Progress Report SP 2016-030

Dirk Hartog Island National Park Ecological Restoration Project – fauna reconstruction

Animal Science

Project Core Team

Supervising Scientist	Saul Cowen
Data Custodian	Saul Cowen
Site Custodian	

Project status as of July 14, 2020, 1:13 p.m.

Update requested

Document endorsements and approvals as of July 14, 2020, 1:13 p.m.

Project Team	granted
Program Leader	required
Directorate	required

Dirk Hartog Island National Park Ecological Restoration Project – fauna reconstruction

S Cowen, C Sims, L Gibson, K Ottewell, S Garretson, K Rayner, J Angus, A Burbidge

Context

The Dirk Hartog Island National Park Ecological Restoration Project (DHINPERP) aims to restore the ecological condition of Western Australia's largest island to that seen by Dirk Hartog when he landed on the island in 1616. Establishment of populations of 12 mammal and one bird species on Dirk Hartog Island (DHI) over a 12 year period is a key part of this project. Of these species, four are listed as Endangered and six as Vulnerable under the national *Environment Protection and Biodiversity Conservation Act 1999*, and their successful re-establishment will contribute towards improving the conservation status of these species. The translocation of 13 native species to an island 633 square km in area, makes it the largest fauna reconstruction project in Australia and one of the largest in the world. To allow this to proceed, sheep, feral goats and feral cats have been removed and the eradication of feral cats represents the largest eradication program achieved globally. Genetic information on source populations is being used to inform founder selection, genetic monitoring of released animals, and ongoing management practices.

Aims

- Identify the most suitable source populations to act as founders for new populations on DHI, using the criteria set out in the *Dirk Hartog Island National Park Ecological Restoration Strategic Plan*.
- Establish new populations of 12 mammal species and one bird species on DHI, using the species selection criteria set out in the Strategic Plan.
- Confirm that the translocations are successful and that all new populations on DHI are healthy and self-sustaining, using criteria set out in the Strategic Plan and approved Translocation Proposals.
- Promote scientific research associated with the translocations, monitoring and establishment of fauna, and publish scientific findings.

Progress

- Translocations of 50 rufous hare-wallabies and 72 Shark Bay bandicoots from Bernier and Dorre Islands and 26 dibblers from a captive-breeding program at Perth Zoo were undertaken.
- All 12 radio-collared Shark Bay bandicoots remained alive after four to seven weeks of tracking and had improved or maintained condition.
- Results of captive trials to optimise collar-fit has been accepted for publication in Australian Mammalogy.
- Reproductive activity was evident in captures of Shark Bay bandicoots, with juveniles also observed on camera, and the first island-born bandicoot captured in March 2020.
- Radio-tracking of dibblers was unsuccessful and a collaring trial is now underway at to improve this technique for future releases.
- Monitoring of source populations on Bernier and Dorre Islands was postponed due to COVID-19.
- Source population monitoring of dibblers on the Jurien Bay islands revealed relatively low numbers, though breeding activity was observed.
- Translocated populations of banded and rufous hare-wallabies have established in the areas they were released in 2017 and 2018 and appear to be increasing in abundance.
- Captive breeding at Perth Zoo continues, with a total of 11 males and 10 female dibblers available for the 2020 breeding season.
- Captures of western grasswrens at Hamelin Reserve and Francois Peron National Park were undertaken to collect genetic samples and band birds to inform a translocation strategy for this species.
- A genomics project is currently underway to investigate the genetic diversity of Shark Bay mouse populations on Bernier, Northwest and Faure Islands, in collaboration with Australian Wildlife Conservancy.
- Monitoring of small extant vertebrates on DHI showed a significant increase in populations of native sandy inland and ash-grey mice.

- The Wildlife Population Health residency position with Murdoch University (Dr Fiona Knox) has begun work on developing a Disease Risk Analysis (DRA) for extant rodents.
- Vegetation plot monitoring on DHI continued, including soil sampling, and collection of imagery using a remotely-piloted aircraft.
- A genomic analysis of island and mainland populations of rufous hare-wallaby to assess the outcomes of mixing Bernier and Dorre Island rufous hare-wallabies on DHI has been completed.
- Harvesting scenarios for Bernier and Dorre Island banded hare-wallabies have been completed in collaboration with UWA.
- Good progress has been made assessing the effectiveness of faecal DNA analysis for monitoring hare-wallabies.
- Analyses on island, mainland and captive populations of dibbler to investigate genome-wide diversity and impacts of genetic mixing in reintroductions are underway.
- Population genomic analysis of all wild and reintroduced populations of boodies is well-progressed and will inform the choice of source populations for reintroduction to DHI.

Management implications

- The successful translocation and establishment of sustainable populations of banded and rufous hare-wallabies, Shark Bay bandicoots and dibblers on DHI is likely to improve both their conservation status and improve ecosystem function on DHI.
- The development of innovative and non-invasive approaches to effectively monitoring fauna species will provide an effective and low-cost solution that can be implemented by staff with limited skills and with no requirement for Animal Ethics Committee approval.
- This project highlights the importance of genomics studies in not only informing population management strategies, but also enabling the development of a suite of novel, affordable monitoring tools to ensure ongoing adaptive management of these populations.

Future directions

- Further supplementation translocations of Shark Bay bandicoots and dibblers are scheduled for spring 2020 and the first releases of greater stick-nest rats and Shark Bay mice are planned for autumn 2021, pending all relevant approvals.
- Population genomic analyses on dibblers, banded hare-wallabies and Shark Bay mouse will be progressed. High-throughput SNP arrays will be developed and validated for genetic monitoring of banded and rufous hare-wallaby, Shark Bay bandicoots and dibblers.