

AUSTRALIA'S FAUNAL EXTINCTION CRISIS

DIRECTOR OF NATIONAL PARKS SUBMISSION TO THE INQUIRY BY THE SENATE ENVIRONMENT AND COMMUNICATIONS REFERENCES COMMITTEE

INTRODUCTION

The Director of National Parks

The Director of National Parks is a corporation sole established under Division 5 of Part 19 of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and is the statutory agency responsible for the conservation and management of the Australian Government's terrestrial and marine protected area estates under the EPBC Act.

The Director is assisted by Parks Australia, a division of the Department of the Environment and Energy (the Department), in the management of these reserves. In this submission, we refer to ourselves as Parks Australia, meaning the Director of National Parks and Parks Australia staff members.

A brief overview of the Director's activities follows, with detailed information available in the Director's annual report: <http://www.environment.gov.au/resource/annual-report-2016-17-director-national-parks>

Management of Commonwealth terrestrial and marine reserves

The Director is responsible for seven terrestrial reserves (six national parks and the Australian National Botanic Gardens) and 59 Commonwealth marine reserves.

Three parks—Uluru-Kata Tjuta, Kakadu and Booderee—are leased to the Director of National Parks by their Aboriginal owners. These parks are managed by the Director in conjunction with a Board of Management established under the EPBC Act with a majority of board members being Indigenous persons nominated by the traditional owners.

From 1 July 2018, an additional 2.3 million square kilometres of Australia's ocean has become protected under Australia's world-leading marine park management system, with five new management plans coming into effect, bringing all 60 Australian marine parks under protection. This means that Australia will be actively managing the second largest network of marine parks in the world – around 3.3 million square kilometres of ocean.

The Minister and the Secretary of the Department have delegated to the Director functions and powers for programs that complement the Director's statutory functions. Under these delegations the Director manages the Australian Biological Resources Study which provides national leadership and support for the discovery, naming and classification of Australia's living organisms. We also work closely with the Department of Environment and Energy on policy direction and programs that contribute to the protection, conservation and management of biodiversity and heritage in areas outside Commonwealth reserves.

Scope of this submission

Notwithstanding the full range of our activities, this submission focuses on the protection of threatened fauna in the Commonwealth terrestrial reserve estate. It complements the submission by the Department of Environment and Energy, which examines the protection of

threatened fauna from a much wider national perspective. This submission also does not seek to address the adequacy of the management and extent of the Australia's entire system of protected areas given the diverse range of ownership and management of those individual properties that make up the National Reserve System (for example Commonwealth, State Government, Jointly managed, Indigenous, and privately owned).

PARKS AUSTRALIA THREATENED FAUNA PROTECTION ACTIVITIES IN TERRESTRIAL RESERVES

Parks Australia is committed to conserving the rich biodiversity, including threatened fauna, within its terrestrial reserves.

Parks Australia's terrestrial reserves protect 72 EPBC listed animals (30 birds, 17 mammals, 13 reptiles, 6 fish, 5 invertebrates and 1 amphibian). These species are threatened by a range of processes—of particular concern are feral cats, weeds, rats and inappropriate fire regimes.

Parks Australia undertakes a range of threatened species management and monitoring activities. A number of these activities are undertaken in conjunction with partners, including the National Environmental Science Program and the Threatened Species Commissioner.

We work closely with researchers and incorporate the lessons learned from research and monitoring into new tools, techniques and management actions within our parks and reserves. We draw on expert advice through a number of park-specific research advisory committees, and from a wide array of researchers and research institutions through partnerships, consultancies and specific projects.

Threatened fauna monitoring programs

Effective monitoring is a crucial management tool across our parks. A number of longstanding monitoring programs on reserves managed by the Director have been important in informing the adaptive management of our parks.

Booderee National Park fauna monitoring

At Booderee National Park a comprehensive park-wide fauna monitoring program based on 132 permanent monitoring sites has been in place since 2002 through a partnership with the Australian National University. This program has provided invaluable information on the effectiveness of park management and in particular the response of vertebrates to feral animal (red fox, *Vulpes vulpes*) control.

The population of Eastern Bristlebirds (*Dasyornis brachypterus*) has also been monitored in the park since 2004. The survey was initially designed to examine the response of bristlebirds to fire, comparing population trends in burnt and unburnt habitat after a major wildfire that occurred in 2003.

Christmas Island, Island-wide survey

The biennial island-wide surveys have been carried out since 2001, covering an extensive network of sites spread across the island. The survey was initially designed to gather data on the distribution and abundance of Yellow Crazy Ants (*Anoplolepis gracilipes*) and Red Crabs (*Gecarcoidea natalis*), but was later expanded to collect data on several threatened fauna species, including bird species such as the Christmas Island Thrush (*Turdus poliocephalus*

erythropleurus), Christmas Island Emerald Dove (*Chalcophaps indica natalis*) and Abbott's Booby (*Papasula abbotti*).

Christmas Island Flying-fox and Hawk Owl surveys

The Christmas Island Flying-fox (*Pteropus natalis*) is the only known endemic mammal species on the Island and is listed as Critically Endangered under the EPBC Act. Flying-foxes are likely to be important pollinators of Christmas Island flora and play a key role in the functioning of the forest ecosystem. An island-wide nocturnal monitoring program for the flying-fox was initiated by Parks Australia in 2006, and has continued on an annual basis from 2012 to the present. The survey also monitors the Christmas Island Hawk-Owl, an endemic species listed as Vulnerable, using the same methodology.

Pulu Keeling National Park Cocos-buff Banded Rail surveys

The Cocos Buff-banded Rail (*Hypotaenidia philippensis andrewsi*), endemic to the Cocos (Keeling) Islands group, declined drastically following human settlement of the islands, and by the 1990s became restricted to Pulu Keeling (North Keeling Island). The population of rails on Pulu Keeling has been monitored by Parks Australia since 1999, with surveys on an annual basis occurring since 2012. Monitoring of the population was essential in informing the successful translocation of an insurance population in 2013, including post-translocation to monitor any changes in the source population following removal of individuals.

Kakadu National Park Nesting Flatback Turtle survey on Field Island

Gardangarl (Field Island) is a critical habitat for Flatback Turtles (*Natator depressus*) and a monitoring site under the Recovery Plan for Marine Turtles in Australia. Every year teams of Kakadu park staff, traditional owners and volunteers camp on Field Island to study the turtles as they come ashore to nest. Surveying began in the 1980s and has continued annually since 1994. The objectives of the survey are to gain baseline population data, examine long-term population trends, and investigate the importance of Field Island as a Flatback Turtle rookery in the region. Recent analysis has reported that numbers of nesting flatbacks at Field Island appear to be relatively stable (Groom et al. 2017).

Cocos (Keeling) Islands Marine turtle survey

The Cocos (Keeling) Islands provide critical habitat for Hawksbill (*Eretmochelys imbricata*) and Green Turtles (*Chelonia mydas*), which are both listed as vulnerable under the EPBC Act.

A marine turtle survey has been undertaken since 1999 to monitor population size, species composition and size structure, obtain growth rates and assess breeding condition (Whiting et al 2014).

Pulu Keeling chief ranger with captured Hawksbill and Green Turtles for weighing, measuring and tagging prior to re-release.



Kakadu National Park Fire Plot Monitoring Program

The Kakadu National Park Fire Plot Monitoring Program commenced in 1995, as part of the wider Three Parks Savanna Fire-effects Plot Network. The aim was to investigate how to effectively manage fire regimes in tropical savanna landscapes through understanding impacts of this disturbance on vegetation and vertebrate fauna. A total of 133 permanent monitoring plots were established in Kakadu to monitor change in vegetation and fauna.

This monitoring program was instrumental in the diagnosis of the decline of small mammals across Australia's northern savannas (Woinarski et al 2010), which has resulted in further research being undertaken by the NERP and NESP into the causes of the declines. The results have also led to modification in the approach to fire management in Kakadu, with a focus on early dry season burns to reduce the extent and severity of late season wildfires.

The program is currently being reviewed and redesigned under a NESP Threatened Species Hub project.

Management of threatened fauna

Parks Australia uses a combination of ecosystem-wide and species-specific approaches to conserve biodiversity and protect threatened fauna. Programs at the ecosystem level often tackle threats such as feral animals, weeds and altered fire regimes. We also undertake targeted projects which help safeguard existing populations of threatened species and trial new approaches to improve their long-term survival, for example, through reintroductions.

In situ management

Eastern bristlebird in Booderee National Park

Booderee National Park is a major stronghold for the nationally endangered Eastern Bristlebird (*Dasyornis brachypterus*) with probably the largest population (approximately one-third of all individuals of the species) occurring on the Bherwerre Peninsula. Booderee manages this species through habitat recovery and threat management, incorporating fire management, intensive feral predator (fox) control and management of invasive Bitou Bush. (Lindenmayer et al 2018a)

Foxes are controlled in Booderee (using 1080 baits) as part of a long term program to protect biodiversity in the Park. The control program began in 1999, and since 2003 baiting has occurred monthly at 120 bait stations across the entire park. In addition to benefiting the Eastern Bristlebird, fox control protects a range of mammal species throughout the park.

Norfolk Island Green Parrot management program

The Norfolk Island Green Parrot (*Cyanoramphus cookii*), endemic to Norfolk Island, is listed as Endangered under the EPBC Act. Thanks to an extensive rat baiting program, the creation and maintenance of 80 predator resistant nesting sites and a program to reduce Crimson Rosella numbers to reduce nest competition, the adult wild population of the Norfolk Island green parrot is now estimated to be 350–400 birds, after suffering from a population decline in 2013 (Ortiz-Catedral et al 2018).

Following this significant recovery, actions are underway to prepare an insurance population for translocation to nearby predator free Phillip Island.

Christmas Island Minesite to Forest rehabilitation

The Christmas Island Minesite to Forest Rehabilitation (CIMFR) program undertakes ecological restoration on old, relinquished phosphate minefields adjacent to forest areas of high conservation value. Since the CIMFR program began in 2004, approximately 300,000 native trees have been planted in relinquished old mine fields across Christmas Island. This program is increasing available habitat for threatened birds such as Abbott's Booby (*Papasula abbotti*), CI Goshawk (*Accipiter hiogaster natalis*), CI Hawk-owl (*Ninox natalis*), White-tailed Tropicbird (*Phaethon lepturus fulvus*) and CI Thrush (*Turdus poliocephalus erythropleurus*).



Christmas Island Minesite to Forest Rehabilitation field with plantings

Christmas Island Feral cat eradication project

Christmas Island is undertaking an ambitious plan to completely eradicate feral cats from the island. Since 2010, the control program has resulted in the removal of over 1,000 cats from the township and the island's road network. An island wide forest baiting campaign was conducted in 2015 with smaller campaigns in 2016 and 2017. The program also employs roadside baiting, cage trapping, elevated soft jaw leg hold trapping and shooting. Camera monitoring arrays have been established across the island to inform on control effort.

As predation by feral cats is one of the most significant processes threatening Christmas Island's biodiversity, successful eradication of feral cats will benefit a number of species, including the Critically Endangered Christmas Island Flying-fox, and well as ground-nesting seabirds and native reptiles.



Feral cat trapping on Christmas Island

Managing threatening process in Kakadu—fire, weeds and ferals

Biodiversity across northern Australia has been declining in recent decades. Inappropriate fire regimes and introduced plants and animals are among the key drivers.

In work partly funded by the Threatened Species Commissioner, Parks Australia has been investigating if intensive management of fire, feral animal and invasive weeds can reverse small mammal declines. An extensive program of early dry season burns to reduce late season wildfire has been implemented over the past two years across the park. Feral animal control was also carried out across 2016-17 targeting buffalo, cattle, donkeys, horses and pigs. This effort resulted in approximately 6,000 feral animals culled from the park. We are also continuing our successful management program for the Giant Sensitive Tree (*Mimosa pigra*), and have treated the three main infestations of Gamba Grass (*Andropogon gayanus*) in the park.

A fire study currently underway is testing whether the changed fire management in 2016 and 2017 is producing improvements in biodiversity.



Prescribed burning in Kakadu National Park

Ex situ conservation

Ex-situ conservation—conserving organisms outside the places in which they currently occur—can help to ensure the recovery and long-term survival of threatened species and the restoration and resilience of ecosystems. Ex-situ conservation is an increasingly important part of our work. These sorts of projects, which complement rather than replace traditional in-situ management, have many potential conservation benefits, including:

- making wild populations more resilient by increasing their abundance, geographic range and genetic diversity
- creating ‘insurance populations’ that reduce the chances of a species becoming extinct
- restoring food webs and ecosystem function and/or important cultural elements of a landscape by reintroducing a species that was formerly present
- increasing our ecological knowledge through research on captive populations

Examples of our ex situ conservation programs are outlined below.

Captive breeding of Lister’s gecko and blue-tailed skink

A captive breeding program for two reptiles endemic to Christmas Island—the Blue-tailed Skink (*Cryptoblepharus egeriae*) and Lister’s Gecko (*Lepidodactylus listeri*)—was initiated in 2009 in response to dramatic declines in the populations of the island’s native reptiles (Andrew et al 2016).

Our captive breeding program for these two EPBC listed reptiles has two centres, one within the park and one at Taronga Zoo. On Christmas Island the reptiles are housed in secure enclosures and outdoor “exclosures”. Reptile numbers in both centres continue to grow, with both populations now over 1000 individuals.

Options for these two species beyond captivity are now being explored, with trial releases into a soft-release site in which introduced predators such as the Wolf Snake (*Lycodon capucinus*) and Giant Centipede (*Scolopendra subspinipes*) are excluded by fencing.

As the Blue-tailed Skink and Lister’s Gecko are no longer considered to be present in the wild, this successful program has saved these two species from extinction.



Christmas Island reptile captive breeding facility (left) and fenced soft release site (right)

Booderee mammal reintroductions

Booderee National Park has been tackling small mammal decline through an intensive fox control program over the past ten years. Predator numbers are now reduced enough so that reintroductions of some locally extinct mammals is now possible and the park can again provide a safe haven for these threatened species.

The Long-nosed Potoroo (*Potorous tridactylus tridactylus*) and the Southern Brown Bandicoot (*Isoodon obesulus obesulus*) were reintroduced to Booderee National Park in 2014 and 2016, respectively, after long being extinct from the park, likely as the result of hunting by foxes (Robinson et al 2018). In June 2017 the first Southern Brown Bandicoot was born in the park in more than a century.

In a pilot release, 20 Eastern Quolls (*Dasyurus viverrinus*) were translocated to Booderee in March 2018, marking their first return to the wild on the mainland in 50 years. While predation and road fatalities have been an issue, three female quolls were found to have produced young in July 2018.

These mammal reintroduction projects have been undertaken in collaboration with the Australian National University, the Forestry Corporation of NSW, the National Environment Science Program Threatened Species Recovery Hub, the Taronga Conservation Society, Rewilding Australia and the World Wide Fund for Nature.



Preparing an Eastern Quoll for reintroduction (left) and releasing a Long-nosed Potoroo into the wild at Booderee National Park (right, © Maree Clout).

Cocos Buff-Banded Rail reintroduction

Until recently Pulu Keeling National Park was home to the last remaining Cocos Buff-banded Rail (*Hypotaenidia philippensis andrewsi*) population within the Cocos Islands group. Parks Australia has now established a second insurance population of rails on Horsburgh Island, after translocation of an initial 39 individuals was successfully undertaken in 2013 (Woinarski et al 2016). The insurance population continues to persist on Horsburgh Island and we have also detected individuals occurring on three other southern atoll islands, which confirms the birds are steadily extending their distribution through self-dispersal. The populations on both Pulu Keeling and Horsburgh Island are closely monitored on an ongoing basis.

Mala captive management

The Endangered Mala or Rufous Hare Wallaby (*Lagorchestes hirsutus*), currently requires feral-free safe havens to persist. A reintroduction program at Uluru-Kata Tjuta National Park for the mala began in 2005 with the construction of a 170 hectare predator-proof enclosure. Uluru also undertook a successful rabbit eradication program, removing rabbits from the 170 hectare enclosure. As rabbits compete with mala for food and space, this was a significant management achievement.

Uluru now provides one of four mainland safe havens for this species and has contributed greatly to maintaining and increasing the total population size, with Mala numbers at Uluru increasing from a founder population of 25 to almost 300 over the last 10 years. Uluru continues to manage this species as part of a co-ordinated national approach to Mala conservation (Lees and Bennison 2016).

Norfolk Island Green Parrot Translocation

Following a significant recovery of the endangered Norfolk Island Green Parrot (*Cyanoramphus cookii*), actions are underway to establish an insurance population on nearby predator free Phillip Island. Phillip Island has undergone transformational change, with significant rehabilitation occurring following the removal of the last introduced herbivore in 1988. The vegetation has now sufficiently recovered to enable the introduction of the Green Parrot.

While a first pilot translocation of Green Parrots to Phillip Island in 2017 was unsuccessful, an independent expert review is currently being undertaken to inform future translocation attempts.

Brush-tailed Rabbit-rat Translocation

In recent decades the Brush-tailed Rabbit-rat (*Conilurus penicillatus*) has disappeared from most of its range across the Northern Territory, including Kakadu. A proposed reintroduction of the rabbit-rat to Kakadu is in the planning stages. Preparatory work on Field Island (Gardangarl) has been undertaken to ensure appropriate habitat for the species, including wet season burning by helicopter to create a mosaic of different stages of burning.

The status of the source population on the Cobourg Peninsula is currently being monitored to establish whether the population size is sufficient to support a translocation. To achieve this, 500 nesting boxes have been set up on Cobourg Peninsula, and these are being monitored from June 2018 onwards.

Science and Research

Science is fundamental to good decision-making across our parks. Through our partnerships with leading research institutions, government agencies and the private sector, we greatly increase the value of our research investment. By partnering in external studies and commissioning specific research where necessary, we access the best available minds to help us tackle many of our park management challenges.

We also draw on expert advice through a number of research advisory committees, such as the Kakadu Research and Management Advisory Committee (KRAMAC), Christmas Island Reptile Advisory Panel (CIRAP), and the Crazy Ant Scientific Advisory Panel (CASAP).

Key examples of the application of science to our biodiversity conservation programs include the following.

Christmas Island yellow crazy ant biocontrol

Yellow Crazy Ants (*Anoplolepis gracilipes*) are an introduced species that are hugely destructive to the environment on Christmas Island. Over recent decades, they have killed tens of millions of Christmas Island's iconic Red Crabs (*Gecarcoidea natalis*). They are also recognised as a threat to a range of EPBC listed threatened fauna on the island.

A research program conducted by La Trobe University, with funding from Parks Australia, began in 2010, to identify biological control techniques as a long-term alternative to current pesticide-based control of Yellow Crazy Ants. A method of indirect biocontrol, using another insect to target the crazy ants' food source, as a way of cutting down their numbers, was developed (Neumann et al 2018).

The indirect biocontrol micro wasp (*Tachardiaephagus somervillei*) was imported into Christmas Island in December 2016 and first released into the environment in January 2017. The micro wasps reduce the food source of the Yellow Crazy Ants. As at June 2017, 15,000 wasps had been produced in the breeding facility on island and had been released at four monitoring sites. We are now monitoring monthly to determine the impact that wasps have on the ants.

National Environmental Science Program

Parks Australia collaborates extensively with the Australian Government's National Environmental Science Program (NESP), which supports targeted research and partnerships for multidisciplinary applied research for biodiversity conservation. Parks Australia is undertaking a number of project collaborations through NESP, including the following examples.

Enhancing threatened species outcomes for Christmas Island

This is a project in partnership between NESP and Parks Australia that aims to provide evidence to directly inform management of threatened species on Christmas Island. One of the species to benefit is the Christmas Island Flying-fox (*Pteropus natalis*). A number of studies are underway on the ecology of this endemic species, as well as strategic decision making for conservation outcomes.

A Christmas Island Frigatebird (*Fregata andrewsi*) workshop was held in 2018, bringing experts together to provide direction for the ongoing management, monitoring and research requirements necessary for the recovery of the species. An integrated Christmas Island Frigatebird work program will be co-ordinated, following on from outcomes of the workshop.

Investigating feral cats in small mammal decline

Building on a project commenced under NERP in 2013, the responses of small mammal populations to predator exclusion were experimentally evaluated at fenced and unfenced sites in Kakadu National Park. Results have shown that cats are also impacting on reptiles, based on an observed recovery (with number and diversity of reptiles increasing) inside the cat-proof enclosures. The findings are informing management responses to address feral cat impacts in Kakadu National Park specifically and northern Australia more generally.

Using reintroductions to understand causes of mammal declines and extinctions at Booderee National Park

NESP researchers are undertaking intensive monitoring of the mammals that are being reintroduced into Booderee National Park. Combined with existing monitoring data, findings will be used to identify the causes of declines and extinctions of mammals at Booderee over the recent decades, as well as examining factors required for successful re-establishment of reintroduced species.

Partnership with Biosecurity Queensland's Pest Animal Research Centre

To assist and support the natural resource managers in cat control techniques and options, Parks Australia has formed a partnership with Biosecurity Queensland's Pest Animal Research Centre. In early 2018 the Threatened Species Commissioner committed \$400,000 for feral cat management projects in parks. These projects are being developed with advice from Biosecurity Queensland, and include a Norfolk Island cat control program, and continuation of the Christmas Island cat eradication program.

Partnership with Taronga Zoo

Taronga Zoo undertakes several research projects focusing on threatened species on Christmas Island, including: housing insurance populations for Lister's Gecko (*Lepidodactylus listeri*) and Blue-tailed Skink (*Cryptoblepharus egeriae*); sponsoring PhD projects on flying fox and reptile health and disease; and sponsoring a PhD into the ecology of flying foxes. In addition, Taronga Zoo provides ongoing animal ethics support for our wildlife programs.

PRIORITISING RESEARCH AND MANAGEMENT ACTIONS

Prioritisation tool for management actions

Faced with ongoing declines of many threatened species and limited conservation resources, it is essential that priorities are set for threatened species conservation.

In 2015, the Decision Making Hub of the National Environmental Research Program developed a prioritisation tool for Parks Australia, designed to help prioritise resource allocations that support threatened species management actions (Di Fonzo et al 2017). The decision tool enables consideration of various decision elements influencing management practices in each reserve, including costs of management actions, feasibility, and likelihood of management success. The tool guides an informed comparison of cost against conservation outcome, providing a transparent, defensible and prioritised list of possible actions.

In 2017 a prioritisation of management activities for threatened fauna across terrestrial parks was completed using the tool. The tool assessed a range of candidate management actions and ranked them based on thresholds of cost-effectiveness. The results from this prioritisation will be able to inform future decisions regarding resource allocation to threatened fauna projects.

Parks Australia Science Direction Statement

In late 2018 Parks Australia released the Parks Australia Science Direction Statement 2018–2022. The statement will guide science activities undertaken by or on behalf of Parks Australia over the next five years and aims to encourage research and innovation that is targeted to address our science priorities, including those for threatened fauna conservation.

As an important next step, we will be developing a detailed and prioritised list of specific priorities for our parks to guide future investment in science activities. Priorities will also continue to evolve in response to new knowledge and new management issues and will be regularly reviewed.

MANAGEMENT EFFECTIVENESS

Parks Australia reports annually on our management effectiveness through the Director of National Parks Annual Report. Under the key goal of “Resilient places and ecosystems” we report on the performance measure “Populations of threatened and significant species are increasing”. To prioritise internal and external resources across the large number of threatened species on the terrestrial reserves, we began to collate and analyse data on threatened species trends centrally in 2015–16, to replace park by park reporting. Results for 2016–17 are available at: <http://www.environment.gov.au/resource/annual-report-2016-17-director-national-parks>. Results for 2017–18 will be published by the end of 2018.

In addition, towards the expiry of each park’s statutory management plan, a technical audit is undertaken to document the plan’s implementation. These audits identify how the park is tracking against its aims, and provide an important foundation for the development of the next management plan including research priorities.

CONCLUSION

Parks Australia is committed to conserving the rich biodiversity within the six Commonwealth national parks—Booderee, Kakadu, Uluru-Kata Tjuta, Christmas Island, Norfolk Island and Pulu Keeling.

Parks Australia undertakes a range of threatened fauna management and monitoring activities, using a combination of ecosystem-wide and species-specific approaches. Science is fundamental to good decision-making across our parks. We work closely with researchers, draw on expert advice through a number of park-specific research advisory committees, and partner with research institutions, including through the National Environmental Science Program, to ensure that we have access to the best science that supports evidence-based adaptive management.

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ATTACHMENT—THREATENED FAUNA TRENDS IN COMMONWEALTH TERRESTRIAL RESERVES

See attached dashboard