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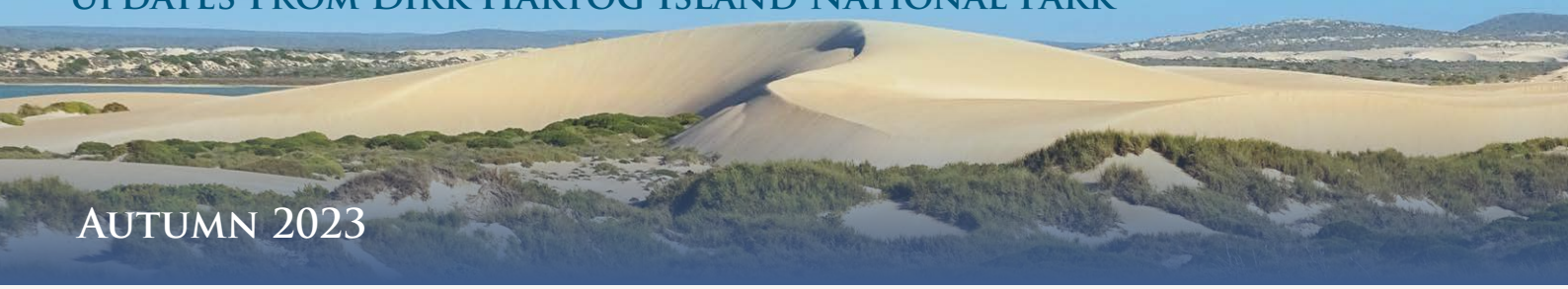
Department of Biodiversity, Conservation and Attractions
GOVERNMENT OF WESTERN AUSTRALIA

Biodiversity and Conservation Science

Dirk Hartog Island
Return to 1616

Wirruwana News

Updates From Dirk Hartog Island National Park



Autumn 2023

With seven threatened and priority native animal species now established on Dirk Hartog Island National Park, see how the science team is working smarter not harder to keep tabs on them all and prepare for new arrivals.

The Goldilocks equation

Above Studying populations of animals like this brush-tailed mulgara is critical to solving the Goldilocks equation". Photo – Dr Leanne Van Der Weyde.

Seven species of Australian native animals have now been returned to Dirk Hartog Island National Park as a result of the Department of Biodiversity, Conservation and Attractions' ecological restoration project *Return to 1616*. Given that wild populations of many of these animals are extinct on the mainland – it begs the question - where have they all come from?

Many species like hare-wallabies, dibblers, Shark Bay bandicoots, Shark Bay mice and greater stick-nest rats have only survived the impact of feral animals thanks to the safe haven offered by feral free islands off the coast of Western Australia. Re-establishing native animals on Dirk Hartog Island has been made possible by careful management of these isolated populations.

Whilst we're lucky to have these surviving populations to draw upon in order to repopulate safe areas like Dirk Hartog Island National Park, how many animals can safely be removed in order to create a new population? The answer isn't simple. Not too many and not too few – that's the 'Goldilocks equation'. It's important to take enough animals with adequate genetic diversity to successfully breed a new population elsewhere.

In other words, despite the tale of Noah's Ark where animals went in two by two, it takes a lot more than two dibblers to produce a healthy new population. It's just as important to not take too many animals, as this would undermine the future survival of that source population. It's therefore essential to know the size of a source population before translocations can occur.

Many factors can affect the size of an animal population. For instance, animals species living in arid environments are adapted to take advantage of good rainfall years. Breeding during good rainfall years can lead to a boom in population size, whilst numbers decline during drought in what is commonly called a 'boom/bust' cycle. Understanding how vegetation and habitat is responding to changing

The Goldilocks equation continued...

Above The logistics of studying animals on remote islands is challenging. Researchers on Bernier Island get ready to scale nearby cliffs with traps. Photo – Erin Smithies.

environmental conditions, and where a population is in that boom/bust cycle, is critical to solving the Goldilocks equation for each species.

Whilst island populations have provided a welcome pool of animals to help repopulate Dirk Hartog Island National Park, studying animals on offshore islands creates a unique set of challenges. The logistics of obtaining the information needed to solve the Goldilocks equation is an order of magnitude more complex when working on remote islands.

Some of the source populations of animals already reintroduced to Dirk Hartog Island National Park have come from far afield, such as Shark Bay mice that came from Northwest Island in the Montebello Islands and greater stick-nest rats from the Franklin Islands in South Australia, over 2000 km away.

Working on these remote islands is also physically challenging. The science team must first navigate difficult weather and sea conditions to land staff and equipment on small beaches and tiny coves. Once there, monitoring population numbers can take many forms, including using remote cameras, trapping, and undertaking spotlight surveys. To collect vital information on general health and breeding status, the team can often spend long hours in the heat of the day walking over exposed islands, climbing steep cliffs and high sand dunes, whilst carrying heavy traps. Tracking down their quarry on cold nights entails a different set of challenges to avoid the perils of navigating limestone ridges full of sink holes in the dark.

Each piece of hard won, new information adds to a library of knowledge that has helped to ensure the success of each animal species reintroduced to their feral free home on Dirk Hartog Island National Park.

Above right Many of the source populations of native animals reintroduced to Dirk Hartog Island National Park like this dibbler have come from remote islands. Photo – Colleen Sims

The grasswrens have landed!

Western grasswrens (*Amytornis textilis*) have undergone one of the largest range contractions of any Australian bird species since European colonisation. Formerly occurring from Shark Bay right across Australia to the Eyre Peninsula in South Australia, they are now only found in Shark Bay and the Eyre Peninsula.

Although locally extinct on Dirk Hartog Island as a result of habitat degradation by sheep and goats and predation by feral cats, healthy populations persist on the nearby Hamelin Station, a property that is owned and managed by Bush Heritage Australia, as well as Francois Peron National Park managed by the Department of Biodiversity, Conservation and Attractions.

The western grasswren is an unusual species behaving much more like a mammal than a bird! Rather than flying, they prefer to bound from bush to bush staying close to the ground. Not being strong fliers, they are unlikely to ever be able to recolonise Dirk Hartog Island National Park without some help.

Scientists estimate that the island is capable of supporting up to 8,000 pairs of grasswrens. Given their habitat is improving with excellent vegetation regrowth following the removal of goats and sheep, the time is ripe! So in October 2022, the carefully planned and precisely coordinated "operation grasswren" swung into action.

This first ever translocation of any grasswren species was the culmination of several years of collaborative work by staff in DBCA's *Return to 1616* project, scientists from Biodiversity and Conservation Science, as well as their Denham-based colleagues from the Parks and Wildlife. Service's Gascoyne District. Also, forming important components of this collaboration were ecologist and field staff from Bush Heritage Australia as well as PhD student Aline Gibson Vega from the University of Western Australia.

Prior to this work, there was very little information available on western grasswrens. Initially their cryptic habits meant they were more easily heard than seen and difficult to catch. Over time however, capture methods have been refined, paving the way for their reintroduction. Scientists now have a better understanding of western grasswren genetics and breeding biology which has helped to plan their translocation and greatly increased their chances of successfully establishing a new island population.

Also based on this research, their journey from Hamelin Station and Francois Peron National Park to Dirk Hartog Island National Park was timed to allow adult birds to finish breeding for the year and their offspring to reach an age where they can survive on their own. Captured using specifically designed nets looking much like a spider web called 'mist-nets', they were then flown to the island via helicopter and quickly released within only hours of capture.

This translocation completes the seventh species to be returned to Dirk Hartog Island. In the short term, their survival will be monitored using transmitters attached to some of the birds but later on, their progress will be monitored by recording western grasswren calls using Audio Recording Units.

Above Dr Tony Friend releasing a western grasswren. Photo – Wendy Payne/DBCA

Stickie detective work

Reintroductions of the greater stick-nest rat to Dirk Hartog Island National Park began in 2021. As for other species released on the island, the *Return to 1616* team needs to check on their progress to see how well they're establishing themselves in their new home. But keeping tabs on stickies using traditional methods is tricky as they can be a secretive, 'trap shy' species. Time to think outside the square and try a new toolkit.

The newest tool in the science team's detective toolkit is showing promising results. Before release onto the island, all of the stickies were microchipped to allow individuals to be identified. The science team has been collaborating with Latrobe University to trial a new, passive scanning device they have developed called Wildtrack, that acts in a similar way to supermarket bar code scanners.

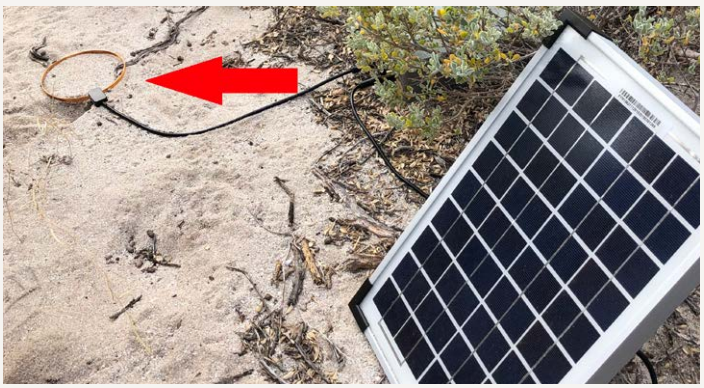
When a stickie walks close enough to or over an antenna placed on the ground, their microchip is scanned and the animal's individual number is uploaded to a database. This provides information on the individual and can be used to monitor survival, distribution and if enough microchips are detected, the system may be able to help determine population size.

Traditional spotlighting at night has been used to detect animals but thick vegetation can make this method less effective. To improve detection and reduce impact on the stickies, infra-red night vision scopes have been found to improve the science team's detective work.

Camera traps have proven their worth as another low impact monitoring method. These can be set to face bundles of sticks and twigs called 'protonests' that were provided to the stickies when first released on the island. Female stickies love to build and improve their nests and, in some instances, these cameras have revealed some amazing imagery of stick-nest rats building nests.

Other ways to gather information on the distribution of stickies around their home include looking for tracks and animal droppings (or scats). If the scat is fresh enough, it can be genetically analysed to identify the individual that produced it and research is currently underway to determine if this can be used to gauge population numbers.

Piecing together all of the clues from hours of detective work using combinations of these methods, has created a mountain of data that is pointing towards a very promising future for the greater stick-nest rat on the island.



Top right Research scientist Leanne Van der Weyde checks remote cameras monitoring a "protonest". **Above** Antennas placed on the ground scan stickies as they pass. **Right** Animal droppings can be used to monitor stickies.

Click here to watch female stick-nest rats building a nest

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Contributions to this biannual newsletter are very welcome. Email wendy.payne@dbca.wa.gov.au

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Keep up to date with what's happening with the Dirk Hartog Island National Park Ecological Restoration Project – Return to 1616 on Sharkbay.org

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