



**Zoo and  
Aquarium  
Association**  
Australasia

# **DROUGHT AND BUSHFIRE RECOVERY INITIATIVE**



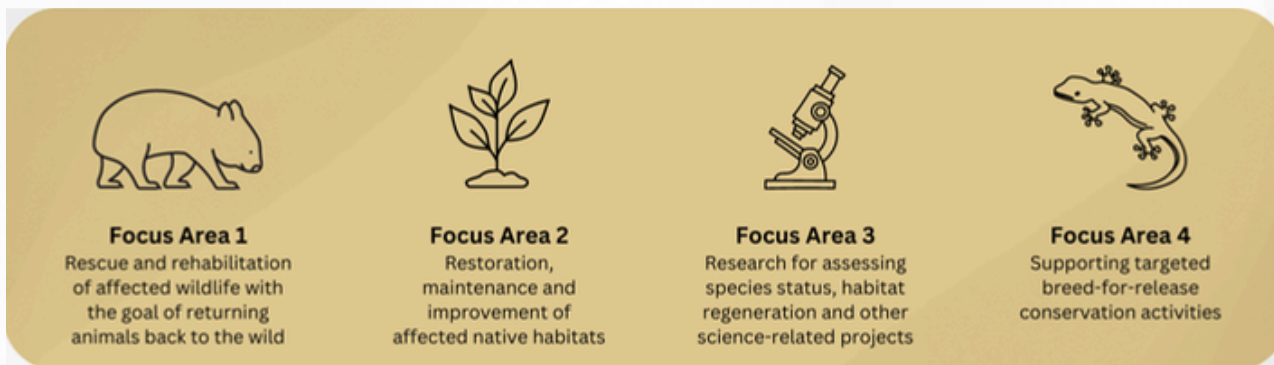
Presented by the Zoo and Aquarium Association Australasia

# Introduction



The Zoo and Aquarium Association (ZAA) Australasia played a major role in the 2019-20 bushfires and droughts. As the peak body for Australasian zoos, ZAA focused their actions on supporting *ex situ* conservation, zoo-based research programs and habitat restoration for rewilding areas.

ZAA's work focused on four Focus Areas:



## What is the WCF?

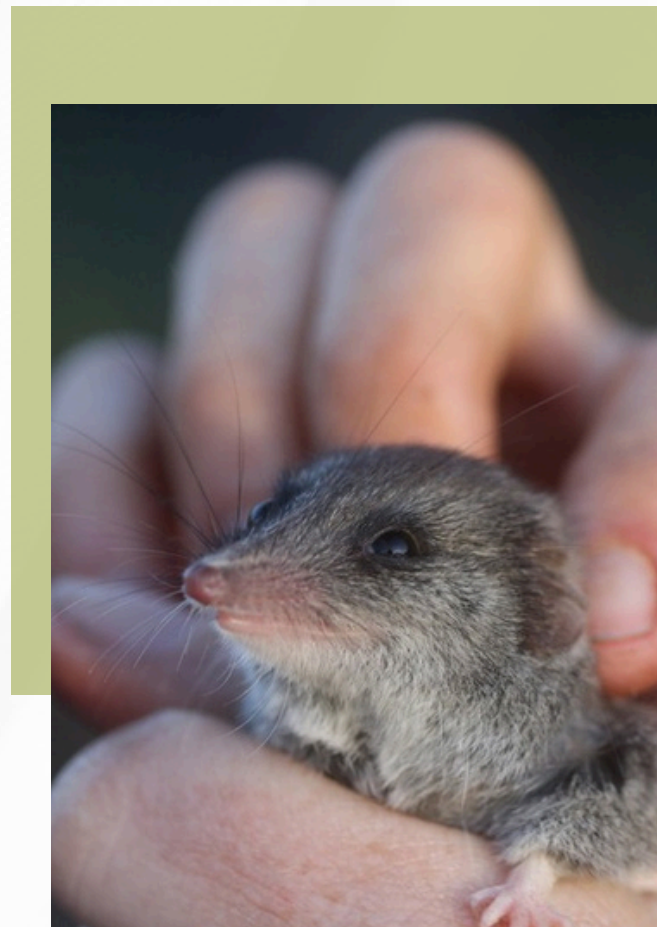
The ZAA Wildlife Conservation Fund (WCF) is the public fund of the Zoo and Aquarium Association.

ZAA raised funds via the WCF for its collaborative zoo and aquarium response to assist wildlife impacted by the drought and bushfires in Australia. These funds were provided as grants to member institutions as well as ZAA staff for disaster recovery, conservation and research projects.

## What is the WCC?

A panel of members from the Wildlife Conservation Committee (WCC) assessed the applications for funding from the ZAA Bushfire Appeal, which raised over \$1.2 million AUD.

The successful projects included vital programs related to bushfire recovery for threatened or valuable native species, from biobanking research to wildlife rescue and rehabilitation.



# WCF Funded Projects



Project	Primary organisation	Amount funded	Focus Area
<i>Ex situ</i> management for bushfire affected species	ZAA	\$7,316	3
Threatened species assessment and coordination	ZAA	\$670,000	3
Rescue and Rehabilitation in the Barrington Region	Aussie Ark	\$67,480	1,4
Securing the genetic diversity of threatened frogs	Taronga Zoo Sydney	\$207,077	3,4
Enhancing breeding facilities for the western ground parrot	Perth Zoo	\$143,600	3,4
Breeding and releasing pookila in Victoria	Moonlit Sanctuary Wildlife Conservation Park	\$158,000	2, 3, 4
Recovery of the Kangaroo Island dunnart	Zoos South Australia	\$126,500	3
Support husbandry and pre-release management of regent honeyeaters	Taronga Conservation Society	\$163,720	4
Creating refuge for spotted tree frogs	Zoos Victoria	\$56,100	2

# Ex situ Management for Bushfire Affected Species



Prior to the bushfires, the role of *ex situ* species management was an unexplored aspect of disaster response in Australia. The Zoo and Aquarium Association (ZAA) proposed a research project to determine whether *ex situ* management could be successfully employed for bushfire-affected species.

ZAA also sought to make recommendations to the Threatened Species Commissioner and Federal Environment Minister to assist with funding prioritisation.

ZAA hosted an extensive workshop bringing together experts to assess and plan for the role that captive breeding and management could play in disaster recovery. The workshops allowed ZAA and its members to review available animal care facilities and expertise, as well as predicting which affected species may require captive breeding support.

Priorities were then determined based on several aspects including, but not limited to, species vulnerability, likelihood of success, husbandry knowledge, historical breeding success and geographic spread.

The workshop and resulting project provided a roadmap for how the zoo sector can play its role in the government's wider drought and bushfire recovery actions.



# Threatened Species Assessment and Coordination



In order to determine if a species is eligible for listing as threatened under the EPBC Act, the Threatened Species Scientific Committee (TSSC) conducts a rigorous scientific assessment of the species and its threats.

Once listed, species are eligible for formal conservation action including the development of an approved Conservation Advice, Recovery Plan or Threat Abatement Plan.

The 2019-20 bushfires affected a vast array of native species and evaluation of impacted species became a critical priority. Assessment, nomination, listing and recovery of species impacted by disaster had to be performed on an unprecedented scale.



The Zoo and Aquarium Association employed and trained three staff – two Threatened Species Assessors, coordinated by a Conservation and Populations Manager – to assist the TSSC with assessments. This team formed the ZAA Centre for Species Survival (CSS), a partnership between ZAA and the International Union for Conservation of Nature's Species Survival Commission.

The CSS coordinated workshops and events, working with relevant government stakeholders to identify conservation needs, plan effective conservation measures and mobilise action.

The team used information from National Native Titles, Indigenous Protected Areas, Land Councils and state and territory-based land rights maps to ensure they engaged with as many relevant Traditional Owners as possible.

Overall, the ZAA CSS worked with an expert panel to develop a list of animals requiring urgent management intervention. The list included 17 bird, 20 mammal, 23 reptile, 16 frog, 5 invertebrate, 22 crayfish and 16 fish species.

# Threatened Species Assessment and Coordination



## Threatened Species Assessments

- Review & consultation
- Elicitation & prioritisation



- Brush-tailed Rock-wallaby
- Spotted-tailed Quoll
- Eastern Quoll
- Broad-toothed Rat
- Fairall's Honeysuckle

## Conservation Advice & Recovery Plans

- Recovery Plan development
- First Nations, government & public consultation



- Northern Corroboree Frog
- Southern Corroboree Frog
- Pookila (New Holland Mouse)
- Brush-tailed Rock-wallaby
- Burrowing Bettong
- Broad-toothed Rat
- Forrester's Bottlebrush
- Lowan Phebalium

## Species Recovery Support

- Recovery Team coordination & participation



- Brush-tailed Rock-wallaby
- Tasmanian Devil
- Northern Bettong
- Mahogany Glider
- Pookila (New Holland Mouse)
- Smoky Mouse
- Southern Cassowary
- Orange-bellied Parrot
- Spotted Handfish
- Red Handfish
- Ziebell's Handfish

# Rescue and Rehabilitation in the Barrington Region



The Barrington Region of NSW was heavily impacted by drought and bushfires in 2019-20, with local wildlife affected by increasing rates of starvation, predation and car strikes. Key species in the region affected were brush-tailed rock wallabies, platypus and freshwater turtles.

Aussie Ark is situated in the centre of the east coast region and consequently played a major role in wildlife support and rescue efforts. In regular communication with government, their team worked tirelessly to relocate wildlife to safer areas, monitoring the new habitats and the condition of relocated animals regularly.

This rescue and rehabilitation endeavour began in December 2019 and continued for several months.



With WCF funding, this project successfully worked to capture, rehabilitate and relocate wild platypus from the Upper Hunter and Manning regions. The platypus were provided with veterinary care and ongoing monitoring as well as dedicated rehabilitation until their release back into their original habitat in September 2020.

The project also successfully provided weekly feeding and monitoring of wild brush-tailed rock wallaby populations through to September 2020.

20 Hunter River freshwater turtles were also rescued during the program, and were provided with dedicated care. An insurance breeding population of the turtles was established with some of the rescued animals, while others were released back into the wild.

# Securing the Genetic Diversity of Threatened Frogs



51 million frogs are estimated to have been killed or affected by the 2019/20 bushfires according to the WWF interim report: [Australia's 2019-2020 Bushfires: The Wildlife Toll.](#)

Zoo-based conservation breeding programs play a critical role in supporting ongoing management and, in some cases, re-establishment of wild populations of threatened frog species.

This project applied established sperm collection methods and developed cryopreservation techniques to capture and store the genetic diversity of four threatened frog breeding programs across two Australian Zoos: The Booroolong Frog (*Litoria booroolongensis*), Northern Corroboree Frog (*Pseudophryne pengilleyi*), Southern Corroboree Frog (*Pseudophryne corroboree*) and Yellow-Spotted Bell Frog (*Litoria castanea*). The biobanking project aims to support the resilience of frog populations by preventing the loss of genetic diversity through selective breeding using cryopreserved sperm.



Taronga scientists led a collaborative team from the University of Wollongong, Zoos Victoria, the Department of Climate Change, Energy, the Environment and Water, and the University of Newcastle. Together they developed cryopreservation protocols for the threatened frog species with results showing that thawed sperm samples have high fertility potential based on motility and other in vitro quality metrics.

This is the first time that sperm from these species have been cryopreserved with the work contributing greatly to the collective understanding of biobanking approaches for threatened Australian frogs. It is anticipated that biobanked samples will provide the genetic material to supplement conservation breeding populations for many years. Ultimately, the project will help to maintain robust genetic diversity, benefiting the long-term fitness of both zoo-based and wild populations.

# Enhancing Breeding Facilities for the Western Ground Parrot



The Critically Endangered western ground parrot (*Pezoporus flaviventris*) is the focus of a formal recovery program in Western Australia, and a key recovery action is to determine whether a conservation breeding program is suitable for this species.

To determine whether a breed-for-release program is a viable option and to provide information about the biology and behaviour of this highly cryptic species, Perth Zoo houses a small number of birds.

After the 2019-2020 bushfires and with the support of the WCF, Perth Zoo upgraded and expanded their existing breeding facilities for improved management and research procedures. This included establishing a dedicated aviary for breeding pairs.

The facility has not yet achieved breeding success, but considerable progress has been made with several new breeding attempts providing information on reproductive behaviour including copulation, nesting and incubation.

In 2023, ZAA WCF-funded facilities were also used for assisted reproduction work including evaluation of semen quality in males and egg incubation. This important work is further increasing knowledge and will contribute to advancing the program in future.



Perth Zoo continues to overcome challenges faced with *ex situ* breeding of western ground parrots. Future goals include increasing egg viability, minimising the risk of egg binding and continuing research into nutritional requirements for breeding parrots.

The facilities will enable Perth Zoo to improve social management of the birds, explore the potential for surrogate parrot species and research various aviary and egg incubation designs.

# Breeding and Releasing Pookila in Victoria



The Pookila, or New Holland mouse (*Pseudomys novaehollandiae*) has been in decline since its discovery in 1970. Remaining populations are highly fragmented and face drought, feral predators, competition, loss of genetic diversity and the effects of the 2019-20 bushfires.

The Victorian Pookila Conservation Breeding and Reintroduction Program was established in 2022 using founders from remaining wild populations. With careful matchmaking, the pookilas born for release are more genetically healthy and diverse than those in the wild.

As a result of the breeding program, ten female pookilas have been released to Wilsons Promontory National Park to introduce genetic diversity to the existing wild population. The resulting wild-born pups have been identified and will be monitored long-term. 28 pookilas have also been released to Royal Botanic Gardens Cranbourne, introducing this species to the region for the first time since 1976.

Since 2022, Moonlit Sanctuary and Melbourne Zoo have successfully bred 102 pookila pups across 15 breeding pairs between the two facilities.

With WCF funding, Moonlit Sanctuary opened the Small Mammal Conservation Breeding Centre which will play a vital role in sustaining populations for threatened mammals including pookilas. The facility can hold over 100 animals and can be adapted to house a wide range of species.

The release of pookilas will go a long way in conserving this species. Their presence is also benefitting their environment: as a burrowing species, they aid the ecosystem in soil turnover, increased water irrigation and seed and fungal dispersal.



# Recovery of the Kangaroo Island Dunnart



The Kangaroo Island Dunnart (*Sminthopsis fuliginosus aitkeni*) is Endangered and found only on Kangaroo Island, South Australia. The bushfires destroyed over 90% of their known habitat, sparking action from Zoos South Australia to locate the remaining dunnarts, research their biology and life history, manage threats to the species and develop plans to recover them if necessary.



In partnership with Kangaroo Island Land For Wildlife, Zoos SA identified dunnarts at 28 sites, indicating that the species was persisting well in the recovering landscape.

Zoos SA also worked with the Kangaroo Island Landscape Board and the World Wildlife Fund to monitor 110 sites long-term. Results indicate that the dunnarts have steadily recovered in refuges and previously burned sites. The team concluded that it was not necessary to establish an *ex situ* breeding population for the species.

Researchers analysed the genetic information, diets, den locations and behaviours of dunnarts in the recovering environment. This information will be collated with data from the current fat-tailed dunnart breeding program at Adelaide Zoo to draft translocation and *ex situ* breeding programs if intervention is ever necessary.

Zoos South Australia is part of the Kangaroo Island Dunnart Recovery Team and will continue to support the conservation of this species.

# Breeding Regent Honeyeaters for Release



Up to 30% of regent honeyeater habitat was affected during the 2019-2020 bushfires, compounded by severe drought. Regent honeyeaters are Critically Endangered, and without further intervention they may go extinct within the next 20 years.

Taronga Western Plains Zoo (TWPZ) has recently established a captive breeding population of regent honeyeaters, boosting the insurance population and enabling larger releases to supplement the wild population. This expansion was initially funded by State and Federal Biodiversity offsets.

***“The support to the breeding program at TWPZ has been critical and allowed for the increase in holding and breeding capacity of the overall program by 90%”***

ZAA WCF funding enabled the ongoing operations, maintenance and husbandry needed for the Taronga Western Plains Zoo honeyeater program in the 2022-23 period. Key successes during this time included:

- 25 birds from Taronga Western Plains Zoo were released in the Lower Hunter region of NSW
- Thirty-eight chicks hatched at the facility and 16 in Taronga Zoo Sydney, representing about 80% of all successful hatchings that year
- Song tutoring trials began at both Taronga Zoo and Taronga Western Plains Zoo to improve fitness and breeding success in released birds

The support from ZAA WCF helped to deliver key actions under the Regent Honeyeater National Recovery Plan. Since 2020, over 130 regent honeyeaters have been released in the core existing habitat. Taronga continues to update the program with monitoring and research of fitness and increasing breeding success of birds in the wild.

# Creating Refuge for Spotted Tree Frogs



Without conservation intervention, spotted tree frogs (*Litoria spenceri*) face extinction caused largely by habitat destruction, non-native predatory fish and chytrid fungus. Their range has constricted by over 50% in eastern Australia, and remaining sites are under threat.

Zoos Victoria pursued recovery plan actions to conserve the spotted tree frog, engaging Traditional Owners to undertake monitoring and removal of invasive fish in key refuges for the frogs.

With WCF support, Zoos Victoria used long-term, broad-scale monitoring to review the conservation status of the species and determine the most effective strategies for management interventions. The project also identified and mapped refuge sites with lower levels of chytrid fungus to secure as insurance populations.

One key goal of the project is to manage non-native predatory fish, which eat spotted tree frog tadpoles and occur at all sites. The project worked collaboratively with recreational fishing groups to ensure that management was supported by local communities.

Suitable selected sites were targeted to create refuges for the frogs. Zoos Victoria supported Traditional Owners and other partners to lead adaptive management trials including frog translocations and fish removal or exclusion. Each site is continuously monitored to evaluate the success of the management actions.

Other threatened species, such as barred galaxias and Murray spiny cray, are also impacted by non-native fish and are expected to benefit from this program.



# Image Credits



Cover: Brush-tailed Rock Wallaby: Lachlan Gilding at Taronga Wildlife Hospital

Kangaroo Island Dunnart: Martin Stokes

Rescuers and platypus: Australian Reptile Park

ZAA WCC meeting: Zoo and Aquarium Association

Brush-tailed Rock Wallaby: Lachlan Gilding at Taronga Wildlife Hospital

Justine O'Brien, Zara Anastas and Rebecca Hobbs preparing Frog sperm samples for cryopreservation at Taronga Zoo (ASilla)

Western Ground Parrot and eggs: Perth Zoo

Pookila in enclosure: Moonlit Sanctuary

Kangaroo Island Dunnart: Kangaroo Island Landscape Board

Adult Regent Honeyeater: Rick Stevens

Spotted Tree Frog: Zoos Victoria

Booroolong Frogs at Taronga Zoo Sydney: Rebecca Hobbs



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