



**M.J. & A.R. Bamford**  
**CONSULTING ECOLOGISTS**  
23 Plover Way  
KINGSLEY WA 6026  
p: 08 9309 3671. Mo. 0400 802692  
e: bamford.consulting@iinet.net.au  
ABN 84 926 103 081

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**Nita Downs Station; survey for the Bilby *Macrotis lagotis* and habitat assessment for other significant fauna**

**Mike Bamford**

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**INTRODUCTION**

Forshaw Pastoral Company Pty Ltd operates Nita Downs Station, about 200km south-west of Broome, and is proposing the installation of an additional 11 pivot irrigation systems, with a group of seven in the north and four in the south (*Figure 1*). In response to the application to clear native vegetation required for the installation of these pivots, the Department of Water and Environmental Regulation requested information on a suite of fauna species of conservation significance that might occur in the area: Greater Bilby *Macrotis lagotis* (Vulnerable), Dampierland Plain Slider *Lerista separanda* (Priority 2), Peregrine Falcon *Falco peregrinus* (Other specially protected fauna), Spectacled Hare-Wallaby (mainland) *Lagorchestes conspicillatus leichardti* (Priority 4) and Night Parrot *Pezoporus occidentalis* (Endangered). Significant species not mentioned but recorded by Bamford Consulting Ecologists (BCE) nearby (Shelamar Station 2018) are the Northern Brushtail Possum *Trichosurus vulpecula arnhemensis* (Vulnerable) and Brush-tailed Mulgara *Dasycercus blythi* (Priority 4). The Bilby is of particular note, as it has been recorded regularly on other pastoral stations in the region (BCE dataset), including Shelamar, Anna Plains and Pardoo, and animals recorded on Nita Downs were part of a monitoring study developed by the Department of Biodiversity, Conservation and Attractions (DBCA) (Dziminski and Bettink 2017).

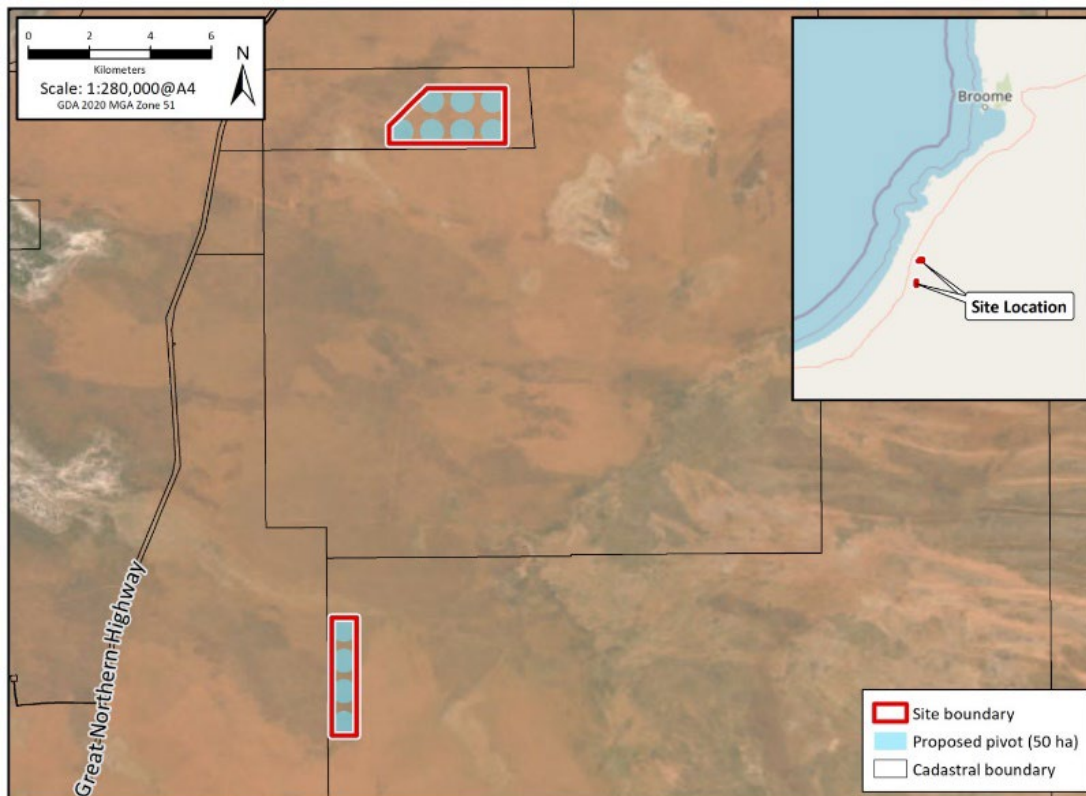


Figure 1. Nita Downs Station, illustrating locations of proposed pivot irrigation systems.

## METHODS

The requested surveys were carried out by Dr Mike Bamford (B.Sc. Hons. Ph.D.) of BCE, in conjunction with botanical surveys carried out by Rachel Weber of Emerge Associates. Dr Bamford has undertaken multiple Bilby surveys since 1996 at locations from the stations along Eighty Mile Beach, across sites in the Great Sandy Desert, and into the northern and eastern Pilbara. He contributed to the development of DBCA guidance on the approach to Bilby surveys. Field work took place on 5<sup>th</sup> and 6<sup>th</sup> September 2023. Investigations involved walking across the areas encompassing all proposed locations for pivots, with walking tracks about 200-300m apart (*Figure 2*). DBCA (2018) guidance suggests a spacing of walked transects of <500m to detect Bilbies, but a closer spacing when trying to find areas of key activity (such as burrows). The intent of the September 2023 survey was to detect Bilbies or to conclude absence with a high degree of confidence. Evidence of Bilbies was also searched for while driving along tracks, as Bilbies will often move along cleared areas, and their highly distinctive footprints can be seen even from a slowly-moving vehicle.

The presence of Bilbies is detected by evidence such as tracks, foraging holes and scats. Burrows are rare to find, whereas this other evidence is usually widespread and easily found. Bilbies can travel hundreds of metres in a night and create foraging holes scattered over several hundred square metres. Over several nights, foraging holes and tracks are thus spread over several hectares. Tracks persist for only days or a few weeks, but foraging holes can remain recognisable for over a year. Scats are distinctive, often placed near foraging holes, but may persist for only days or a few weeks probably due to insects consuming them. Therefore,

foraging holes are the most reliable way to detect current, recent and even past (>1 year) presence of Bilbies in an area.

Walking across the two proposed development areas also allowed for the assessment of habitat suitability for Bilbies and other targeted fauna, and for general fauna observations to be made.

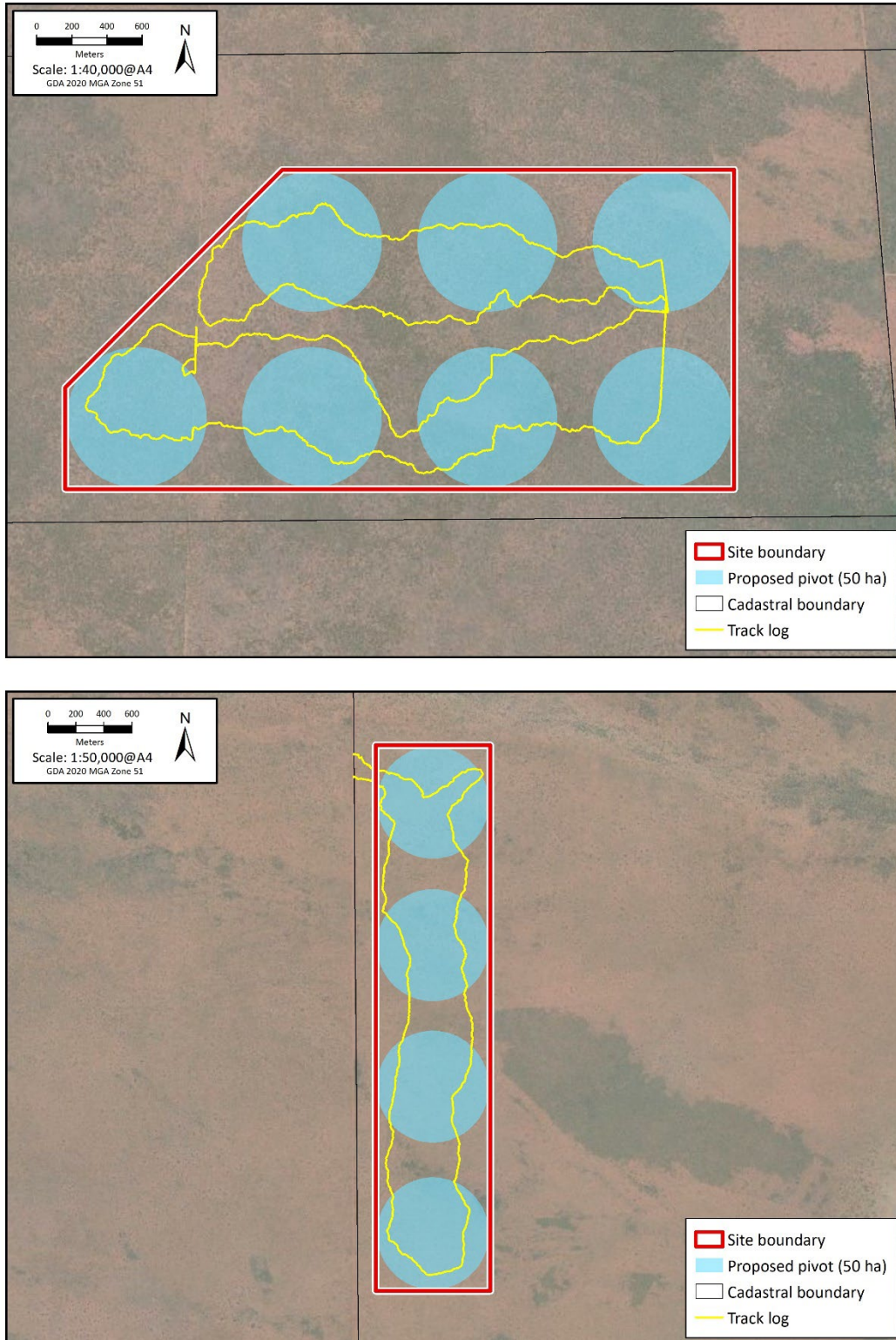


Figure 2. Walking tracks followed across the two pivot areas in September 2023.



## RESULTS

### Site descriptions

The northern pivot area supports an acacia tall shrubland over spinifex (*Triodia* spp.) on firm sandy-loam soils (Figure 3). This area has very little relief. Similar vegetation extends outside the northern area. The southern area supports more open vegetation (Figure 4), with broad areas of spinifex hummock grassland with scattered shrubby acacia (sometimes forming thickets) and occasional eucalypts and Desert Walnut (*Owenia reticulata*). Soils are a sandy loam. The southern area has little relief, but just to the north is a broad, slight depression. Neither area had been recently burnt, but there was evidence of past fires (charcoal on trees) perhaps 10-15 years previously.



Figure 3. Typical vegetation in the northern pivot area.



Figure 4. Typical vegetation in the southern pivot area (R. Weber).

### **Bilby**

No evidence of the Bilby was found in the northern pivot area, but evidence was found in the southern area (Table 1 and Figure 5). The evidence in the southern area consisted largely of recent and old foraging holes, with some faint tracks and a few scats, all in an area to the west of the northernmost pivot. The age and pattern of the evidence suggests a single animal that had foraged in the location several months before, and had returned within the last few weeks. It had not been present for at least a week, and quite possibly not for several weeks. No burrow was found, but the evidence was close to a fenceline and the burrow could have been several hundred metres the other side of the fence.

Both the northern and southern pivot areas provide potential habitat for the Bilby, with the southern area probably more suitable as the soils are slightly sandier, and it is close to a low-lying area. In previous surveys in the region by BCE, Bilbies tended to be found close to low-lying areas where soil moisture may be higher, but their pattern of local distribution is going to be complicated by other factors, such as time since fire.



Table 1. locations and descriptions of Bilby evidence.

utm zone 51K, datum GDA2020.

ID	Comment	Easting	Northing
1	Fresh to recent tracks along fenceline	362049	7875473
2	Recent foraging hole with scat	362069	7875460
3	Cluster of old foraging holes	362098	7875458
4	One old and one recent foraging hole	362171	7875445
5	Old foraging hole	362201	7875423
6	Recent foraging hole	362270	7875356
7	Recent foraging hole	362242	7875305
8	Recent foraging hole with faint tracks	362239	7875290
9	Recent foraging hole with faint tracks	362253	7875229
10	Recent foraging hole with faint tracks	362263	7875219
11	Two old foraging holes about 5m apart	362336	7875144
12	Recent foraging hole with old foraging hole 5m east	362161	7875543
13	Recent foraging hole	362146	7875556

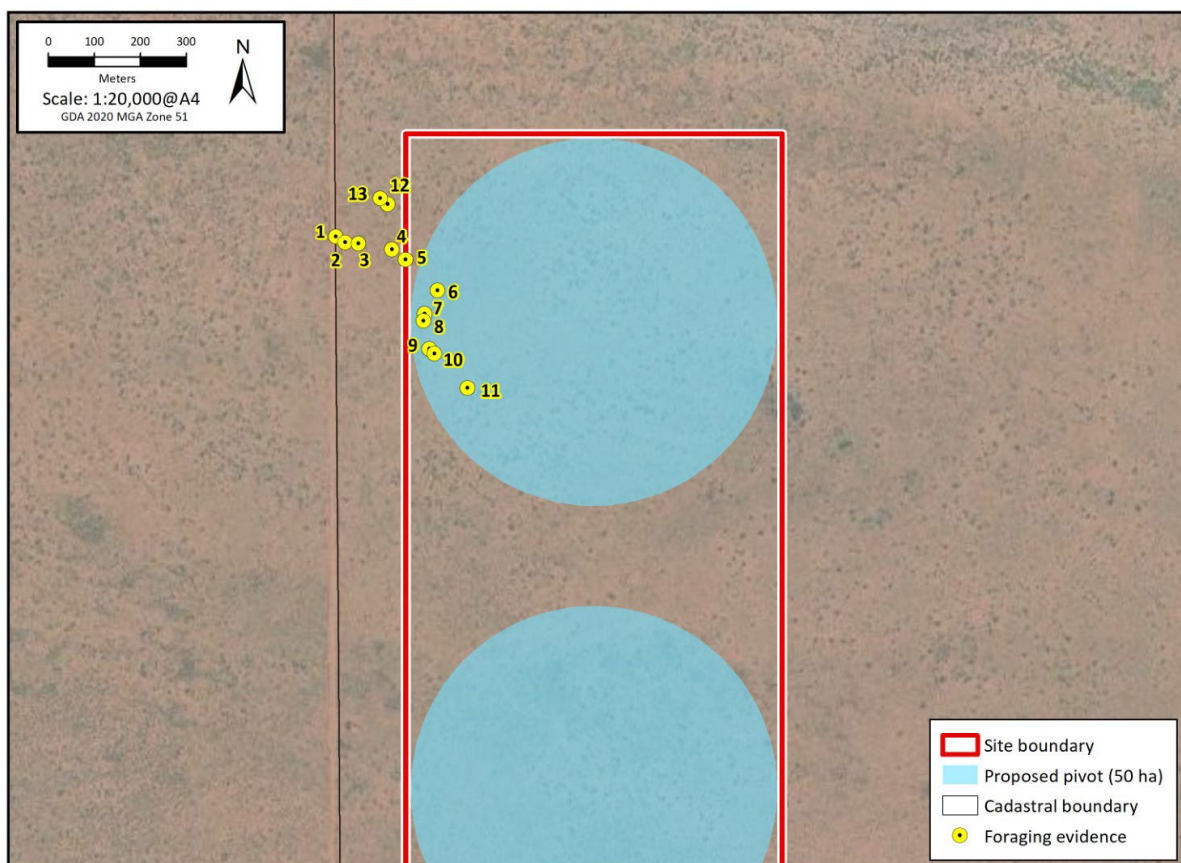


Figure 5. Results of the survey showing locations of evidence of Bilbies.



Figure 6. Recent Bilby diggings in the southern pivot area.

### **Dampierland Slider**

This small lizard (snout-to-vent length about 32mm) is described as occurring in sandy soils of the western Kimberley as far south as Nita Downs (Wilson and Swan 2021). The project area is therefore just within range of the species, and the soils are at least somewhat sandy. Searching for the species would be a major undertaking and concluding absence would require a massive survey effort. Therefore, on a precautionary basis it must be concluded that the species is present and note that similar vegetation and soils are widespread in the region.

### **Peregrine Falcon**

This species was not observed and is usually conspicuous when present, but individuals and even resident pairs can range over very large areas, and thus not be seen at one location during a short period. The project area is likely to be within the home range of a pair, but it lacked large trees on which the species can rely for nesting.



### **Spectacled Hare-Wallaby**

No evidence of this species, such as tracks or scats, was found, but there are records from the broader region. It is reported to require large hummocks of spinifex for shelter and therefore declines in regions where fires are extensive and regular (Burbidge and Johnson 2008). While it cannot be concluded to be absent without a very comprehensive survey, if present at all it is likely to only be in small numbers due to the lack of large hummocks of unburnt spinifex.

### **Night Parrot**

Nita Downs lies within the priority (but not high priority) survey area for the Night Parrot according to current guidance (Department of Parks and Wildlife 2023). The guidance notes that ‘at the landscape scale, Night Parrots require two distinct habitats: patches of low, dense vegetation in which they roost during the day, and nearby floodplains or other low-lying areas supporting diverse assemblages of native grasses and herbs in which to feed at night.’ The roosting habitat is commonly large spinifex hummocks such as form in the long absence of fire. The pivot areas have neither roosting nor foraging habitat, so the likelihood of the species being present is very low.

### **Northern Brushtail Possum**

Bamford (2018) recorded this species on the adjacent Shelamar Station, so it is likely to be present in the pivot areas on Nita Downs. Both pivot areas have scattered eucalypts that may provide hollows in which possums could shelter, with trees at a higher density in the north compared with the south.

### **Brush-tailed Mulgara**

This species was not confirmed on Nita Downs and was considered likely but at a low density on Shelamar by Bamford (2018). Spinifex on sandy to sandy loam soils is typical habitat for the species, so it may be present at a very low density on Nita Downs. Burrows of the Brush-tailed Mulgara are usually readily found where the species is abundant.

### **Other fauna**

Other species of fauna were noted when observed, with observations summarised in Appendix 1.



## CONCLUSIONS

The vegetation and soils of the two pivot areas on Nita Downs are within the range of and provide habitat for the Greater Bilby, Brush-tailed Mulgara, Spectacled Hare-Wallaby, Northern Brush-tailed Possum, Peregrine Falcon and Dampierland Slider. All these species may therefore be present but probably in low numbers. The Night Parrot is considered unlikely to be present.

Recent evidence of the Bilby was found in the southern pivot area, with the evidence consistent with an individual animal moving into the area for several nights in succession to forage. There was also evidence that probably the same animal had entered the area to forage several months before. There was no sign that this animal had dug a burrow for shelter in the area, and it was not resident at the time of the site visit. There was no evidence of Bilby activity in the northern pivot area, suggesting that it has been at least a year, and probably longer, since a Bilby might have been active in that area.

It is recommended that if a clearing permit is approved, pre-clearing surveys for Bilbies should be undertaken in the southern pivot area to check for the presence of resident animals at the time of clearing.

## REFERENCES

- Bamford, M. (2018). Assessment of the status of the Greater Bilby *Macrotis lagotis* on Shelamar Station. Unpubl. report.
- Burbidge, A.A. and Johnson, P.M. (2008). Spectacled Hare-Wallaby. pp. 314-316 in *The Mammals of Australia* (3<sup>rd</sup> Edition). Eds. S. van Dyck and R. Strahan. Reed New Holland, Sydney.
- DBCA (2018). Guideline for the survey and relocation of Bilbies in Western Australia. Department of Biodiversity, Conservation and Attractions, Kensington.
- Department of Parks and Wildlife (2023). Interim guideline for considering the presence of Night Parrot (*Pezoporus occidentalis*) in Western Australia. Version 2; March 2023.
- Dziminski, M. and Bettink, K. (2017). Greater Bilby Survey: La Grange Project Area. Department of Biodiversity, Conservation and Attractions, Kensington.
- Wilson, S. and Swann, G. (2021). *A Complete Field Guide to Reptiles of Australia*. 6<sup>th</sup> Edition. Reed New Holland; Sydney.

Appendix 1. Annotated species list, Nita Downs Station, September 2023,

1. Green Tree Frog *Litoria caerulea*. Several in bathroom at homestead.
  2. Dtella gecko *Gehyra* sp. A large and very pale *Gehyra* around homestead.
  3. *Ctenophorus isolepis*. Abundant; males developing breeding colour.
  4. *Tiliqua scincoides* and/or *multifasciata*. A lot of tracks along cleared lines. Large *T. scincoides* at homestead. Nita Downs is in a region where the two species may be sympatric.
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1. Crested Pigeon. Few along tracks and in pivot area.
  2. Diamond Dove. One in southern pivot area.
  3. Whistling Kite. One near homestead.
  4. Brown Falcon. One along track to northern pivots.
  5. Australian Bustard. Tracks throughout both pivot areas. Three seen in evening drive back to homestead from northern pivots.
  6. Red-winged Parrot. One along track driving back from northern pivots and group of about four around homestead.
  7. Button-quail. Seen twice but only briefly. Dark and lacking pale side to rump. Slightly larger than Little Button-quail.
  8. Horsfield's Bronze-Cuckoo. One calling northern pivots.
  9. Red-backed Fairy-wren. Multiple parties in both pivot areas; few coloured males present.
  10. Purple-backed Fairy-wren. Female seen in a party of Red-backed Fairy-wrens in northern pivots. Party including coloured male in southern pivots.
  11. Little Friarbird. Small group in northern pivots.
  12. Yellow-throated Miner. Around homestead and several parties in northern pivots.
  13. Black-chinned Honeyeater. One party in northern pivot and heard in southern pivots.
  14. Brown Honeyeater. Few small groups in northern pivots and southern pivots.
  15. Singing Honeyeater. Common throughout northern pivots; ones and twos. Few in southern pivots area.
  16. Rufous-throated Honeyeater. Several seen in the southern area; juveniles with indistinct rufous on the throat.
  17. Red-browed Pardalote. One calling near homestead.
  18. Grey Shrike-thrush. One heard northern pivots.
  19. Rufous Whistler. Several seen and heard northern pivots.
  20. Crested Bellbird. Two heard northern pivots.
  21. Grey-crowned Babbler. Two parties in northern pivot. Heard in distance in southern pivots.
  22. Willie Wagtail. Scattered and apparently single birds throughout.
  23. White-winged Triller. Loose flocks of up to 20 birds in northern pivots. Full colour males present. Smaller numbers in southern pivots.
  24. Black-faced Cuckoo-shrike. One in southern pivots area.
  25. Rufous Songlark. Several seen and heard northern pivots.
  26. Brown Songlark. One seen in southern pivots.
  27. Great Bowerbird. One seen in northern pivots.
  28. Mistletoebird. Several in northern pivots.
  29. Zebra Finch. Two in northern pivots.
  30. Black-faced Woodswallow. Small group throughout.

31. Masked Woodswallow. Fe in south.
32. Magpie-lark. Few around homestead.
33. Torresian Crow. Few throughout.

1. Greater Bilby. Recent and old foraging signs on edge of southern pivot area.
2. Dingo. Few tracks.
3. Cat. Tracks throughout northern pivots and southern pivots. One, a small ginger, seen in north.
4. Agile Wallaby. Few tracks throughout.
5. Camel. Fairly fresh tracks in southern pivots area.