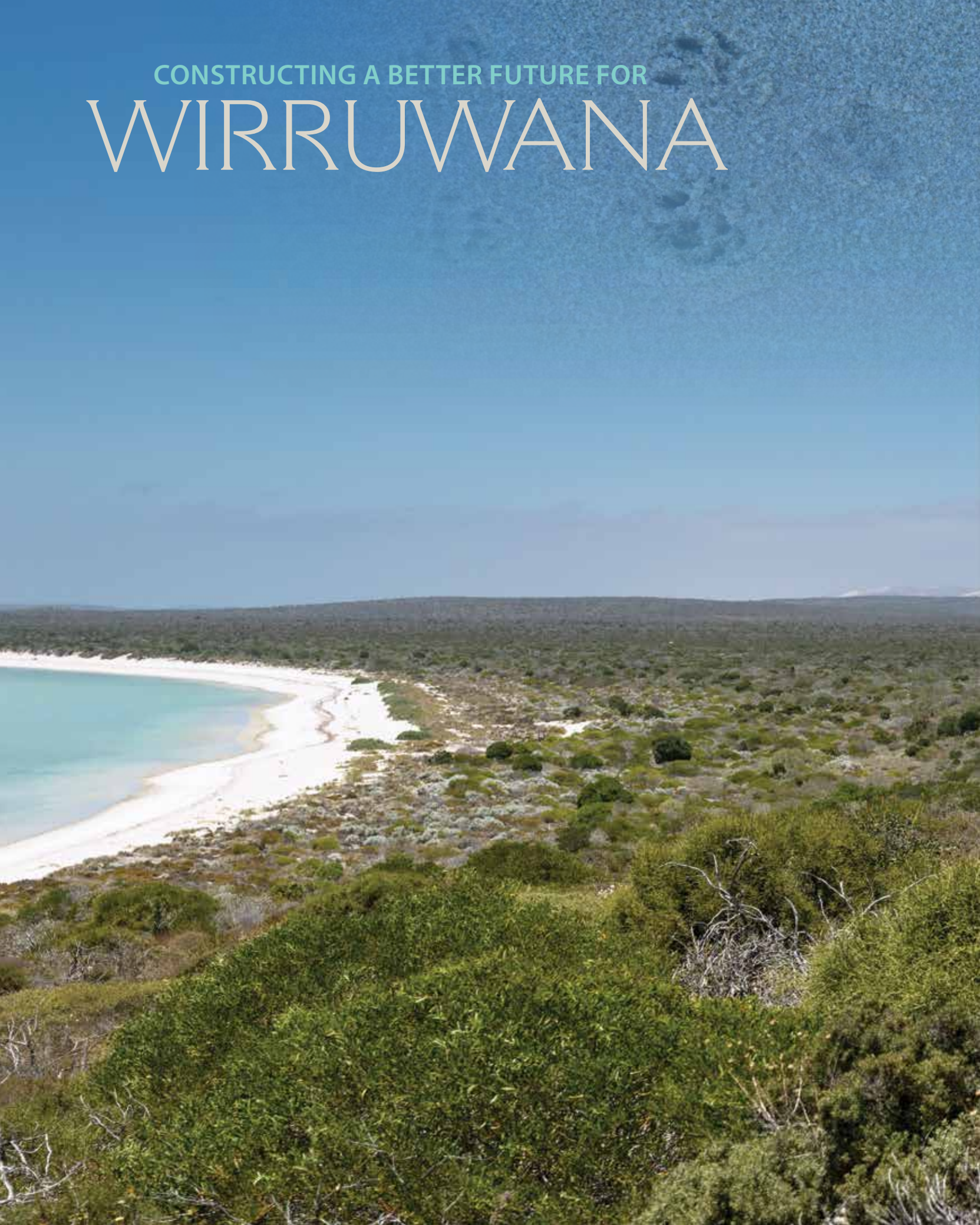


CONSTRUCTING A BETTER FUTURE FOR
WIRRUWANA





Conservation efforts on Dirk Hartog Island have been aided by collaboration between members of the community, volunteers, students, contractors, prisoners and even a retired woodworker, all leading to the improvement of prospects for people and animals on the island.

by Sean Garretson, Kim Branch, Kelly Rayner, Colleen Sims and Saul Cowen





Between its jagged western cliffs and shallow eastern bays, only ghostly whispers of Dirk Hartog Island’s former feral inhabitants blow in the wind. With goats, sheep and feral cats eradicated from the island by the end of 2017, the only mammals to survive the feral onslaught were two native rodent species, two bats, a dunnart and the introduced house mouse (see ‘De-stocking Dirk Hartog,’ *LANDSCOPE*, Spring 2019).

As the heavily degraded vegetation begins to rejuvenate following removal of feral herbivores, threatened fauna are now returning to Western Australia’s largest island, known as *Wirruwana* to the local Malgana people. The island is once again hosting the tracks, diggings, squeaks and scats of the species that were present

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Main East coast of Wirruwana.

Photo – Janine Guenther

Top Greater stick-nest rat tracks.

Photo – Kelly Rayner

Inset left Shark Bay mouse (*Pseudomys gouldii*).

Inset right Greater stick-nest rat (*Leporillus conditor*).

Photos – Jiri Lochman

Above UWA masters student Rebecca Quah radio tracking Shark Bay mice.

Above right Shark Bay mice released on Wirruwana in April 2021.

Photos – Fiona Knox

when Dutch sailor and explorer Dirk Hartog and his crew landed there in 1616.

The aim of the Dirk Hartog Island Ecological Restoration Project, *Return to 1616*, is to return the 633-square-kilometre island to an ecological state similar to what it was before European influence.

SHARKIES AND STICKIES

In 2018, the project entered Stage II (see ‘Welcoming Wallabies to Wirruwana,’ *LANDSCOPE*, Winter 2018). This current fauna reconstruction phase aims to re-establish 13 species of native fauna on the island and return many of the ecological processes to the island.

These natural services include increased nutrient turnover and soil permeability through animal digging, pruning of vegetation, seed dispersal, insect control and fertilisation through their droppings. The aim of the project is to contribute toward improving the worldwide conservation status of a number of these species through the establishment of additional genetically representative, and potentially large, subpopulations.

So far, six species have been released on the island—the rufous hare-wallaby (*Lagorchestes hirsutus*), banded hare-wallaby (*Lagostrophus fasciatus*), Shark Bay bandicoot (*Perameles bougainville*), which is the smallest species of bandicoot, and the dibbler (*Parantechinus apicalis*), a small carnivorous marsupial related to quolls and Tasmanian devils.

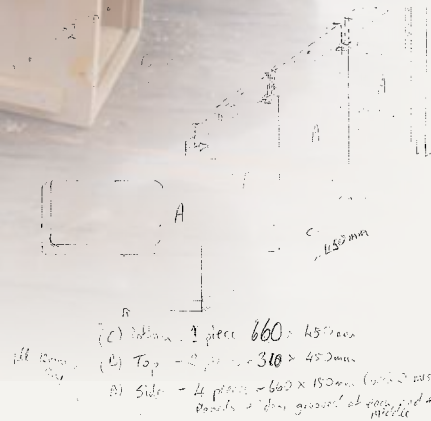
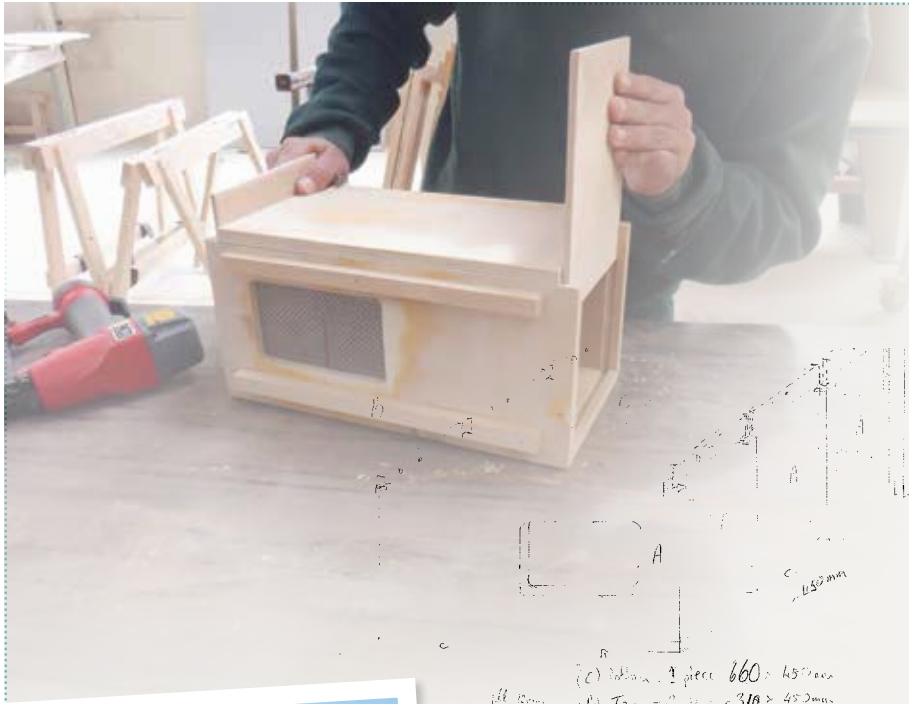


● Dirk Hartog Island National Park

The Shark Bay mouse (*Pseudomys gouldii*) and wopilkara or greater stick-nest rat (*Leporillus conditor*), affectionately known as ‘sharkies’ and ‘stickies,’ are the most recent additions to Wirruwana with 80 sharkies translocated from Northwest Island in the Montebello Island group (see ‘Montebello Island Conservation Estate’ on page 8) and 62 stickies arriving from Salutation Island in Shark Bay.

In the months of April and May 2021, a team of DBCA animal science researchers, locally-based nature conservation staff and volunteers spent several early mornings checking traps for their quarry. Captured animals were implanted with a unique Passive Integrated Transponder (PIT) tag to enable life-long identification and were carefully selected for health, size and sexual maturity to maximize breeding potential and survivability at their new island home.

While the sharkies underwent an initial one-hour helicopter transfer from Northwest Island to Onslow, followed by a three-and-a-half-hour light plane transit to Wirruwana, the stickies faced a relatively



Top Custom-made wooden transport boxes.
 Photo – Nathan Gligorevic/Albany Regional Prison

Above Detail of design plans of transport box.
 Photo – Colleen Sims

Left A helicopter was used to translocate greater stick-nest rats within transport boxes from Salutation Island to Wirruwana.
 Photo – Kelly Rayner

Stickie boxes

The stickie box project owes its ongoing success to the enormous support received from the local community, volunteers, students, contractors and other collaborators. In early 2021, a retired wood-working hobbyist and volunteer, Graeme Branch, and a team of inmates from the Albany Regional Prison's Cabinet Shop constructed animal transport boxes for the stickies.

Graeme provided his prototype box and design plans to Cabinet Shop instructor, Nathan Gligorevic, and the team spent several months thoughtfully constructing 66 custom wooden transport boxes that were used to temporarily house the stickies during their translocation from Salutation Island to Wirruwana in May 2021.

"The prisoners were proud to be involved in the work," Nathan said.

Not only was it a valuable contribution to biodiversity conservation work, but the experience also counted toward the fulfilment of traineeships and a Certificate II in furniture making, contributing to their rehabilitation and reintegration.



Above Murdoch veterinary resident Fiona Knox and senior project officer Colleen Sims fitting a Shark Bay mouse with a radio collar.
 Photo – Kelly Rayner

Right Drivers on Wirruwana must now consider the newest furry road users and slow down between dawn and dusk.
 Photo – Janine Guenther



Discover more about returning stick-nest rats to Wirruwana

Scan this QR code or visit Parks and Wildlife Service's 'LANDSCOPE' playlist on YouTube.





speedy 40-minute helicopter ride from Salutation Island to Wirruwana. A subset of 12 sharkies and 15 stickies was fitted with radio-telemetry collars to track post-release survival and habitat use for up to 29 days and 35 days, respectively.

PROTO-NESTS

Small mammals such as sharkies and stickies are vulnerable to Wirruwana's native predators like bungarra or sand goannas (*Varanus gouldii*), snakes and raptors.

To help the stickies settle into their new home, DBCA staff and volunteers gathered natural materials and pre-constructed nests (referred to as 'proto-nests') at release sites. It was hoped that having artificial refuges early in the translocation would help to encourage stickies to remain close to the release area and provide protection from predators.

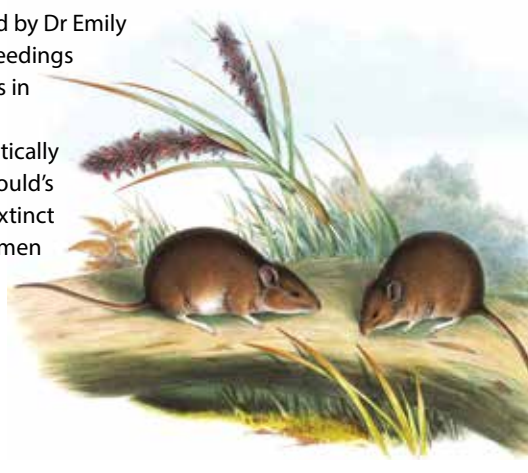
Upon arrival at site, the transport boxes containing their furry inhabitants were permanently situated under these proto-nests and doors removed to allow

the stickies to come and go freely. In the longer term, the team hopes that some stickies may continue construction of the nests and build themselves some prime coastal real estate.

Initial monitoring including radio tracking, camera trapping and live animal trapping suggested that the proto-nests performed their role in helping the stickies settle following translocation. Early signs indicate they are adjusting nicely, and some have been busy reinforcing and expanding their nests.

Resurrected from extinction

Recent genetic analysis published by Dr Emily Roycroft and colleagues in the Proceedings of the National Academy of Sciences in 2021 confirms the Shark Bay mouse (previously *Pseudomys fieldi*) is genetically identical to the presumed extinct Gould's mouse (*P. gouldii*), resurrecting an extinct species last known from a live specimen collected along the Victoria-New South Wales border in 1857. Potentially securing another population of this highly restricted species highlights the significance of this project.



"Early signs indicate [the stickies] are adjusting nicely, and some have been busy reinforcing and expanding their nests."

Above left Colleen Sims releasing translocated greater stick-nest rats within a pre-constructed proto-nest.
Photo – Fiona Knox

Above Sand monitor (*Varanus gouldii*).
Photo – Janine Guenther

Left Elizabeth Gould's illustration of *Pseudomys gouldii* from John Gould's *The Mammals of Australia*, 1863.
Photo – Commons Wikimedia



Sticking to it

True to their name, stickies live communally within multigenerational stick nests that are primarily constructed by the dominant female interweaving sticks. These industrious matriarchs combine their urine and faeces into a resin-like material that solidifies and strengthens the bonds between sticks with rat 'bitumen'. Nests are sturdy—towering up to one metre high and 1.5 metres wide—and are known to repel the hungriest of predators while safely accommodating up to 20 individuals within an interior lined with grasses and other soft vegetation. Matrilineal inheritance of nests ensures the hard work is not wasted as future generations of this exceptionally gentle species are provided protection and a chance to renovate to their liking.



MONITORING SUCCESS

There are also early indications of success for sharkies, with many quickly establishing refuges in the dense coastal spinifex (*Spinifex longifolius*) into which they were released. Nearly 70 per cent of the radio-collared animals surviving the post-release radio-tracking period. Additional trapping undertaken in September 2021 also resulted in the capture of 33 individuals, including 25 recruits born on the island, and most of the adult females showing signs of recent breeding.

Preliminary results are also encouraging for the stickies too. More than 85 per cent of the collared animals surviving the post-release radio-tracking period, and were in excellent condition coming into spring, with evidence that they too had been busy producing offspring.

Given the abundance of suitable habitat on Wirruwana, the successful establishment of sharkies and stickies is expected to be a highly beneficial outcome for both species. This is yet another example of how Wirruwana continues to show its incredible value for conservation

and its potential to support the largest feral-predator-free populations of many threatened species.

With each new success, the project and the diverse group of individuals involved are improving the outlook for Wirruwana's ecosystem and the numerous species destined to call it home.

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Top left Artificial refuges, known as 'pseud-homys', were used as release sites for Shark Bay mice.

Photo – Kelly Rayner

Above left Camera trap image showing a greater stick-nest rat working to incorporate a transport box into its proto-nest.

Photo – DBCA

Top right Greater stick-nest rat nest.

Above Beach spinifex (*Spinifex longifolius*) is an important source of habitat for Shark Bay mice.

Photos – Kelly Rayner

Above right New island-born Shark Bay mouse captured in September 2021.

Photo – Rebecca Quah/UWA

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