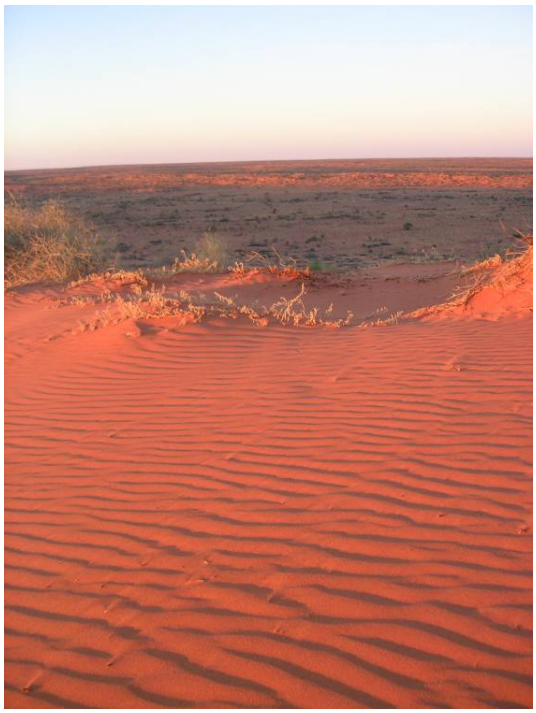
A Survey of Southern Marsupial Moles *Notoryctes typhlops* and Plains Rats *Pseudomys australis* in the Western Simpson Desert and Witjira National Park, South Australia, May 2007.



A report prepared for the SA Arid Lands NRM Board and the Friends of Simpson Desert.

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Australian Government

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Friends Of Simpson Desert Annual Working Bee May 2007

Marsupial Mole Surveys, 14th-25th May 2007

Introduction

Following on from the success of Marsupial Mole surveys in 2006 (Watson, 2006), the Friends of Simpson again undertook a survey for Marsupial Moles in the Simpson Desert in 2007. It was decided after negotiation with the Witjira Board of Management and the Aboriginal Heritage Branch of the Department of Premier and Cabinet that the surveys would be undertaken along the WAA Line and the Rig Road (continuing on from the final survey sites of 2006). In addition to undertaking mole surveys using the trench method adopted in 2006, the group also carried out track surveys at each site to identify the presence of sand-dwelling species of interest in the survey area.

Methods

The methods adopted in 2007 were identical to those used in 2006. In summary this involved digging three trenches (50 cm wide x 80 cm deep x 1 m long) on the crest, mid-slope and lower slope of the western side of sand dunes, with 5 km between sampling dunes. The trenches were excavated and then left for at least two days before they were inspected for signs of marsupial mole activity.

At each of the sites, a twenty minute search was undertaken of a 2 hectare area, during which time all signs (tracks, scats and burrows) of native and feral animals were recorded on a standard datasheet currently being used for these types of surveys across the SA Arid Lands Natural Resource Management region.

Results and Conclusions

A total of 25 sites, containing 75 trenches were surveyed during May 2007. Mole holes were recorded at seven of the 25 survey sites (Figure 1). Of the 75 trenches that were dug during the survey only nine contained mole holes, though three of these contained more than one hole (two holes in all three cases). During this survey, five of the nine trenches that contained holes were found on the lower dune, two were mid-dune and two were on the dune crests.

A comparison of the data collected during the 2006 and 2007 surveys (Figure 2) show that considerably fewer mole holes were observed during 2007. This comparison also shows that in 2007 more mole holes were recorded in the lower dune trenches, and the least number of holes were observed in the crest trenches. The density of mole holes per square metre of soil was also highest in the lower dune trenches and lowest in the crest trenches. This is in direct contrast to the results recorded in 2006 and during surveys conducted along the French Line in 2005 (Benshemesh, 2005).

Figure 1. Location of 2007 Marsupial Mole survey sites in relation to sites from 2006 and 2005 surveys.

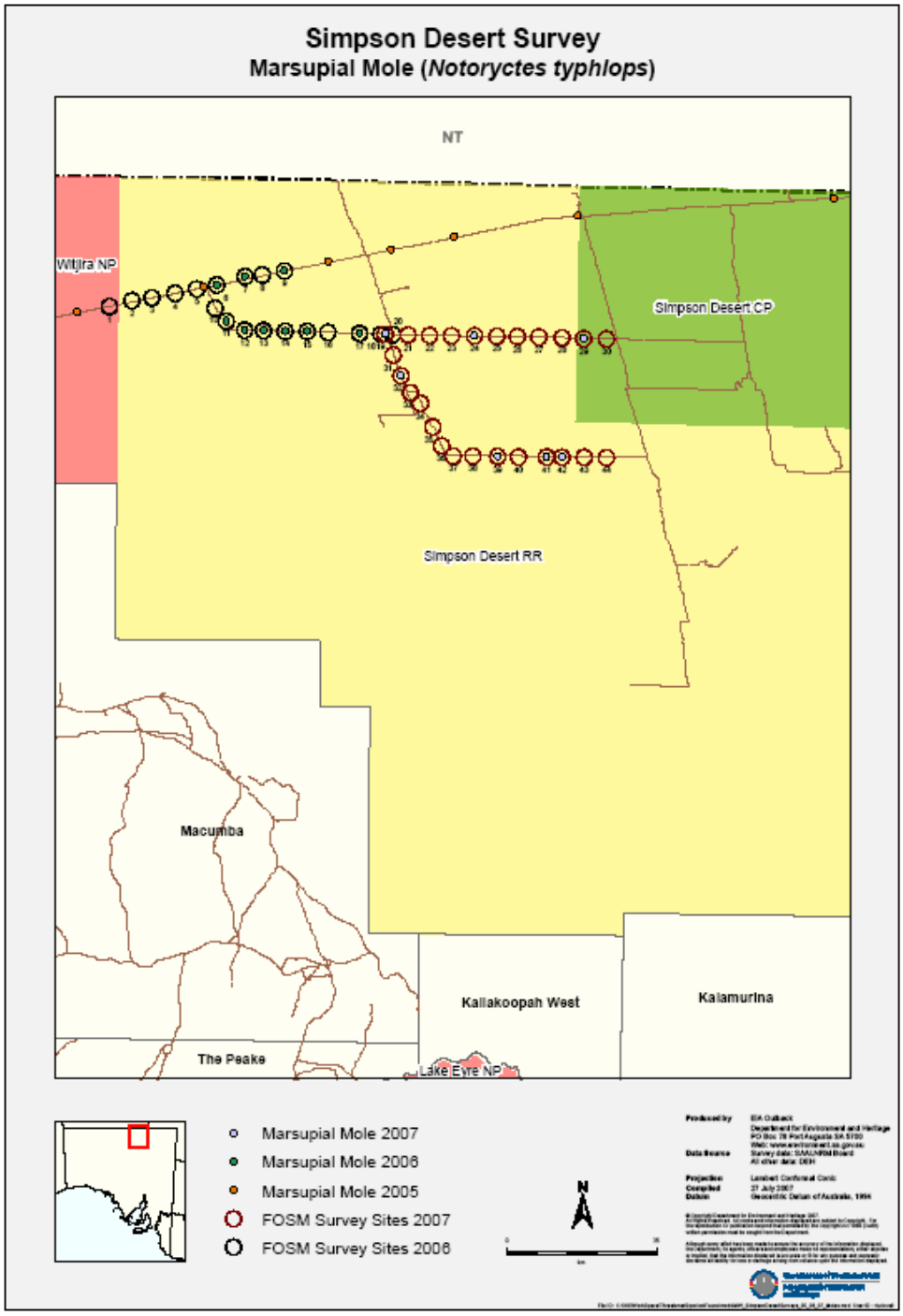


Figure 2. Proportion of trenches with mole holes in relation to position of trench on sand dune (2006 and 2007 data compared).

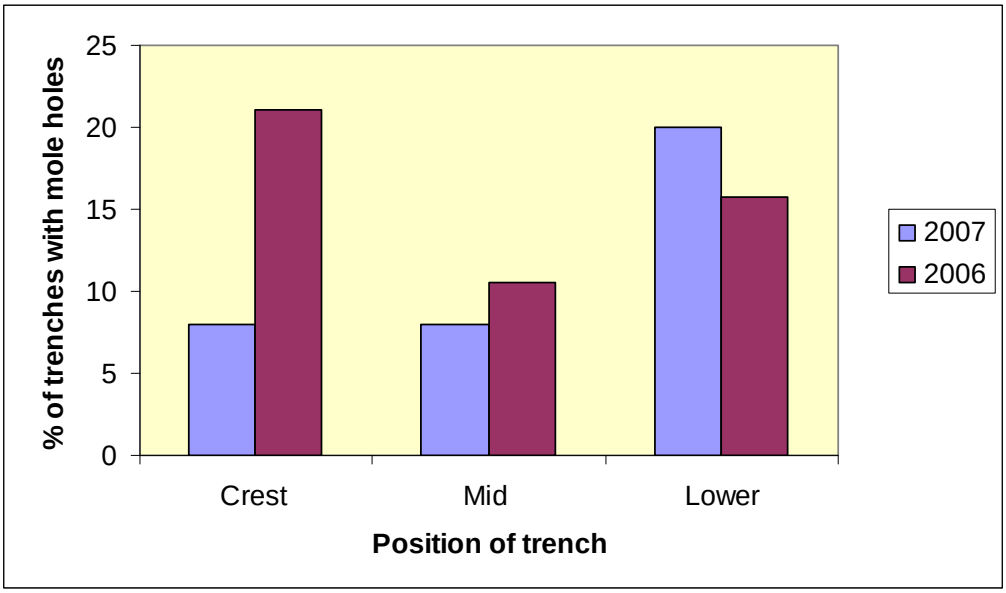
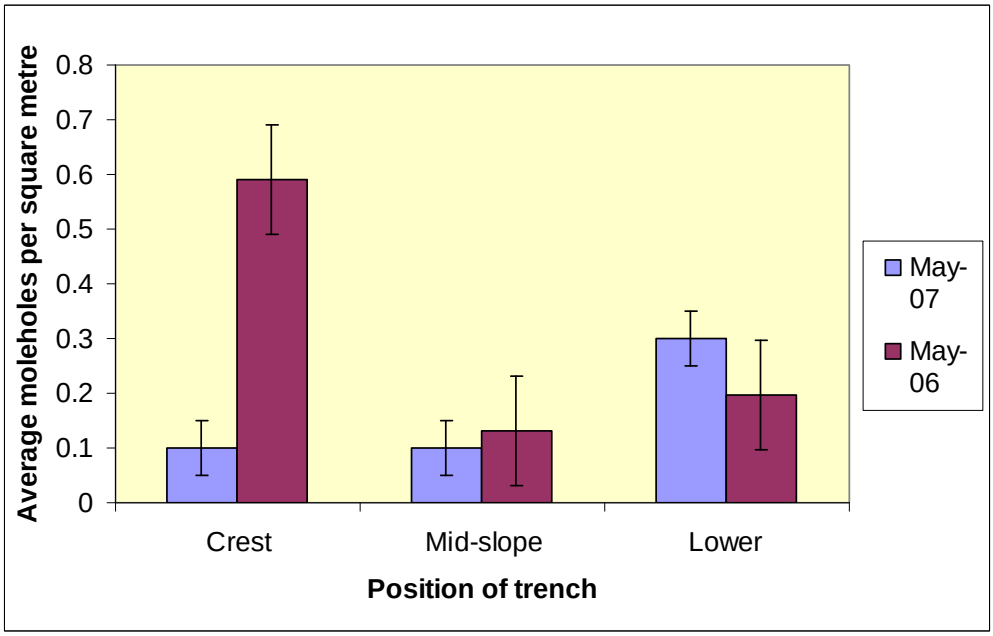


Figure 3. The average density of moleholes per vertical metre^2 in trenches relative to position of trench on dune. (Error bars are standard error).



Track Surveys

Native species

Searches of 2 ha plots at each of the mole survey sites provided very few native mammal tracks. Small rodent tracks were recorded at 13 of the 25 sites and hopping mice tracks were recorded at 4 of the 25 sites. Since no trapping was undertaken in conjunction with these track surveys, species identification could not be confirmed. Small rodent tracks were far less common in 2007 than they were in 2006, when they were recorded at 13 of the 19 sites surveyed. There were no ampurta/mulgara tracks recorded in 2007, despite this species being quite commonly recorded in 2006. Kangaroos were recorded at only 1 site this year compared with 2 of 19 sites in 2006.

Predator species

Dingoes, foxes and cats were recorded at 5, 1 and 1 sites respectively. These numbers were again quite low compared to 2006 results, when dingoes were recorded at 17 out of 19 sites and cats were recorded at 5 out of 19 sites. There were no fox tracks recorded at survey sites in 2006.

Introduced herbivores

Camels were the most common introduced herbivore in 2007, with sign recorded at 14 out of 25 sites. Rabbits were recorded at 9 sites and both cow and donkey were recorded at 2 sites. These figures were again quite low compared to 2006, when both camels and rabbits were recorded at 16 of the 19 survey sites, donkeys were recorded at 10 out of 19 sites and cows were recorded at 2 sites.

Conclusions

The 2007 surveys yielded considerably fewer signs of marsupial mole and other native species than was recorded in 2006 (Watson, 2006). The low numbers of marsupial mole holes and native and introduced animal tracks recorded in 2007 compared to 2006 may be due to a number of factors. At the time of survey in 2007, particularly during the first week of work, weather conditions were less than ideal for both trench and track surveys, with wind and rain events occurring patchily across the study area. Both wind and rain can greatly obscure animal tracks, rendering the tracking surface almost unusable. This could explain the very low numbers of tracks from native species, which due to the small size of these animals are most impacted by rain and wind.

Trench surveys can also be affected by rainy and windy conditions. Additional moisture in the soil due to rain events immediately preceding and during the survey can make mole holes difficult to identify as soil that backfills the mole holes remains more firmly in place if it is moist. Rain and wind can also cause disturbance on the surface of the trench walls making holes more difficult to distinguish.

The areas surveyed in 2007 may also be approaching the distributional limits of some of these species, particularly the Southern Marsupial Mole and the low numbers observed during the surveys may truly indicate lower densities of the species in these areas. This is in part supported by the results obtained during 2005 surveys along the French Line which clearly demonstrated a decline in mole hole abundance along a west to east

gradient (Benshemesh, 2005). Although little is known of the southerly limits of the distribution of marsupial moles in the Simpson Desert it is possible that such a gradient may also exist from north to south.

In addition to the increased difficulty associated with conducting these surveys under less than ideal weather conditions and in areas potentially representing the limits of the distribution of some of these species, many of the volunteers who participated in the surveys in 2007 were not present during 2006, and therefore had less experience with the survey techniques than some of their fellow participants. There was also less capacity for training in 2007, as much of the work was carried out independently by the Friends of Simpson volunteers, or in some cases with the assistance of National Parks and Wildlife Service Rangers (who themselves have only very limited experience with this type of survey work).

Nevertheless, these surveys continue to provide valuable new information about the distribution of native animals, particularly the Southern Marsupial Mole, in the Simpson Desert. However, the results of the 2007 surveys may indicate that further training and reference materials are required for use by volunteers undertaking these surveys, especially if rangers or other technical staff with adequate experience in these techniques are not always available to assist with the surveys.

Plains Rat Trapping at Mt Crispe, Witjira National Park 22nd-25th May 2007

Introduction.

Between 1992 and 1999, the South Australian Department for Environment and Heritage (DEH) managed a project looking into the distribution, abundance and habitat requirements of the Plains Rat *Pseudomys australis.* Much of the work conducted during this project was centred around permanent monitoring sites on Billa Kalina and Macumba Stations, however other sites in suitable habitat were also surveyed opportunistically during the life of the project. These sites were useful in providing information about the persistence of Plains Rats in areas not considered to be core habitat for the species. One such site was established at Mt Crispe in Witjira National Park, following the capture of a single Plains Rat at that location during a broadscale fauna survey conducted in 1992. A further specimen was collected in August 1997 during a targeted survey at the site. The last trapping undertaken at the site was conducted by the Scientific Expedition Group at the site in 2003 but no Plains Rats were recorded at the site.

Species description and ecology

The Plains Rat is one of the largest native rodents found in South Australia. Adults weigh between 30 and 70 grams. Its fur is grey to grey-brown on the back and creamy below and this pattern continues on the tail. In some individuals, the entire tail and the feet may be white.

Adult male Plains Rat (Photograph by Peter Canty)

The Plains Rat was formerly distributed widely throughout arid and semi-arid Australia. Since European settlement, the species has undergone a significant decline in its geographic distribution and is now thought to be extinct in Victoria, Queensland, New South Wales and Western Australia (Moseby, 2006). A population of Plains Rats was thought to persist in the Mac Clarke Conservation Reserve in the Northern Territory, but recent surveys have failed to capture any animals there. As a result, it is now possible that the only surviving populations are restricted to the Stony Plains Bioregion of northern South Australia.

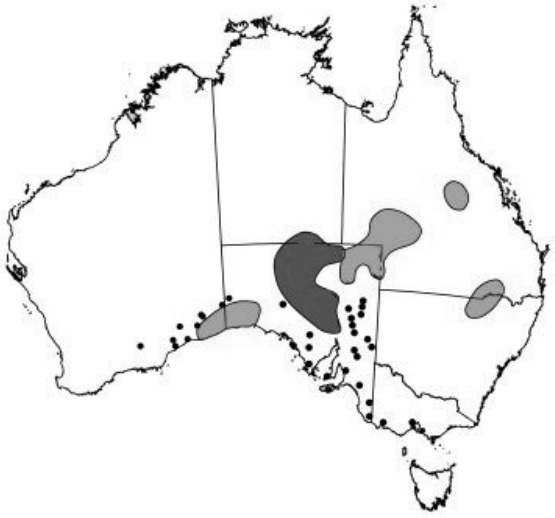


Figure 4: Past (light grey) and present (dark grey) distribution of the Plains Rat. Black dots indicate subfossil material (Map adapted from Moseby (2006)).

The Plains Rat is a social, burrowing animal. Colonies are usually quite small, but may rapidly increase in size following rain, sometimes irrupting into plagues. Burrows are usually found in soft gypseous clay soils, often characterized by large cracks or "crab-holes". The presence of these types of soils appears to be more important than the type or structure of the vegetation, as surveys in South Australia have recorded Plains Rat from a variety of vegetation types and from sites where vegetation is virtually absent (Brandle, 1998). Brandle (1998) recorded Plains Rats from four main vegetation communities including:

- Coolibah *Eucalyptus coolabah* Low Woodland
- Oldman Saltbush *Atriplex nummularia/* Plains Lantern-bush *Abutilon halophilum* Low Very Open Shrubland
- Cottonbush *Maireana aphylla/* Bristly Love-grass *Eragrostis setifolia/* Barley Mitchell-grass *Astrebla pectinata/* Bladder Saltbush *Atriplex vesicaria* Low Very Open Shrubland
- Tangled Bindyi *Sclerolaena divaricata/ E. setifolia/A.vesicaria* Low Open Shrubland.

Methods

In May 2007, the Friends of Simpson Desert with the assistance of Michelle Watson (SA Arid Lands NRM Board) re-opened the trapping grid previously used to survey Plains Rats at Mt Crispe in Witjira National Park. Locational information for the grid had been obtained from the DEH databases, but these co-ordinates proved to be incorrect (but have since been updated) and the grid was subsequently re-located with the assistance of Travis Gotch who visited the site with the Scientific Expedition Group in 2003.

Mt Crispe trapping site (Photograph Ruth Grgurich)

A total of 100 Elliott Traps and 20 pitfall traps were set for two consecutive nights at the grid which was located in low chenopod shrubland with numerous gilgais on undulating hills.

Results and Conclusions

A total of six animals were caught over the two nights trapping, including one Fat-tailed Dunnart *Sminthopsis crassicauda*, four Stripe-faced Dunnarts *Sminthopsis macroura* and one Forrest's Mouse *Leggadina forresti*. There were no Plains Rats captured or observed at the site or in nearby similar habitat. Fox scats were common on the trapping grid but no foxes were observed during the trapping period.

Table 1. Summary of animals captured at Mt Crispe

Species	Common Name	Trap type	Sex	Reproductive Condition	Weight
Sminthopsis crassicauda	Fat-tailed Dunnart	Pitfall	Male	Mature, scrotal testes	11 grams
S. macroura	Stripe-faced Dunnart	Pitfall	Male	Mature, scrotal testes	14 grams
S. macroura	Stripe-faced Dunnart	Elliott	Male	Mature, scrotal testes	14.5 grams
S. macroura	Stripe-faced Dunnart	Pitfall	Male	Mature, scrotal testes	17 grams
S. macroura	Stripe-faced Dunnart	Elliott	Female	Mature, developed pouch but no young	11 grams
Leggadina forresti	Forrest's Mouse	Pitfall	Male	Mature, distended testes	19.5 grams

During the course of the trapping period a number of bird species were observed at the site, including:
Brown Songlark (resident on grid)
White-winged Fairy Wren
Zebra Finches
Brown Falcon
Banded Whiteface
Australian Raven

No reptiles were observed during the trapping period.

The failure to record Plains Rat at the Mount Crispe site in 2007 means that it has been ten years since the species has been recorded at the site. In 1997, a single specimen was recorded during monitoring conducted as part of DEH's Rare Rodents project. At the time, the project officer's commented that the site did not represent "typical" or "preferred" habitat for Plains Rats and that they suspected that there may be a more substantial population in better habitat within the vicinity of the site. There has however, been no further records of the species from within Witjira National Park, so any resident populations remain unknown.

The failure to capture any Plains Rat and the relatively low numbers of other species recorded during the trapping was somewhat surprising given recent good conditions in the area. Recent rainfall events were still having an effect on the habitat, with surface water still present in gilgais and quite abundant vegetation cover across the entire trapping area. Further trapping at the site in the future may be worthwhile to investigate whether the site has been re-colonised by populations in adjacent habitats that have bred in response to recent good conditions.

Acknowledgements
I would like to thank the Board of Management of Witjira National Park for their assistance and support during the planning stages of these surveys. In addition, staff from the Department for Environment and Heritage Outback Region also assisted with the planning of the surveys. In particular I would like to thank Tony Magor for his time and efforts and Dean Ah Chee for sharing his knowledge and experience of the survey areas with the volunteers and for his efforts during the surveys. Travis Gotch, from the SA Arid Lands NRM Board also assisted with mapping and relocation of study sites and Rick Tuckwell from DEH provided Marsupial Mole maps. I would also like to thank the members of the Friends Of Simpson Desert Parks for their continued commitment and enthusiasm to volunteering in the Simpson Desert.

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