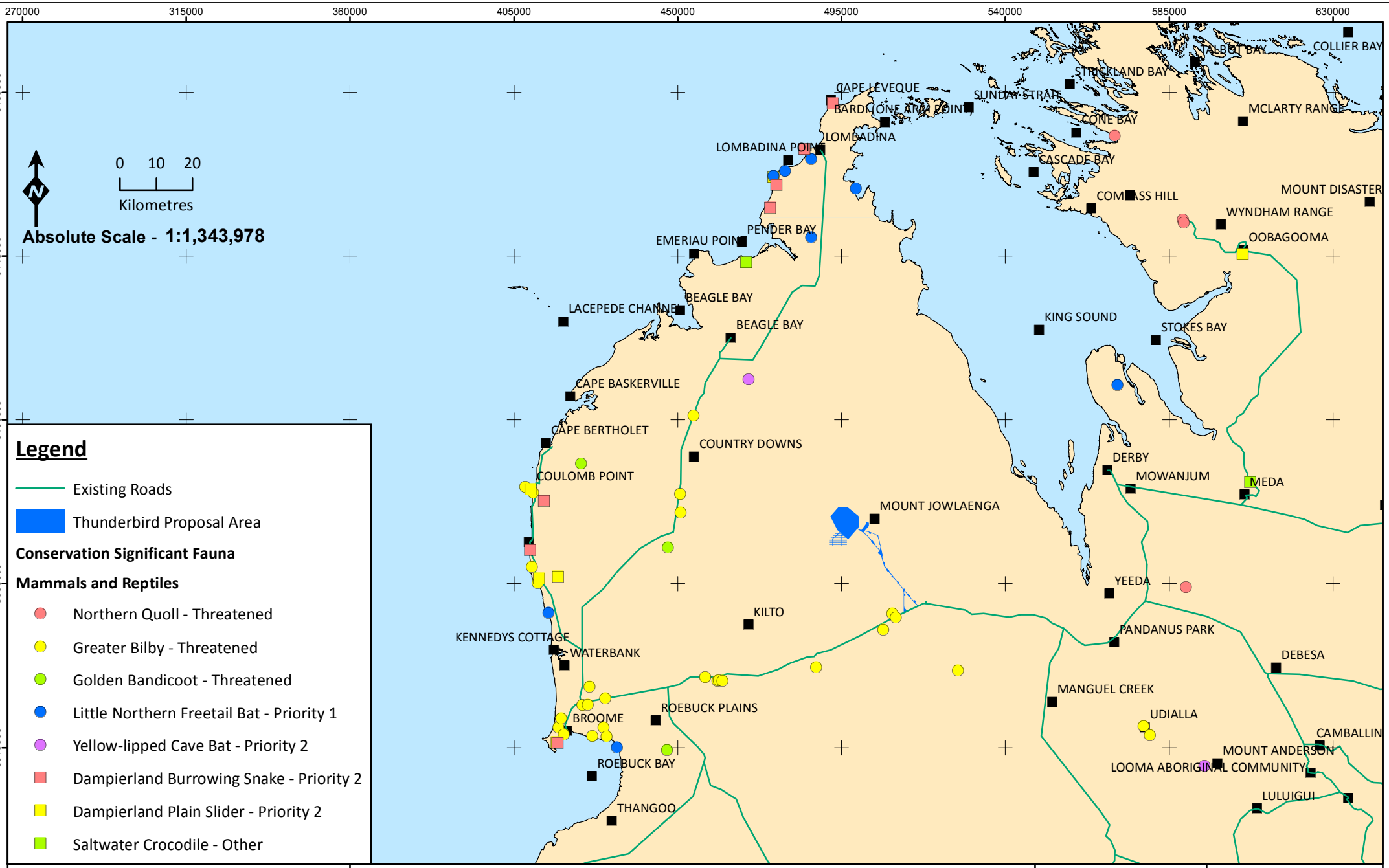
An assessment of likelihood of occurrence of the potential eight mammal, 13 bird and three reptile species of conservation significance in the Proposal Area was completed with the results summarised in Table 14. Seven species listed as Threatened under either the EPBC Act and/or WC Act were

identified within the desktop searches, with only one these species recorded within the Thunderbird survey area; the Greater Bilby (*Macrotis lagotis*). Another two species had a medium likelihood of occurring within the survey area; the Golden Finch (*Erythrura gouldiae*) and the Grey Falcon (*Falco hypoleucos*).

A total of eight Priority fauna species, listed by DPAW, were identified in the desktop search results, including two P1 species, three P2 species and three P4 species. Two of these Priority fauna are known to occur within the Thunderbird survey area based on the desktop assessment; the Short-tailed Mouse (*Leggadina lakedownensis*) and the Australian Bustard (*Ardeotis australis*). Two Priority fauna had a medium likelihood of occurring within the survey area; the Dampierland Burrowing Snake (*Simoselaps minimus*) and the Dampierland Plain Slider (*Lerista separanda*).

Two species identified in the desktop searches were listed under Schedule 4 of the EP Act, the Peregrine Falcon (*Falco peregrinus*) and the Saltwater Crocodile (*Crocodylus porosus*). The Peregrine Falcon had a medium likelihood of occurrence within the survey area.

Lastly, seven Migratory bird species were reported in the desktop searches, with two known to occur within the Thunderbird survey area and another three given a medium likelihood of occurring.



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Conservation Signficant Fauna
Desktop Search Results
Mammal and Reptile Records

Figure: 6.10
Project ID: 1645

Drawn: BH
Date: 18.11.2015

Coordinate System
Name: GDA 1994 MGA Zone 51
Projection: Transverse Mercator
Datum: GDA 1994

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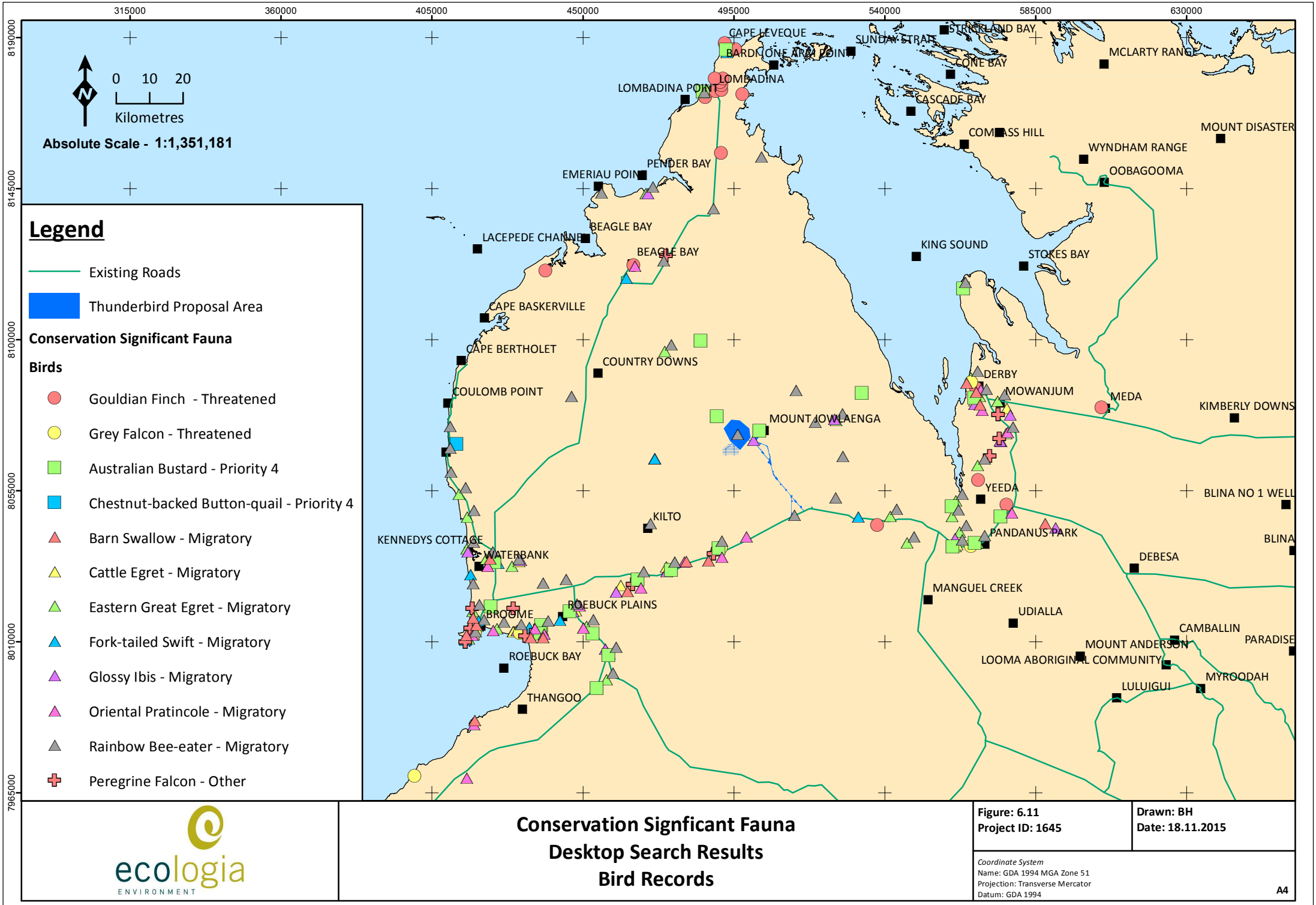

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Conservation Signficant Fauna
Desktop Search Results
Bird Records

Figure: 6.11
Project ID: 1645

Drawn: BH
Date: 18.11.2015

Coordinate System
Name: GDA 1994 MGA Zone 51
Projection: Transverse Mercator
Datum: GDA 1994

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Table 14: Assessment of likelihood of occurrence of potential conservation significant fauna

Species	Common Name	Conservation significance			Habitat	Likelihood of occurrence within Thunderbird Survey Area
		EPBC Act	WC Act	DPaW		
Mammals						
Dasyurus hallucatus	Northern Quoll	EN	S1	EN	Rocky areas, also eucalypt forest and woodland.	Low
Macrotis lagotis	**Greater Bilby**	**VU**	**S1**	**VU**	**Variety of habitats on soft soil, including spinifex grassland, acacia shrubland, open woodland, and cracking clays.**	**RECORDED**
Isoodon auratus auratus	Golden Bandicoot	VU	S1		Rocky sandstone spinifex and vine thickets.	Low
Dasycercus cristicauda	Crest-tailed Mulgara	VU	S1		Sandy areas predominately on the top of sand dunes at the base of large Canegrass clumps or Nitre Bush hummocks.	Low
Mormopterus loriae cobourgiana	Little Northern Freetail Bat			P1	Roost in mangrove stands, hunt in mangroves and forests.	Low
Vespadelus douglasorum	Yellow-lipped Cave Bat			P2	Tropical woodlands of West Kimberley	Low
Leggadina lakedownensis	Short-tailed Mouse			P4	Spinifex and tussock grassland on cracking clays. Also acacia shrubland, samphire, woodlands, and stony ranges.	High
Birds						
Erythrura gouldiae	Gouldian Finch	EN	S1	EN	Tropical savannahs; breed in rocky hills with hollow-bearing eucalypts near water.	Medium
Falco hypoleucos	Grey Falcon		S1	VU	Lightly wooded coastal and riverine plains.	Medium
(*Tyto novaehollandiae kimberli*)	Masked Owl	VU		P1	Forest, woodland, caves, mature trees with hollows.	Low
Hirundo rustica	Barn Swallow	M	S3		Open country, agricultural land, especially near water.	Low
Ardea ibis	Cattle Egret	M	S3		Grassy habitats and wetlands, particularly damp pastures.	Medium
Ardea modesta	Eastern Great Egret	M	S3		Floodwaters, rivers, shallows of wetlands, intertidal mud-flats.	Medium

Species	Common Name	Conservation significance			Habitat	Likelihood of occurrence within Thunderbird Survey Area
		EPBC Act	WC Act	DPaW		
Apus pacificus	Fork-tailed Swift	M	S3		Almost entirely aerial, particularly associated with storm fronts.	High
Plegadis falcinellus	Glossy Ibis	M	S3		Shallows and adjacent flats of freshwater lakes and swamps; river pools; flooded samphire; sewage ponds. Nest in freshwater/brackish wetlands with tall, dense stands of emergent vegetation and low trees or bushes.	Low
Glareola maldivarum	Oriental Pratincole	M	S3		Plains, shallow wet and dry edges in open bare wetlands, tidal mudflats, beaches.	Medium
Merops ornatus	**Rainbow Bee-eater**	**M**	**S3**		**Open country, most vegetation types, dunes, banks.**	**RECORDED**
Ardeotis australis	**Australian Bustard**			**P4**	**Open grasslands, chenopod flats and low heathland.**	**RECORDED**
Turnix castanota	Chestnut-backed Button-quail			P4	Savannah woodlands in sandstone and lateritic country.	Low
Falco peregrinus	Peregrine Falcon		S4	Other	Coastal cliffs, riverine gorges and wooded watercourses.	Medium
Reptiles						
Simoselaps minimus	Dampierland Burrowing Snake			P2	Coastal dunes or sandy areas between dunes and adjacent acacia shrublands.	Medium
Lerista separanda	Dampierland Plain Slider			P2	Sandy areas of Dampierland.	Medium
Crocodylus porosus	Saltwater Crocodile		S4	Other	Tidal rivers, coastal floodplains and channels, billabongs and swamps up to 150 km inland.	Low

EN – Endangered, VU – Vulnerable, M – Migratory, S1-S4 – Schedule 1 to 4, P1-P4 – Priority 1 to 4

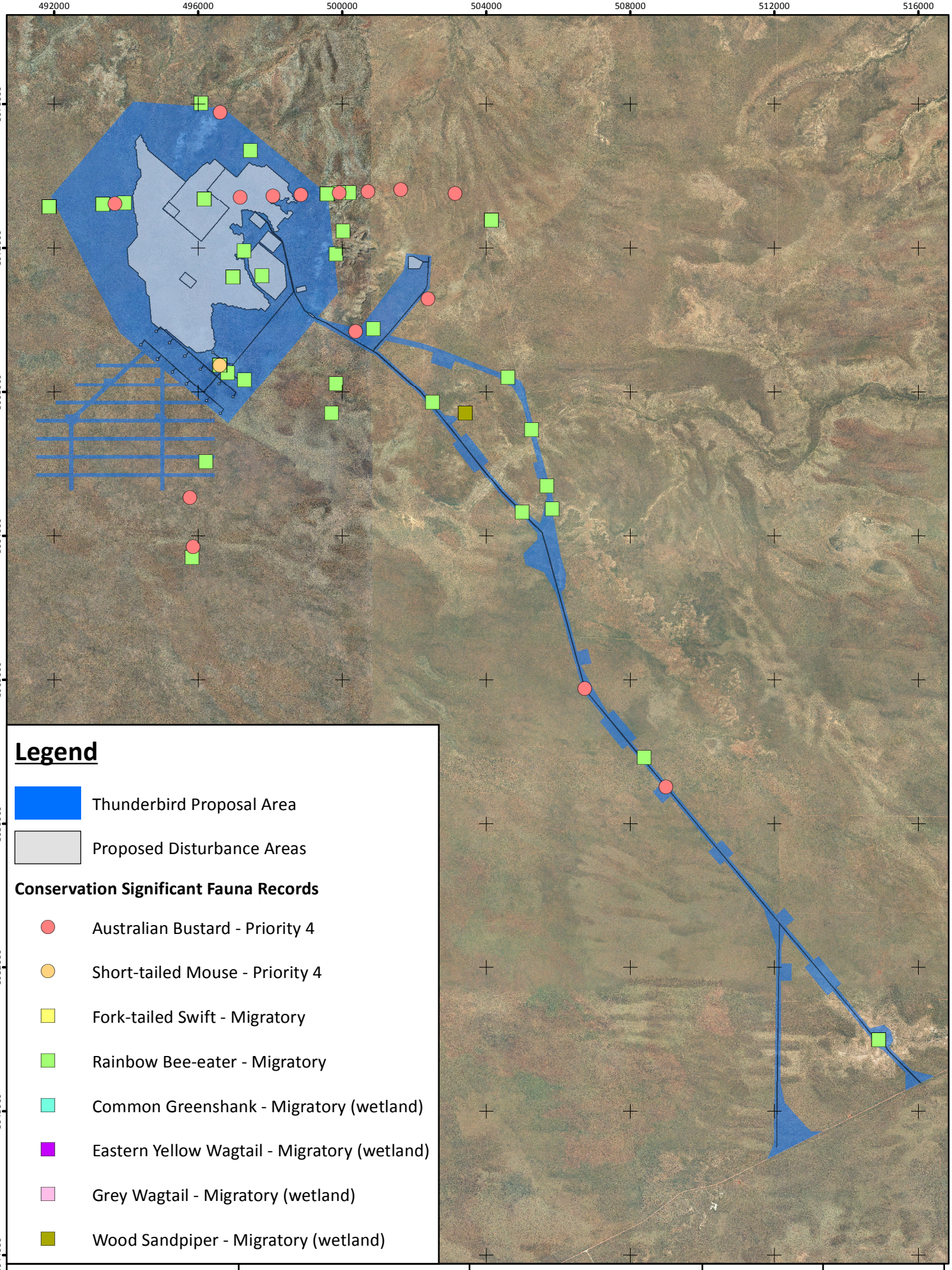
Table 15: Coastal and wetland conservation significant bird species

Species name	Common name	Species name	Common name
Fregata ariel	Lesser Frigatebird*	*Arenaria interpres*	Ruddy Turnstone*
Sula leucogaster	Brown Booby*	*Limnodromus semipalmatus*	Asian Dowitcher*
Egretta sacra	Eastern Reef Egret*	*Calidris tenuirostris*	Great Knot*
Haliaeetus leucogaster	White-bellied Sea-Eagle[J]	*Calidris canutus*	Red Knot*
Pluvialis fulva	Pacific Golden Plover[J]	*Calidris alba*	Sanderling*
Pluvialis squatarola	Grey Plover[J]	*Calidris ruficollis*	Red-necked Stint[J]
Charadrius leschenaultii	Greater Sand Plover*	*Calidris subminuta*	Long-toed Stint[J]
Charadrius mongolus	Lesser Sand Plover*	*Calidris melanotos*	Pectoral Sandpiper*
Charadrius veredus	Oriental Plover[J]	*Calidris acuminata*	Sharp-tailed Sandpiper[J]
Rostratula australis	Australian Painted Snipe[J]	*Calidris ferruginea*	Curlew Sandpiper[J]
Gallinago megala	Swinhoe's Snipe[J]	*Limicola falcinellus*	Broad-billed Sandpiper*
Limosa limosa	Black-tailed Godwit*	*Philomachus pugnax*	Ruff[J]
Limosa lapponica	Bar-tailed Godwit[J]	*Stercorarius parasiticus*	Arctic Jaeger*
Numenius minutus	Little Curlew[J]	*Sternula albifrons*	Little Tern*
Numenius phaeopus	Whimbrel*	*Hydroprogne caspia*	Caspian Tern*
Numenius madagascariensis	Eastern Curlew*	*Chlidonia leucopterus*	White-winged Black Tern[J]
Xenus cinereus	Terek Sandpiper*	*Sterna dougallii*	Roseate Tern*
Actitis hypoleucos	Common Sandpiper[J]	*Sterna sumatrana*	Black-naped Tern*
Tringa brevipes	Grey-tailed Tattler*	*Sterna hirundo*	Common Tern*
Tringa glareola	Wood Sandpiper[JR]	*Thalasseus bengalensis*	Lesser Crested Tern*
Tringa nebularia	Common Greenshank[J]	*Motacilla cinerea*	Grey Wagtail[JR]
Tringa stagnatilis	Marsh Sandpiper[J]	*Motacilla tschutschensis*	Eastern Yellow Wagtail[JR]

6.2.2.3 Conservation Significant Species

A total of nine fauna species of conservation significance were recorded during terrestrial fauna surveys conducted within the Thunderbird area. One species, the Greater Bilby (*Macrotis lagotis*) is listed as Threatened (Vulnerable) under the both the EPBC Act and the EP Act. Two Priority 4 species were recorded; the Australian Bustard (*Ardeotis australis*) and the Short-tailed Mouse (*Leggadina lakedownensis*). The other six species recorded during the surveys are listed as Migratory species, four of which are considered coastal and wetland restricted birds.

Table 16 summarises the number of sightings of each of the conservation significant fauna recorded during the surveys and specifically within the Proposal Area. Locations of these species are shown on Figure 6.12.



Legend

- Thunderbird Proposal Area
- Proposed Disturbance Areas

Conservation Significant Fauna Records

- Australian Bustard - Priority 4
- Short-tailed Mouse - Priority 4
- Fork-tailed Swift - Migratory
- Rainbow Bee-eater - Migratory
- Common Greenshank - Migratory (wetland)
- Eastern Yellow Wagtail - Migratory (wetland)
- Grey Wagtail - Migratory (wetland)
- Wood Sandpiper - Migratory (wetland)

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Kilometres
Absolute Scale - 1:134,200

Conservation Significant Fauna Recorded in the Proposal Area (other than Greater Bilby)

Figure: 6.12
Project ID: 1645

Drawn: BH
Date: 05.11.15

Coordinate System
Name: GDA 1994 MGA Zone 50
Projection: Transverse Mercator
Datum: GDA 1994

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Table 16: Conservation Significant Fauna Recorded During Thunderbird Surveys

Common Name	Species	Conservation Status	No. of Locations Recorded During Surveys	No. of Locations Recorded Within Proposal Area
Greater Bilby	*Macrotis lagotis*	Threatened – Vulnerable	905	475
Australian Bustard	*Ardeotis australis*	Priority 4	15	8
Short-tailed Mouse	*Leggadina lakedownensis*	Priority 4	1	1
Fork-tailed Swift	*Apus pacificus*	Migratory	1	0
Rainbow Bee-eater	*Merops ornatus*	Migratory	57	41
Common Greenshank*	*Tringa nebularia*	Migratory	1	1
Eastern Yellow Wagtail*	*Motacilla tschutschensis*	Migratory	1	0
Grey Wagtail*	*Motacilla cinerea*	Migratory	1	0
Wood Sandpiper*	*Tringa glareola*	Migratory	2	0

* Wetland conservation significant species

The Greater Bilby (*Macrotis lagotis*), listed as a Threatened species, was recorded from 905 locations during the Thunderbird surveys, 475 of which were within the Proposal Area. The potential impacts to this species is discussed further in Section 6.2.2.3.1 below.

The Australian Bustard (*Ardeotis australis*) occurs Australia wide and utilises a number of open habitats, including open or lightly wooded grasslands, chenopod flats, plains and heathlands (Johnstone and Storr 1998). It is a nomadic species, ranging over very large areas, and its abundance varies locally and seasonally from scarce to common, largely dependent on rainfall and food availability. Hunting, grazing and predation by feral species are considered its major threats. During the Thunderbird surveys, the Australian Bustard was recorded from 15 locations, eight of which were within the Proposal Area, although it is likely some of these sightings were the same inidivudal. This species may be resident within the Proposal area, and when conditions are suitable, it is likely to breed. The Proposal may result in displacement of individuals during clearing activties, however, Australian Bustards readily desert nests in response to disturbance by humans (Garnett and Crowley 2000). The Australian Bustard is not considered likely to be significantly impacted by the Proposal.

The Short-tailed Mouse (*Leggadina lakedownensis*) is listed as a Priority 4 species. Populations of this small, elusive rodent are distributed across northern Australia, but records have been sporadic. They occupy a diverse range of habitats but are usually found in seasonally inundated habitats on red or white sandy-clay soils (Moro and Kutt 2008). The mouse was observed within the Proposal Area at one location in the vicinity of the proposed borefield area. Suitable habitat occurs through most the study area however and therefore impacts to this species resulting from the Proposal are expected to be minimal.

The Fork-tailed Swift (*Apus pacificus*) is listed as a Migratory species. Its distribution spans from central Siberia and throughout Asia, breeding in north-east and mid-east Asia, and wintering in Australia and south New Guinea. It is a relatively common trans-equatorial migrant from October to April throughout mainland Australia (Simpson and Day 2004). In Western Australia the Fork-tailed Swift is considered uncommon to moderately common near the north-west, west and south-east coasts, common in the Kimberley and rare or scarce elsewhere (Johnstone and Storr 1998). However, it is a completely aerial whilst in Australia. One individual was recorded during the Thunderbird surveys, outside the Proposal Area. Although Fork-tailed Swifts may be found in varying numbers foraging in the air above the Proposal Area, it is not considered likley to be impacted by the implementation of the Proposal.

The Rainbow Bee-eater (*Merops ornatus*) is also listed as a Migratory species. It is scarce to common throughout much of Western Australia, except for the arid interior, preferring lightly wooded, preferably sandy country near water (Johnstone and Storr 1998). In Western Australia, the Rainbow

Bee-eater can occur as a resident, breeding visitor, post-nuptial nomad, passage migrant or winter visitor. It nests in burrows usually dug at a slight angle on flat ground, sandy banks or cuttings, and often at the margins of roads or tracks (Simpson and Day 2004). Eggs are laid at the end of the metre-long tunnel from August to January (Boland 2004). The Rainbow bee-eater was recorded 57 times during the Thunderbird survey, 41 of which were within the Proposal Area. Some individuals were recorded within breeding burrows. It is likely the Proposal Area contains suitable habitat and they are known to breed in the area. It is likely to forage in all habitat types and construct breeding burrows in any habitats where suitable sandy substrate exists. Individuals may be displaced and nests may be impacted during clearing activities for the Proposal.

The Common Greenshank (*Tringa nebularia*), Eastern Yellow Wagtail (*Motacilla tschutschensis*), Grey Wagtail (*Motacilla cinerea)* and the Wood Sandpiper (*Tringa glareola*) are Migratory species all recorded during the Thunderbird surveys. However, these birds were generally recorded outside the Proposal Area at the nearby Mount Jowlaenga homestead, located approximately 2 km north-east of the proposed camp, with the exception of the Common Greenshank, which was also observed at the southern end of the internal haul road. They were observed alongside a man-made turkey nest containing water, within the Savannah Woodland habitat. This habitat also comprises of small drainage lines and low-lying landscapes which may provide temporary suitable foraging habitat for the Common Greenshank during the wet season. All the four Migratory wetland species rely on well-watered areas and are not expected to directly utilise the Proposal Area (with the possible exception the Savannah Woodlands area) and therefore are considered unlikely to be impacted by the Proposal.

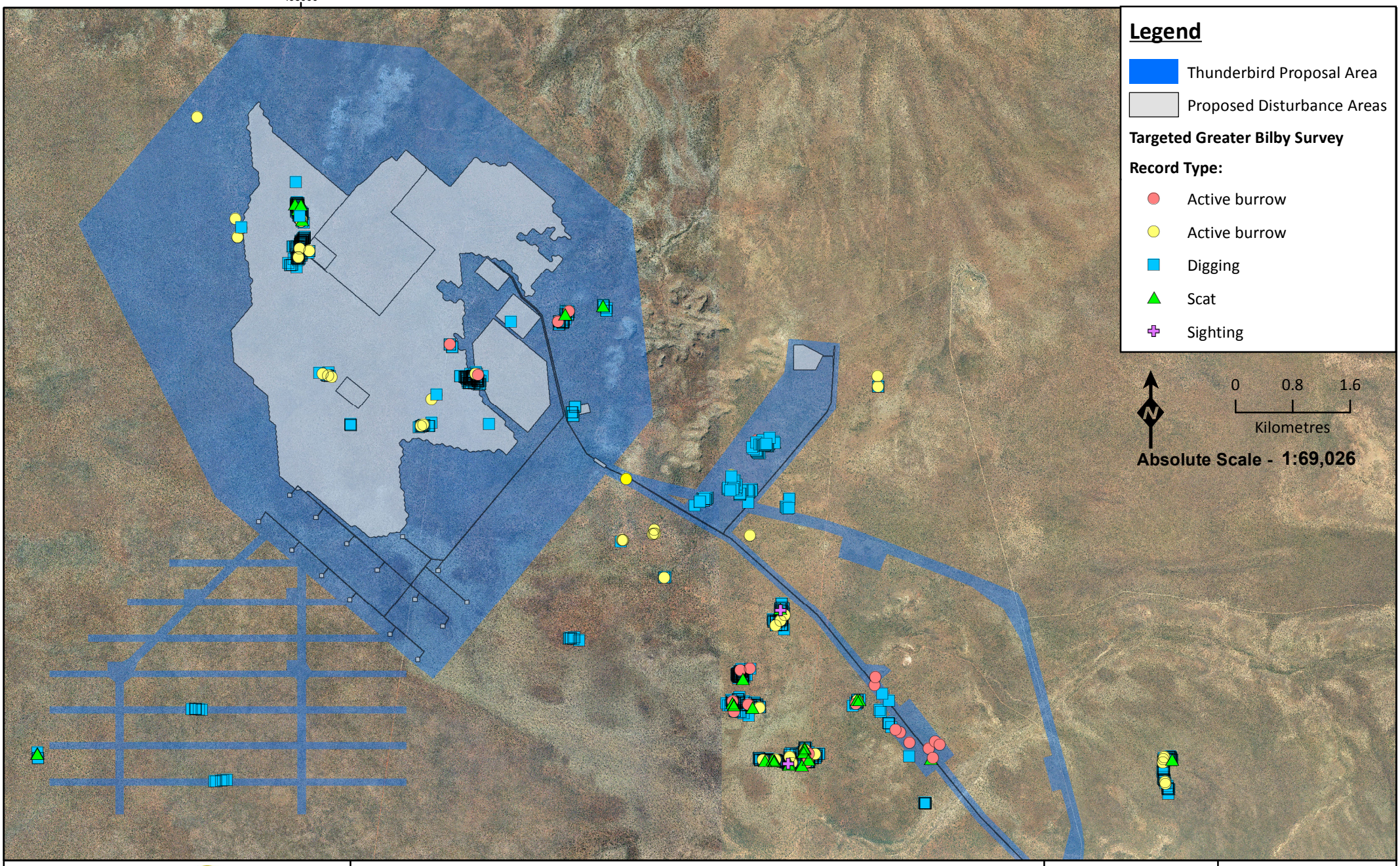
6.2.2.3.1 Greater Bilby

The Greater Bilby (*Macrotis lagotis*) is a mainly solitary omnivorous marsupial which formerly occurred over 70% of mainland Australia's arid and semiarid regions prior to European settlement (ABAS 2002). During the 20th century its range reduced significantly and is now absent from its previous southern and central range and restricted to northern Australia (Tyndale-Biscoe 2005). Unlike other bandicoot species, the Greater Bilby constructs burrows where it shelters during the day. Greater Bilbies are strictly nocturnal and have been known to move up to 5 km each night in search of food (Pavey 2006b).

The Greater Bilby was recorded at 905 locations during the four Thunderbird fauna surveys (Figure 6.13). Records consisted of secondary evidence in the form of diggings, scats, active burrows (Plate 6) and camera trap (sightings) records (Plate 7). Just over half of these records (475) were from within the Proposal Area and only 256 were within proposed disturbance areas.

During the most recent targeted survey, Greater Bilby scats were collected and analysed to identify the minimum number of individuals likely to be present at the time of the survey. On the basis on the analysis of 26 scats collected, the results indicated that nine Greater Bilby individuals were present. DNA analysis results generally show each isolated cluster of Greater Bilby activity belongs to at least one individual, with some clusters recording up to three individuals. These results suggest locations where Greater Bilby activity was recorded but failed to record scats, are likely to contain unique individuals. Based on this, a conservative estimate of the local Greater Bilby population within the Thunderbird survey area is considered to be approximately 25 individuals.

The Greater Bilby records were predominately from within the Pindan Shrubland habitat (refer to Section 6.2.2.5, Figure 6.14) and more specifically within the dense, mature *Acacia tumida* var. *tumida* woodland micro-habitat. This micro-habitat appears to be influenced by fire age, with an older fire age (>2 years), dense canopy and relatively open ground cover, compared to surrounding areas. Fire age and intensity is therefore likely to be an important local factor in determining



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Greater Bilby Records in the Proposal Area and surrounds

Figure: 6.13
Project ID: 1645

Drawn: BH
Date: 10.11.2015

Coordinate System
Name: GDA 1994 MGA Zone 51
Projection: Transverse Mercator
Datum: GDA 1994

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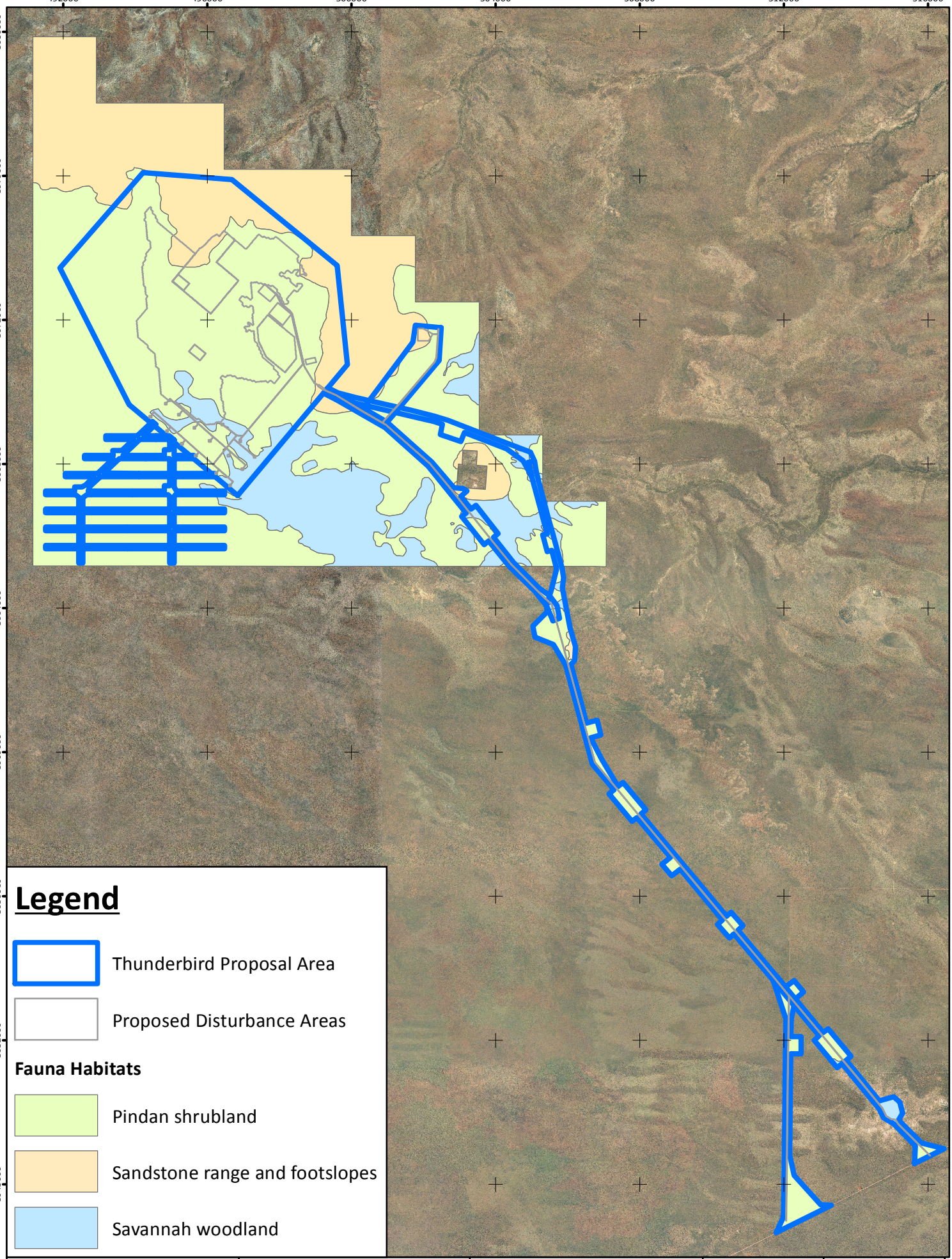

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Kilometres

Absolute Scale - 1:134,200

Fauna Habitats

Figure: 6.14
Project ID: 1645

Drawn: BH
Date: 10.11.15

Coordinate System
Name: GDA 1994 MGA Zone 50
Projection: Transverse Mercator
Datum: GDA 1994

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suitability of habitat for Greater Bilby, with small scale and mosaic fire patterns likely to be of greater benefit than larger scale fires of high intensities (Ecologia in draft).

A strong Greater Bilby association was also identified with *Acacia tumida* var. *tumida* plants, where shell casings of Witjuti grub larvae (*Endoxyla* spp.) were observed at the base of these plants in the vicinity of Greater Bilby diggings, indicating Greater Bilby foraging.

Overall, the spatial occurrence of the Greater Bilby is higher outside Proposal area than within. Furthermore, all individuals identified through DNA analysis of scats, were outside of proposed disturbance areas. Home ranges were estimated at 3.69 km^2 per individual, which is consistent with other calculations for the species (Ecologia 2015), however is likely to be less than like due to its preference towards micro-habitats within the Pindan Shrubland.

Due to the uncertainties regarding the status of the Dampier Peninsula population, the regional significance of the Greater Bilby population within the Thunderbird survey area is difficult to determine. Using the estimated Greater Bilby national population of 10,000 (Woinarski et al. 2012) and the estimated local population of 25 individuals from the Thunderbird study area, it is estimated that the Thunderbird survey area would contain 0.25% of the estimated total Greater Bilby population.

The Proposal is likely to have some impact on some of the local Greater Bilby population, mostly as a result of the displacement of individuals due to clearing of habitat and burrows. Accidental injury or death may also result from vehicle/equipment strikes, particularly at night and potentially from increased feral animal activity and/or accidental fires in the area. With the implementation of management actions, discussed in Table 19, the overall risk to the Greater Bilby population that occupy the Proposal Area is considered to be low.

Plate 6: Example of a Greater Bilby active burrow (Ecologia 2015)

Plate 7: Greater Bilby individual recorded by a camera trap (Ecologia 2015)

6.2.2.3.2 Other Species of Interest

The Level 2 fauna survey conducted in 2013 recorded 12 individuals of the Short-tailed Pygmy Monitor (*Varanus brevicauda*) within the Thunderbird survey area. Following the completion of this survey, Doughty *et al* (2014) identified a new species, the Dampier Peninsula Goanna (*Varanus sparnus*) using one of the specimens collected from Thunderbird. The newly described *Varanus sparnus* has been split from the similar looking and widely distributed Short-tailed Pygmy Monitor (*Varanus brevicauda*), on the grounds of both distinct morphological and DNA characteristics (Doughty et. al. 2014). However, based on current knowledge, both species occur sympatrically, and could both therefore occur within the study area.

Given only one specimen was vouchered for analysis, it now unknown which of the 12 records are that of *V. brevicauda* and *V. sparnus* within the Thunderbird survey area, but individuals were recorded from all three broad habitat types.

Regionally, few records exist of *V. brevicauda/sparnus* on the Dampier Peninsular, however this is likely attributed lack of survey effort across the area. Based on two disjunct records of *V. sparnus* approximately 85 km apart, and the habitat from where the species was recorded is widely distributed in the region, it is likely the species occurs throughout the Dampier Peninsular.

6.2.2.4 Introduced Species

Four introduced species have been recorded during the Thunderbird surveys, including the European Cattle (*Bos Taurus*), Dog (*Canis lupus*), Cat (*Felis catus*) and the House Mouse (*Mus musculus*).

6.2.2.5 Fauna Habitats

Three broad fauna habitat types were identified within the Thunderbird survey area and are considered extensive throughout the region:

- pindan shrubland (10,318.04 ha mapped)
- sandstone range and footslopes (3,910.49 ha mapped)
- savannah woodland (2,012.55 ha mapped).

Habitat analysis did not indicate a significant difference between the three habitat types in terms of their respective vertebrate fauna assemblage. As a result, many of the species recorded during the surveys were found in all three habitat types in inconsistent abundances.

Each habitat is considered likely to support fauna species of conservation significance. In particular, the Pindan Shrubland habitat is considered a locally significant habitat for the Greater Bilby within the Thunderbird area, with the majority of Greater Bilby records located within or close to the boundary of this habitat.

The locations of each of these habitat types are shown on Figure 6.14.

6.2.3 Short-Range Endemic Invertebrate Fauna

Surveys for short-range endemic invertebrate (SRE) fauna were conducted within the Thunderbird survey area in 2013 and 2014 (Ecologia, 2015). The 2013 surveys was conducted across two field trips, targeting different seasons in April and October and the 2014 survey was conducted in one field trip in May. SRE fauna were surveyed using a combination of three sampling techniques; dry pitfall trapping, analysis of collected leaf litter and opportunistic foraging. The number of sampling sites for each sampling method is summarised in Table 17. Locations of the SRE survey area and sampling sites for are shown on Figure 6.15.