Welcoming wallabies to Wirruwana

More than 400 years ago, Dirk Hartog and his crew landed on WA's largest island. Since then it has been used for a variety of purposes, which have severely impacted the island's native mammals. The Return to 1616 *project aims to restore the island to its pre-colonial glory and is giving two species of hare wallaby, and other threatened mammals, a fighting chance.*

by Kelly Rayner, Saul Cowen, Colleen Sims, Sean Garretson, John Angus and Keith Morris

Dirk Hartog, Western Australia's largest island, lies at the very western-most boundary of the Australian continent. For thousands of years, the island has been well-known to the local Malgana people, who call it *Wirruwana*. And it was here that in 1616 the island's Dutch namesake landed and left an inscribed pewter plate, marking the first record of European visitation to Western Australia.

The island Dirk Hartog and his crew encountered in 1616, where a number of native mammals roamed free, would have been quite different to that of today. During the intervening centuries, the island has had a varied history, culminating in a range of legacies – in the 1860s it became a pastoral lease where sheep were grazed; in the early 1900s it was a home to lighthouse keepers who introduced goats as a source of food; and it later became an environment where feral cats roamed as the top terrestrial predator. Consequently, Dirk Hartog Island slowly had its populations of vertebrate fauna eroded, with at least 10 mammal species and one bird succumbing to local extinction on the island. By the time the island was gazetted as a national park, just three small mammals remained (two rodents and a dunnart) and the island's vegetation was severely degraded.

Learn more about the translocations

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

Previous page
Main Looking back at Steep Point from the rugged west coast of Dirk Hartog Island.
Photo – Saul Cowen/DBCA
Inset Banded hare wallabies were one of two species released on Dirk Hartog Island last year.
Photo – Richard Manning

Above One of the earliest depictions of the banded hare-wallaby encountered during the Baudin expedition in 1803.
Illustration – Nicolas-Martin Petit /Museum d'historie naturelle, Le Havre

A NEW BEGINNING

In 1995 the tide began to change for the island's biodiversity when the pastoral lessees, the Wardle family, prepared an environmental management plan to rid the island of feral mammals and replace them with native ones. Destocking of sheep and goats began in 2007 and, when the island was gazetted as a national park in 2009, the then Department of Environment and Conservation (a predecessor of DBCA) carried out an aerial eradication program that was completed in late 2017. Analysis of satellite imagery at the end of this process revealed that the vegetation cover in some areas of the island had increased by more than 50 per cent in response to the removal of grazing pressure. A baiting and trapping program to eradicate feral cats was also started in 2014 and there have been no signs of feral cats on the island since October 2016. While cat monitoring will continue until September 2018, DBCA staff who are working on the island are confident that cats have been eradicated from Dirk Hartog Island, the largest island in the world on which this has been achieved. The success of the invasive species eradication program has now paved the way for the return of some of the island's rightful inhabitants.

Trial translocations involving a small number of banded hare-wallabies (*Lagostrophus fasciatus*) and rufous hare-wallabies (*Lagorchestes hirsutus*) were undertaken in mid-2017, to provide us with information about capturing, transport and monitoring techniques for these threatened species. This pilot study built knowledge and experience that will help prepare us for when we translocate larger numbers of these species to Dirk Hartog Island in 2018. As special as these first translocations to Dirk Hartog Island were, there is still something of a mystery surrounding the presence of these species on the island in recent history.

Banded and rufous hare-wallabies still occur on Bernier and Dorre islands – 25 kilometres north of Dirk Hartog Island, and persisted on the nearby mainland in the Gascoyne area into early pastoral times. Subfossil records have also been recovered from Edel Land and Peron Peninsula on the mainland immediately to

Above left The Cape Inscription Lighthouse built between 1908 and 1910, where Dirk Hartog landed and left his pewter plate.
Photo – Saul Cowen/DBCA

Above The first group of hare wallabies on their way to Dirk Hartog island.
Photo – Claudia Buters

Inset below Banded hare-wallaby.
Photo – Jiri Lochman

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the south and east of Dirk Hartog Island. Anecdotal reports of animals that seem to most resemble banded hare-wallabies exist from the early explorers who visited the island; William Dampier noted 'a sort of raccoon' in 1699, while Peron, the naturalist who became responsible for writing up the joint French voyage in 1803 of *Le Geographe* and *Le Naturaliste*, described this species as occurring in 'swarms' over the three islands – Bernier, Dorre and Dirk Hartog. However, no specimens or subfossil remains have ever been collected of either species from Dirk Hartog Island. While the history of these species on the island is still uncertain, their successful establishment here will greatly benefit the conservation outlook for both. They now occur naturally only on Bernier and Dorre islands, with additional translocated populations of the banded hare-wallaby having previously been established at just two other locations: Faure Island in Shark Bay undertaken by the Australian Wildlife Conservancy (AWC), and Wadderin Sanctuary, a fenced enclosure in the eastern Wheatbelt, managed by the local community in the Shire of Narembeen. Since the historic release of these species to Dirk Hartog Island in August 2017 by DBCA, another new translocation of banded hare-wallabies has been carried out by AWC to their Mt Gibson fenced reserve in the western woodlands.

SAILING TO A NEW LAND

On the morning of 29 August 2017, the first hare-wallabies (six banded and six rufous) from Bernier Island were delivered to Dirk Hartog Island. The collection of these animals was the final task for the boat-based team, who had spent the previous weeks battling strong winds and rough seas in order to confirm that the source populations were sufficiently abundant enough to withstand the harvest of animals for translocation. The new arrivals were held for the day, while staff completed health checks on the animals

Banded hare-wallaby (Lagostrophus fasciatus)

The banded hare-wallaby was one of the earliest Australian species to be described by Europeans, with one individual spending time aboard *Le Geographe* in the 1803 expedition. While bearing the same name and a similar disposition to the rufous hare-wallabies, banded hare-wallabies are actually quite distinct. They are the only members of the Lagostrophinae lineage and are thought to be more closely related to the extinct subfamily to which the giant browsing kangaroos belonged, than they are to any living macropods. Unfortunately, this species is highly susceptible to predation from introduced carnivores and as a result became extinct on the mainland early in the 20th century with the last record coming from South Australia in 1927.

and fitted them with radio-collars. After a final check at dusk, the hare-wallabies were loaded into vehicles and transported to their new home at the southern end of the island. A small crowd of excited onlookers accompanied DBCA staff for the historic event – the first release in Australia's largest ecological restoration program. An additional 12 hare-wallabies from Dorre Island arrived the next day and were released later that night by staff and a small group of community members from nearby Denham. These banded and rufous hare-wallabies are now roaming an island that had lacked native medium-sized mammals for more than a century.

Careful monitoring of these animals was extremely important for fulfilling the aims of the trial translocation. An attempt was made to radio-track all individuals every day for the three months after release, with extreme care taken not to disturb animals during this process. Hare-wallabies are known to be vulnerable to predation by birds of prey so ensuring the animals weren't exposed to this threat was vital to success. This intensity of monitoring was undertaken as a key element of the trial was to confirm if the animals survived after they were released and, if not, what caused their death – a task that is made more difficult with each day that passes after mortality. Unfortunately, one rufous hare-wallaby was found freshly dead a few days after release. Vets at Murdoch University confirmed its mortality was likely due to capture myopathy: a stress-related syndrome that rufous hare-wallabies can be particularly vulnerable to. Fortunately, thanks to the efforts of the capture team to minimise stress on these animals in transit, no other deaths have occurred since the release – an extremely good outcome for a translocation of medium-sized mammals.

Radio-tracking was supported with surveys for tracks and scats, as well as images taken from remote cameras, providing additional information regarding movement and habitat usage that will inform future releases for these species.

Rufous hare-wallaby (Lagorchestes hirsutus)

Weighing less than two kilograms, this species very much reflects the source of its latin name – shaggy or hairy hare dancer. Describing both the physical appearance but also its typical behaviour when alarmed, these delicate animals can look deceptively rotund in their long coats while darting away from you through the spinifex. The Shark Bay rufous hare-wallaby is distinct from the previously more broadly distributed mainland subspecies, the 'mala'. Having been separated since the last ice age more than 8000 years ago, the island animals have become larger and developed a coat colour that is more grizzly brown as opposed to the bright rufous of the mala. The rufous hare-wallaby is one of only two *Lagorchestes* species that still exists (the other being the spectacled hare-wallaby (*Lagorchestes conspicillatus*)). The central hare-wallaby (*Lagorchestes asomatus*) and eastern hare-wallaby (*Lagorchestes leporides*) became extinct following European settlement.

Above left A rufous hare-wallaby being released.
Photo – Claudia Buters

Above Keith Morris and Claudia Buters releasing the first banded hare-wallabies onto Dirk Hartog Island.
Photo – Richard Manning

Left Rufous hare-wallaby.
Photo – Jiri Lochman

Right Lei Zhang listening for a signal from a radio-collared rufous hare-wallaby.

Centre left Volunteers Jessica Wilkinson and Jordan Sprylan recording bearings of radio-collared hare-wallabies.
Photos – Saul Cowen/DBCA

Centre right A rufous hare-wallaby captured on remote camera by the cat monitoring team.
Photo – Michael Johnston/DBCA

Below Kelly Rayner, Colleen Sims and Saul Cowen radio-collaring hare-wallabies prior to release.
Photo – Claudia Buters

These monitoring methods became particularly useful when animals moved beyond their expected area of occupation, making them difficult to locate using ground-based radio-telemetry. This was the case with one particular rufous hare-wallaby that often proved elusive, regularly disappearing for days at a time. The mystery was solved when the cat monitoring team arrived to complete their spring surveillance session and recovered an image of the wallaby in question, 20 kilometres north of the release area.

NEW ARRIVALS FILLING UP POUCHES

Three months after their release, the monitoring team turned its attention to recapturing animals to see how they were faring in their new home. Of particular interest was how collars were fitting and the overall condition of the animals. After a few initial hurdles (both literally and figuratively) in capture efforts, there were pleasing outcomes for the efforts. All the animals had gained weight since their release and the pouches of eight females were occupied by new young born on Dirk Hartog Island. The team is anticipating that there will be at least five new rufous and three new banded hare-wallabies exploring Dirk Hartog this year. This is very promising for the overall success of the hare-wallaby translocations, and a good indicator that both these species will have an excellent chance of continuing to thrive

Species to be translocated to Dirk Hartog island as part of Return to 1616

Common name	Scientific name
Banded hare-wallaby (v)	*Lagostrophus fasciatus*
Rufous hare-wallaby (v)	*Lagorchestes hirsutus*
Dibbler (e)	*Parantechinus apicalis*
Western barred bandicoot (e)	*Perameles bougainville*
Boodie (v)	*Bettongia lesueur*
Woylie (e)	*Bettongia penicillata*
Greater stick nest rat (v)	*Leporillus conditor*
Desert mouse (nl)	*Pseudomys desertor*
Shark Bay mouse (v)	*Pseudomys fieldi*
Heath mouse (e)	*Pseudomys shortridgei*
Chuditch (v)	*Dasyurus geoffroii*
Mulgara (nl)	*Dasycercus blythi*
Western grasswren (nl)	*Amytornis textilis*

(v) Vulnerable (e) Endangered (nl) Not listed

there. Although collars had to be removed from six animals, as they were no longer fitting comfortably due to the weight gains, the majority of individuals kept their collars, enabling the continued tracking of their survival and movements over the summer – a crucial period that could determine the outcome of this translocation.

FUTURE

In the immediate future, DBCA staff will return to complete the final steps in the trial translocation, which will help determine future directions for the program. Hare-wallabies will be recaptured in order to remove collars that will shortly be reaching the end of their expected battery life, while an assessment of the wallabies' condition after a dry summer with very little rainfall will also be a high priority. Should the outcomes from this work meet the translocation criteria for success, the team intends to move forward on a larger scale, translocating 40–50 individuals of each species in late 2018 and supplementing this with 30 more individuals in 2019. There are also plans to translocate three more of the 13 species identified for inclusion in the *Return to 1616* program in 2019: the boodie or burrowing bettong (*Bettongia lesueur*), the dibbler (*Parantechinus apicalis*) and the western barred bandicoot (*Perameles bougainville*).

Above A number of species are being released at Dirk Hartog Island as part of *Return to 1616*.
Photo – Saul Cowen/DBCA

Below Banded hare-wallabies are being offered a second chance at life on Dirk Hartog Island.
Photo – Richard Manning

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