Biodiversity and Conservation Science

Dirk Hartog Island National Park
Return to 1616
Ecological Restoration Project

Stage Two – Year Seven

Translocation and Monitoring Report

June 2024 to June 2025

Mike Smith, Kelly Rayner, Colleen Sims, Kym Ottewell and Lesley Gibson

July 2025

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Acknowledgments

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Summary

Year seven of the second stage of the Dirk Hartog Island National Park Ecological Restoration Project saw the translocation of 180 woylies (*Bettongia penicillata*) to the island in April 2025. The woylies were translocated and released over a two-week period, with 60 individuals coming from each of Dryandra Woodland National Park, Kingston National Park and state forest blocks and Tone-Perup Nature Reserve. The current number of individual animals translocated to the island across nine species is 1133.

Ongoing monitoring of translocated fauna continues to rely upon a range of different methods, including cage, Elliott, and camera trapping as well as faecal pellet collections, audio recordings, track searches, and the WildTrack passive RFID detections. Additionally, trials investigating the feasibility of eDNA as a future monitoring technique commenced in this reporting period. Translocations continue to be assessed against success criteria, prescribed in approved Translocation Proposals, with more progress made towards achieving these goals in 2024-25.

Here we present:

- the results for the woylie translocation,
- translocated species monitoring undertaken between July 2024 and June 2025,
- current assessments against criteria for success, and
- the monitoring of extant fauna undertaken in October 2024.

1 Background

1.1 The vision

The vision for the Dirk Hartog Island National Park Ecological Restoration Project (ERP) is to create a special place that is valued by Western Australians (and people from further afield) because of the well managed system processes that support healthy vegetation and fauna, including a suite of re-established (since the time of Dirk Hartog's landing in 1616) and newly established (for conservation outcomes) terrestrial animals. The vision aligns with the goal for Dirk Hartog Island, or Wirruwana, as a National Park, which is to ensure these natural assets are "conserved, protected and valued" by people (https://www.dbca.wa.gov.au/parks-and-wildlife-service). The island is now co-managed with the Malgana Aboriginal Corporation with formal ratification of the joint management agreement occurring in 2024.

1.2 Site description

Dirk Hartog Island (or Wirruwana, hereafter DHI) is located in the Shire of Shark Bay in Western Australia at approximately -26° S and 113° E, and forms part of the Shark Bay UNESCO World Heritage Area. It falls within the Department of Biodiversity, Conservation and Attractions (DBCA) Parks and Wildlife Service's Gascoyne District in the Midwest Region and is co-managed with the Malgana Aboriginal Corporation. The island is approximately 80 km long and up to 12 km wide with a total area of 63,300 ha, making it the largest island in WA. The island contains multiple terrestrial vegetation elements, including *Acacia*-dominated shrubland communities, *Triodia*-dominated grasslands, *Thryptomene dampieri* heath, large areas of *Spinifex longifolius* (typically associated with consolidated and mobile dune-systems) and chenopod communities associated with the many 'birrida' clay-pans (Beard 1976).

The project has achieved eradication of sheep (*Ovis aries*), goats (*Capra hircus*) and feral cats (*Felis catus*) from the National park (Algar et al., 2020) — ameliorating issues relating to unsustainable predation and over grazing — followed by the re-introduction / introduction of eight mammal and one bird species. A strategic framework for the program, prepared by Morris *et al.* (2017), outlined a further four species to be translocated to the island: heath mouse (*Pseudomys shortridgei*), desert mouse (*P. desertor*), boodie (*Bettongia lesueur*), and chuditch (*Dasyurus geoffroii*). Because source populations cannot be identified, heath mice and desert mice are no longer being considered for translocation to the island.

1.3 Rainfall

DHI has a semi-arid climate, typically receiving most rain over the winter months but with occasional heavy falls in summer and autumn due to cyclonic events. Annual rainfall for the reporting period (1 July 2024 to 30 June 2025) was 169 mm, below the estimated annual average of 230mm for the island. The largest falls for this period were between July and August 2024, and 29 May to 4 June 2025.

Temperatures over the reporting period at BOM stations were above average for Mar-May 2025. Climate data for DHI are presented in Figure 1.

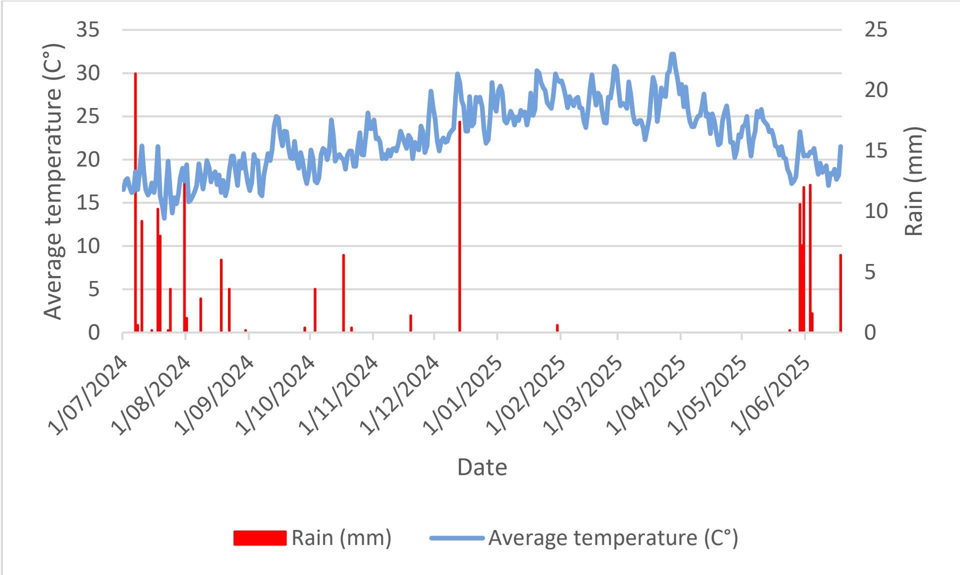

Figure 1 Average daily temperature and daily rainfall recorded on DHI during the 2024-2025 reporting period.

1.4 Annual Progress

After the removal of key introduced species (goats, sheep and feral cats), phase two of the program was fully initiated in 2018. The major annual outcomes of that work are:

2017 to 2018

- Trial translocation of banded hare-wallabies (*Lagostrophus fasciatus*; BHW) and rufous hare-wallabies (*Lagorchestes hirsutus*; RHW)
- Monitoring of extant reptiles and small mammals

2018 to 2020

- Full scale translocations of BHW and RHW
- First trials of DNA analysis from faecal pellets to monitor population size and genetic diversity
- First cohort of Shark Bay bandicoots (*Perameles bougainville*; SBB) translocated
- First cohort of dibblers (*Parantechinus apicalis*) translocated from a captive-breeding program at Perth Zoo
- Monitoring of extant reptiles and small mammals

2020 to 2021

- Additional releases of SBBs and dibblers
- First translocations of Shark Bay mice (*Pseudomys gouldii*; SBM) and greater stick-nest rats (*Leporillus conditor*; GSNR)
- Monitoring of previously translocated species
- Monitoring of extant reptiles and small mammals

2021 to 2022

- Additional translocations for dibbler, SBM, and GSNR
- Monitoring of translocated species
- Monitoring of extant reptiles and small mammals

2022 to 2023

- Translocation of the western grasswren (*Amytornis textilis*; WGW)
- Additional translocations of dibblers
- Translocation of brush-tailed mulgara (*Dasycercus blythi*; BTM)
- Ongoing monitoring of translocated fauna
- Monitoring of extant reptiles and small mammals

2023 to 2024

- Final translocation of dibblers
- Monitoring of translocated fauna

2024 to 2025

- Translocation or woylies (*Bettongia penicillata;* BTB)
- Monitoring of translocated species
- Monitoring of extant reptiles and small mammals

1.5 Release summaries

Nine species have been translocated to DHI since 2017, with 1133 individual animals released (Table 1 and Figure 2).

Table 1: General location (refer to Figure 2 for more detail) and timing of releases for each translocated species.

Species	Source and year	Cohort size	Area of release
Woylie	Dryandra Woodland National Park, 2025	60	Between the cat fence and Tetradon Loop
	Kingston National Park & forest blocks, 2025	60	
	Tone-Perup Nature Reserve, 2025	60	
Brush-tailed mulgara	Matuwa Kurrara Kurrara National Park, 2023	100	Louisa Bay area
Western grasswren	Hamelin Station Reserve, 2022	38	Around the under-construction airstrip and associated drainage lines in the greater Herald Bay area
	Peron Peninsula, 2022	47	
Greater stick-nest rat	Salutation Island, 2021	62	Garys Beach
	East & West Franklin Islands, 2022	60	Between Garys Beach and Quoin Bluff
Shark Bay mouse	Northwest Island, 2021	80	Northwest Tetradon Loop
	Bernier Island, 2022	50	Herald Heights

Species	Source and year	Cohort size	Area of release
Dibbler	Jurien Bay Islands via Perth Zoo Native Species Breeding Program, 2019 – 2023	203	Between the weather station and Herald Bay, including the greater foreshore area
Shark Bay bandicoot	Bernier Island, 2019-2020	47	Between Herald Bay and Ten Mile Well
	Dorre Island, 2019	52	
Rufous hare-wallaby	Bernier Island, 2017-2019	53	Between Cape Ransonnet and Herald Bay
	Dorre Island, 2017-2019	59	
Banded hare-wallaby	Bernier Island, 2017-2018	49	Between Cape Ransonnet and Notch Point
	Dorre Island, 2017-2018	53	

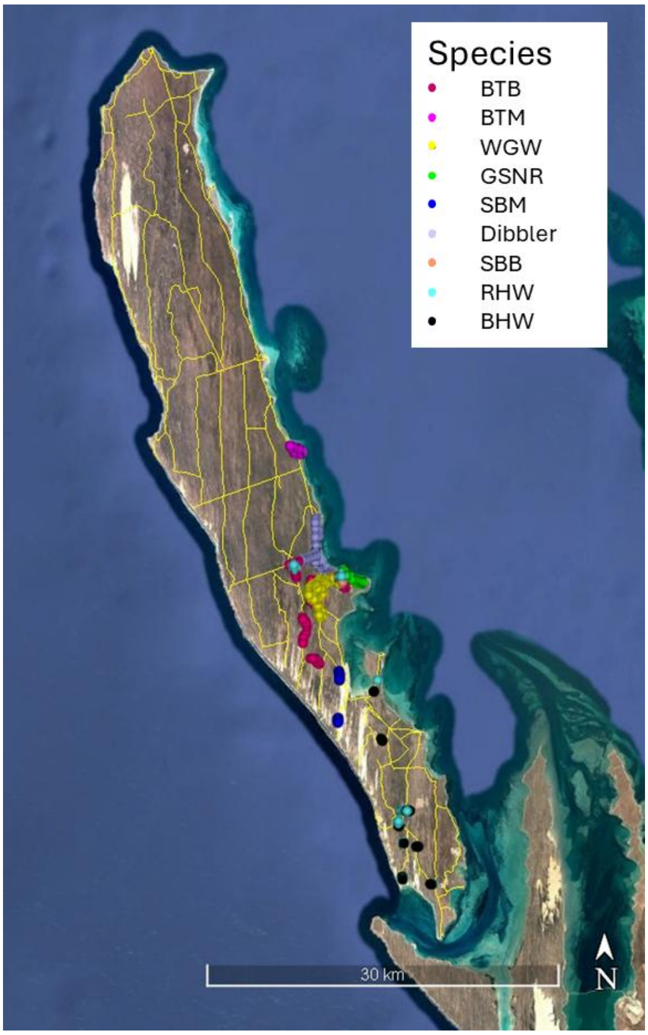

Figure 2: Release locations for each translocated species. BTB = Bettongia penicillata, BTM = Dasycercus blythi, WGW = Amytornis textilis, GSNR = Leporillus conditor, SBM = Pseudomys gouldii, Dibbler = Parantechinus apicalis, SBB = Perameles bougainville, RHW = Lagorchestes hirsutus, BHW = Lagostrophus fasciatus.

2 Woylie translocation

Although originally scheduled for release in year two or three of Stage 2, it was recognised early on that successful establishment of this species had the potential to interfere with the monitoring of other species through trap disturbance. Consequently, the woylie translocation was delayed until April 2025.

2.1 Harvesting

Founders for this translocation were harvested from the three remnant, wild populations of woylies in the Dryandra, Kingston and Perup areas, which are recognised to be genetically distinct from each other and represent the breadth of genetic diversity within the species. Woylies were captured using small Sheffield cage traps placed within 5 m of roads at 200-400 m intervals that had been pre-baited with universal bait (peanut butter and rolled oats) from 1 to 12 days prior to opening traps. On the harvest nights, traps were checked one to two times between midnight and 6:00 am then closed. All woylies were assessed at their capture site for suitability for translocation.

Trapping at Dryandra was conducted on the 2-3 April 2025 with a total of 270 trap nights resulting in 60 adult woylies and 11 pouch young (PY) translocated (Table 2). These were harvested from both the Woylie Numbat Sanctuary (sanctuary) and the broader Dryandra Woodland (woodland). Trapping at Kingston and Perup was conducted on the 8-11 April 2025, with a total of 958 trap nights resulting in 120 adult woylies and 47 PY translocated (Table 2). No animals were harvested from the Perup Woylie Sanctuary.

A total of 180 (92M:88F) independent woylies (plus 58 PY) were translocated and released onto DHI from the 2-11 April 2025.

Table 2 Number of woylies sourced from Dryandra and the Upper Warren Region (Kingston and Perup)

Cohort	Dryandra (sanctuary/woodland)	Kingston	Perup
Male	27 (17/10)	35	30
Female	33 (19/14)	25	30
Pouch young	11	21	26
Total adults	60 (36/24)	60	60
Trap nights	270	619	339

2.2 Translocation and release

All woylies selected for translocation were taken to a central point for final checks and processing (including PITs applied). Animals deemed suitable for radio-collars (adult >900 g, no PY) were also fitted with transmitters (collar mounted Holohil XM2C VHF radio-transmitters with mortality sensing and 10-month battery life). Animals were replaced inside dark handling bags with a small amount of moist food (e.g.

universal bait ball/apple/carrot/cucumber/sweet potato/corn) to provide some nutrition and hydration. Bags were then placed within a standard pet-pack (53cm L x 37cm W x 37cm H) with a maximum of two animals per pet-pack and bags tied in opposite corners to minimise risk of injury, stress and contact, and to maximise airflow. Animals were then transported (30-60 mins) by road in air-conditioned vehicles to the nearest airport (Narrogin for Dryandra, or Manjimup for Perup/Kingston), where they were transported via fixed wing aircraft to Monkey Mia Airport. Pet-packs were then transferred onto helicopter for transfer to Herald Bay on DHI.

Once arrived on DHI, animals were taken to airconditioned facilities, reweighed (average loss of 27.1 g or 2.1 % across the cohort), checked for health and collar fit and held until transported by vehicle or helicopter to release sites just prior to dusk. Animals were released after dark in groups of up to four per site, with a minimum of 200 m between sites. Any animals carrying large pouch young (>30 mm) were soft released, all other animals were hard released. Release sites were selected based on habitat (dense shrubs) and covered an area of approximately 2000 ha between the cat fence and Tetradon Loop (Figure 3). Cohorts from different source sites were released in a mosaic across the release area to facilitate genetic mixing of the founders. Twenty-two (13M:9F) or approximately 12% of animals were radio-collared prior to release, comprising nine (4M:5F) from Dryandra, four (2M:2F) from Perup and nine (7M:2F) from Kingston.

Figure 3 Woylie release points on DHI with source sites of individuals indicated by colour.

One female with a PY from the Kingston area was 'soft-released' in its bag on 11 April but subsequently died in the bag. This animal was discovered the following morning and underwent a necropsy and histological examination which revealed it had an underlying liver infection. This compromised health status was likely a major contributing cause of its failure to survive the stress of capture and translocation.

2.3 Monitoring

Monitoring the translocated woylies at DHI over the first two months post release involved daily tracking of radio-tagged animals to determine survival, investigate location of mortality signals and recovery of confirmed dead animals for the first six weeks. Tracking frequency was reduced to every other day for a further three to four weeks until 5 June 2025, then monthly until collars are removed in Oct-Nov 2025. Cameras allocated to the island wide survey (IWS) monitoring were also positioned within the release area.

Targeted trapping to check collar fit and condition of collared animals (weight, body condition, reproductive condition) was carried out at five to six weeks post release using small cage traps. Animals were radio-tracked to their daytime refuges late in the day, causing as little disturbance as possible and then surrounded with up to 16 traps baited with universal bait, carrot and apple.

In response to concerns about early mortalities and whether animals were finding enough food, a small trial to provide supplementary food to some of the collared individuals commenced in mid-May. Cameras were placed on feed stations and an additional three un-lured cameras within the ~ 500 x 500 m test and control sites (two of each, Figure 4 and Figure 5).

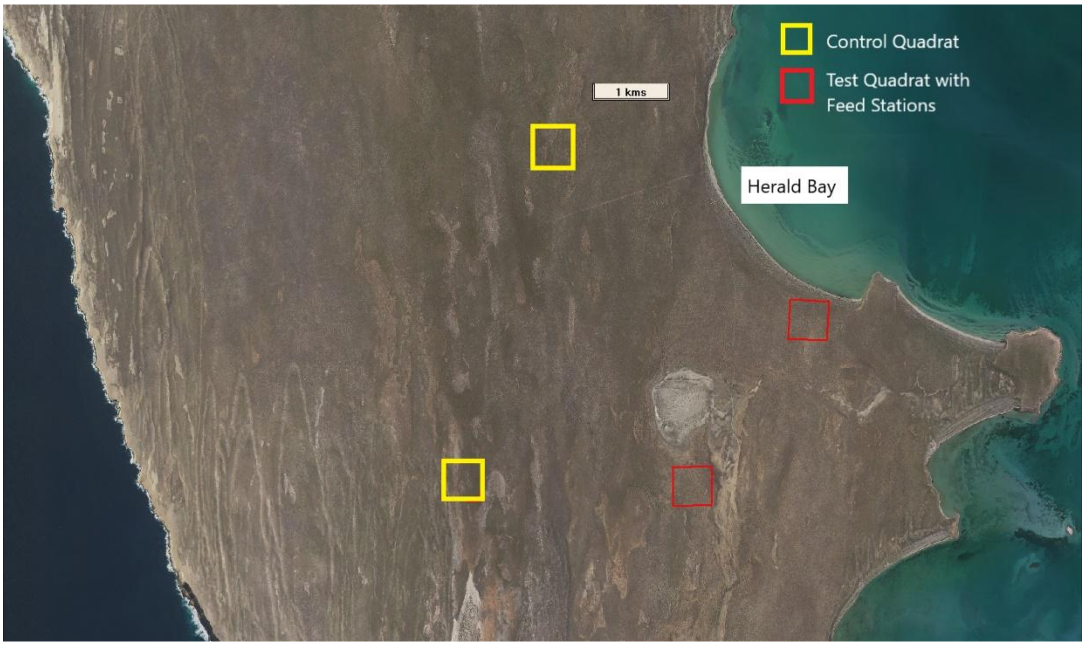

Figure 4 Supplementary feed trial treatment and control quadrats (~250 ha each) positioned where at least two radio-collared woylies were resident.

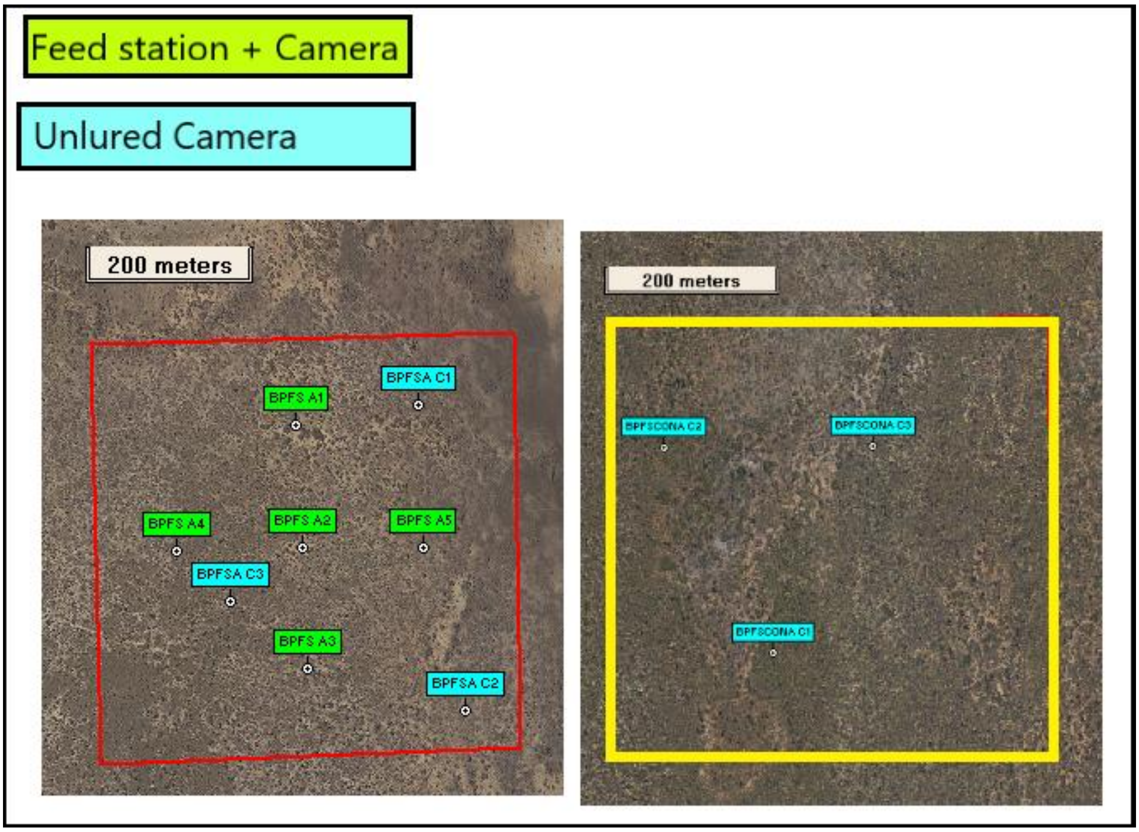

Figure 5 Approximate arrangement of five feed stations plus camera, and three un-lured cameras in each treatment and control quadrats.

Eleven of the 22 collared animals died between two and 12 days after release. These included individuals from all source populations, however there was a difference in the mortality rate for the two main source sites, with 33% of Dryandra and 62% of Upper Warren (Perup plus Kingston) collared animals dying (Table 3). Necropsies were performed on six individuals. Samples from two of the freshest carcasses were sent for histological examination, however high ambient temperatures and length of time between death and discovery/collection of carcasses limited the quality of information available from histology. Despite this, results provided no positive evidence of acute stress myopathy in the skeletal muscles sampled, but there were some findings that suggested multi-organ congestion and heart failure which could be associated with a stress/shock response. All individuals had very little material in their stomach or small intestine, suggesting they had not been able to find sufficient food. One additional mortality was recorded within this same period, with an uncollared animal found after being hit by a car near Tetradon Loop.

Table 3 Source and fate of collared woylies to 25 June 2025 (12 weeks post release)

Animal ID	Channel	Date released	Source	Sex	Date of last known live	Outcome by 12 weeks	Days elapsed
BP08	23	02/04/25	Dry (wild)	M	24/6/25	Live	83
BP14	8	02/04/25	Dry (Sanc)	F	24/6/25	Live	83
BP29	16	02/04/25	Dry (wild)	F	13/04/25	Dead	11
BP32	22	02/04/25	Dry (wild)	F	24/6/25	Live	83
BP33	7	02/04/25	Dry (wild)	M	9/04/25	Dead	7
BP47	15	03/04/25	Dry (Sanc)	M	24/6/25	Live	82
BP51	12	03/04/25	Dry (Sanc)	F	24/6/25	Live	82
BP55	19	03/04/25	Dry (Sanc)	F	19/04/25	Dead	16
BP57	11	03/04/25	Dry (wild)	M	24/6/25	Live	82
BP73	24	08/04/25	Perup	M	24/6/25	Live	77
BP87	6	08/04/25	Kingston	M	15/04/25	Dead	7
BP88	5	08/04/25	Kingston	M	24/6/25	Live	77
BP89	13	08/04/25	Kingston	M	24/6/25	Live	77
BP99	3	09/04/25	Perup	F	17/04/25	Dead	8
BP108	21	09/04/25	Kingston	M	24/6/25	Live	76
BP113	34	09/04/25	Perup	F	23/04/25	Dead	14
BP115	28	09/04/25	Kingston	M	17/04/25	Dead	8
BP145	14	10/04/25	Kingston	M	11/04/25	Dead	1
BP147	1	10/04/25	Kingston	F	16/04/25	Dead	6
BP152	32	10/04/25	Kingston	F	13/04/25	Dead	3
BP155	29	10/04/25	Kingston	M	24/6/25	Live	75
BP156	25	10/04/25	Perup	M	17/04/25	Dead	7

No further mortalities of radio-collared animals were recorded up to 12 weeks post release. All 11 collared animals were trapped and checked at least once at 4-5 weeks post release. During this targeted trapping, an additional 13 uncollared individuals were also captured. Of these 24 individuals, 10 were below their release weight, and 14 had gained weight (Table 4). Four individuals were recaptured a second time within a week of their first capture, and all had retained or increased their body weight.

The timing of the woylie translocation was planned as a compromise between several conflicting logistical, biological and environmental constraints. The timing in early to mid-April was selected to avoid the worst heat of summer and associated extreme weather events. The translocation was intended to take place when the temperatures in Shark Bay were expected to begin falling, as well as to avoid rain disrupting trapping and flying conditions in the southern jarrah forest and limiting access to, on and around DHI. It was also timed to pre-empt high numbers of female woylies with large pouch young in the source populations, which would appear in response to rain events. Presence of large pouch young creates a significant welfare risk to animals and limits the availability of suitable females for harvesting.

Table 4 Weight changes of recaptured woylies at ~ 5-6 weeks post release

				Release		First Check		
Woylie ID	**Source Population**	**Channel**	**Sex**	**Date**	**Weight**	**Date**	**Weight**	**Weight change**
BP155	Kingston	29	M	10/04/25	1355	5/05/25	1280	-75
BP108	Kingston	21	M	9/04/25	1650	5/05/25	1560	-90
BP08	Dry (wild)	23	M	2/04/25	1090	6/05/25	1010	-80
BP14	Dry (Sanc)	8	F	2/04/25	1050	7/05/25	1180	+130
BP32	Dry (wild)	22	F	2/04/25	1150	7/05/25	1000	-150
BP89	Kingston	13	M	8/04/25	1105	11/05/25	1060	-45
BP57	Dry (wild)	11	M	3/04/25	1115	13/05/25	1180	+65
BP88	Kingston	5	M	8/04/25	1330	17/05/25	1350	+20
BP47	Dry (Sanc)	15	M	3/04/25	1040	17/05/25	1150	+110
BP73	Perup	24	M	8/04/25	1340	19/05/25	1420	+80
BP51	Dry (Sanc)	12	F	3/04/25	1105	21/05/25	1290	+185
BP60	Dry (Sanc)	N/A	F	3/04/25	1140	13/05/25	1280	+140
BP91	Perup	N/A	F	8/04/25	855	13/05/25	910	+55
BP97	Perup	N/A	F	8/04/25	1030	13/05/25	1060	+30
BP09	Dry (wild)	N/A	F	2/04/25	1170	7/05/25	1070	-100
BP122	Kingston	N/A	F	9/04/25	1490	7/05/25	1410	-80
BP128	Kingston	N/A	M	9/04/25	1305	7/05/25	1350	+45
BP160	Kingston	N/A	F	10/04/25	1850	5/05/25	1760	-90
BP48	Dry (Sanc)	N/A	F	3/04/25	1000	16/05/25	1060	+60
BP52	Dry (Sanc)	N/A	F	3/04/25	1005	16/05/25	1010	+5
BP46	Dry (wild)	N/A	F	3/04/25	1255	17/05/25	1370	115
BP54	Dry (wild)	N/A	M	3/04/25	1150	19/05/25	1310	160
BP18	Dry (wild)	N/A	F	2/04/25	1275	21/05/25	1260	-15
BP90	Kingston	N/A	M	8/04/25	1440	21/05/25	1360	-80

However, in 2025, the autumn conditions in Shark Bay produced higher than average temperatures. The week prior to the release, maximum temperatures recorded on the island were more than seven degrees warmer than the average maximum temperatures from the five previous years, which in combination with the low summer rainfall and ongoing warm conditions, significantly dried out vegetation on DHI. In addition, maximum temperatures on days animals were released were above 30°C, with several >37°C (Figure 6).

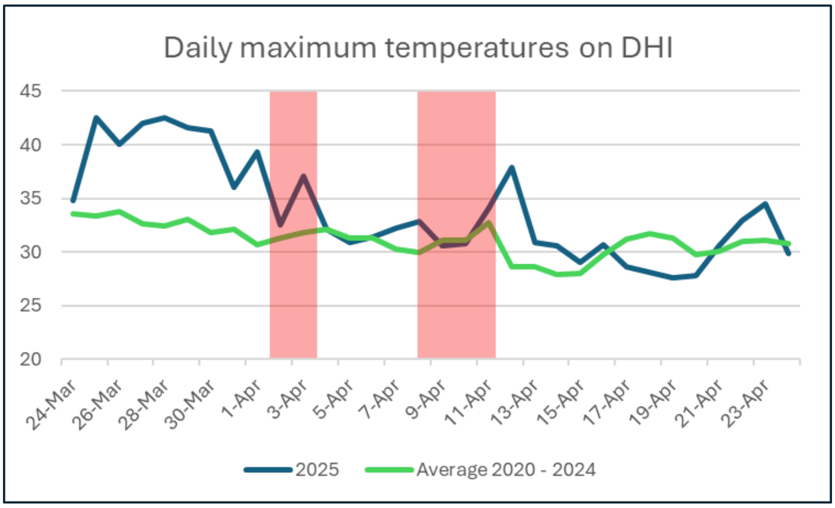

Figure 6 Maximum daily temperatures recorded on DHI from one week prior to the 2025 woylie translocation until the last recorded mortality. For comparison in green, average maximum temperatures from the five years previous. Red shading indicates release days.

In combination with the inherent stress associated with translocations, it is likely that these challenging environmental conditions contributed to the unexpected high mortality rate of collared individuals. There was no indication that collars themselves contributed to mortality. If the proportion of collared animals surviving (50%) is a representative sample of the whole founder population, then it would indicate at least 90 founder woylies have survived the initial post-translocation adjustment period. Follow up trapping and the most recent radiotracking, suggest animals have now adjusted to their new environment, finding sufficient food resources to recover their body weight and reproduce.

3 Individual species updates 2024-2025

3.1 Brush-tailed mulgara

3.1.1 Monitoring

3.1.1.1 Trapping

Elliott trapping was undertaken in June 2025, with one transect targeting the 2023 release area and a second transect targeting areas where animals had been detected on the IWS cameras. Trap sites were separated by 100 m intervals, with two Elliott traps baited with universal bait set at each of the 123 sites. Thirty-one sites were within the 2023 release area, while 92 sites were along ATV tracks inland of the release area, covering just over 12 km (Figure 7).

Fifteen individuals were captured; seven founders from the 2023 release and eight island born animals. All animals were captured along the ATV tracks (Figure 7). The eight island-born animals included both adult and first year individuals based on size and reproductive condition. All animals were in good condition with the average weight only 1.8 g lighter than the average weight of the cohort translocated in 2023.

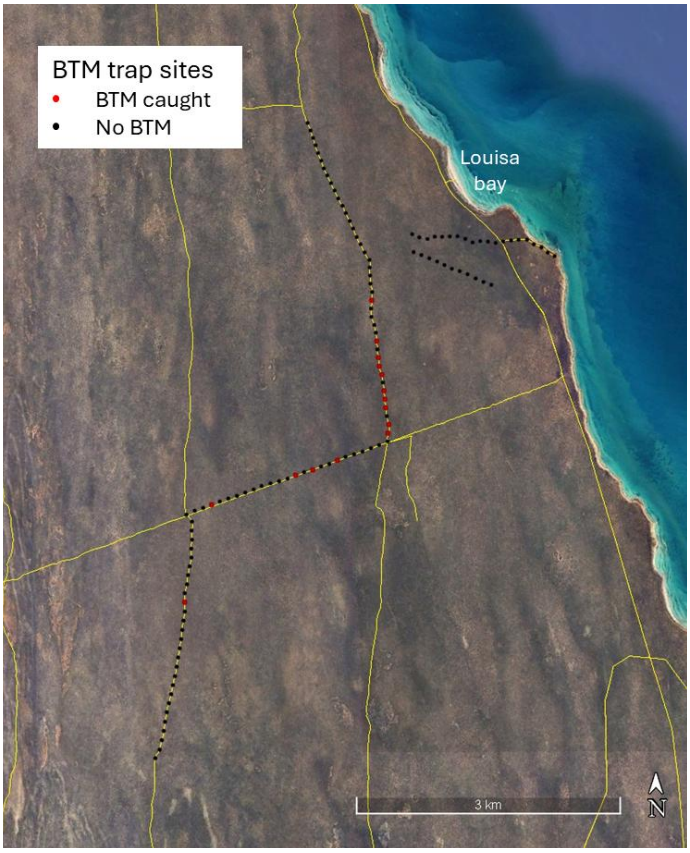

Figure 7 Location of trap sites in the 2025 monitoring of brush-tailed mulgara on DHI. Red dots indicate sites where animals were captured.

3.1.1.2 Remote cameras

No cameras were used to specifically monitor BTM over the 2024-2025 reporting period, although it was expected that IWS cameras (Table 5, Figure 8) would contribute to the monitoring of BTM. The most recent service of cameras and collection of images took place in March 2025. Cameras were set 20-50 m off track, set to ‘high sensitivity’ and trained on a paver as a size reference for the purpose of assisting rodent identification.

Table 5 Deployment of IWS cameras during the 2024-2025 reporting period.

Area	Number of cameras	Deployment period
North	40	July 2024 - March 2025
Central	40	November 2024 - current
South	40	March 2024 - July 2024
	38	March 2025 - current

BTM have been captured on remote camera at three locations in the last 12 months (Figure 9). Two of these locations were within proximity (5-6 km) of the 2023 release area, while the third was approximately 20 km north.

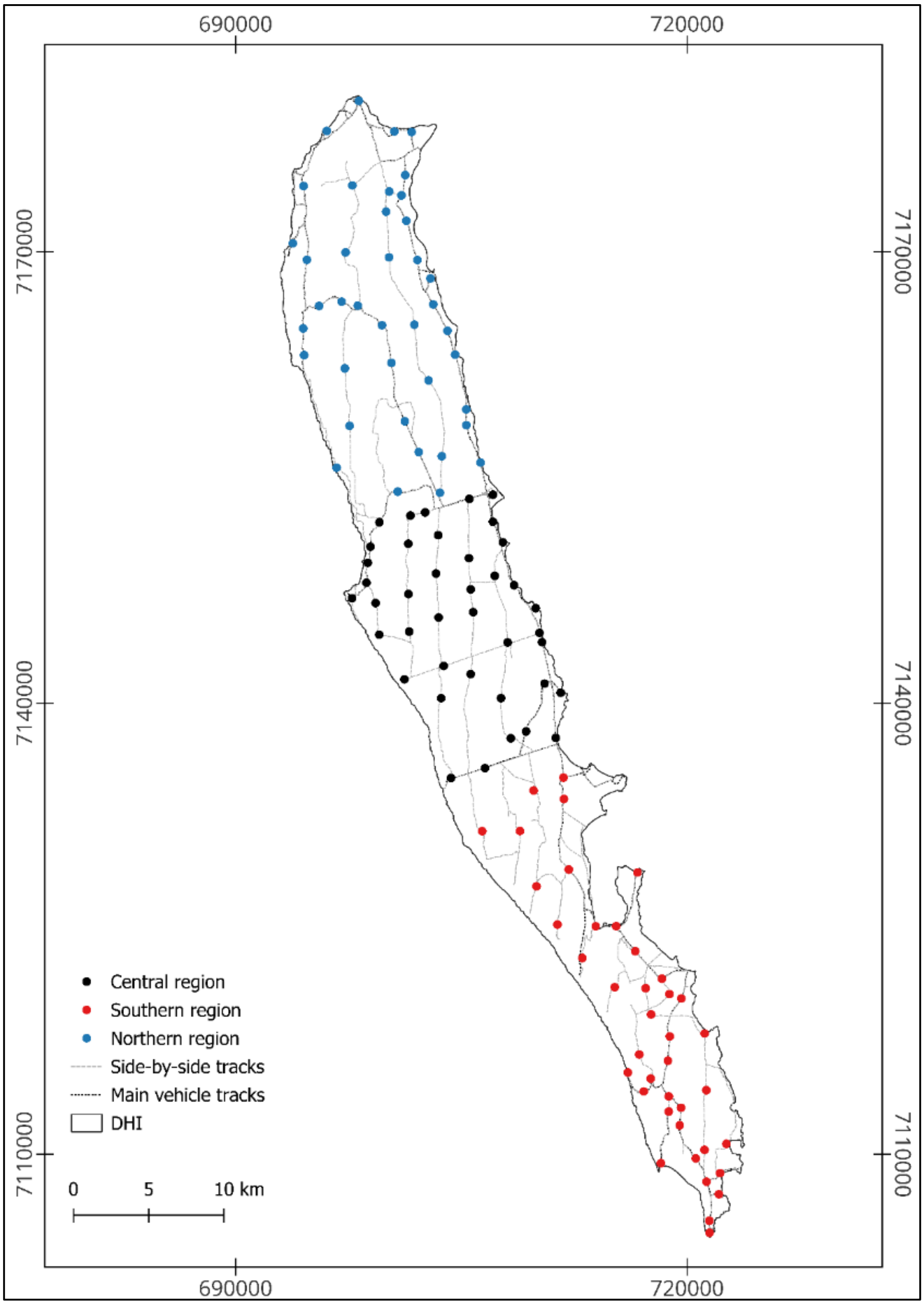

Figure 8 Island-wide camera survey points (IWS). Symbol colour indicates the region (northern, central, southern) within which up to 40 cameras are deployed at any given time. In any region, the cameras are deployed for approximately 4 months after which they are moved to another region.

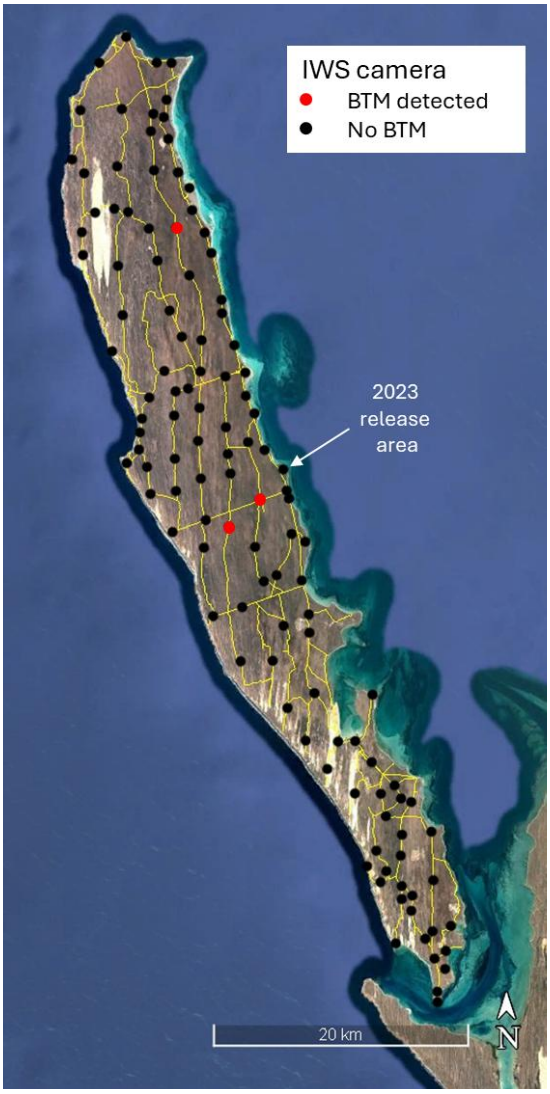

Figure 9 IWS camera array with detections of BTM during the 2024-2025 reporting period indicated in red.

3.1.2 Success criteria

As brush-tailed mulgara (BTM) were translocated in 2023, we provide information for the medium-term success criteria (Table 6), noting that short-term criteria have largely been met (DBCA 2024a).

Table 6 Assessment of medium-term success criteria as defined in the BTM translocation proposal

Criteria	**Assessment**	**Evidence**
Medium-term (6-24 months)		
Population settled in an area of suitable habitat as evidenced by monitoring methods (e.g., cameras, traps, or tracks) within 24 months post-release.	Successful	BTM continue to be detected inland and south of the initial release area. Animals have been caught in traps, remote cameras and diggings observed. Based on numbers caught in June 2025, a population of BTM have settled in this area.

Criteria	Assessment	Evidence
Evidence of reproduction and successful recruitment of F1 and possibly F2 individuals into the populations within 24 months post-release.	Successful	Seven new recruits were captured in June 2025. As such, recruitment of at least F1 animals has been confirmed, with the possibility of some of these animals having bred last season.
Average body weight and condition of captured individuals is maintained within range (within +/- 5%) of that observed in founder group at release (dependent on comparable rainfall and breeding season) within 24 months.	Successful	Average weight of the founder group at release was 77.3 g and the average weight of BTM upon first capture in June 2025 was 75.5 g, falling within 5% of founder average.
Evidence of dispersal of new recruits beyond initial release area by two years post-translocation.	Successful	Seven new recruits were captured approximately 4-6 km west of the release area in June 2025 and BTM have been detected at one camera location 20 km north of the release area.

3.1.3 Summary

Both short-term and medium-term success criteria have largely been met with recent monitoring detecting 15 individuals, seven of which have been born on the island, all located 4-6 km west of the original release area. Animals have also been detected at two locations west of the release area and one animal 20 km north of the release area on the island-wide cameras.

3.2 Western grasswren

3.2.1 Monitoring

3.2.1.1 *Point counts and ad hoc surveys*

The aural/visual survey undertaken in 2023 was replicated in September 2024 using methods described in DBCA (2024a). Systematic surveys were conducted at 201 points on 474 occasions in the 2022 release area (Figure 10). At locations where birds were detected, further time was spent observing individuals to age, ID them (colour band combinations) and to determine their reproductive status. In addition to the systematic surveys, searches were conducted in likely habitat beyond the release area. Eight Mile Well was targeted, with three pairs of observers searching passively for 90 minutes. Conditions throughout the period allocated to monitoring were predominantly windy, less than ideal for detection of this species. Occupancy analysis of the systematic survey was completed using methods described in Appendix 1.

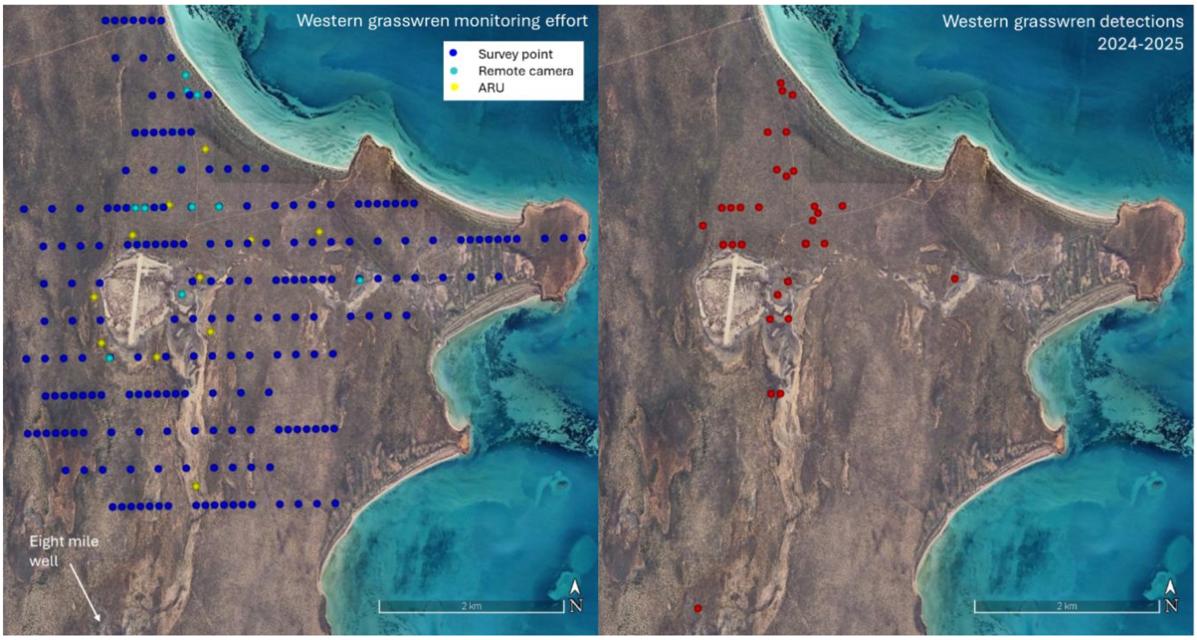

Figure 10 Locations of point counts, remote cameras and autonomous recording units used in targeted monitoring of WGW during the 2024-2025 reporting period on the left. Locations where WGW were detected during the same period on the right.

WGW were detected at 19 points in the systematic survey and a further eight locations within the survey area while this work was being completed. In addition, WGW were detected at one location in the Eight Mile Well survey area (Figure 10). Of the birds that were seen, all were founder animals with one or more leg bands visible. No DHI born animals or evidence of breeding were observed during the survey period. However visual observations of WGW during the systematic survey were scant due to windy conditions, resulting in birds only being seen on eight occasions compared to 32 when birds were heard. Mean predicted occupancy on the survey transects was 0.29 (95 % CIs = 0.19 to 0.71), similar to those in 2023 (mean predicted occupancy = 0.36: 95% CIs = 0.21 to 0.89).

3.2.1.2 Cameras

Twenty cameras were allocated to sites where birds were detected during the 2023 survey period (Figure 10), with two additional cameras deployed following new detections in the 2024 survey period. Cannisters of fleece (Hamelin WGW previously observed using wool to line nests) were set in front of cameras over the breeding season (May – September) to capture evidence of reproductive behaviour. In addition, cameras allocated to the IWS monitoring were expected to contribute to the monitoring of WGW.

Two groups (based on colour bands) of western grasswrens were detected on four cameras during this reporting period. Of the images where bird legs were visible, only founder animals were caught on camera (presence of leg bands). No WGW were detected on the IWS cameras.

3.2.1.3 *Autonomous recording units (ARUs)*

ARUs deployed in the WGW release area continued to fail over this reporting period. The 11 units that remained functional were collected in March 2025. Twenty new units (Song Meter minis) have now replaced failed units and will be deployed beyond the release area with the purpose of determining if birds have expanded in distribution. These units will be allocated to 58 sites for one month each over the 2025 breeding season (Figure 11).

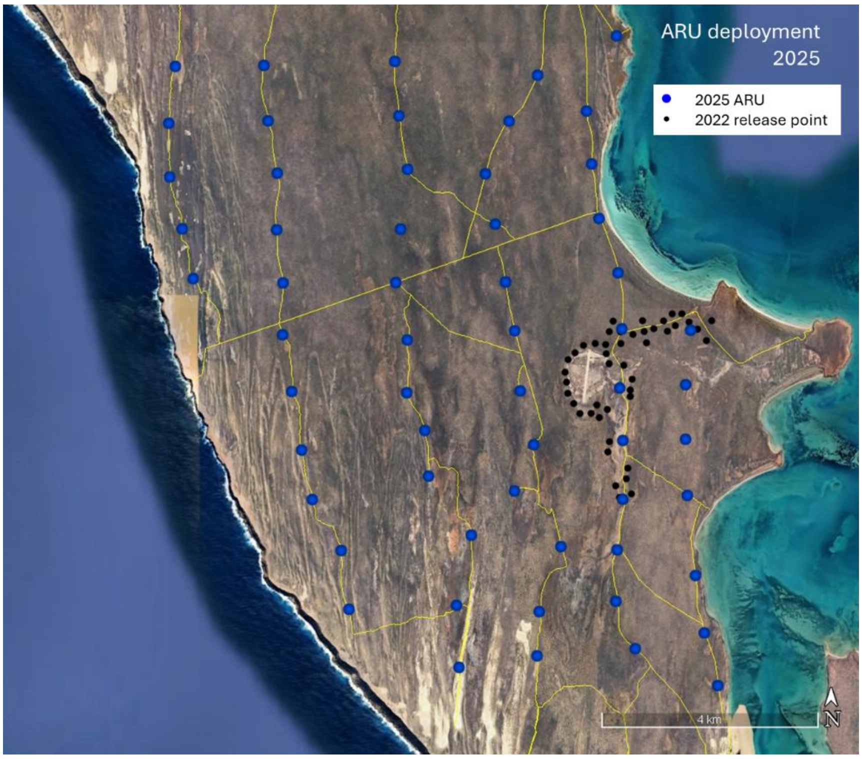

Figure 11 Fifty-eight survey sites allocated to autonomous recording units (ARUs) for the purpose of detecting expansion of the population beyond the release area (indicated by release sites in black).

3.2.2 Success criteria

As western grasswrens were translocated in 2022, we continue to provide an assessment of progress towards the medium-term success criteria (Table 7). Short-term success criteria were all met, and some medium-term results have already been reported (DBCA 2024a).

Table 8 Assessment of success criteria as defined in the WGW translocation proposal

Criteria	**Assessment**	**Evidence**
Medium-term (6 - 48 months)		
Evidence of reproductive behaviour (e.g., nest-building activity) (10 months post-release).	Successful	This success criterion has been met (DBCA 2024a).

Continued survivorship of founders with grasswrens detected (via sighting (including call broadcast surveys) or recording) at ≥50% of 'territories' established during initial post-release period (12 months post-release).	Successful	WGWs continue to persist on the island as demonstrated by individuals with leg bands being sighted during the 2024 visual/aural walking surveys and captured on remote camera, indicating survival of founders >24 months post release. Based on post-release radio-tracking data, WGWs had initially established at 18 independent locations in the release area. Fourteen independent groups or territories were detected within the survey area in September 2024 meeting the second component of the criterion.
Evidence of successful reproduction (e.g. observations of juveniles or unbanded birds) (13 months post-release).	Successful	This success criterion has been met (DBCA 2024a).
The extent of occurrence of grasswrens continued to expand beyond initial release area (24 months post-release).	TBD	This criterion is still under assessment, but one territory was detected outside the initial release area in 2024 (4 km south) however it is unknown if this is a new territory or just newly detected.

3.2.3 Summary

Most of the short and medium-term success criteria for the western grasswren have now been met except for clear evidence of dispersal away from the release area.

3.3 Greater stick-nest rat

3.3.1 Monitoring

3.3.1.1 Northern airstrip survey and ad hoc observations

A modified replication of the airstrip survey completed in March 2024 (DBCA 2024b) was undertaken in November 2024. East-west transects at 10 m intervals were walked across the entirety of the proposed northern airstrip with the addition of a 10 m buffer around the current footprint to account for exclusion zones identified for active sinkholes (Figure 12). Records were made of GSNR presence (scats, tracks, nest building etc), but results should be considered conservative as a weather event two days prior removed signs of presence.

Approximately 12 ad hoc spotlight surveys have been completed in the last 12 months, with observations taking place between sunset and half an hour after last light. Surveys were completed in all months except January and February by 2-6 people. In addition, a small number (5) of remote cameras were also in place.

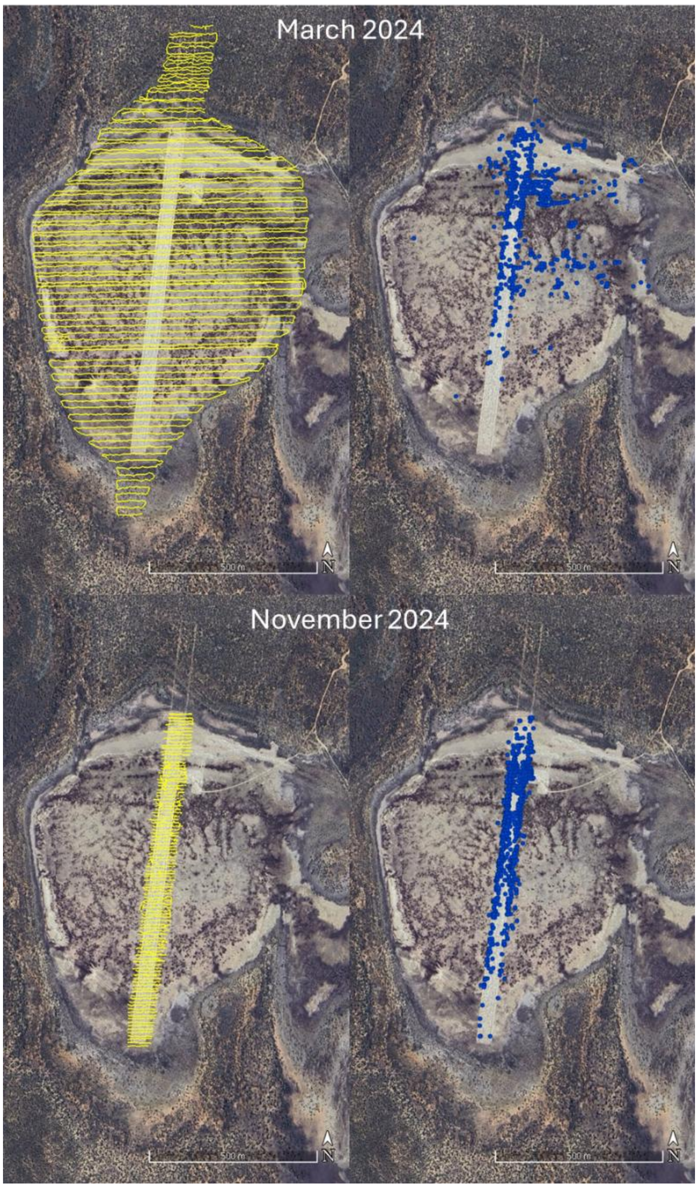

Figure 12 Transects walked (left) surveying the northern airstrip site and detections of GSNR evidence (right).

In total, 803 observations of GSNR sign were recorded across the northern airstrip in the November 2024 survey (Figure 12), 28 of these records included active nests in sinkholes (Figure 13). Multiple GSNR were observed on all occasions when spotlighting was undertaken, and animals were captured on all remote cameras throughout deployment at this site. Images captured included animals of all age categories, confirming persistence and breeding of GSNR.

Figure 13 Examples of GSNR nest building observed in sinkholes of the northern airstrip site in November 2024.

3.3.1.2 Scat DNA trial

As described in DBCA (2024a), a field trial of scat DNA methods was undertaken in May 2024. A 100 x 200 m grid (grid size 20 x 20 m) was searched for scats in the highest activity area identified in March 2024 (Figure 14). Up to three fresh scats were collected from within a one metre radius of each grid point. These scats were then processed using a targeted SNP array to identify unique animals (R. Thavornkanlapachai pers. comm.).

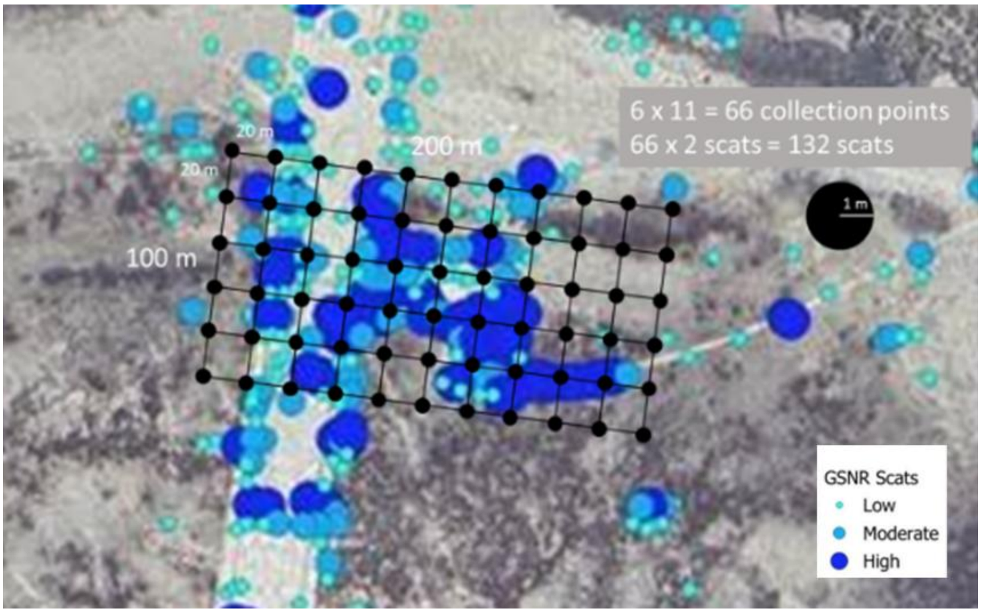

Figure 14 Survey grid searched for the scat DNA trial (black) as informed by GSNR activity levels in March 2024 (blue).

A total of 87 scats were collected with analysis of 76 (after removal of low-quality samples) with 23 individuals detected in the sampling area. Rarefaction analysis estimated up to 29 individuals may be present (R. Thavornkanlapachai pers. comm.). Given the success of the SNP array for identifying individuals from scats, the survey was replicated in May 2025.

3.3.1.3 Island survey

Broader searches continued across the island to try and locate a second (or more) established population of GSNR. Sites targeted in 2025 were those locations where radio-collared animals had previously been detected following release or other ad hoc detections. Forty-four locations were originally identified for the completion of sign surveys (tracks, scats, nesting etc) (Figure 15). Surveys involved two people spending 20 minutes randomly searching the site with any sign of GSNR recorded and fresh scat collected for genetic analysis. In addition, IWS cameras were expected to contribute to the monitoring of GSNR.

Figure 15 Survey sites for GSNR based on historical data. Points in black indicate sites with no sign of GSNR, points in red are those where GSNR were detected.

GSNR were detected at five of 33 sites surveyed between March and June 2025 (Figure 15). One scat was collected near the 2021 release area (Garys Beach) but was old and not useful for DNA extraction. Three locations were within 1 km of the northern airstrip and based on movements observed during the post translocation monitoring, well within a nightly distance moved from the high activity area. The fifth location was approximately 4 km south of the northern airstrip and the only location of the five from this survey likely to be independent of the known population. GSNR were not detected on any IWS cameras.

3.3.2 Success criteria

As GSNR were last translocated in 2022, we provide an assessment of progress towards the long-term success criteria (Table 9) – noting that the medium and short-term success criteria have been largely met (DBCA 2024a).

Table 9 Assessment of success criteria as defined in the GSNR translocation proposal

Criteria	Assessment	Evidence
Long-term (>24 months)		
Population has increased and continued to expand area of occupancy to at least twice that initially occupied by the founder group.	Partially met	The species has dispersed beyond the initial release area and appears to have established in at least one new location since the final release in 2022. The total area of occupancy is difficult to quantify but it appears GSNR have abandoned the initial release area and no new populations have been located in this reporting period. The population at the northern airstrip site is estimated to be at least 23 individuals based on preliminary scat DNA results from the 2024 collection.
F2 (and longer) generation present and reproducing	Successful	Images from the population located at the northern airstrip site regularly include sub-adult and juvenile animals.
Body weight and condition is maintained at levels similar to source populations, > 50% females breeding (as appropriate to prevailing seasonality and variable rainfall).	Partially met	There have been no recent live captures, so data to fully assess this criterion is lacking. However, animals regularly observed at night and captured on camera at the northern airstrip site appear to be in a healthy condition. While breeding has been confirmed at this site (visual encounter and remote camera) the percentage of females breeding could not be quantified.
Population persists and recovers their area of occupancy and density after a first drought cycle	Successful	Known area of occupancy (northern airstrip) has been maintained through the 2023 drought cycle. The population persisted during this period, with breeding evident during a period of record high temperatures.
Genetic variability (allelic richness and heterozygosity) maintained at ≥90% of released individuals at five to 10 years post-release (alternative criteria may be developed based upon deviations of genetic diversity from a mean value)	TBD	Still to be determined. Due to the limited number of live captures for this species, few tissue samples are available for analyses. This criterion may need to be assessed from scat samples (genetic analysis underway).

3.3.3 Summary

Progress towards the long-term criteria has been made, facilitated by the results of the scat DNA monitoring, with an estimate of ~29 individuals at the northern airstrip site. Despite being sensitive to drought conditions, the population at this site persisted (and reproduced) throughout the hot and dry conditions experienced over the last summer period, highlighting the importance of this area in providing suitable refuges via sink holes. Ongoing scat DNA analyses will help to quantify the criteria related to breeding success should animals persist at this site.

3.4 Shark Bay mouse

3.4.1 Monitoring

3.4.1.1 Trapping

Trapping targeting SBM was undertaken in the 2021 release area, utilising the same trapping array described in Cowan et al. (2022). Two Elliott traps were set with universal bait at each of the 60 trap sites and opened for four consecutive nights. SBM were processed following normal protocols however they were not PIT tagged due to previous welfare concerns regarding the resulting stress exhibited by some individuals. Instead, animals were temporarily marked on their tails using xylene-free coloured marker, each being allocated a unique colour combination for individual identification (Figure 16).

In addition, SBM were also captured during the targeted dibbler trapping undertaken in Herald Bay (Section 3.5.1.1). SBM were processed and marked as per protocols used at the 2021 release area.

Figure 16 Example of temporary tail markings used to identify individual SBM as an alternative to PIT tags.

Captures of SBM increased substantially at both the 2021 release area (Tetradon Loop) and Herald Bay in comparison to previous trapping sessions at the same locations (**Error! Reference source not found.**). All animals caught at both sites were new, with 113 individuals captured at Tetradon Loop and 54 individuals captured at Herald Bay – a substantial increase from the 10 individuals caught 12 months earlier at the same location. The temporary tail marking proved to be sufficient for the four days it was required to be visible, and no reports of stress or adverse events came about as a result, achieving the intended outcome in the change of marking methods.

Table 10 Trapping effort and capture success for SBM at the two sites monitored in 2025

Trapping period	**SBM 2021 release area/ Tetradon Loop**	**Dibbler release area/Herald Bay**
Autumn 2025	113 individuals from 144 captures (120 traps over four nights)	54 individuals from 77 captures (240 traps over four nights)
Autumn 2024	n/a	10 individuals from 11 captures (120 traps over three nights)
Autumn 2022	40 individuals from 53 captures (120 traps over three nights)	n/a

3.4.1.2 Cameras

No cameras were allocated to the targeted monitoring of SBM over the 2024-2025 reporting period. However, cameras allocated to the IWS monitoring were expected to contribute to the monitoring of SBM.

Shark bay mice were detected on 25 of the 120 IWS cameras. While the majority (22) of these detections were in the southern third of the island, animals are now being detected in the northern half of the island as well (Figure 17).

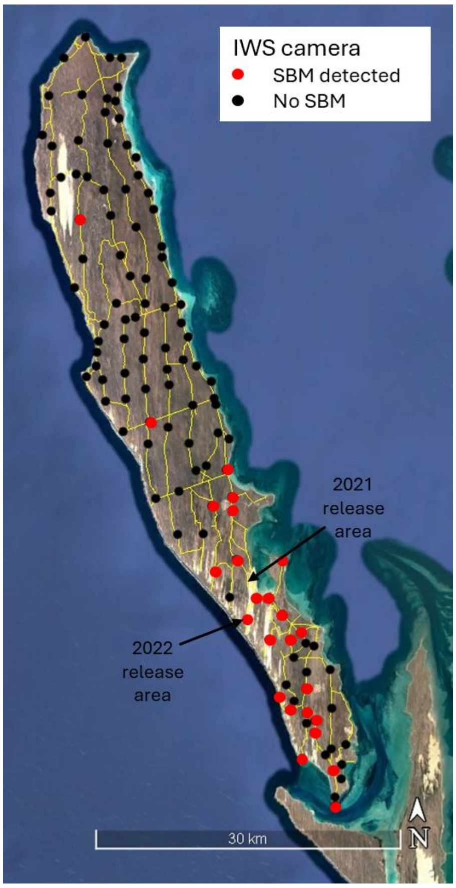

Figure 17 IWS camera array with detections of SBM during the 2024-2025 reporting period indicated in red.

3.4.2 Success criteria

As SBM were last translocated in 2022, we provide an assessment of progress towards the long-term success criteria (Table 11) – noting that the medium and short-term success criteria have been met (DBCA 2024a).

Table 11 Assessment of success criteria as defined in the SBM translocation proposal

Criteria	**Assessment**	**Evidence**
Long-term (>24 months)		
Population has continued to expand area of occupancy to at least twice that initially occupied by the founder group (as confirmed through increased number of sites with positive detections) and monitoring indicates increase in population size.	Successful	SBMs captured in the Tetradon Loop monitoring area included 113 new individuals from 144 captures. SBMs were also caught in large numbers at Herald Bay. In addition to camera detections across the southern half of the island, ad hoc sightings of SBMs also extend over 5 km west of Herald Bay. In the last 12 months, animals have been seen with increasing frequency around the Herald Bay camp and northern airstrip site.

		SBMs continue to be detected within and away from the release area, demonstrating that this success criterion has been met.
F2 (and longer) generation present and reproducing.	Successful	No recaptures from previous trapping sessions were caught in 2025, indicating all animals were born on DHI. Given the short lifespan of SBM and that F1 individuals were captured within six months of initial release, it can be presumed that the ongoing persistence after four years means the presence of animals of F2 generation or longer.
Genetic variability (allelic richness and heterozygosity) maintained at >90% of released individuals at 5- and 10-years post-release.	Successful	Heterozygosity and allelic richness of DHI individuals increased across survey years (2021 – 2023), most likely as a result of increasing admixture between the two founder source populations.
Population persists and recovers their area of occupancy and relative activity or relative abundance after a first drought cycle.	Successful	SBM have clearly persisted following their first drought cycle and based on the substantial increase in captures at Herald Bay and ongoing sightings inland and north of this area, the area of occupancy has expanded over this time.

3.4.3 Summary

All the long-term criteria have been met, with ongoing increasing population size at monitoring sites and detections at multiple locations away from the release area, indicating population expansion. Initial analyses have indicated an increase in genetic diversity in the DHI population, likely due to admixture between animals from the two genetically differentiated source populations. The 2023/24 drought cycle does not appear to have impacted the species.

3.5 Dibbler

3.5.1 Monitoring

3.5.1.1 Trapping

Targeted trapping of dibblers was undertaken over four nights in May 2025, using the same trap array used to target SBB in May 2024. Two Elliott traps were set at 120 trap sites on a 50 m grid in the foredune habitat of Herald Bay. Traps were baited with universal bait, but as per methods in 2024, sardines were substituted with cat kibble (Hills Senior vitality) following feed trials undertaken at Perth Zoo. Dibblers were processed as per standard protocols.

Two female dibblers were captured in May 2025, one founder released as a sub-adult in 2023 and one island born animal. Both animals were in good condition, and both were carrying pouch young. The 2023 founder had a full complement of pouch young (8), while the DHI recruit was carrying three pouch young.

3.5.1.2 Cameras

The 20 remote cameras set up for the 2023 dibbler release remain in place (Figure 18). These units are targeted on nest boxes that animals were released from which all remained in situ following the releases of animals. Cameras allocated to the IWS monitoring were also expected to contribute to the monitoring of dibblers.

Dibblers were captured on 11 remote cameras in the Herald Bay area in the last 12 months (Figure 18). These images included the capture of a female animal (with an obviously full pouch) collecting nesting material from the release boxes and at least one subadult animal a few months later (Figure 19).

No dibblers were detected on the IWS cameras.

3.5.1.3 Wildtrack scanners

The 16 units deployed and working in Herald Bay as of June 2024 remained in place, with an additional 22 units deployed in October 2024 (Figure 18). Units were primarily targeting release sites with the scanning component of the units placed at the entrance of nest boxes that had remained in situ from the 2023 release.

One dibbler was detected on a Wildtrack scanner in the last 12 months. This animal was the same founder female caught during the trapping program undertaken in May 2025. While the Wildtrack scanners have been a useful tool in monitoring the released cohort, the effectiveness of these units will decrease over time as the proportion of the dibbler population PIT tagged will also naturally decrease due to the short lifespan of this species and the low capture rates.

3.5.1.4 eDNA trial

Due to the low detection rates of dibblers and the need to begin development and inclusion of long-term, low effort monitoring programs, a trial collection of eDNA (environmental DNA) targeting dibblers was undertaken in May 2025. Three sampling methods were trialled: air filters, swabs of vegetation and collection of spiders webs. Results from this trial will be reported on once samples have been processed.

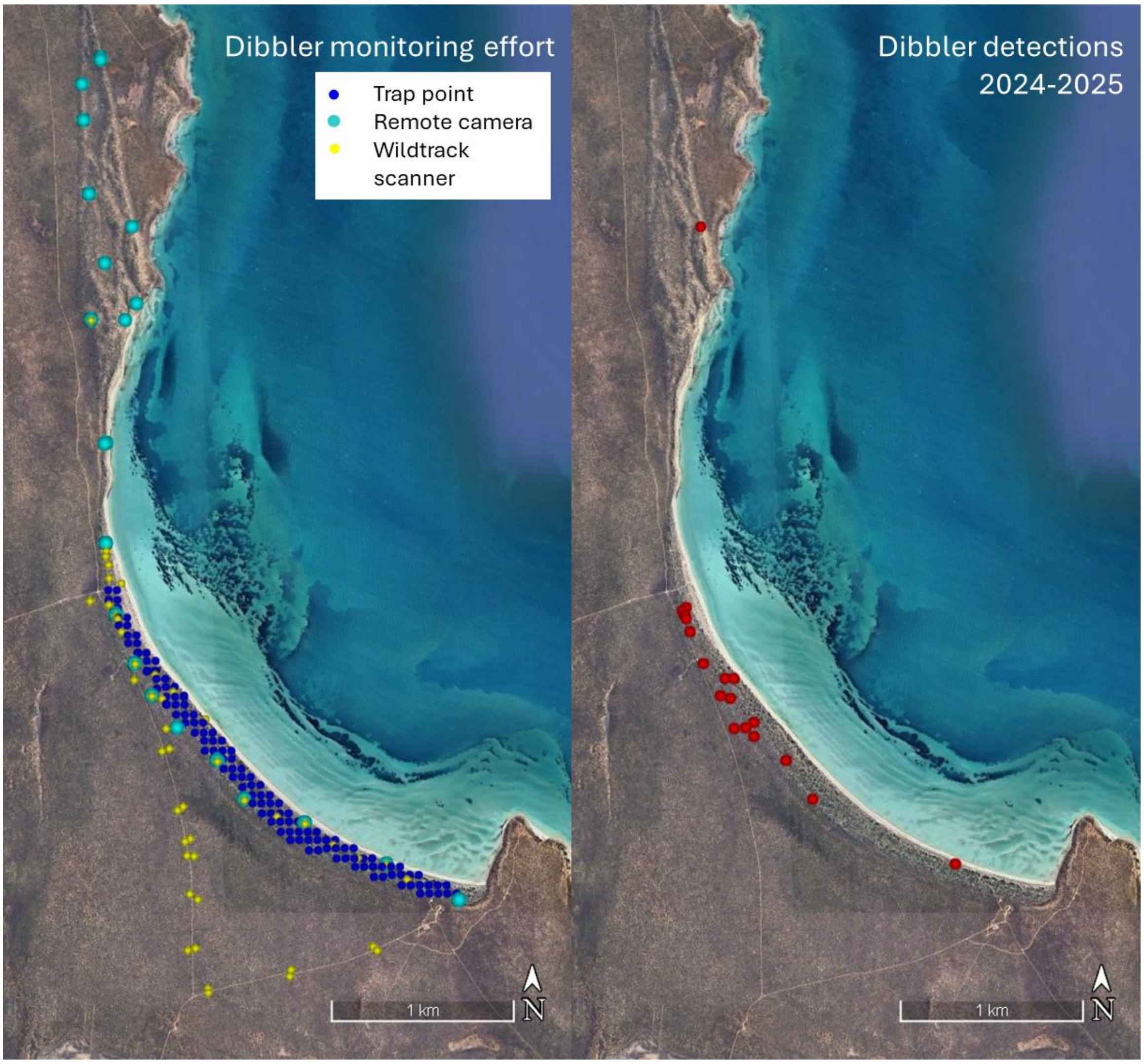

Figure 18 Locations of trap sites, remote cameras and Wildtrack PIT tag scanners used in targeted monitoring of dibblers during the 2024-2025 reporting period on the left. Locations where dibblers were detected during the same period on the right.

Figure 19 Dibbler reproductive behaviour caught on camera; top left female with bulging pouch, bottom left female collecting nesting material, top and bottom right juvenile dibbler.

3.5.2 Success criteria

As dibblers were last translocated in 2023, we provide an assessment of progress towards the medium-term success criteria (Table 12) – noting that most of the short-term success criteria have been met (DBCA 2024a).

Table 12 Assessment of success criteria as defined in the dibbler translocation proposal

Criteria	**Measure of success** **(Triggers for action and/or review)**	**Success**	**Evidence**
Medium-term: 13 - 36 months post-release			
Animals persist on island 36 months since first release.	Founder individuals captured up to 24 months post-release.	Successful	One founder individual was captured this reporting period within 24 months of release in 2023 (18 months).
	Naïve occupancy at lured camera and soft-release/nest-box sites increases.	Partially met	Naïve occupancy appears to be consistent with observations from 2023-2024, despite lacking the artificial addition of animals to the population through a release event.

Criteria	Measure of success (Triggers for action and/or review)	Success	Evidence
	Founder animals maintain health and condition.	Successful	Founders that have been recaptured following release have been in good condition, as indicated by weights and the capacity to produce offspring.
	Body weight and condition maintained within variation observed in initial release data and taking climatic variation into account.	Successful	Animals that have been captured have fallen within the weight range of animals at the time of release.
Successful reproduction and population recruitment	≥50% of trapped females with pouch young at 19 months and 31 months after first release.	Successful	Two females were captured in May 2025, both animals had pouch young.
	Island-born juveniles (F1) trapped by 36 months successful reproduction and population recruitment.	Successful	One new recruit adult female (at least F1) was captured in May 2025, with pouch young. This is the second confirmed F1+ adult female recorded.
Population expansion	Extent of occurrence increases between 12 and 36 months based on trapping/camera trap data.	TBD	This success criterion is still to be determined; no positive detections of dibblers have been recorded beyond Herald Bay thus far.

3.5.3 Summary

While monitoring results further confirm the persistence and breeding of dibblers on the island, many of the success criteria remain difficult to assess. Dibblers continue to be detected in their general release area, both on camera and via Wildtrack scanners, but evidence of dispersal is currently lacking.

3.6 Shark Bay bandicoot

3.6.1 Monitoring

3.6.1.1 Trapping

Trapping was undertaken in the Herald Bay SBB monitoring area in May 2025 (see Section 3.4.1.1), with four nights of trapping completed (compared to only three in 2024). As this was primarily targeting dibblers, no cage traps were used, but the use of Elliott traps was successful for this species. SBBs were also trapped during other monitoring sessions targeting BTM, SBM and BTB (see above). As this monitoring was outside the SBB monitoring area no animals were PIT tagged but were otherwise processed as per normal protocols.

From 122 captures of SBBs in the Herald Bay monitoring area, 43 of 62 individuals were new animals. An additional 55 captures occurred while trapping took place targeting other species, contributing to overall information regarding health and condition of the species. Average weight of adult animals (186.9g) is consistent with average weights from the previous two years, down from averages observed prior to the 2023 drought (**Error! Reference source not found.**). Observed body condition scores also followed this trend, averaging 2.3 in 2025 out of a possible score of five. No females caught in 2025 were in breeding condition, consistent with other parameters. By comparison, 50 and 32 percent of females caught in 2021 and 2022, respectively, had pouch young.

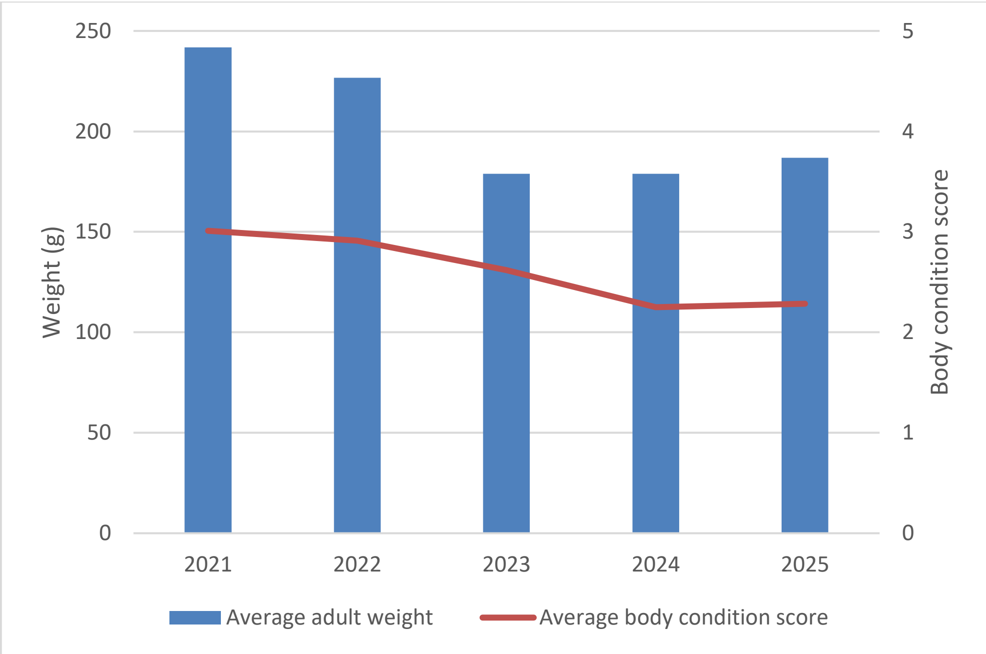

Figure 20 Average weight and body condition of SBB caught each year since translocations ceased. Both measures decreased in response to the 2023 drought conditions but have since stabilised.

3.6.1.2 Cameras

No cameras were allocated to targeted monitoring of SBB over the 2024-2025 reporting period. However, cameras allocated to the IWS monitoring were expected to contribute to the monitoring of SBB. Shark Bay bandicoots were detected on 89 of the 120 cameras allocated to the IWS. SBB were detected right across the island (Figure 21).

Figure 21 IWS camera array with detections of SBB during the 2024-2025 reporting period indicated in red.

3.6.2 Success criteria

As SBB were last translocated in 2020, an assessment of progress towards the long-term success criteria is presented in Table 13 – noting the short- and medium-term success criteria have all been met (DBCA 2024a).

Table 13 Assessment of success criteria as defined in the SBB translocation proposal

Criteria	**Assessment**	**Evidence**
Long-term (24 - 120 months)		
Population has increased and continued to expand area of occupancy to at least twice that initially occupied by the founder group and up to 25% of suitable habitat south of the management fence.	Successful	SBBs captured in the Herald Bay monitoring area included 43 new individuals from 122 captures. SBBs were also captured between Louisa Bay and Tetradon Loop when completing woylie collar checks, SBM monitoring and BTM monitoring. In addition to camera detections across most of the island, ad hoc sightings and evidence (tracks

Criteria	Assessment	Evidence
Long-term (24 - 120 months)		
		and roadkills) of SBBs also extend as far north as Cape Inscription and south to Cape Ransonnet. SBBs are consistently detected within and away from the release area, demonstrating that this success criterion has been met.
F2 (and longer) generation present and reproducing.	Successful	This success criterion has been met as there are many animals now on the island, far more than the original number translocated.
Body weight and condition is maintained at levels like source populations, >50% females breeding (as appropriate to prevailing seasonality and variable rainfall).	Successful	Body weights remained lower in 2025 than previous years, however this is indicative of lower rainfall years and consistent with observations from Bernier and Dorre islands (C. Simms pers. comm.). While no females were recorded in breeding condition the presence of new individuals in the population confirms breeding having occurred in the last 12 months.
Genetic variability (allelic richness and heterozygosity) maintained at >85% of released individuals at five- and 10-years post-release (alternative criteria may be developed based on deviations of genetic diversity from a mean value).	Successful	Heterozygosity and allelic richness of DHI individuals increased across survey years (2021 – 2024) as a result of admixture between the two founder source populations.
Population persists and recovers their area of occupancy and density after a first ‘drought’ cycle.	Successful	Population has persisted, increased in distribution and increased (based on captures in trapping areas) since the 2023-2024 drought cycle.

3.6.3 Summary

With all success criteria met, including the retention of genetic diversity, Shark Bay bandicoots appear to be establishing well on the island. They have also retained/re-established their area of occupancy after the drought conditions of 2023.

3.7 Hare-wallabies

3.7.1 Monitoring

No targeted monitoring was undertaken in 2024-2025 for either hare-wallaby species. However, the IWS camera array was expected to contribute to the monitoring of both species.

Rufous hare-wallabies were detected at 46 IWS cameras during this reporting period, while banded hare-wallabies were detected at 12. In comparison to previous camera detections (Figure 22) it appears that both species are maintaining their distribution in the southern half of the island while continuing to expand further north.

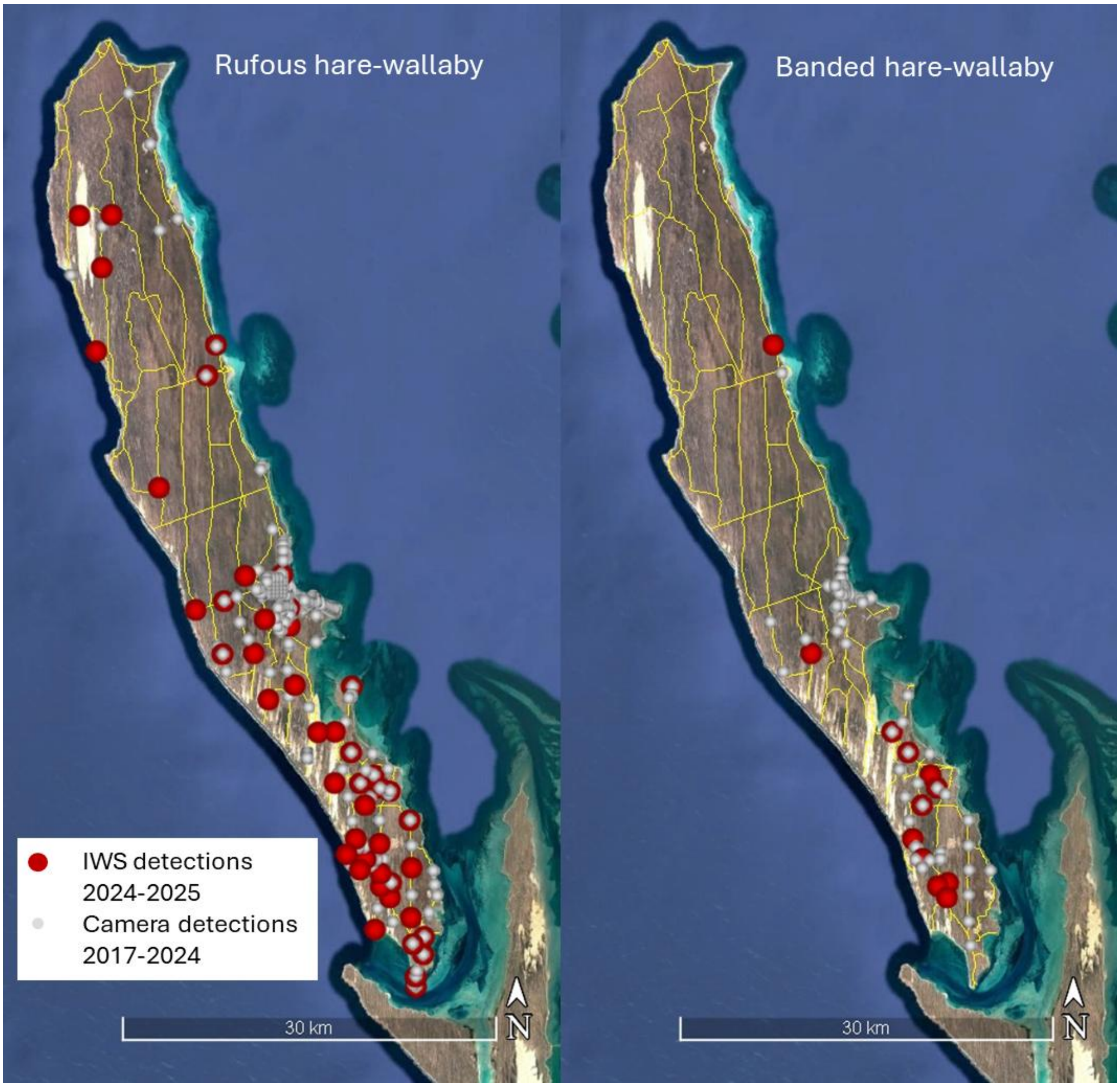

Figure 22 Locations hare-wallabies have been detected on camera since initial release in 2017. Detections from this reporting period indicated in red, those prior to July 2024 indicated in grey.

3.7.2 Success criteria

3.7.2.1 Rufous hare-wallaby

As rufous hare-wallabies (RHW) were last translocated in 2019, an assessment of progress towards the long-term success criteria is presented (Table 14) – noting the short- and medium-term success criteria have all been met (DBCA 2024a).

Table 14 Assessment of success criteria as defined in the RHW translocation proposal

Criteria **Long-term (3-10 years post last translocation)**	**Assessment**	**Evidence**
Population size improved from initial release and area of occupancy expanded.	Successful	Based on ad hoc observation, scat DNA analyses, camera imagery and roadkill reports, RHW detections now span the whole island indicating that this criterion has been met. Animals are continuing to disperse and occupy new areas of the island. Mark-recapture analysis from scat surveys at three survey sites estimates the population size at 2421 ± 521 individuals (95% CI 1588 – 3691) in 2023.
Health and condition maintained providing non-drought conditions experienced.	Successful	Based upon photographic evidence from remote cameras, condition of road kills and ad hoc observations of animals at night, the animals appear in good condition. This is supported by continuation of breeding (informed by the same observations described above).
Evidence of F2 (and longer) generations, at least 50% of females breeding (depending on climatic conditions).	Successful	Given the expansion of this species across the island and the ongoing observations of breeding, F2 and/or above generations are clearly present. F2/later generation hybrids have been confirmed via genetic analysis from the scat surveys.
Population recovers area of occupancy and density after first drought cycle.	Successful	Distribution of RHW across DHI based on camera imagery appears to be similar before and after the drought phase experienced in 2023.
Genetic variability is maintained at ≥90% of allelic diversity and heterozygosity of released individuals.	Successful	Heterozygosity and allelic diversity have increased in the DHI population relative to founders as a result of admixture between the two founder source populations.

3.7.2.2 Banded hare-wallaby

As banded hare-wallabies (BHW) were last translocated in 2018, an assessment of progress towards the long-term success criteria is presented (Table 15) – noting the short- and medium-term success criteria have all been met (DBCA 2024a).

Table 15 Assessment of success criteria as defined in the BHW translocation proposal

Criteria **Long-term (37-120 months post last translocation)**	**Assessment**	**Evidence**
Population has increased and expanded area of occupancy.	Successful	BHWs have now been detected as far north as Sandy Point indicating that their distribution across the island increased since release. Mark-recapture analysis from scat surveys at three survey sites estimates the population size at 486 ± 186 individuals (95% CI 229 – 1029) in 2023.

Criteria	Assessment	Evidence
Long-term (37-120 months post last translocation)		
Body weight and condition maintained, >50% females breeding.	Successful	Based upon photographic evidence from remote cameras and the condition of three road-killed animals this reporting period, the animals appear in good condition. This is supported by animals presumably continuing to breed, hence ongoing increases of distribution across the island.
Evidence of F2 (and longer) generations.	Successful	Based upon the available information, there are likely to be more BHWs on the island than released up to 5 years ago, indicating that there are at least F2 generations. F2/later generation hybrids have been confirmed via genetic analysis from the scat surveys.
Population recovers area of occupancy and density after the first drought cycle.	Successful	Distribution of BHW across DHI based on camera imagery appears to be similar before and after the drought phase experienced in 2023.
Genetic variability is maintained at ≥90% of allelic diversity and heterozygosity of released individuals 5 to 10 years post release.	Successful	Heterozygosity and allelic diversity have increased in the DHI population relative to founders as a result of admixture between the two founder source populations.

3.7.3 Summary

Both hare-wallaby species have met all their success criteria and appear to be establishing well on the island, gradually expanding their distribution to the north of the island.

4 Extant small vertebrate fauna

The extant fauna on DHI continues to be monitored regularly in spring and aims to investigate the long-term trends across a range of taxa following the eradication of introduced species, the restoration of previously extinct species and the introduction of new species. Baseline data prior to both programs was collected and provides an assessment of the potential impact of the eradication and restoration programs. Trapping methodology is provided in Cowen et al. (2020) with the exception that Elliott trapping was not included in 2024. This decision was made because this method is only effective for rodent species for which monitoring data is sufficiently captured elsewhere.

From 1120 trap nights, 381 unique individuals (from 400 captures) were recorded during the seven-day survey period in October 2024. Five mammal species and 30 reptile species were identified (Appendix 2). Skinks represented the highest proportion (51%) of reptile species caught, followed by geckos (27%). The largest percentage of total mammal captures was ash-grey mice (*Pseudomys albocinereus*;

32%) followed by the sandy inland mouse (*Pseudomys hermannsburgensis*; 29%). A Shark Bay bandicoot was also caught in a funnel trap.

Discounting captures from Elliott and funnel traps in previous years, the number of individual animals of all mammal species declined from 2022 to 2024 (529 c.f. 143), particularly sandy inland mice and ash-grey mice (Figure 23), which is likely to be due to the drought conditions in 2023. These observations are consistent with changes in rodent capture rates observed during other trapping sessions through the same period. Interestingly, the overall number of reptile individuals increased from 197 to 239 (Figure 24), but it was variable for individual species with some geckoes and dragons noticeably declining (e.g. *Strophurus spinigerus* and *Ctenophorous maculatus*, Figure 25).

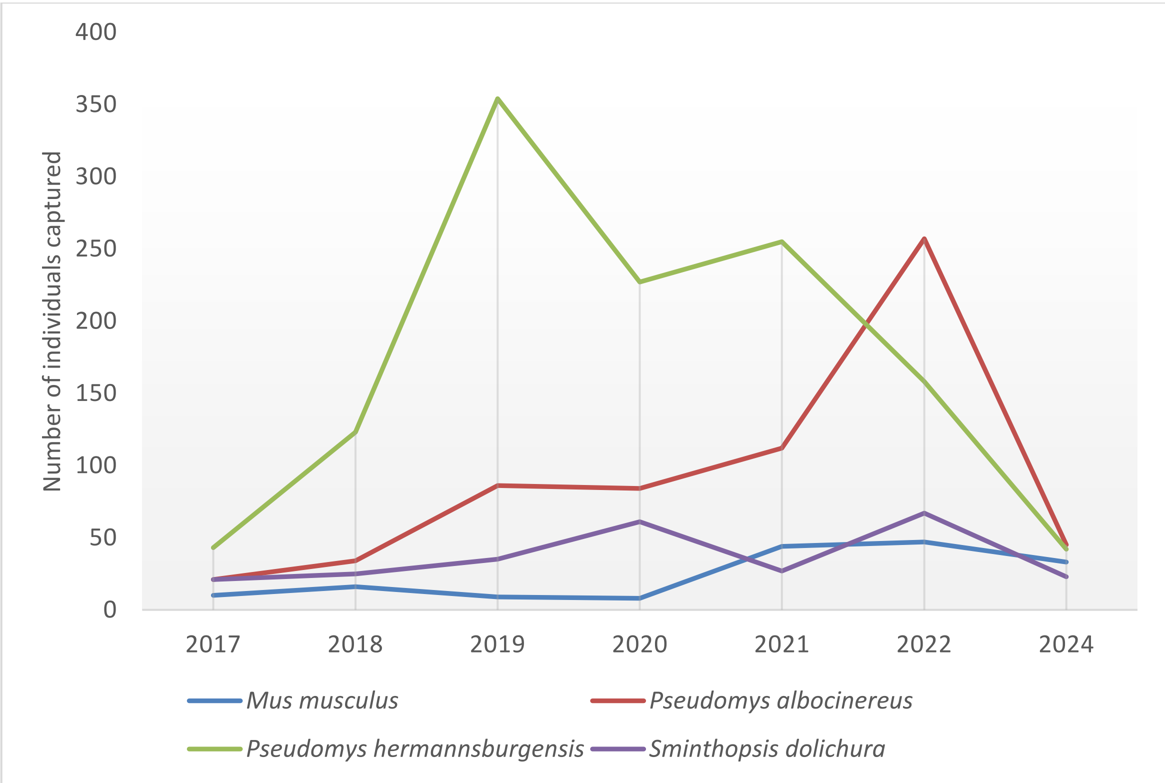

Figure 23 Number of individuals per mammal species captured in spring each year from 2017-24.

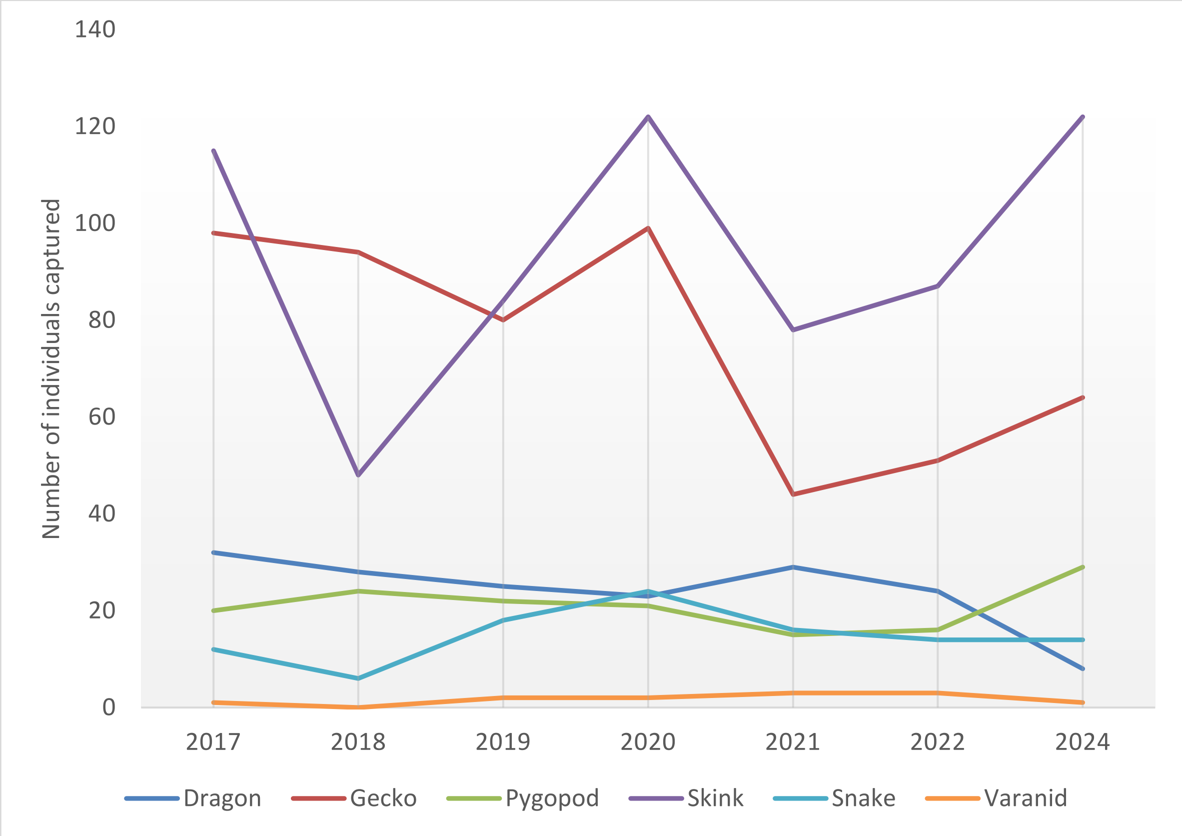

Figure 24 Number of individuals per reptile group captured in spring each year from 2017-24.

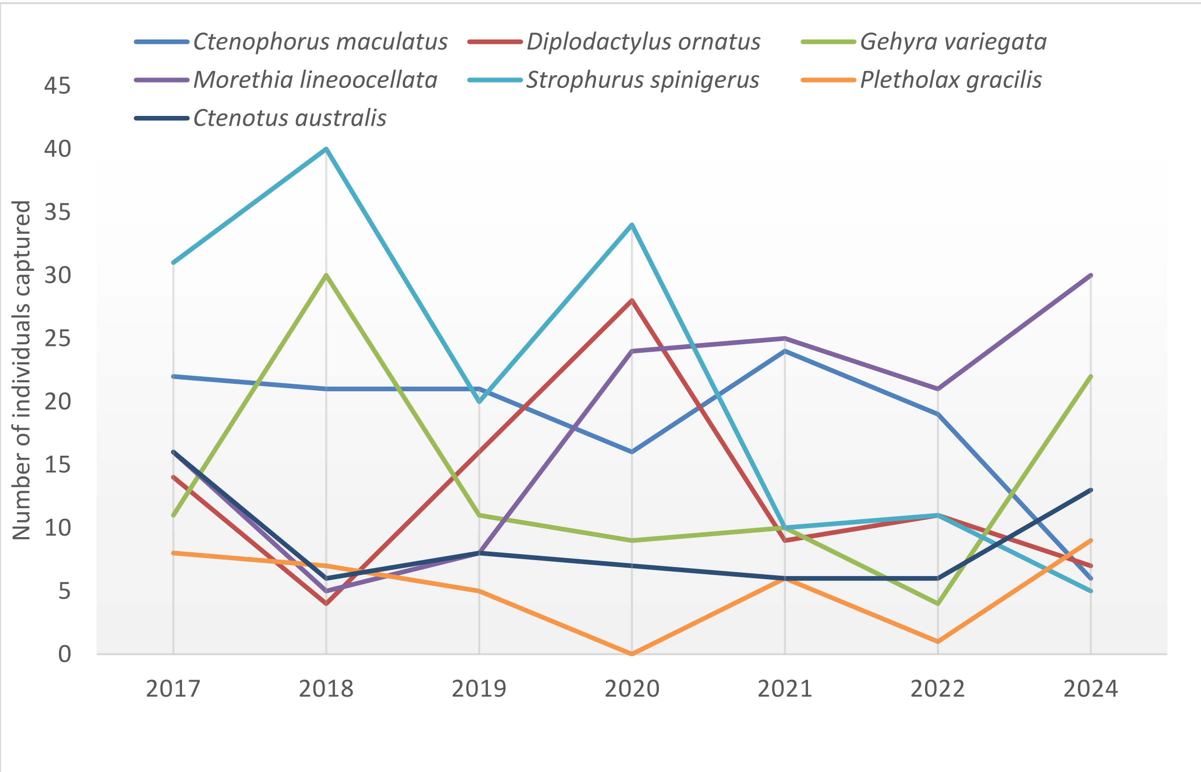

Figure 25 Number of individuals per reptile species captured in spring each year from 2017-24.

5 General conclusions

As for previous years, the results for the 2024 to 2025 period were mostly positive, with translocated populations persisting through drought conditions. There was a decline in other small native mammal captures over this period, but a general increase in reptile captures. Progress towards meeting the success criteria of translocation proposals continued, with some species now detected widely on the island, and reproduction evident for almost all species. Initial results of the woylie translocations were unexpected, but the species since appears to be adjusting to its new environment. Dibblers remain challenging to monitor with very low capture rates. Even so, every female captured over multiple years has had pouch young. It is expected that as the populations grow, the island-wide camera system will yield a better understanding of the dispersal and expansion of species' distributions across the island.

6 Planning for 2025-2026

An initial translocation of boodies is proposed for spring 2026, allowing woylies more time to establish on the island. Monitoring of translocated species to the island will continue either by targeted survey or by the island-wide camera system. Investigation of eDNA as a potential tool for detecting dibblers and potentially other species will continue. Genetic diversity assessments of targeted species (e.g. SBM and SBB) will be continued as will further development of the faecal DNA approach to estimate density of greater stick-nest rats.

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Appendices

Appendix 1: Methodological details for 2024 WGW survey

Occupancy survey

A total of 53 (600 m long) east to west running transects were placed in and around the area where the grasswrens were released in 2022 and were surveyed in 2023 (27th September to 6th October) and 2024 (3rd to 12th September). Each transect was randomly assigned to one of three effort categories: ‘Low’, ‘Moderate’, and ‘High’. Low effort transects had three stop points (300 m apart), Moderate effort transects had four stop points (200 m apart) and High effort transects had seven stop points (100 m apart). Each transect was separated in an east to west direction by a minimum of 300 m and in a north to south direction by 400 m. Stop points were set up for each effort category. Two surveyors (with a minimum of one experienced participant) walked along a given transect looking and listening for grasswrens. At each stop point one of three pre-recorded four-and-a-half-minute call sequences were played on a mobile phone connected to an Ultimate ears Wonderboom 3 Bluetooth speaker. Each sequence consisted of two minutes of silence followed by three 20 second sets of call playback each followed by 30 seconds of silence. If grasswrens were observed, the call sequence was ceased, and birds were observed passively for a period of up to 10 minutes to gather data on induvial numbers, status and location in relation to the survey point (for the purposes of identifying independent territories). In 2023, some sites were not surveyed (n=11), but the remaining were surveyed either once only (n = 14), twice (n=10) or thrice (n=8). In 2024, nine sites weren’t surveyed, but 12 were surveyed once, 14 twice, 11 thrice, five sites were surveyed four times, and one site was surveyed 5 times and another 6 times.

Statistical analysis

Three key covariates were modelled on detection: survey effort (as a random variable), time of survey (AM or PM), and average daily wind speed. Three covariates were modelled on occupancy, survey year, normalised difference vegetation index (NDVI) and the quadratic of NDVI. The covariates can be interpreted as follows:

- Survey effort = a random variable expressing the categories: ‘Low’, ‘Moderate’, and ‘High’.
- AM = a binary variable depicting whether the survey was run in the morning (‘1’; between 06:21 and 11:18 AWST) or not (‘0’; i.e., between 14:53 and 17:38 AWST).
- Average daily wind speed = average daily wind speed (km/h) measured from an Environdata weather station located on the island.

NDVI (NIR-Red)/(NIR+Red) = A standard satellite image-based vegetation index that quantifies the level of 'green' vegetation (Kriegler et al. 1969). We used NDVI as a proxy for vegetation coverage/density. The index normalises the amount of green leaf scattering in the Near Infra-red (NIR) wavelengths. Broadly, NDVI varies from -1 to 1, whereby negative values indicate high moisture and/or open water. Values closer to zero typically indicate clearer areas (e.g., rock, sand). Lower positive values (≈ 0.2 to 0.4) are usually indicative of shrubs and grasslands, while higher positive values are normally associated with heavy vegetation coverage. We used Sentinel 2 satellite-based information (freely available and kindly provided by the U.S. Geological Survey) to quantify median NDVI within an area defined by a 50 m buffer around each transect (Figure 1). We chose a 50-metre buffer as that distance captured the typical maximum distance over which a bird was seen or heard. For the analysis, mean NDVI estimates were calculated over each 50-metre buffer area (≈ 7ha). In 2023, the satellite image was captured on the 4th October and on the 24th September — dates that correspond to when the actual surveys were conducted. The Sentinel 2 information was processed within QGIS (QGIS Development Team 2009) making particular use of the Semi-Automatic Classification plugin (Congedo 2021) and the 'Zonal Statistics' function.

The survey data was analysed within the spOccupancy package (Doser et al. 2021) launched within the R software environment (R Core Team 2013). Given the nature of the data (repeat secondary surveys within a single primary period), multiple-season single-species spatial occupancy modelling was applied (Doser et al. 2021). We first compared a full covariate model with each of three different spatial covariance models: exponential, spherical, and gaussian. We then used models with the most supported spatial covariance model and compared different covariate combinations in the process models — different combinations of the NDVI covariate (no covariate, NDVI, and NDVI + NDVI^2). The quadratic model was used to assess the possibility of a non-linear effect of vegetation coverage (i.e., birds are more likely to occupy areas with intermediate vegetation coverage). All of these models included the three detection covariates. NDVI was standardised to have a mean of zero and SD of 1 in all models. Model-covariate combinations were compared with the Watanabe-Akaike information criterion (WAIC; Watanabe and Opper 2010), with smaller WAIC values indicating greater support. We then compared different combinations of covariates on the observation model (with the most supported version of the process model) again using WAIC. We used the most supported model for final assessment.

The technical details for multi-season spatial occupancy models and their application in spOccupancy are described in detail by Doser and Kéry (2022). We used the initial values and priors recommended by Doser and Kéry and all models were run with ar1 set to 'TRUE' and n.neighbors set to '15'.

A typical model performance and fit assessment process, as described by Doser et al. (2022), was followed which included:

1) visually assessing parameter convergence,
2) using the R-hat statistic (Kéry and Royle, 2016) to further assess parameter convergence, and
3) using the 'ppcOcc' function in spOccupancy to assess model goodness-of-fit with Bayesian-p values (Kéry and Royle, 2016). This process was run for the most preferred model. Both 'chi-squared' and 'freeman-tukey' posterior predictive checks were made for group 1 and group 2 levels.

R-hat estimates less than 1.1 indicate convergence and Bayesian-p values close to 0.5 indicate excellent model fit (Kéry and Royle, 2016).

Incidental surveys

Ten incidental surveys were conducted in both 2023 and 2024 by experienced surveyors to collect additional more detailed information on sex, filial status, and age (adult/juvenile). The surveyors travelled to spots points where grasswrens were sighted recorded during the occupancy surveys, likely habitat or had been detected using other methods (e.g., remote cameras) and spent time looking for 'following' birds after which information on group size, colour band combination, sex and age was collected.

Statistical results for occupancy survey

All models converged well (R-hat estimates less than 1.1). Grasswrens were detected at 11 of the 42 sites surveyed in 2023 (26%) and 10 of the 44 sites surveyed in 2024 (23%). The model with the Gaussian covariance function was most supported and as such was used for all further modelling. Both the full model and the most supported model were a good fit to the data.

The observation model with no covariates was most supported, followed by the model with the AM covariate. There was little difference in WAIC values for the process models indicating some level of support for including NDVI and its quadratic term. Based upon the mean estimate and associated 95% Credible Intervals (-1.0 [-2.77 to 0.65] and -1.06 [-2.75 to 0.42], respectively; Table A.1) for parameters in the full model, we can see that NDVI, and its quadratic term had a negative relationship with the probability of occupancy that only just included zero, suggesting it is reasonable to infer a negative relationship between occupancy and vegetation cover. Surveying in the morning (0.70 (-0.50 to 1.94)) could also be reasonably inferred to have a positive effect on probability of detection (Table A.1). The other detection covariates were much more equivocal (Table A.1), with little support for a strong effect of survey effort. Occupancy was predicted to be slightly lower in 2024 when compared to 2023.

Table A.1: Assessment results for the full occupancy model.

Occurrence (logit scale)	Mean	SD	2.5%	50%	97.5%	Rhat
(Intercept)	-0.97	1.07	-3.19	-0.95	1.09	1.00
scale(Primary)	-0.61	0.77	-2.19	-0.59	0.85	1.00
scale(NDVI)	-0.99	0.86	-2.77	-0.96	0.65	1.00
scale(NDVI)^2)	-1.06	0.81	-2.74	-1.02	0.42	1.00
Detection (logit scale)	**Mean**	**SD**	**2.50%**	**50%**	**97.50%**	**Rhat**
(Intercept)	-0.49	0.70	-1.85	-0.50	0.90	1.00
AM	0.69	0.62	-0.49	0.69	1.93	1.00
scale(Wind)	0.06	0.28	-0.47	0.05	0.61	1.00
Detection Random Effect Variances (logit scale)	**Mean**	**SD**	**2.50%**	**50%**	**97.50%**	**Rhat**
Effort	1.06	5.96	0.04	0.31	5.81	1.04
Spatio-temporal Covariance	**Mean**	**SD**	**2.50%**	**50%**	**97.50%**	**Rhat**
sigma.sq	11.93	17.65	1.25	7.30	49.10	1.05
phi	0.00	0.00	0.00	0.00	0.00	1.03
sigma.sq.t	0.47	0.72	0.09	0.29	1.94	1.00
rho	0.01	0.58	-0.95	0.01	0.95	1.00

Appendix 2: Species list for small vertebrate trapping in October 2024

Family	Species	Individual captures
Agamidae (dragon)	*Ctenophorus butlerorum*	2
	Ctenophorus maculatus	6
Carphodactylidae (gecko)	*Nephrurus levis*	19
	Underwoodisaurus milii	2
Dasyuridae (mammal)	*Sminthopsis dolichura*	23
Diplodactylidae (gecko)	*Crenadactylus ocellatus*	5
	Diplodactylus ornatus	7
	Strophurus spinigerus	5
Elapidae (snake)	*Brachyurophis fasciolatus*	1
	Demansia reticulata	1
	Pseudechis australis	1
	Simoselaps littoralis	11
Gekkonidae (gecko)	*Gehyra variegata*	22
	Heteronotia binoei	4
Muridae (mammal)	*Mus musculus*	33
	Pseudomys albocinereus	45
	Pseudomys hermannsburgensis	42
Peramelidae (mammal)	*Perameles bougainville*	1
Pygopodidae (pygopod)	*Aprasia haroldi*	15
	Delma butleri	2
	Lialis burtonis	1
	Pletholax edelensis	9
Scincidae (skink)	*Ctenotus australis*	13
	Ctenotus fallens	6
	Cyclodomorphus celatus	1
	Gehyra variegata	1
	Lerista elegans	26
	Lerista lineopunctulata	5
	Lerista planiventralis	9
	Lerista praepedita	22
	Lerista varia	8
	Liopholis multiscutata	1
	Menetia greyii	1
	Morethia lineoocellata	31
Typhlopidae (pygopod)	*Anilios australis*	2
Varanidae (varanid)	*Varanus gouldii*	1
Grand total		384