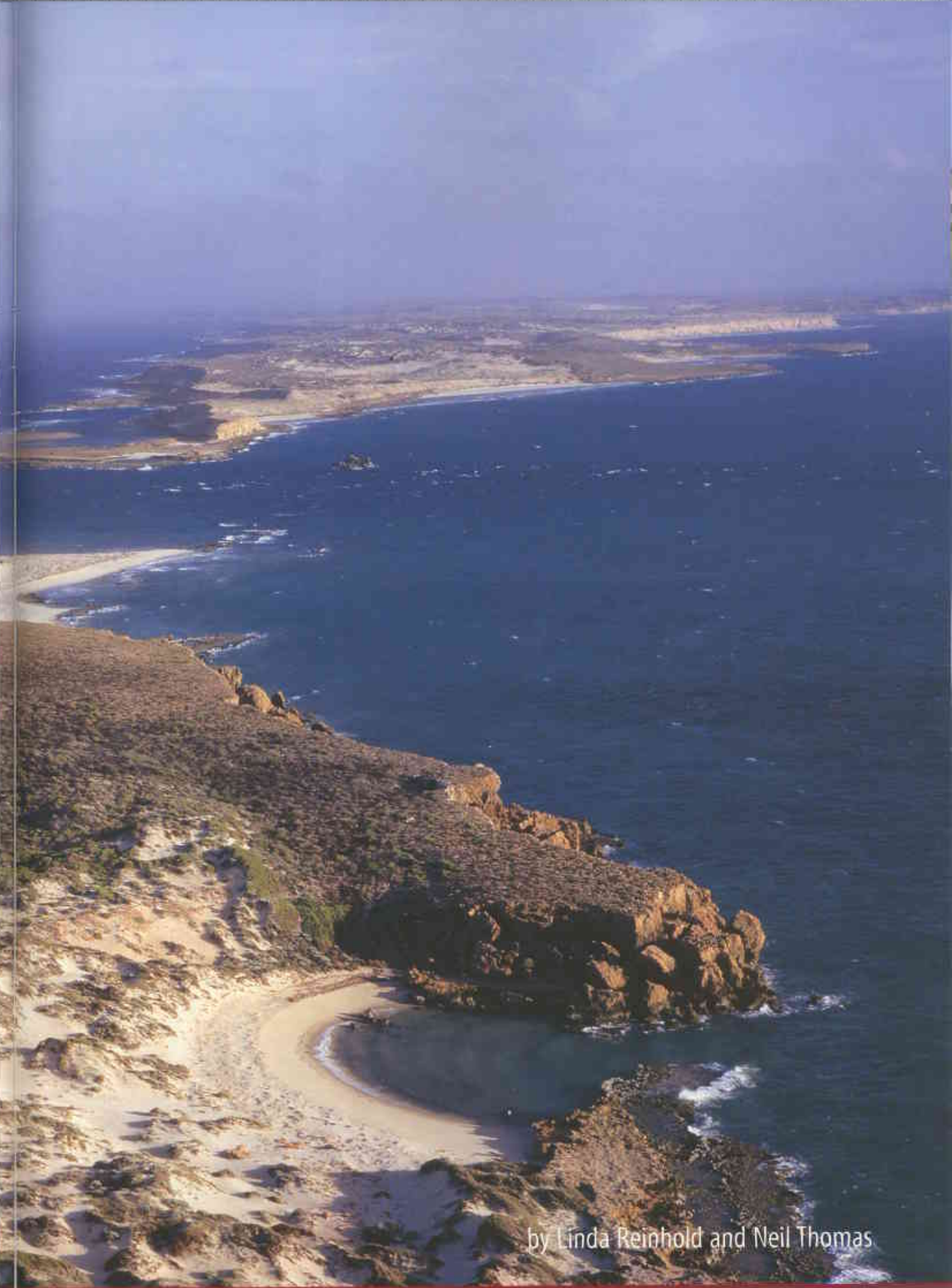


Bernier and Dorre: islands of marsupials, mice and men

Located some 50 kilometres west of Carnarvon, Bernier and Dorre islands are two of the most important refuges for some of Australia's most endangered mammals.





by Linda Reinhold and Neil Thomas

Bernier and Dorre islands are part of an old sand dune system at the north-western edge of the Shark Bay World Heritage area (see map on page 31). When the sea level rose 8000 years ago, these areas were marooned, forming two natural arks where the island inhabitants went about their existence, blissfully unaware that thousands of years later their cousins on the mainland would be driven to extinction. Of Australia's 26 species of threatened terrestrial mammals, five reside on these two reserves. This can be attributed to their isolation and the fact that they are free of any introduced predator or herbivore species. Between them, the islands cover less than 100 square kilometres. At many places, the islands are less than a kilometre wide, but reach just over three kilometres at their widest point.



The islands are home to the last naturally occurring wild populations of western barred bandicoots or marl (*Perameles bougainville*), banded hare-wallabies or merrnine (*Lagostrophus fasciatus*) and rufous hare-wallabies or mala (*Lagorchestes hirsutus*). Shark Bay mice or djoongari (*Pseudomys fieldi*) are found only on Bernier. Burrowing bettongs or boodie (*Bettongia lesueur*), ash grey mice (*Pseudomys albocinereus*) and water rats (*Hydromys chrysogaster*)

also inhabit the islands, but are found elsewhere.

It is envisaged that once feral cats are eradicated from Shark Bay's Dirk Hartog Island, these species will be reintroduced to that island, aiding in their long-term conservation. The Peron Captive Breeding Centre, which is part of the Department of Environment and Conservation's (DEC's) Project Eden program, and the Return to Dryandra Field Breeding Facility are breeding the two hare-wallabies and the boodie for this purpose (see 'Return to Eden', *LANDSCOPE*, Autumn 1995 and 'Return to Dryandra', *LANDSCOPE*, Winter 2001). Previous reintroductions of hare-wallabies to Dirk Hartog Island and Peron Peninsula failed, predominantly due to feral cat predation, making the refuge status of Bernier and Dorre islands and the two captive breeding facilities even more crucial.

Because the islands had not been thoroughly surveyed for mammals since CSIRO expeditions of 1988–1989 and 1991–1992, DEC was keen to find out how the populations were faring on what is quite possibly Australia's most important threatened mammal nature reserve. So, last August, a team of biologists and veterinary scientists from DEC and Murdoch University made the voyage from Denham to the islands with funding from DEC's *Saving our Species* program (see 'Saving our Species, Saving our State' on page 10).

For two weeks, the boat crew ferried the research team back and forth from the charter vessel to the islands—day and night. They journeyed to the islands in the afternoon to place wooden stakes and reflective tape to mark transects for that night's spotlighting. Carrying bundles of stakes and later spotlighting batteries, they made their way across spinifex, through bushes and over sand dunes in search of the islands' threatened inhabitants. They



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Main Dorre Island (bottom) and Bernier Island (top).

Photo – David Bettini

Inset Banded hare-wallaby.

Photo – Linda Reinhold/DEC

Left Boodie.

Photo – Jiri Lochman



Above Dwarf bearded dragon (*Pogona minor*).
Photo – Michael Mathieson/DEC

Right Dorre island.

Below right Ash grey mouse.
Photos – Linda Reinhold/DEC



criss-crossed the islands spotlighting from sunset until midnight, walking back and forth with old and new technology in hand—a compass and GPS. At sunrise, they were back on the islands to check traps.

Spotlighting and trapping

Going ashore after sunset, the team found the transects marked out earlier that afternoon. In two or three teams, they traversed the island, back and forth, walking at a steady three kilometres an hour. Lines were set by the distant glint of another piece of reflective tape atop the next hill, as the spotlight moved over the varied terrain, constantly scanning for the slightest sign of life in the form of a furry rump, eyeshine or a hopping movement. The main quarry was boodies, merrnine and mala. The team saw marl less often and on rare occasions a djoongari or ash grey mouse would be caught in the beam of the spotlight. Once they sighted a water rat—a species that uses the islands' beaches to fossick.

Where practical, the team duplicated the methodologies of the previous CSIRO expeditions. They could then calculate how many animals were seen per kilometre of transect, roughly comparable to the earlier surveys. The 1988–1989 trips were undertaken at the end of a drought, and



the 1991–1992 trips after a period of good rainfall. For all species counted, numbers had increased on the second survey. In 2006, the team saw a greater number of boodies. Densities of the two hare-wallabies were less than in 1991–1992, but much the same as in 1988–1989. Sightings of marl were similar to 1991–1992.

The number of hare-wallabies is estimated by spotlighting, boodies can be counted by spotlighting and trapping, but marl, djoongari and ash grey mice must be trapped to accurately assess their population sizes, as they are not sighted frequently enough in the

spotlight surveys to conduct statistical analyses.

The team set out cage and Elliott traps as another way to measure abundance, especially for the smaller species. Trapping also enabled the team to check the animals' health and provided an opportunity for the scientists to see these rare animals up close after glimpsing them in the spotlight.

Each species had a very different temperament. Boodies were always full of spirit, sometimes having rolled several traps over before finally getting caught in one. While, at the other extreme,



Left Murdoch University vets Mark Bennett and Lucy Woolford took swabs from marl to test for viruses.
Photo – Michael Mathieson/DEC



Below left Boodie.
Photo – Linda Reinhold/DEC

ash grey mice were very placid, and would usually sit on a researcher's hand for a while before deciding to hop off and amble away when they were being released. Djoongari were somewhere in between—a big furry handful, easy-going, but not averse to trying to get a bite in if given the chance. The marl took it all quite well, unaware of the part they were playing in representing their species for such important research.

Veterinary research

Two veterinary PhD candidates from Murdoch University joined the expedition to examine marl for a papillomatosis and carcinomatosis (wart and skin cancer) syndrome that

has been hindering captive breeding efforts in some mainland populations (see 'Western barred bandicoot: warts and all', *LANDSCOPE*, Spring 2003). Marl affected by this disease develop multiple, wart-like lesions of the haired skin, conjunctiva, oral cavity and pouch. With time these lesions often undergo malignant transformations to form large squamous cell carcinomas (malignant cancer). Involvement of the feet, eyes and the mouth leads to problems with walking, vision and eating. Affected animals often die due to secondary complications and are euthanased to prevent suffering.

Researchers at Murdoch University have recently detected a virus similar to papillomavirus in association with

this disease. On the two islands, the team caught 22 marl for examination. During the veterinary examinations, the bandicoots' skin was swabbed in order to test for the presence of this virus. Marl showing wart-like skin lesions and testing positive for the virus were detected on Bernier Island. No signs of the disease were seen on Dorre Island and all Dorre marl swabbed negatively for the virus. These findings are consistent with previous expeditions that have found this disease on Bernier but not Dorre Island. However, this was the first expedition in which disease findings could be supported by testing for the presence of the virus. As with all trapping sites, the team cleaned each trap and hessian bag with viral disinfectant between the islands to stop the transfer of infectious material between populations.

Animal life

Although the team was focused on the land-based mammals, it was hard not to notice some of the larger marine visitors. Humpback whales passed by every day, splashing and slapping as if vying for attention. A highlight was the sighting of a tiger shark that slowly cruised around near the anchorage. These creatures seem a lot less menacing when swimming slowly in a pool-like bay, taking a long time to hone in on a smell, tasting and nudging potential food rather than attacking. Their apparently gentle behaviour challenged their reputation as a fearsome predator.

Of the native animals handled, several stood out as particularly interesting. Take boodies for example. Not quite the peaceful herbivores they appear, boodies have been known to attack other animals that are caught inside traps. There have also been reports of them digging into turtle nests on the beaches. Despite their feisty nature, boodies were no match for cats and foxes and became extinct



Above Researchers travelled to and from the islands by boat and were sometimes accompanied by marine animals such as a tiger shark.

Photo – Colleen Sims/DEC

on Dirk Hartog Island in the 1920s, and on the mainland in the early 1960s. Boodies also occur on Barrow and Boodie islands, and have been successfully reintroduced to Heirisson Prong (part of a CSIRO reintroduction project), Faure Island (part of an Australian Wildlife Conservancy reintroduction project, see 'Return to Faure', *LANDSCOPE*, Autumn 2007) and the Arid Recovery Project in South Australia.

After foxes, feral cats and domestic stock wiped them out from the mainland more than 100 years ago, djoongari persisted only on Bernier Island. From here they have been translocated to Doole Island, Heirisson Prong, North West Island (Montebello group) and Faure Island. The latter two of these translocations have so far been successful. The Doole Island translocation failed, probably due to goanna predation, while the Heirisson Prong failure was attributed to feral cat predation.

Discovery and devastation

Dirk Hartog discovered Bernier and Dorre islands in 1616 but Dorre Island (or 'Dor Eyland', meaning dry or barren island) wasn't surveyed and named until Dutch sailor Willem de Vlamingh visited it in 1697. Bernier Island was named after the astronomer on Nicholas Baudin's French scientific expedition of 1801–1803.



In 1874, pioneer Julius Brockman camped on the southern end of Dorre Island and documented a devastating fire.

"The Island was high with spinifex which had never been burnt and we were maybe the first people that had ever landed on it. There were thousands of wallaby. The wind was blowing a gale from the south and when I lighted a fire to camp, it swept the Island bare for twenty-two miles."

The next day he sailed to the north end of Dorre.

"I walked about the Island, which was now bare as a sandpatch and what were not burnt of the animals would have no food except seaweed until rain fell again."

Fires due to human presence again burnt much of Dorre Island in both 1908 and 1973.

Left Lock hospitals were used between 1908 and 1918.

Photo – Courtesy of the Battye Library

Sandalwood cutters worked on Bernier Island in 1896. Sheep were also grazed on Bernier for about 10 years at the turn of the twentieth century. Goats, possibly released with the closure of the Lock Hospital (see 'The Lock hospitals' below), were finally eradicated from the island in 1984 by the then Department of Fisheries and Wildlife. Today the shifting sand dunes found on the island can be partly attributed to over grazing by the goats.

The Lock hospitals

From 1908 to 1918 the islands were the site of a Lock Hospital for the treatment of venereal and other diseases in Aboriginal people. Men were sent to Bernier Island while women went to Dorre. About 200 patients are estimated to have died on the islands.



Above Bernier Island.
Photo – Linda Reinhold/DEC

Daisy Bates describes her visit in her book *The Passing of the Aborigines*:

“Dorre and Bernier Islands: there is not, in all my sad sojourn among the last sad people of the primitive Australian race, a memory one half so tragic or so harrowing, or a name that conjures up such a deplorable picture of misery and horror unalleviated, as these two grim and barren islands off the West Australian coast that for a period, mercifully brief, were the tombs off the living dead. When I landed on Bernier Island in November 1910 there were only fifteen men left alive, but I counted thirty-eight graves. There were seventy-seven women on Dorre Island, many of them bed-ridden. I dared not count the graves there.”

Remnants of the hospital sites can still be found on the two islands. In 1986 they were registered as protected areas under Australia’s *Aboriginal Heritage Act 1972*. The islands’ cultural heritage significance was also recognised with their inclusion on the Register of National Estate in 1987.

Protection

In 1907 Dorre Island was declared a reserve for native game. This protected fauna from ‘wanton destruction’ but did not protect their habitat. Cabinet rejected a request from the Natural History Society of Western Australia that either island be set aside as a flora and fauna reserve.

In 1919, Bernier Island was also declared a reserve for native game. Both the Keeper of Biology at the Western

Australian Museum and the Royal Society of Western Australia requested that cats and firearms be prohibited, but these requests were refused.

In 1957 a comprehensive survey of the islands was finally undertaken. The survey team, comprising some of the most eminent biologists of the time, stated:

“... they (the islands) are of paramount importance to anyone who is conscious of the need for the permanent preservation of areas of natural land which clearly illustrate the state of Australia before the advent of the white man and his introductions”.

The islands were then gazetted as A Class Nature Reserves for the conservation of fauna.

There are certainly no cats or firearms allowed on the islands today. Due to the high nature conservation values of this reserve, camping is not

allowed on either island. This restriction aims to minimise the islands’ greatest threats, which are the possibility of wildfire and the accidental introduction of invasive species.

What of the future? Comprehensive data is needed to be able to detect population trends, so DEC plans to survey the mammals on the islands at least every couple of years in the long term, subject to funding. Fluctuations in numbers could possibly be attributed to rainfall but only further surveys will aid in determining this. Over many years, trends due to any threatening processes over and above the background of natural fluctuations may be seen.

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