



# Global Re-introduction Perspectives: 2010

Additional case-studies from around the globe  
Edited by Pritpal S. Soorae



IUCN/SSC Re-introduction Specialist Group (RSG)





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## Re-introduction of the ‘extinct in the wild’ South Australian mainland tammar wallaby on Yorke Peninsula, Australia

Andy Sharp<sup>1</sup>, Peter Copley<sup>2</sup>, Julia Bignall<sup>3</sup>, Sue Carthew<sup>4</sup>, David Taggart<sup>5</sup>,  
Jason Van Weenan<sup>6</sup>, Greg Johnson<sup>7</sup>, Ian Smith<sup>8</sup>, Jasmine Swales<sup>9</sup>,  
Leah Kemp<sup>10</sup>, Tony Austin<sup>11</sup> & Ken Rudd<sup>12</sup>

- <sup>1</sup> – Conservation Programs Manager, Department for Environment & Heritage, Northern & Yorke Region, Unit 3, 17 Lennon Street, Clare, South Australia, 5453, Australia; Adjunct Senior Researcher, School of Biological Sciences, Flinders University, GPO Box 2100, Adelaide, South Australia, 5001, Australia ([andy.sharp@sa.gov.au](mailto:andy.sharp@sa.gov.au))
- <sup>2</sup> – Senior Ecologist, Department for Environment & Heritage, Threatened Species Unit, 1 Richmond Road, Keswick, South Australia, 5035, Australia ([peter.copley@sa.gov.au](mailto:peter.copley@sa.gov.au))
- <sup>3</sup> – Ecologist, EBS Ecology, Unit 4, 48 Barwell Avenue, Kurrulta Park, South Australia, 5037, Australia ([julia.bignall@ebsecology.com.au](mailto:julia.bignall@ebsecology.com.au))
- <sup>4</sup> – Associate Professor, School of Earth & Environmental Sciences, The University of Adelaide, Adelaide, South Australia, 5005, Australia ([sue.carthew@adelaide.edu.au](mailto:sue.carthew@adelaide.edu.au))
- <sup>5</sup> – Principal Scientist, Royal Zoological Society of South Australia, Frome Road, Adelaide, South Australia, 5000, Australia ([david.taggart@adelaide.edu.au](mailto:david.taggart@adelaide.edu.au))
- <sup>6</sup> – Threatened Fauna Ecologist, Department for Environment & Heritage, 1 Richmond Road, Keswick, South Australia, 5035, Australia ([jason.vanweenan@sa.gov.au](mailto:jason.vanweenan@sa.gov.au))
- <sup>7</sup> – Senior Lecturer, School of Biological Sciences, Flinders University of South Australia, GPO Box 2100, Adelaide, South Australia, 5001, Australia ([greg.johnston@flinders.edu.au](mailto:greg.johnston@flinders.edu.au))
- <sup>8</sup> – Veterinarian, Royal Zoological Society of South Australia, Monarto Zoo, Princes Hwy, Monarto, South Australia, 5254, Australia ([ismith@zoossa.com.au](mailto:ismith@zoossa.com.au))
- <sup>9</sup> – Ranger, Department for Environment & Heritage, Yorke District, CMB Stenhouse Bay, South Australia, 5575, Australia ([jasmine.swales@sa.gov.au](mailto:jasmine.swales@sa.gov.au))
- <sup>10</sup> – Doctoral Candidate, School of Earth & Environmental Sciences, The University of Adelaide, Adelaide, South Australia, 5005, Australia ([leah.kemp@adelaide.edu.au](mailto:leah.kemp@adelaide.edu.au))
- <sup>11</sup> – Animal Keeper, Royal Zoological Society of South Australia, Monarto Zoo, Princes Hwy, Monarto, South Australia, 5254, Australia ([mzpwildman@monartozp.com.au](mailto:mzpwildman@monartozp.com.au))
- <sup>12</sup> – Animal & Plant Control Officer, Northern & Yorke Natural Resources Management Board, PO Box 175, Crystal Brook, South Australia, 5523, Australia ([ken.rudd@nynrm.sa.gov.au](mailto:ken.rudd@nynrm.sa.gov.au))

### Introduction

Tammar Wallabies (*Macropus eugenii*) are one of the smallest of the wallaby family (~5 kg) and are distinguished by a dark grey-brown coat, with a pale buff grey belly, reddish-brown arms, feet and flanks and a faint white cheek stripe. Prior to the 20<sup>th</sup> century, two distinct sub-species inhabited South Australia. Today, only the Kangaroo Island (KI) sub-species remains extant (*M. e. decres*). The South Australian mainland sub-species (*M. e. eugenii*) was extinct by the

1930s, due to broad-scale clearance of its preferred habitats for agriculture and predation by the introduced European red fox (*Vulpes vulpes*) (Jones, 1923-1925; Jones, 1975). The mainland sub-species is listed as 'extinct in the wild', under the Australian Commonwealth Environment Protection and Biodiversity Conservation Act 1999. However, morphometric and genetic studies conducted in the 1990s (Poole, *et al.*, 1991; Taylor & Cooper, 1999) revealed that feral populations of tammars



Tammar wallaby © SA DEH

in New Zealand had originated from mainland South Australian stock. These New Zealand populations were derived from a private menagerie established in the 19<sup>th</sup> century by Sir George Grey (former Governor for South Australia, 1841). The rediscovery of this extinct sub-species and the intention of New Zealand's conservation agency to initiate a feral wallaby control program provided the impetus to repatriate the wallabies to their former range in Australia. A detailed translocation proposal was developed to guide the re-introduction program (DEH, 2004).

## Goals

- Goal 1: To establish a captive breeding colony of mainland tammars, to enable the production of individuals for a re-introduction program.
- Goal 2: To select a suitable release site within the wallaby's former range and manage current threatening processes.
- Goal 3: To establish a self-sustaining, free-ranging, viable population of mainland tammar wallabies within their former range.

## Success Indicators

- Indicator 1: The production of sufficient individuals to enable numerous re-introduction events to occur.
- Indicator 2: The development and maintenance of an essentially fox-free release environment and the mediation of other significant threatening processes.
- Indicator 3: A re-introduced population of mainland tammars exhibiting a positive population growth rate.

## Project Summary

**Establishment of a captive colony:** During 2003-2004, 85 adult wallabies (33 males:52 females) and seven female pouch young were repatriated from New Zealand. The wallabies were held in captivity at Monarto Zoo, where

comprehensive health and disease checks were performed, followed by a strict six month quarantine period. From 2004, female KI tammars were used as surrogate mothers in a cross-fostering program (see Taggart *et al.*, 2005), to increase the reproductive output of the mainland tammars. Between 2004 & 2006, 110 mainland tammar young were cross fostered, with a survival rate of 80%. The cross-fostering program ceased in 2007, due to an outbreak of macropod herpes virus (MaHV-1) within the KI tammar surrogate population. Between 2004-2007, the captive breeding program produced a total of 178 wallabies for re-introduction. The program ceased in 2008, with the remaining 42 wallabies scheduled for relocation to display populations at Australian Zoos, enabling the potential re-constitution of the breeding population at a later date.

**Site selection and management:** Following a rigorous selection process, Innes National Park (NP) (Yorke Peninsula, South Australia) was chosen as the re-introduction site because the park i) is located within the species historic range, ii) is of sufficient size to sustain a population of tammars, iii) contains large areas of suitable habitat and iv) retains on-site personnel, enabling regular monitoring and management. An intensive predator control program was established in 2003 to control the abundance of European red foxes (fortnightly 1080 ground baiting), and continues to date. Analysis of fox activity (passive tracking stations; Engeman & Allen, 2000) between 2003 and 2007 indicated a significant reduction in fox abundance on the park. In 2006, a community-based fox control program was initiated on lands surrounding Innes NP, to reduce the immigration rate of foxes into the park and thereby lower the intensity of predator control required on the park. By 2008-2009, 24 landholders were participating in the program, covering approximately 60,000 ha.

**Population re-introduction:** Prior to release, health and condition checks were performed on all wallabies. The identity of each wallaby was recorded using sub-cutaneous passive integrated transponders and each wallaby was fitted with either a radio or GPS tracking collar, to monitor post-release survival. Re-introduction events followed “hard-release” protocols, with the wallabies held for several hours, until dusk, in temporary pens. Two release sites were utilized, spaced 1.5 km apart. Demographic data were collected on the population post-release, via. radio-telemetry, trapping and spotlight surveys. A trial release of ten tammar wallabies was undertaken in November 2004. All survived the first three months, before four were taken by a fox during a single week. The fox control program was intensified and no further predation was noted. At 12 months post-release, only four wallabies remained alive (40% survival). The additional two mortalities were due to a collision with a car and death from unknown causes. A second release of 36 wallabies was undertaken in June 2005. Ten of these wallabies died within the first month and a further nine had died by the end of three months. Autopsies attributed these deaths to cachexia (i.e. starvation), believed to be due to low nutrient levels in winter feed and the inability of animals to transition and survive winter conditions. Following the onset of warmer weather and improved pastures, the survival rate increased significantly. Fox predation was implicated in subsequent deaths and, by the end of 12 months, only five wallabies remained alive (14% survival). The remaining five animals were

observed to recover their condition and to have successfully raised young. The learning from the second release was that winter is an unsuitable time to undertake re-introductions - of this species, due to low nutrient levels in available forage.

A further 36 wallabies were released in October 2006. Ten wallabies died within the first month from an unknown infection (evidenced by haemorrhagic lungs at autopsy), but the survival rate subsequently stabilized. At 12



**Tammar cross-foster © Julia Bignall**

months post-release, 22 wallabies remained alive (61% survival). A planned release for 2007 was postponed due to the discovery of MaHV-1 within the captive tammar populations. However, subsequent analysis of blood samples collected from local western grey kangaroos (*Macropus fuliginosus*) and the Innes' tammar population confirmed the presence of MaHV-1 at the site. A fourth release of 43 wallabies occurred in October 2008. Of these, seven died within the first month and an additional five were known to have died within the first 12 months (70% survival). However, radio collar malfunctions meant the fate of an additional 11 wallabies was unknown. It is possible that up to 24 may have died during the first 12 months (47% survival rate).

Current estimates suggest that there are between 36 and 49 re-introduced wallabies alive on Innes NP, following five years of releases. The wallabies are known to be breeding at the site, with fourth generation Innes-born animals detected. In total, 22 Innes-born wallabies have been captured, of which 13 are thought to have subsequently died (41% survival rate). It is highly probable that there are numerous Innes-born animals that have evaded capture, further contributing to the population.

## Major difficulties faced

- Following early discussions with landholders adjacent to Innes NP, strong opposition to the re-introduction developed within the local farming community (Peace, 2009). The primary point of contention revolved around the potential for the Innes population of mainland tammars to quickly become over-abundant and migrate off-park, resulting in significant damage to crops across the southern Yorke Peninsula and subsequently impacting on farm productivity. Although an early goal of the Recovery Team, the concept of re-establishing the mainland tammars across Yorke Peninsula was quickly reversed, in response to the community's concerns. Local distrust of the capacity to manage the wallaby population remains strong.



**Tammar release in 2008 © Jasmine Swales**

- Due to the relatively small size of Innes NP (9,232 ha) and the creation of a dispersal sink, an intensive effort was required to manage the abundance of European red foxes.
- Disease and health issues had a significant effect on survival rates following the second and third releases at Innes NP and disrupted the captive breeding program at Monarto Zoo. The observation that cachexia led to significant mortalities - following the second release, provided valuable insights

into the suitable timing for subsequent releases. An unidentified virus resulted in considerable losses during the third re-introduction. A census of pathogens at the release site may have enabled better preparation prior to the releases.

- All released wallabies were fitted with tracking devices that incorporated mortality sensors, allowing for the rapid retrieval of corpses. However, the distance between the release site and wildlife veterinary facilities made it difficult to positively identify the cause of death in many instances. This was somewhat overcome by training local national park staff in field necropsy techniques.
- An unforeseen threat to the wallabies at Innes NP was collisions with vehicles, resulting in the mortality of at least six individuals. Innes NP is a major tourist destination in South Australia, with many visitors using the bitumen road that encircles the park to access its numerous beaches. To limit future tammar losses, the speed limit was reduced along the section of road adjacent to the wallaby release site, warning signs were erected and rumble strips were installed on the road.

## Major lessons learned

- It is essential that community consultation occur well in advance of any planned re-introductions to identify and clarify any issues and to develop community support and ownership for the project. Substantial confusion developed in the current project, because the community was equating the release of mainland tammars on Yorke Peninsula to the status of Kangaroo Island tammar wallabies. Foxes have not become established on Kangaroo Island and agricultural clearance has resulted in the creation of large areas of the wallaby's favored edge habitat. As such, Kangaroo Island tammars exist at high densities and are considered a pest species.
- Re-introduced cohorts suffer from initial heavy losses, particularly during the first month post-release. However, survival rates stabilize after several months

and the wallabies acclimatize to their new environment and commence breeding.

- Despite the considerable effort allocated to fox control, it quickly became apparent that even low densities of foxes could severely impact on the Innes' tamar population, as witnessed by the loss of 40% of the first release group to (arguably) a single fox. With fox control at a maximum possible level, the success of the program hinged on whether reproductive output would outweigh the losses incurred from (primarily) fox predation. The answer to this question is, as yet, unclear.

## Success of project

Highly Successful	Successful	Partially Successful	Failure
		√	

### Reason(s) for success/failure:

- Despite numerous re-introductions over five years, it remains unclear as to whether a self-sustaining population of tamaras has been established on Innes NP.
- Managing the complexities of this project has required a collaborative effort by dedicated staff from a wide range of institutions, including State and regional conservation agencies, tertiary institutions and zoos.
- This project demonstrated the feasibility of cross-fostering to accelerate the production of individuals of this species for reintroductions. On average, cross-fostering resulted in a two to three fold increase in production of young.
- Community engagement was handled in a reactive fashion and required the allocation of considerable resources during the first 18 months of the program.
- The intensive monitoring program enabled the identification of causes of mortality (predation, cachexia, vehicle collision, virus), allowing for the implementation of management actions and the modification of release protocols.
- Although the level of fox immigration into the core re-introduction site is considered low, it is not apparent whether predation is being offset by recruitment.
- The intensive community engagement and monitoring program were only possible because of the allocation of two dedicated staff to the project.
- The low density fox environment on Innes NP has also providing a haven for a range of other National and State threatened species, including malleefowl (*Leipoa ocellata*), western whipbird (*Psophodes nigrogularis nigrogularis*), hooded plover (*Thinornis rubricollis*), painted button-quail (*Turnix varia*) and heath goanna (*Varanus rosenbergi*). The influence of the fox control program is further highlighted by the recording of a bush stone-curlew (*Burhinus gallarius*) in the reserve in early 2009; a species which has not been recorded on the Yorke Peninsula for more than 40 years.
- The primary contemporary risk to the program is an insecurity of funding support.

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