

# Protecting and detecting the Kangaroo Island dunnart

## Research update, September 2018

Project 1.1.10



National Environmental Science Programme

The Kangaroo Island dunnart. Photo Jody Gates



### About the project

The Kangaroo Island dunnart (*Sminthopsis aitkeni*) is a small carnivorous native marsupial that is listed nationally as Endangered and is restricted to Kangaroo Island.

When the project began in April 2017 the species had only been seen at eight sites in the last 20 years and little was known about its habitat preferences, current distribution and abundance.

Feral cats are considered a key threat to the dunnart. To protect the dunnart and other species a feral cat eradication program has commenced on Kangaroo Island.

Some key aims of this project are:

- to understand how the Kangaroo Island dunnart will respond to broad scale feral cat control
- to determine how best to monitor the species in future
- to fill knowledge gaps about the ecology, habitat preferences, distribution and abundance of the species.

A key activity of the project has been an extensive survey across western Kangaroo Island, which trialled and compared a variety of monitoring methods in order to determine which techniques are most effective at detecting the dunnart.

The survey covered a number of vegetation types and fire histories in order to help us gain a better understanding of what habitats the species prefers, and what resources it requires to persist in the landscape.

The density of feral cats in the region was also assessed, to understand the extent to which cats may threaten the remaining dunnart population and to provide information for the planned cat eradication.

In August 2018, the final part of the project commenced, when we began examining the potential impacts of broad scale feral cat baiting on the Kangaroo Island dunnart and other native small mammal species.

### Key messages

*The Endangered Kangaroo Island dunnart persists on western Kangaroo Island in low numbers.*

*The species is hard to detect. This project trialled four monitoring methods. It found that camera traps facing drift fences were the cheapest and most effective detection method.*

*Dunnarts were only found at five of 42 sites surveyed. Low detection rates meant the study was unable to conclude, with reasonable confidence, if there has been a reduction in site occupancy in the last two decades.*

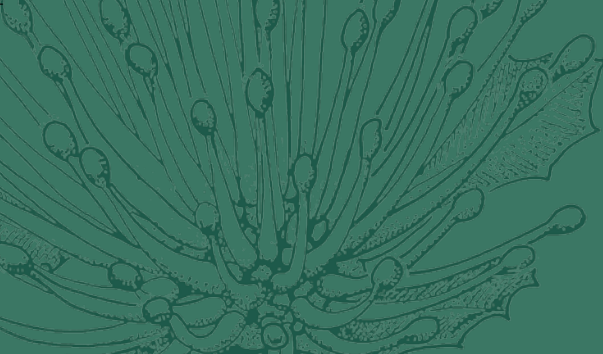
*Feral cats pose a threat to the dunnart. Arrays of remote cameras found that cat densities in some areas on western Kangaroo Island were higher than average densities on mainland Australia.*

*An island-wide cat eradication project has begun, for economic and environmental reasons.*

*Inaccessibility makes aerial feral cat baiting the most practical option for western Kangaroo Island. The next stage of this project will undertake non-toxic bait trials to determine how baiting will impact upon the dunnart and other small mammal species.*

Camera trap image of a Kangaroo Island dunnart. Photo: Rosemary Hohnen





The three pit sizes trialled.  
Photo: Rosemary Hohnen.



A camera trap facing a bait station.  
Photo: Rosemary Hohnen

## Kangaroo Island dunnart surveys

Surveys for Kangaroo Island dunnarts took place across western Kangaroo Island over a five month period in August-September 2017 and March-May 2018. A total of 42 sites were trapped using four methods: Elliott traps, pitfall traps, camera traps facing fence lines, and baited camera traps. Also, three different sizes of pitfall trap were trialled, including two pit sizes that are used commonly in other biodiversity surveys across Australia, and also a deep wide pit, which is a size that has been shown to be effective

for trapping the similar Butler's dunnart on the Tiwi islands.

To examine the impact of fire on dunnart occurrence we divided the sites between three main categories, recently burnt (0-10 years post fire), regenerating (10-20 years post fire) and long unburnt (>20 years post fire). Within these categories, most sites had an overstorey of Kangaroo Island mallee-ash (*Eucalyptus remota*), brown stringybark (*Eucalyptus baxteri*) or coastal white mallee (*Eucalyptus diversifolia*).

## Findings

Dunnarts were detected on camera on seven occasions at five sites. Four of those sites were new, previously unsurveyed, sites and one site had a historic record.

Levels of occupancy were similar between this survey and a historic survey conducted in 1999-2001. The taxon was predicted to occupy 27% (95% confidence interval: 7 - 65%) of sites in eucalypt woodlands on western Kangaroo Island, and approximately 8% of the island as a whole.

Camera traps placed to face drift fence lines were both the cheapest and the most effective dunnart detection method. Drift fence lines consist of 30 m lengths of heavy duty plastic that are dug into the ground, forming a large barrier that funnels animals towards the cameras. Power analysis suggests that future surveys using this method must sample at least 55 sites in spring and autumn to be capable of detecting a 60% decline, and 26 sites to detect an 80% decline.

Although the sampling effort was very large, no dunnarts were caught in traps. However, wide deep pits (diameter 30 cm, depth 70 cm) were the most effective at catching small mammals such as native bush rats and western pygmy possums, compared to other sizes such as PVC pipes, or standard 20L buckets which are used commonly in biodiversity surveys throughout Australia. This indicates that if dunnarts need to be caught, for example to collect genetic samples, wide deep pits are likely to be the most effective method.

Dunnarts were detected in recently burnt, regenerating and long unburnt habitats, so there was no evidence of selection for one particular post-fire vegetation age. Dunnarts were detected most frequently at open low mallee sites dominated by *E. remota*, but they were also caught at one open woodland site dominated by *E. obliqua*.



A camera trap facing a fence line.  
Photo: Rosemary Hohnen

## Feral cat density estimates

Using arrays of 50 remote infrared cameras, we assessed feral cat density within Flinders Chase National Park, and at the border of the national park and farm land. After a two-month period the cameras were collected and the images downloaded and individual cats were then identified using their fur patterns.

On the border of the forest and farm land the density of cats on some arrays was over 0.4 cats/km<sup>2</sup>, higher than the mean density of cats on mainland Australia.

In August this year one final array of cameras will be deployed in farmland adjacent to the national park, to build a final picture of how cat densities vary between forest, forest borders, and farmland on western Kangaroo Island.



*An open woodland site. Photo: R. Hohnen*

## Next steps

The final stage of the project commenced in August 2018 when we began examining how broad scale feral cat baiting will impact upon resident small mammal species.

Currently, "Eradicat" baits (based on the poison "1080") are the only commercially available feral cat poison baits in Australia. If feral cat eradication is implemented in western Kangaroo Island, baits are likely to be the preferred technique as much of the park is fairly inaccessible by road, and baits can be dropped aerially to control cats in these areas.

Some small mammals on western Kangaroo Island have a reasonably low tolerance to 1080 and could die if they eat a sufficient amount of the feral cat baits. What we don't know is if small mammals will eat the baits if they are available.

To examine bait uptake by these non-target species, we will use non-toxic baits that contain a biomarker called Rhodamine B. If an animal consumes a bait, the Rhodamine B will subsequently be deposited in the animal's whiskers and will be visible under UV light. So, by taking whisker samples from resident small mammals we'll gain an idea of the proportion of the population that may be impacted if toxic baiting occurs.

The trial will occur at sites with recent Kangaroo Island dunnart and southern brown bandicoot records, but we also expect to catch bush rats, little pygmy possums and western pygmy possums which are common at the sites.



*An open mallee site. Photo: R. Hohnen*



*A fenceline with a pit. Photo: R. Hohnen*



*Wide deep pit construction. Photo: R. Hohnen*



## Conclusion

The results of our study suggest the Kangaroo Island dunnart occupies less than one third of sites in remnant eucalypt woodlands on western Kangaroo Island, and less than 8% of Kangaroo Island's total landmass.

Arrays of remote cameras suggest that feral cat densities in western Kangaroo Island are higher than on mainland Australia. These results are concerning and suggest that

cat control could be very beneficial for wildlife in the region.

Hopefully the results from the non-toxic trials this year will allow us to determine the feasibility of broad scale feral cat baiting, which may be an important tool that alongside targeted monitoring, would support the persistence of the Kangaroo Island dunnart in the future.

## More Information

If you want to talk to someone about the research project please contact:

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*A young southern brown bandicoot. Many other species of small mammals, amphibians and birds were caught during the survey. Wide pits (diameter 30 cm, depth 70 cm) were the most effective for catching small mammals in general. Photo: Rosemary Hohnen.*

