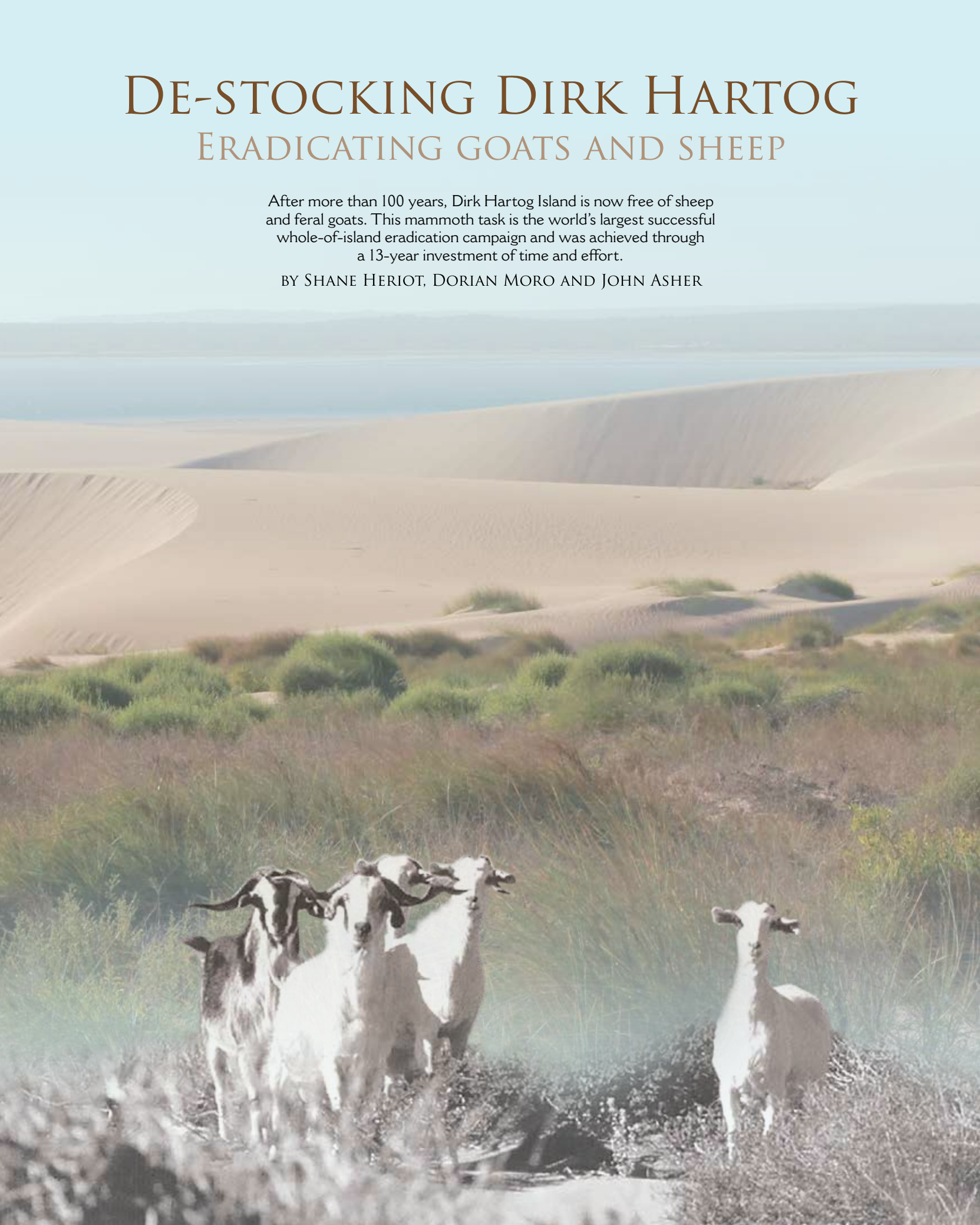
De-stocking Dirk Hartog

Eradicating goats and sheep

After more than 100 years, Dirk Hartog Island is now free of sheep and feral goats. This mammoth task is the world's largest successful whole-of-island eradication campaign and was achieved through a 13-year investment of time and effort.

by Shane Heriot, Dorian Moro and John Asher



Dirk Hartog Island has been settled and inhabited for more than 100 years. Due to the remoteness of the Shark Bay settlement – including its islands – food had to be shipped to the area, albeit infrequently. Settlers introduced sheep to Dirk Hartog Island in the 1860s to grow the sheep industry and then, in the early 1900s, lighthouse keepers brought goats to the island as a ready source of milk and meat. In its heyday, some 26,000 sheep and goats grazed the remote expanse of Dirk Hartog Island. Unfortunately, the animals' intense grazing and trampling denuded the island's vegetation and left a lasting legacy.

'RETURN TO 1616'

In the 1970s, well before the island became a national park in 2009, a bold vision was proposed to return Dirk Hartog Island to the ecological condition it was in when seen by the Dutch mariner Dirk Hartog and his crew in 1616. The Dirk Hartog Island National Park Ecological Restoration Project *Return to 1616* was started in 2012, substantially funded through the Gorgon Barrow Island Net Conservation Benefits Fund (see 'Welcoming wallabies to Wirruwana', *LANDSCOPE*, Winter 2018). This ambitious program set out to eradicate feral cats and all sheep and goats from the 63,300-hectare island in order to restore the island's environment, and to support the reintroduction of native fauna.

EARLY DE-STOCKING

Removing sheep and goats from Dirk Hartog Island was first started in 2007 by the former pastoral lessee. Four thousand sheep and 750 goats were transported off the island. However, several thousand more feral goats and sheep roamed the vast island and were difficult to herd; ground shooting was limited to direct line of sight, which was challenging among the thick scrub, and the high cliffs on the west coast could not be traversed easily on foot.

In 2009, most of the island was declared a national park. Several small freehold properties remained on the island, and the owners supported the total eradication of sheep and goats, including from their properties. This enabled the successful implementation of a whole-of-island eradication plan.

Previous page
Main The inland moving sand dunes.
Photo – Dorian Moro/DBCA
Inset Feral goats on Dirk Hartog Island.
Photo – Shane Heriot/DBCA

Top The rugged coastline of Dirk Hartog Island National Park.

Above The island lighthouse keeper's house.
Photos – Dorian Moro/DBCA

AERIAL SHOOTING

In 2010, the then Department of Environment and Conservation (now DBCA) commenced aerial shooting operations using dedicated helicopters and skilled shooters. Flights over the island were conducted year-round: during the cooler winter months when animals foraged in the open all day, during spring to detect breeding animals with young, and during summer – the hottest and driest part of the year – to target the dawn and dusk feeding times. From February 2010 to November 2017, 20 aerial shooting operations were carried out, and 6933 feral goats and 124 feral sheep were removed from Dirk Hartog Island. Aerial shooting proved to be highly effective in

Above Motion-sensor cameras capture a 'Judas' goat with her kid.

Above right Goats were aerially tracked.
Photos – Shane Heriot/DBCA

Right Banded hare wallabies were released on Dirk Hartog Island in 2017.
Photo – Richard Manning

reducing and ultimately eradicating sheep and goats from the island, especially when 'Judas' goats were used to reveal the goats' locations.

JUDAS GOATS

Goats, particularly females, are very social and aggregate to acquire mates and attract companions. Male goats tend to be more cautious and wary. So, 20 healthy adult female goats were captured on the island and used as 'Judas' goats. These goats were fitted with radio collars so they could be tracked, and released back into the wild population on the island. These animals were checked during the aerial program to determine whether they had adult companions or young, which betrayed the presence of males. Using this method was an extremely effective way of locating and removing uncollared goats. By undertaking this program three times a year, the number of goats was reduced to nearly zero within a reasonably short timeframe. The last Judas goat was removed from the western cliffs of Dirk Hartog Island in November 2017, two years after the last uncollared goat was sighted and removed.

Drones monitoring on Dirk Hartog Island

Hare wallabies on Dirk Hartog Island have been part of a WA first trial to use drones for radio-tracking.

Banded and rufous hare wallabies were translocated to Dirk Hartog from nearby islands in 2017 as part of the *Return to 1616* initiative (see 'Welcoming wallabies to Wirruwana', *LANDSCOPE*, Winter 2018). The animals were fitted with radio collars in order to track their survival and movement and were monitored daily for 12 weeks using traditional on-ground tracking, which proved time consuming and labour intensive.

This year, the use of drones has been trialled to locate the collared hare wallabies. And, so far, the trial has had positive results.

The new technology has made it possible to track multiple animals in real time from the air, which is far more efficient than manually following one animal at a time on the ground. The use of drones has also meant that large areas with difficult terrain can be searched rapidly with minimal effort.

The data collected from the trial suggest the reintroduction program of the hare wallabies has been a success. All the wallabies appeared to be in good condition and all females either had joeys in their pouch or at-foot. More than 28 offspring have been recorded since the first wallabies were released on Dirk Hartog Island in 2017.

MONITORING TRACKS

Following fresh tracks from the air was also an effective method to locate goats and sheep, as fresh prints contrast well against the white sands of the island. The shallow topography on Dirk Hartog Island is also conducive to tracking from the air, as there is little relief except on the west coast, and relatively low vegetation, which results in few gullies or vegetated thickets for the animals to hide in. Dirk Hartog Island has predominantly strong southerly winds that prevail for most of the year, which quickly remove fresh tracks from the soft sand. This enabled the helicopter crew to easily determine that any tracks they saw were most likely fresh ones. The west coast cliffs and caves provided the only refuge for animals to evade detection. However, the animals that sheltered in these areas still needed to emerge from the caves and onto the open cliff top areas to feed, so fresh prints could still be observed.

ATTRACTING ANIMALS WITH WATER

Motion-sensor cameras were set up at watering troughs on the island as another method to detect any remaining goats and sheep. Dirk Hartog Island has no fresh

"It took 13 years (2005–2017) to remove a combined total of 16,318 sheep and goats from Dirk Hartog Island ... "

permanent surface water. Historically, a network of wells and windmills were established across the island to provide water for sheep, but as sheep numbers diminished so did the permanent watering points. Water troughs were an effective tool to attract animals during the hot dry months, and images of goats at water troughs taken by the motion-sensor cameras confirmed whether goats remained. The last four uncollared goats on the island were all juveniles that were detected with a Judas female, by motion-sensor cameras in November 2015.

ISLAND-WIDE ERADICATION

No sheep or uncollared goats have been detected, nor tracks or images of grazing animals recorded, since November 2015. Statistical modelling of the data confirmed that there was only a very low likelihood that goats or sheep remained on Dirk Hartog Island. The island was declared free of sheep in 2016 and, following the removal of the last Judas goat, free of feral goats in November 2017. Shortly after this milestone, it was declared that feral cats had also been eradicated from the island (see 'Declaration on Dirk', *LANDSCOPE*, Autumn 2019).

CONSERVATION OUTCOMES

This project has shown that the size and complexity of an island is no longer an impediment to achieving a successful eradication outcome to benefit conservation. It took 13 years (2005–2017) to remove a combined total of 16,318 sheep and goats from Dirk Hartog Island and to confirm their eradication, making this program the largest successful whole-of-island ungulate eradication program in the world. Dirk Hartog Island, Western Australia's largest offshore island, is already showing recovery following the eradication: increased vegetation cover and reduced erosion is apparent, and the successful reintroductions of native mammals continues.

Above left Wells were used on the island to provide water to stock.
Photo – Dorian Moro/DBCA

Above A motion-sensor camera detects uncollared goats at a watering point.
Photo – Shane Heriot/DBCA

Below left Vegetation on the island is recovering after the de-stocking.
Photo – Dorian Moro/DBCA

Shane Heriot is a DBCA operations officer for the Dirk Hartog Ecological Restoration project. He can be contacted on (08) 9948 2226 or by email (shane.heriot@dbca.wa.gov.au).

Dr Dorian Moro worked as a DBCA senior research scientist before moving to a role with the Great Victoria Desert Trust.

John Asher was manager of the Dirk Hartog Island Ecological Restoration Project until 2019 when he became DBCA Ecosystem Health Branch manager. He can be contacted on (08) 9725 5951 or by email (john.asher@dbca.wa.gov.au).

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