M.J. & A.R. Bamford
CONSULTING ECOLOGISTS
[redacted]

Assessment of the Bilby *Macrotis lagotis* on Wallal Downs Station; Homestead and Chirup project areas

[redacted]

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1 INTRODUCTION

Wallal Downs Station is located on 70 Mile Beach Rd off Great Northern Hwy, 260 km south-west of Broome and 220 km east-north-east of Port Hedland. The owner of Wallal Downs, the Warrawagine Cattle Company, is proposing to develop a multi-stage pivot irrigated hay production facility to improve cattle welfare, condition and throughput, and is seeking clearing approval from the Department of Environmental Regulation (DER).

The two project areas occur in a region where there are recent records of the Bilby *Macrotis lagotis*, a threatened species of high conservation significance and listed under both state and federal legislation. As a result, the DER has requested the owners to provide information on the status of the Bilby in the proposed development area. Bamford Consulting Ecologists (BCE) was commissioned by EnviroWorks Consulting and Groundwater Consulting Services to review existing data on the Bilby and conduct a site survey to ascertain the presence/absence of the species in the proposed development area. This report provides a summary of the results from the Bilby survey conducted on the 17th and 18th of August 2016.

2 PROJECT DESCRIPTION

The Homestead and Chirup survey areas are located approximately 300 m and 1.5 km north of the Great Northern Highway and are 1,465 ha and 1,179 ha respectively. The survey areas consist of sparse low shrubland (*Acacia*, *Grevillia* and *Melaleuca* spp) over spinifex hummock grassland on red sand and sandy-loam. Vegetation condition in the Homestead survey area is good, due to very little damage from livestock and the absence of weed species. The vegetation appears to have not been burnt for at least 3-5 years. Vegetation condition in the Chirup survey area is considered fairly degraded due to impacts from historical and current cattle grazing. Wallal Downs is situated south of the Eighty Mile Beach Ramsar site, which stretches from Cape Keraudren in the south-west to Cape Missiessy in the north-east. The Ramsar site is also considered an Environmentally Sensitive Area.

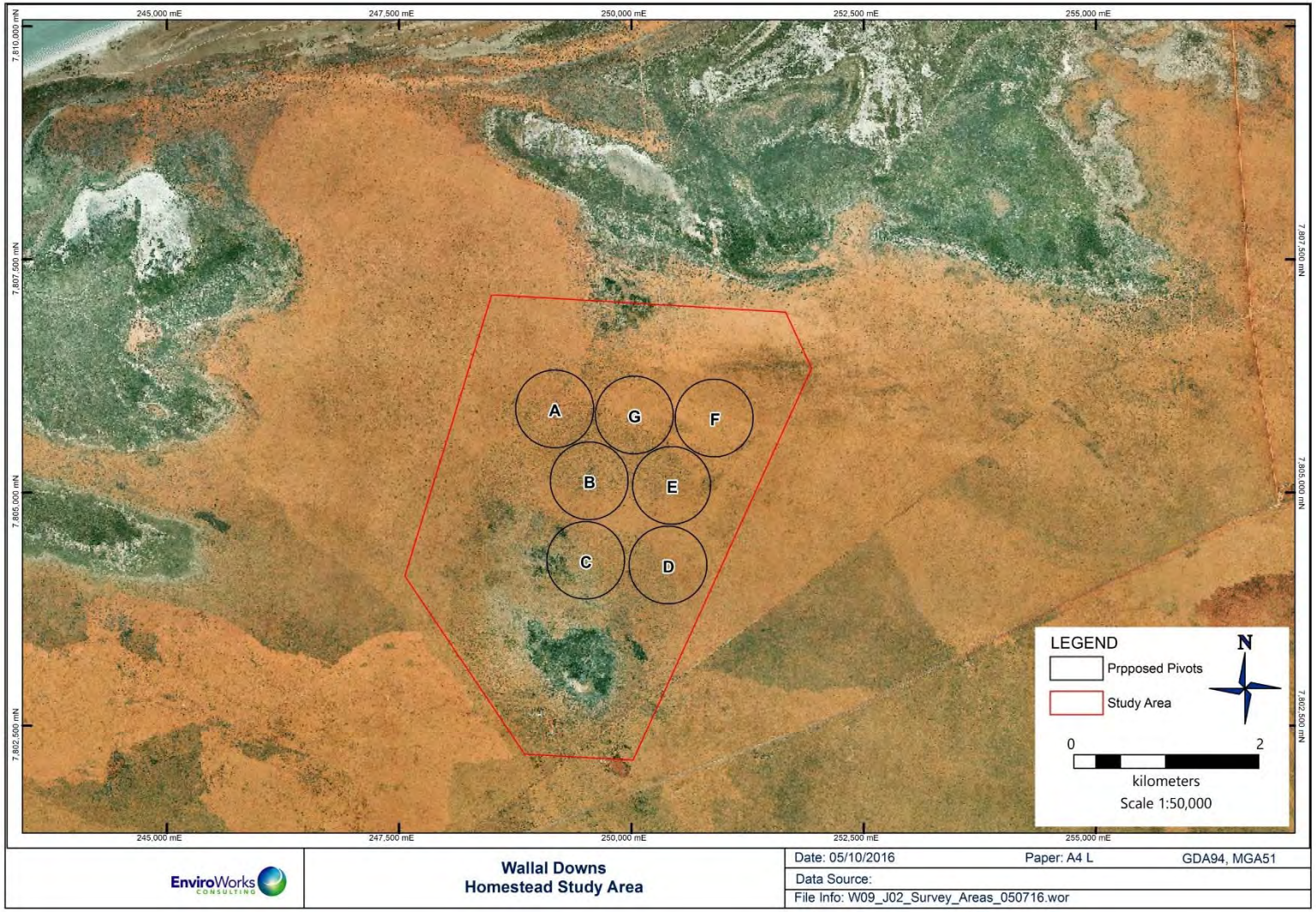

Figure 1. Location of the Homestead survey area, with the survey area visited in August 2016 outlined in red.

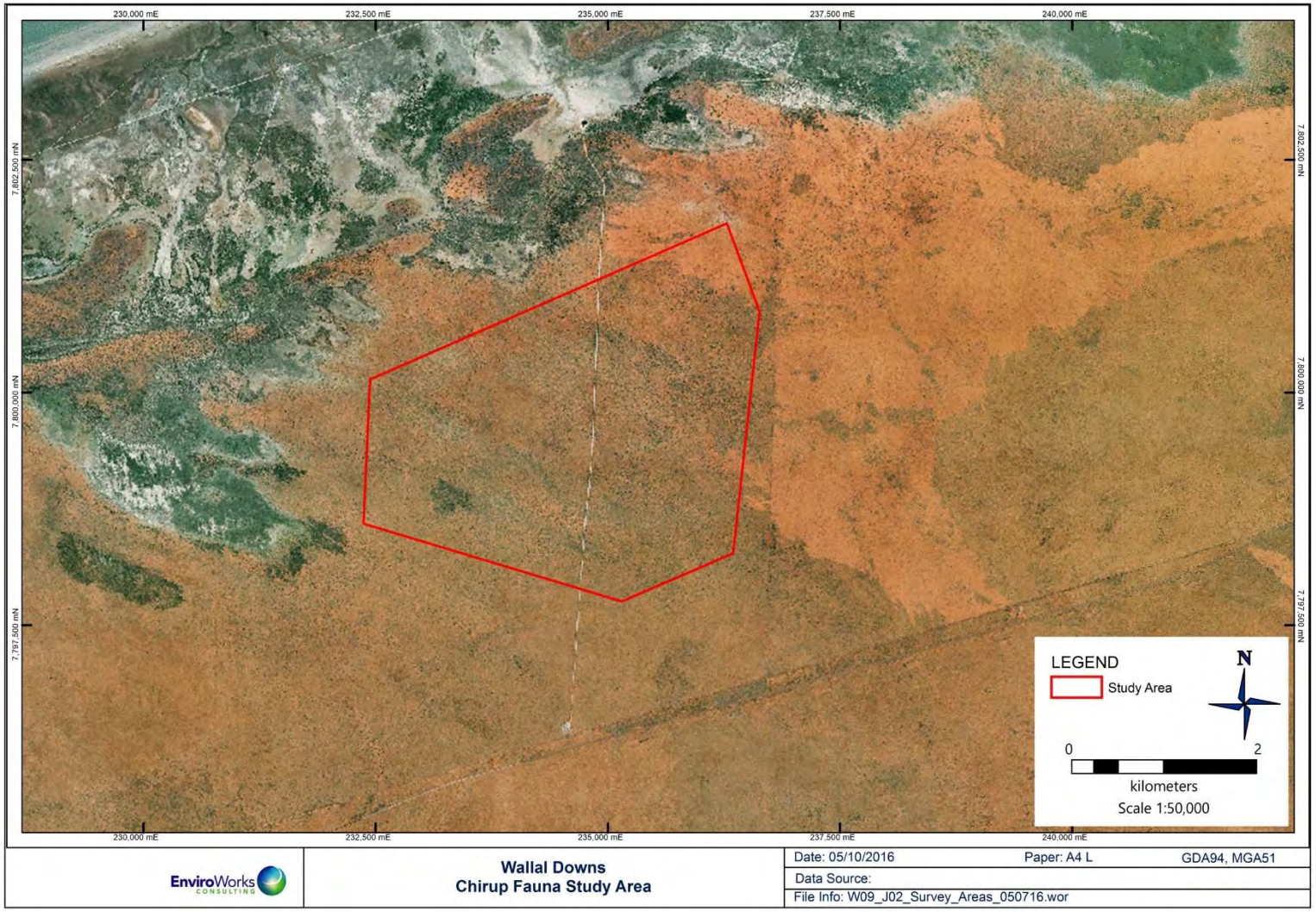

Figure 2. Location of the Chirup survey area, with the survey area visited in August 2016 outlined in red.

3 METHODOLOGY

3.1 Desktop assessment

The purpose of the desktop assessment was to identify the potential for Bilbies to occur within the vicinity of the two project areas based on unpublished and published data using a precautionary approach. Databases such as Naturemap and the Atlas of Living Australia were consulted as well as records of previous BCE fauna assessments in the area. Vegetation maps and satellite photographs of the area were examined for potentially suitable Bilby habitat and to ascertain the degree of clearing in the local area.

3.2 Field survey

The aim of the field survey was to collect information on Bilby distribution and abundance, and to identify areas of suitable habitat that may support the species. Bilby activity can be confirmed by searching for evidence such as scats, tracks, diggings and burrows.

Searching for evidence of Bilbies was approached systematically by personnel walking transects 300 - 500 m apart. Transect locations are given in Figure 4 (Homestead) and Figure 5 (Chirup). All personnel involved in searching were familiar with the evidence of the species. The survey was conducted on the 17th and 18th of August 2016 by Cameron Everard (BSc (Env. Sci.), MSc (Env. Mgt.)) and Jeff Turpin BSc (Zool.).

At all times, observations of other fauna were noted when they contributed to the accumulation of information on the fauna of the site. These included such casual observations as birds or reptiles seen while travelling through the site.

4 RESULTS AND DISCUSSION

4.1 Desktop results

The Bilby is listed as Vulnerable under the relevant state and federal legislation (Department of the Environment and Energy 2016). The species formerly utilised a wide range of environments across the continent. Extant populations are restricted to a variety of "tall shrublands, open woodlands and hummock grasslands" (Maxwell *et al.* 1996). The species appears to occur in scattered populations across the northern Pilbara, including close to Port Hedland (Thompson and Thompson 2008).

The desktop study identified 13 Bilby records in the general area (Table 1), although most of these were recorded between 1980 and 2000. There have been three moderately recent records, in 2003, 2008 and 2011 (Table 1). These three records were all dead specimens along the Great Northern Highway and presumably roadkills. Records L and K (from 1984 and 1996 respectively) were recorded close to the two project areas (Figure 3).

Table 1. Details of Wallal Downs Bilby records.

ID*	Year	Source	Type	Coordinates					
H	2003	WA Threatened Fauna Database	Dead	20	8'	29"S	119°	41'	20"E
I	1992	WA Threatened Fauna Database	Sighting	19	58'	56"S	120°	7'	3"E
J	2008	WA Threatened Fauna Database	Dead	19	57'	38"S	120°	15'	58"E
K	1996	Pilbara Threatened Fauna	Pers. com.	19	49'	48"S	120°	30'	0"E
L	1984	Pilbara Threatened Fauna	Pers. com.	19	49'	48"S	120°	40'	11"E
M1	1982	WA Threatened Fauna Database	Sighting	19	45'	56"S	121°	5'	5"E
M2	1982	Pilbara Threatened Fauna	Sighting	19	45'	60"S	121°	4'	59"E
M3	2011	Pilbara Threatened Fauna	Roadkill	19	46'	14"S	121°	5'	23"E
N1	1981	Pilbara Threatened Fauna	Pers. com.	19	51'	1"S	121°	15'	0"E
N2	1980	Pilbara Threatened Fauna	Pers. com.	19	51'	1"S	121°	15'	0"E
O	1899	WAM Mammal Database	Roadkill	20	23'	1"S	120°	2'	0"E
P1	1993	WA Threatened Fauna Database	Dead	20	23'	48"S	120°	3'	56"E
P2	1993	WA Threatened Fauna Database	Diggings	20	23'	48"S	120°	3'	56"E

*Records with the same letter are too close together to be labelled individually in Figure 3.

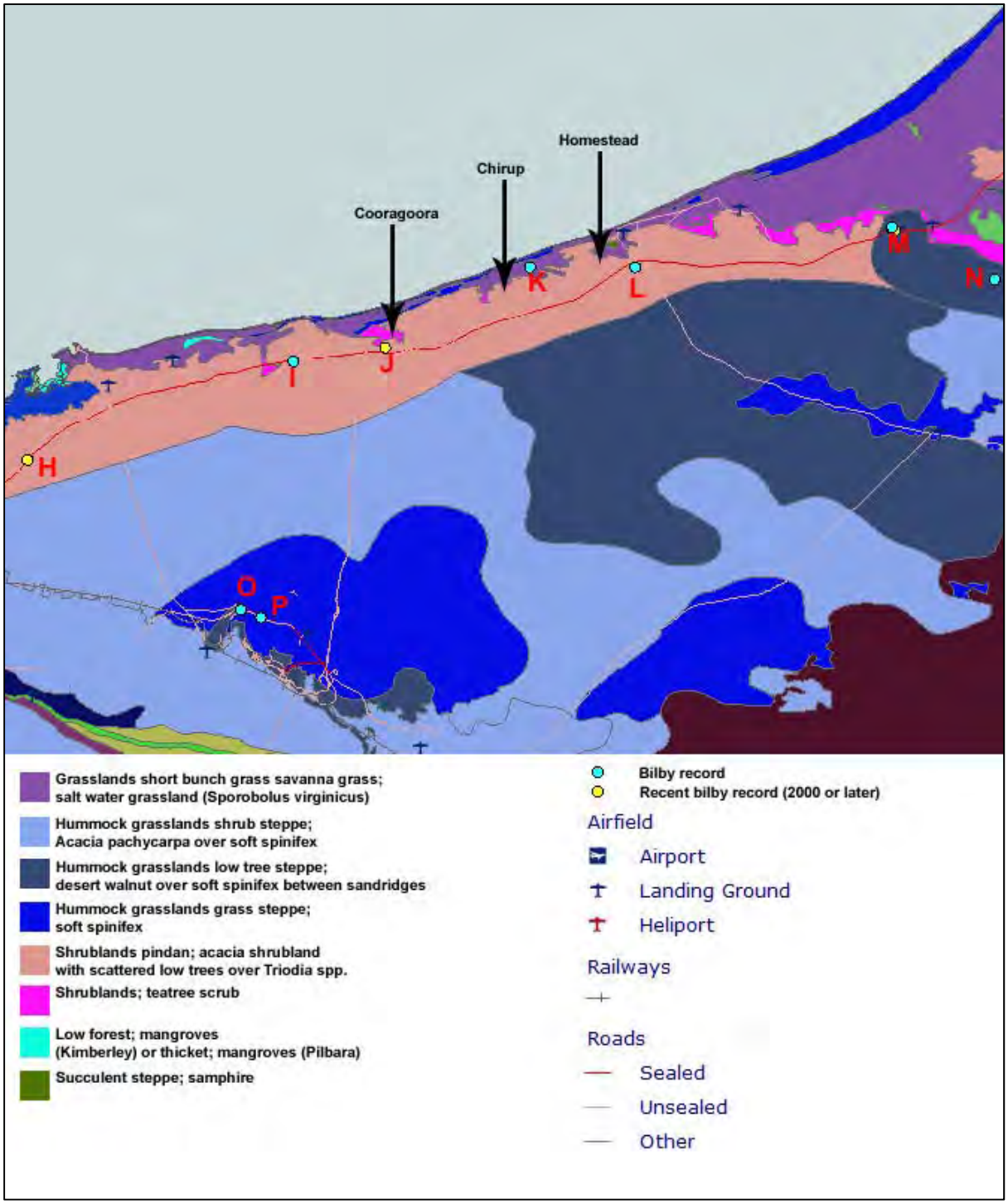

Figure 3. Wallal Downs Bilby records and pre-European vegetation types (only vegetation types within Wallal Downs Station are shown on legend). Letters indicate Bilby records and relate to details in Table 1. Some records are too close together to be labelled individually (see Table 1).

4.2 Transect survey

4.2.1 Homestead

No Bilby tracks, scats or diggings were recorded in the Homestead project area during the survey. A very old, abandoned burrow which had been overtaken by a goanna was recorded in Acacia thicket at [redacted] (Plate 1, Figure 4). The area around the old burrow was searched and no other tracks, diggings or burrows were found.

Data from the desktop assessment and site survey suggest that Bilbies appear to be uncommon in the region and not to currently occur in the Homestead survey area. It is likely that the species has declined in the area due to predation by Foxes and habitat degradation from livestock. Foxes appear to occur along the coastal strip in the region and Bilbies appear to persist only inland where the lack of water may limit access by Foxes; on a recent survey on Anna Plains station to the north-east, Fox tracks were found along the highway and Bilby tracks about 20 km further inland along the southern boundary of the station (M. Bamford, pers. obs, January 2014). Foxes were reported around Wallal Downs Station by station personnel (August 2016) and tracks were found on Pardoo Station, located approximately 70 km west of the Homestead project area (M. Bamford, pers. obs, July 2016).

There is thus no evidence of an extant Bilby population within the Homestead project area although Bilbies are highly mobile and re-settle areas over distances of many kilometres. For example, adult females can move up to 1.5 km between burrows on consecutive days and adult males can move 2–3 km and up to 5 km between burrows on consecutive days (Southgate *et al*. 2007). The roadkills along the Great Northern Highway (Table 1) and records from the Chirup project area (Section 4.2.1 below) suggest that Bilbies are still present nearby and individuals may move through Wallal Downs Station (including the Homestead area). The station does provide habitat for the species, with suitable Acacia shrubland over spinifex on sand and sandy-loam soils being extensive.

On this basis, it is recommended that a clearance survey is conducted for Bilby prior to the clearing occurring at Homestead.

Whilst the Homestead area does contain suitable habitat for Bilby, it should be recognised that the survey area represents a very small proportion of available habitat. The total survey area at Homestead (1,465 ha) represents only 2.92% of 50,214 ha native vegetation suitable as Bilby habitat lying within a 15 km radius.

Other (common/widespread) fauna identified include varanid (goanna) diggings and tracks, *Notomys alexis* (Desert Hopping-Mouse), Bush Stone-curlew and Australian Bustard tracks and a suite of bird species (listed in Appendix 1). There was no evidence of the Brush-tailed Mulgara in the Homestead area, although it was recorded in the Cooragoora area approximately 35 km to the south-west. The Agile Wallaby and Military Dragon (*Ctenophorus isolepis*) were recorded throughout the Homestead project area. Introduced fauna species identified from tracks include the feral Cat and Dog (Table 2).

Table 2. Location of fauna evidence recorded in the Homestead project area.

Date	Evidence	Zone	Easting	Northing
17/08/16	Old abandoned Bilby burrow	51K	[redacted]	
17/08/16	Cat track	51K	0251036	7806389
17/08/16	Cat track	51K	0250817	7806106
17/08/16	Dog Track	51K	0249393	7806080
17/08/16	Dog Track	51K	0249225	7805799

Plate 1. Old abandoned Bilby Burrow in the Homestead project area, now used by a goanna.

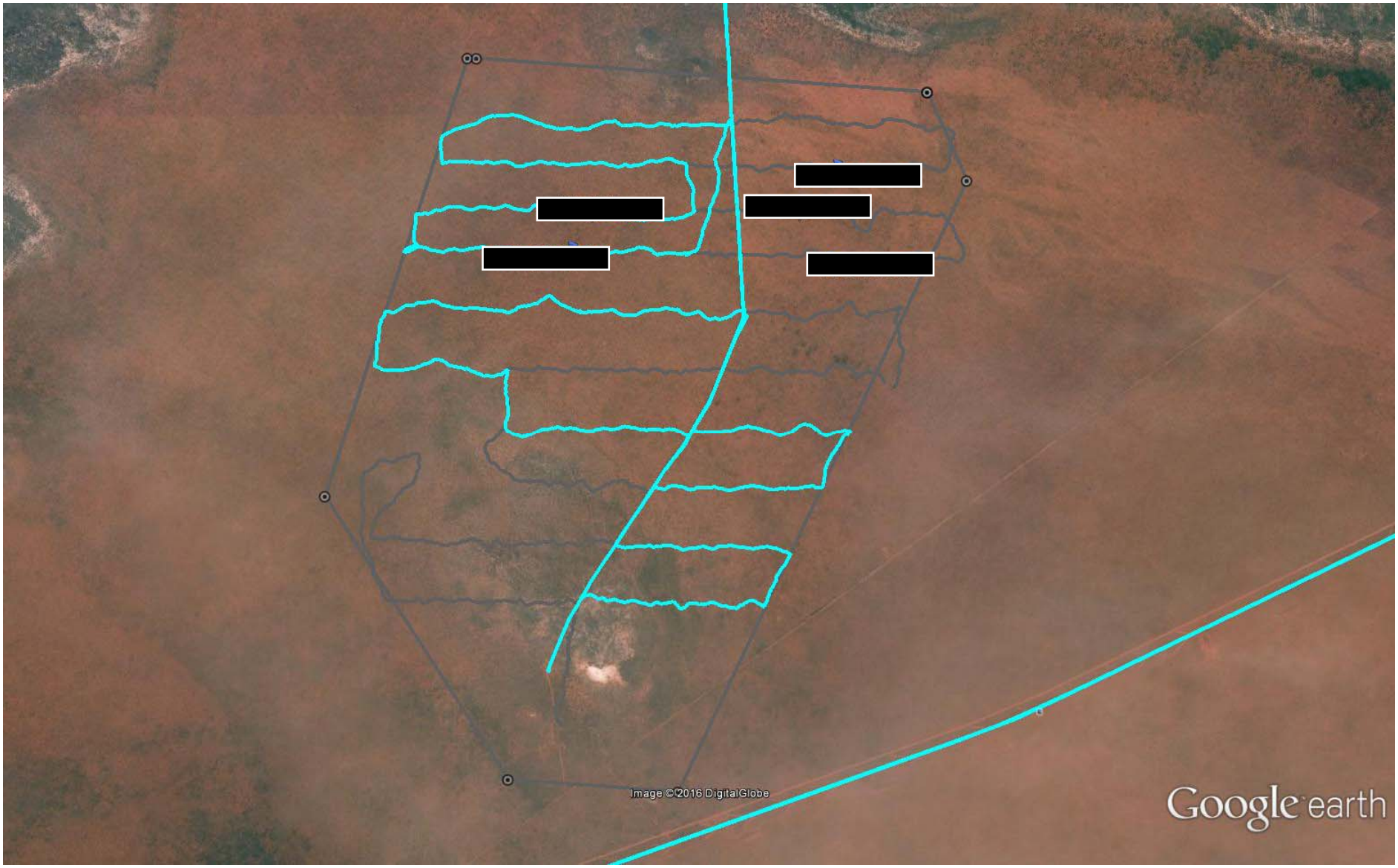

Figure 4. Location of transects (aqua and grey colour), an old burrow and feral animal evidence within the Homestead project area.

4.2.1 Chirup

Two Bilby burrows were recorded in the north-western corner of the Chirup project area during the survey (Figure 5, Plates 2-6).

One recently active burrow was found in the survey area with 2-4 week old tracks on the spoil pile [redacted] The entrance to the burrow was approximately 20 cm in diameter, with 1 m x 1 m soil fan. An old scat containing sand and invertebrate remains was found on the spoil pile. No other tracks were recorded around the spoil pile, however the ground surrounding the burrow was considerably harder and more compact than the spoil pile. A 40-50 m search in the area located several goanna diggings, but no other Bilby tracks or scats, and no foraging holes. The recently active burrow was found at the base of a small shrub in open spinifex on red sand. Evidence of cattle damage (i.e. trampled and grazed vegetation) was prevalent at the site.

A second burrow was recorded approximately 10m from the first burrow [redacted] (Figure 5). The entrance to the burrow was approximately 20cm in diameter and situated under a medium shrub. The spoil fan was approximately 1m x 1.5m and it was estimated that the burrow had been used about a month previously. No recognisable tracks or scats were found on the spoil pile or around the burrow. The area was searched and no tracks, diggings or burrows were recorded.

No other evidence of the Bilby was recorded in the Chirup project area during the survey.

Plate 2. Recently active Bilby Burrow recorded in the Chirup project area.

Plate 3. Recent (<4 weeks old) Bilby tracks with tail drag and scat (beside pencil) located at the entrance to the burrow.

Plate 4. Recently active Bilby burrow located at the base of a small shrub in open spinifex on red sand.

Plate 5. Recently active Bilby burrow showing footprints on the spoil pile.

Plate 6. Second Bilby burrow with soil pile and no other evidence, recorded approximately 10m from first burrow.

Data from the desktop assessment and surveys show that Bilbies appear to be uncommon in the region (due to predation by Foxes, habitat degradation from livestock and recent fires), but with at least one animal recently on the edge of the Chirup project area. This animal may have been passing through, but the presence of two burrows suggests it may move through the area regularly and could be resident nearby.

On this basis, it is recommended that a clearance survey is conducted for Bilby prior to the clearing occurring at Chirup.

Whilst the Chirup area does contain suitable habitat for Bilby, it should be recognised that the survey area represents a very small proportion of available habitat. The total survey area at Chirup (1,179 ha) represents only 2.36% of 49,821 ha native vegetation suitable as Bilby habitat lying within a 15 km radius.

No evidence of Mulgara was recorded during the survey, although the species was found in the Cooragoora project area, located approximately 18 km west-south-west of the Chirup project area.

Other (common/widespread) fauna identified include varanid (goanna) diggings and tracks, *Notomys alexis* (Desert Hopping-Mouse), Agile Wallaby, Bush Stone-curlew and Australian Bustard tracks and a suite of bird species (listed in Appendix 1). The Military Dragon (*Ctenophorus isolepis*) and Netted dragon (*Ctenophorus nuchalis*) were recorded in the project area. Introduced fauna species identified from tracks include the feral Dog and Fox (Table 3).

Table 3. Location of fauna evidence recorded in the Chirup project area.

Date	Evidence	Zone	Easting	Northing
18/08/16	Bilby burrow 1	51K	[redacted]	
18/08/16	Bilby burrow 2	51K		
18/08/16	Fox track	51K		
18/08/16	Dog Track	51K		
18/08/16	Bush Stone-curlew	51K		

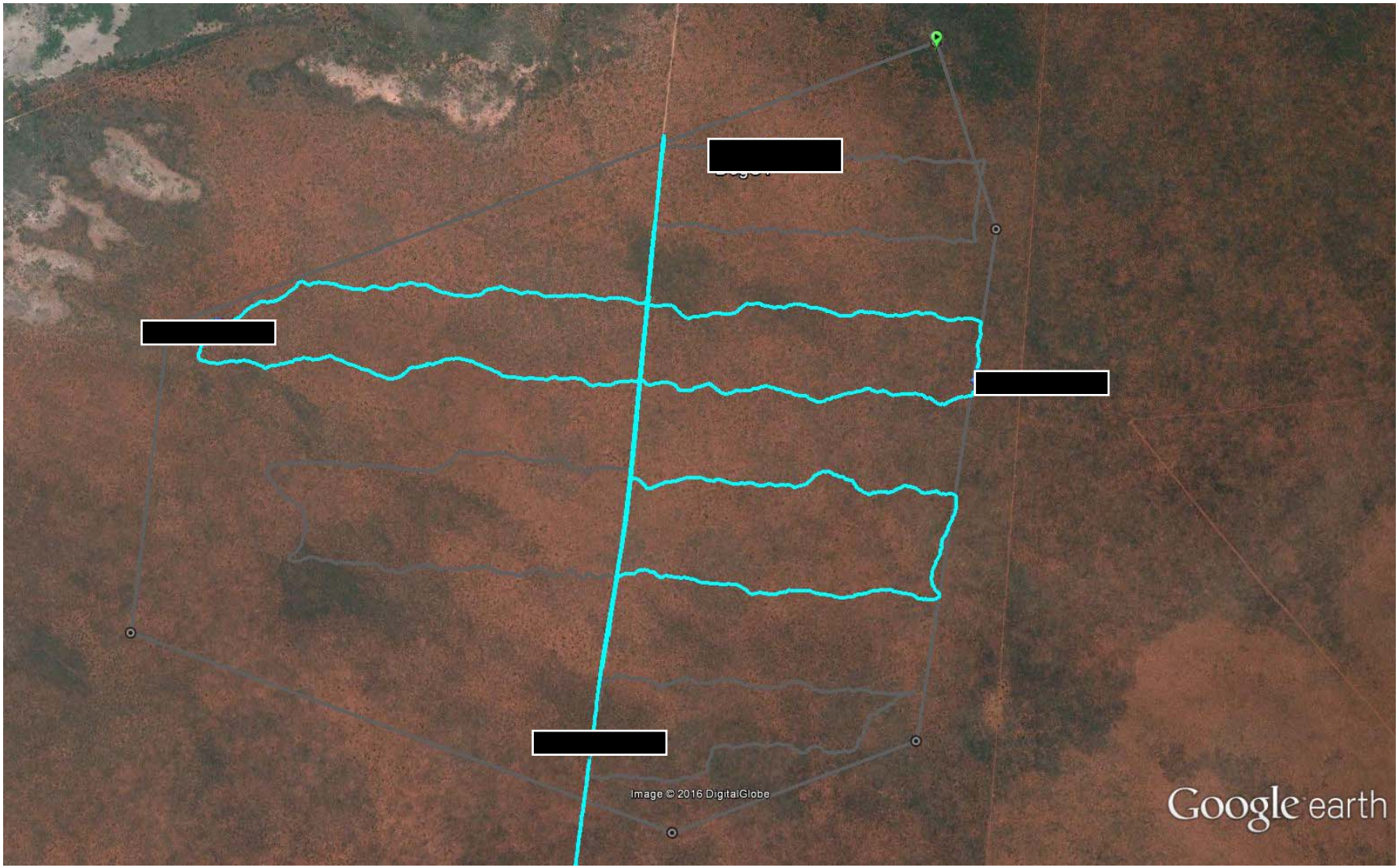

Figure 5. Location of transects (aqua and grey colour), two Bilby burrows (Bil1, Bil2), Bush Stone-curlew (BSC C1) and feral animal evidence within the Chirup project area.

5 CONCLUSIONS

Homestead

No Bilby tracks, scats or diggings were recorded in the Homestead project area during the survey. A very old abandoned burrow which had been overtaken by a goanna was recorded in the project area. The area around the old burrow was searched and no other tracks, diggings or burrows were found.

There is thus no evidence of an extant Bilby population within the Homestead project area, although it is recognised that Bilbies are highly mobile and re-settle areas over distances of many kilometres. The presence of suitable habitat within the survey area and recently active burrows recorded from Chirup, located approximately 15 km west-south-west of the Homestead area, suggest that Bilbies are still present in the region and therefore individuals may move through the Homestead area.

On this basis, it is recommended that a clearance survey is conducted for Bilby prior to the clearing occurring at Homestead.

Whilst the Homestead area does contain suitable habitat for Bilby, it should be recognised that the survey area represents a very small proportion of available habitat. The total survey area at Homestead (1,465 ha) represents only 2.92% of 50,214 ha native vegetation suitable as Bilby habitat lying within a 15 km radius.

Chirup

Two Bilby burrows were recorded in the north-western corner of the Chirup project area during the survey. One recently active burrow was found with 2-4 week old tracks on the spoil pile. An old scat was found on the spoil pile and no other tracks were recorded on or around the spoil pile. A second burrow was recorded approximately 10m from the first burrow. No other evidence of Bilby activity was recorded on or around this burrow. The area around the two burrows was searched for up to 40-50m and no other tracks, scats, diggings or burrows were recorded.

Data from the desktop assessment and surveys show that while Bilbies appear to be uncommon in the Chirup area, at least one animal has recently visited the site and may be resident nearby.

On this basis, it is recommended that a clearance survey is conducted for Bilby prior to the clearing occurring at Chirup.

Whilst the Chirup area does contain suitable habitat for Bilby, it should be recognised that the survey area represents a very small proportion of available habitat. The total survey area at Chirup (1,179 ha) represents only 2.36% of 49,821 ha native vegetation suitable as Bilby habitat lying within a 15 km radius.

REFERENCES

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APPENDIX 1. OPPORTUNISTIC BIRD SIGHTINGS AT THE HOMESTEAD AND CHIRUP PROJECT AREAS

Homestead

1. Nankeen Kestrel.
2. Bush Stone-curlew (tracks).
3. Australian Bustard (tracks).
4. Pheasant Coucal.
5. Rainbow Bee-eater.
6. Red-backed Kingfisher.
7. Variegated Fairy-wren.
8. White-winged Fairy-wren.
9. Singing Honeyeater.
10. Brown Honeyeater.
11. Rufous Whistler.
12. Willie Wagtail.
13. Black-faced Cuckoo-shrike.
14. Black-faced Woodswallow.
15. Pied Butcherbird.
16. Zebra Finch.
17. Torresian Crow.
18. Rufous Songlark.

Chirup

1. Emu (tracks).
2. Crested Pigeon.
3. Diamond Dove.
4. Brolga (tracks).
5. Brown Falcon.
6. Bush Stone-curlew (tracks).
7. Australian Bustard (tracks).
8. Galah.
9. Cockatiel.
10. Pallid Cuckoo.
11. Pheasant Coucal.
12. Rainbow Bee-eater.
13. Variegated Fairy-wren.
14. White-winged Fairy-wren.
15. Yellow-throated Miner.
16. Singing Honeyeater.
17. Brown Honeyeater.
18. Crested Bellbird.
19. Rufous Whistler.
20. Magpie lark.
21. Willie Wagtail.
22. Black-faced Cuckoo-shrike.
23. Black-faced Woodswallow
24. Pied Butcherbird.
25. Mistletoebird.

26. Rufous Songlark.
27. Zebra Finch.

These other fauna species observed in Homestead and Chirup are widespread in the general region.