



NSW National Parks and Wildlife Service

Threatened Species Framework annual report

2021–22 and 2022–23



Acknowledgement of Country

Department of Climate Change, Energy, the Environment and Water acknowledges the Traditional Custodians of the lands where we work and live.

We pay our respects to Elders past, present and emerging.

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Artist and designer Nikita Ridgeway from Aboriginal design agency – Boss Lady Creative Designs, created the People and Community symbol.

Cover photo: Yellow-footed rock-wallaby (*Petrogale xanthopus*). Peter Sherratt/DCCEEW

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Foreword

In December 2022 Australia joined most other nations around the world in adopting the Global Biodiversity Framework under the Convention on Biological Diversity, committing to 'halt human-induced extinction of known threatened species and for the recovery and conservation of species, in particular threatened species, to significantly reduce extinction risk' by 2030.

Australia has the worst mammal extinction record in the world, with known rapid declines also occurring in birds, reptiles and amphibians. In New South Wales alone there are 928 species listed as threatened with extinction under the *Biodiversity Conservation Act 2016* (NSW) (BC Act).

The establishment and management of both public and private protected areas is one of the most effective strategies to protect and restore threatened species populations, integrated with other complementary measures.

National parks cover 10.4% (8.2 million ha) of the state, protecting around 84% of threatened plants and animals present in NSW. However, ongoing threats like feral animals, weeds, altered fire regimes, disease and climate change continue to cause declines. Targeted action is required to ensure NSW national parks remain a permanent stronghold for the conservation and recovery of threatened species.

The National Parks and Wildlife Service (NPWS) Threatened Species Framework, launched in 2021, sets 2 ambitious goals: to ensure there are zero extinctions across the national park estate as a whole; and to stabilise or improve the trajectory of all threatened species by 2030 (with an interim target of stabilising or improving the trajectory of 300 threatened species by 2026).

Whilst this will be challenging, it represents the level of ambition required to meet the Global Biodiversity Framework targets to protect and restore Australia's unique biodiversity for future generations.

This initial report sets out early progress in delivering actions to meet these ambitious targets, including:

- The first threatened species status report has been published, reporting on data trends for 101 threatened species: 36 are stable or increasing, 6 are decreasing and trends for 59 species are currently undetermined. This status report is a first step in a groundbreaking initiative to objectively measure and report trends for threatened species on park.
- Specific measures to protect threatened species are now better integrated into landscape-scale fire management and increased efforts to control feral animals and weeds across the park estate.
- Over 680,000 ha were acquired in 2021–22 and 2022–23 to protect a diverse range of threatened species' habitats.
- Critical habitats for 108 threatened species now have enhanced statutory protections as Assets of Intergenerational Significance, with conservation action plans outlining risk mitigation actions.
- Twelve species listed as extinct in NSW have been successfully reintroduced into our network of feral predator-free areas, a historic achievement delivered in partnership with non-government organisations and universities.
- Ensuring no extinctions are recorded for species that occur on the national park estate.

These early achievements have been built on the exceptional skill and dedication of NPWS staff, working with colleagues across the Department of Climate Change, Energy, the Environment and Water, and the NSW Government, as well as effective collaboration with Aboriginal partners, the Federal Government, scientists, community groups and neighbouring landholders.

Effective delivery of the NPWS Threatened Species Framework over the next few years is set to provide a world-leading example of how the loss of biodiversity can be halted and reversed.

Atticus Fleming AM

Deputy Secretary, NSW National Park and Wildlife Service

NSW Department of Climate Change, Energy, the Environment and Water



Anemone buttercup (*Ranunculus anemoneus*). Photo: Gavin Phillips/DCCEEW

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Acronyms and abbreviations

Abbreviation	Definition
AIS	Asset of Intergenerational Significance
AWC	Australian Wildlife Conservancy
BC Act	<i>Biodiversity Conservation Act 2016 (NSW)</i>
BFMC	bushfire management committee
CAP	conservation action plan
DCCEEW	NSW Department of Climate Change, Energy, the Environment and Water (the department)
FPFA	feral predator-free area
framework, the	NPWS Threatened Species Framework for zero extinctions
ICON	Incident Control Online
NPW Act	<i>National Parks and Wildlife Act 1974 (NSW)</i>
NPWS	National Parks and Wildlife Service
RFS	NSW Rural Fire Service
SoS	Saving our Species program



The NSW National Parks and Wildlife Service is the first national park agency in Australia, and one of the first in the world, to set a zero extinctions target.

Eastern bristlebird (*Dasyornis brachypterus*). Photo: Alex Pike/DCCEEW

Introduction

In New South Wales there are currently 928 plants and animals listed as critically endangered, endangered or vulnerable under Schedule 1 of the *Biodiversity Conservation Act 2016* (NSW) (BC Act), excluding marine mammals, invertebrates and fungi. Just over 84% of threatened plant and animal species are represented on NSW national parks, which cover 10.4% (8.3 million ha) of land in the state. This concentration of threatened species and their habitat in the reserve system highlights the critical role of the NPWS in threatened species conservation.

The NPWS Threatened Species Framework sets bold objectives for threatened species conservation in our national parks system to achieve zero extinctions.

By 30 June 2026

- Stabilise or improve the on-park trajectory of at least 300 threatened species (measured by reference to metrics appropriate to the relevant species).
- No extinctions on the national park estate (that is, no loss of threatened species from the national park estate as a whole).

By 30 June 2030

- Stabilise or improve the on-park trajectory of all threatened species.
- No extinctions on the national park estate

For the purposes of this report, the term 'NSW national parks' refers to land reserved under the *National Parks and Wildlife Act 1974* (NSW) (NPW Act) including:

- national parks
- nature reserves
- state conservation areas
- Aboriginal areas
- regional parks
- historic sites
- karst conservation areas
- land owned and managed by the NPWS but not yet formally reserved.



Delivery of the NPWS Threatened Species Framework for zero extinctions will ensure national parks remain a permanent stronghold for threatened species in New South Wales.

Diuris eborensis (*Diuris eborensis*). Photo: Lachlan Copeland/DCCEW

Reporting against targets

The NPWS is committed to reporting against the targets set out in the Threatened Species Framework to ensure transparency and to demonstrate the achievements being made towards threatened species conservation. This is the first report published under the framework and includes an overview of relevant programs and initiatives, and highlights the achievements during both the 2021–22 and 2022–23 financial years. A summary of these achievements is presented in Table 1.

Table 1 Summary of achievements against the 8 framework actions, 2021–22 and 2022–23

No.	Action	Progress
1.	Establish and maintain an inventory of threatened species on the national park estate	The first iteration of the NPWS threatened species inventory has been established. Of the 928 threatened plants and animals listed in NSW, 780 (84%) have been recorded in NSW national parks .
2.	Map the on-park distribution of each threatened species	To date, the distribution modelling has been completed for 347 threatened species that occur on-park. Discrete areas of threatened species habitat declared as AIS (action 3) have also been mapped.
3.	Declare and manage important habitat as Assets of Intergenerational Significance (AIS)	Over 280,000 ha of land has been declared as environmental AIS protecting important habitat for 108 threatened species across 279 sites . The priorities for management and monitoring within these areas has been set out in 111 conservation action plans (CAPs) .
4.	Improve the integration of threatened species objectives in the design and delivery of landscape-scale park management actions and in land acquisition decisions	<p>Reserve establishment:</p> <ul style="list-style-type: none"> Land acquisitions for the NPWS estate included 483,597 ha in 2022–23 and 195,189 ha acquired in 2021–22, providing important habitat for threatened species that is now managed for conservation in perpetuity. <p>Feral animal control:</p> <ul style="list-style-type: none"> In 2022–23 over 47,700 feral animals were removed from park estate by aerial shooting, ground shooting, mustering and trapping. This included over 30,400 km of aerial baiting, 1,490 hours of aerial shooting, 14,200 trap nights and 199 ground shooting days, together with 27,000 ground baits being laid. In 2021–22 over 38,000 feral animals were removed from park estate by shooting, mustering and trapping. This included over 28,000 km of aerial baiting and 1,400 hours of aerial shooting. <p>Weed control:</p> <ul style="list-style-type: none"> In 2022–23 the NPWS completed 57,400 ha of weed control, including 30,198 ha for threatened species conservation. In 2021–22 over 54,900 ha of weed control was completed. <p>Feral predator-free areas (FPFAs):</p> <ul style="list-style-type: none"> NPWS currently manages 3 FPFAs across more than 19,000 ha in partnership with Australian Wildlife Conservancy and Wild Deserts. Four locally extinct species were reintroduced into those areas in 2021–22. An additional 2 locally extinct species were reintroduced in 2022–23. As of

Threatened Species Framework annual report, 2021–22 and 2022–23

No.	Action	Progress
		<p>30 June 2023, a total of 12 species listed as ‘extinct in the wild’ have been returned to NSW national parks.</p> <ul style="list-style-type: none"> The NPWS is currently establishing an additional 4 FPFAs which, when combined, will bring the total fox- and cat-free area in NSW national parks to approximately 65,000 ha. <p>Fire management:</p> <ul style="list-style-type: none"> NPWS has integrated AIS into strategic fire risk planning to support the effective management of important habitat for threatened species. Species-specific fire guidance outlines the risks posed to AIS in relation to fire, identifies appropriate fire regimes and provides operationally prescriptive response measures to enable appropriate fire protection actions to be implemented. AIS site information has been integrated into Rural Fire Service (RFS) response management systems, ensuring at-risk species and important habitat are strategically managed and protected during planned and unplanned fires, including during emergency responses.
5.	Report against targets	<p>A groundbreaking threatened species status report which captures current data trends for 101 threatened species using monitoring and survey results from several sources. This is the first attempt in NSW to systematically identify and report on-park data trends for threatened species, which will inform trajectories.</p> <p>NPWS ecological health monitoring (performance scorecards) were initiated for Kosciuszko and Royal National parks, with another 6 parks planned for the program by the end of 2025.</p> <p>Scorecards for 7 of the FPFAs are planned for reporting by June 2024.</p>
6.	Integrate activities with Saving our Species (SoS) and other programs	<p>Actions to implement the Threatened Species Framework were effectively integrated with the SoS program, supporting specific on-ground actions for 175 threatened entities including 146 threatened plants and animals in 2022–23.</p>
7.	Deliver NPWS threatened species research strategy	<p>A research strategy has been developed for the NPWS FPFA program. The NPWS will develop a threatened species research strategy for the reserve system.</p>
8.	Implement a data management plan	<p>The NPWS will enhance data management protocols through the implementation of a robust data management plan by 2025.</p>

Threatened species actions

The framework is designed to promote the protection and recovery of threatened species in NSW national parks and includes the 8 actions (set out in Table 1) designed to support the delivery of our objectives. Dedicated funding to achieve threatened species outcomes and to help the NPWS to meet the objectives under the framework is provided through core funding for the NPWS, Commonwealth funding initiatives, NSW Koala Strategy, NSW Environmental Trust grants, the NSW Government’s Saving our Species (SoS) program and other contributing partnerships.

This section provides a summary of progress towards the delivery of each action.

NPWS threatened species inventory

The first iteration of an inventory of threatened species recorded in NSW national parks has been established. This inventory forms an important baseline for the species for which we need to establish future reporting on trajectories within NSW national parks.

The number of threatened species recorded in NSW national parks was calculated based primarily on confirmed sightings recorded in the NSW BioNet Atlas since 1950, as well as modelled species distributions and expert advice. It includes threatened plant and animal species listed in Schedule 1 of the BC Act, excluding marine mammals, fungi and invertebrates. The NSW BioNet Atlas is the repository for plant and animal records submitted by various groups and individuals and is managed by the NSW Department of Climate Change, Energy, the Environment and Water. The NPWS validates records prior to inclusion in the inventory.

There are currently 928 threatened animal and plant species in NSW, of which 780 (84%) had been recorded in NSW national parks since the 1950s (Table 2). Of the species listed as critically endangered in the state, over 67% have been recorded in NSW national parks (Figure 1).

Table 2 Summary of threatened species (excluding marine mammals, invertebrates and fungi) recorded in NSW national parks

Species group	Number of threatened species in NSW	Number of threatened species recorded on-park	% of threatened species in NSW recorded on-park
Amphibians	30	27	90%
Birds	130	119	92%
Mammals	59	57	97%
Reptiles	50	45	90%
Plants	659	532	81%
Total	928	780	84%

Note: While care has been taken to develop this list, data are based on historic observational records and therefore may be subject to error. The quality, integrity and validation of this information will improve over time as additional data are collected and historical records are verified. The NPWS threatened species inventory will be improved and updated each year.

Threatened Species Framework annual report, 2021–22 and 2022–23

In establishing the inventory, we have identified 148 threatened species that have not been recorded within NSW national parks. For example, some species that do not have recent BioNet records on the national park estate include the southern hairy-nosed wombat (*Lasiorhinus latifrons*), the purple-gaped honeyeater (*Lichenostomus cratitius*) and the scarlet-chested parrot (*Neophema splendida*). Determining the distributions of these species will help to identify potential areas for future acquisition to ensure a greater number of threatened plants and animals are protected through the reserve system.

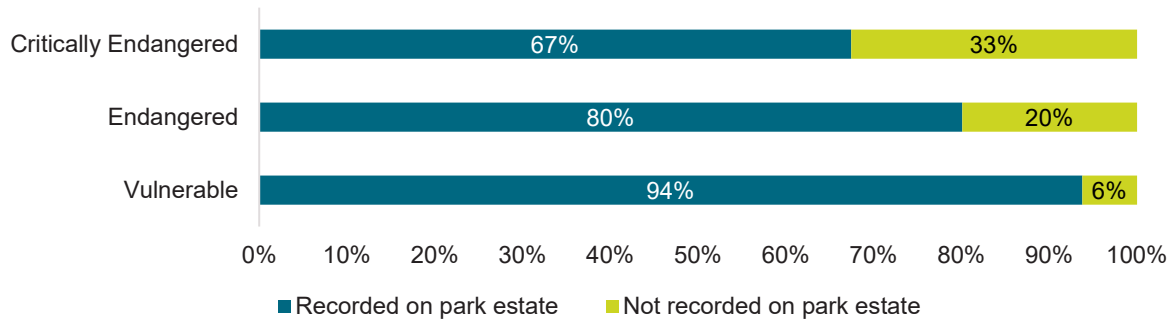


Figure 1 Percentage of threatened plants and animals recorded in NSW national parks

Establishing species trajectories

Understanding the status and trajectories of threatened species will help us focus action on ensuring NSW national parks are a stronghold for the conservation and recovery of threatened species.

Measuring the trajectory of threatened species is challenging and it can take years to acquire the data and species ecological knowledge required to analyse and interpret changes (for example, accounting for the influence of natural variability and impacts of events such as fire or floods).

The NPWS is implementing the following steps to meet the objective of stabilising and improving the on-park trajectory of all threatened species recorded on the park estate:

- A comprehensive data audit commenced in 2024 to compile available monitoring information for threatened species on-park.
- From 2024, monitoring programs, both existing and new, will be reviewed to ensure the monitoring design meets the requirements of the NPWS threatened species monitoring protocol (to be published in late 2024).
- An initial population status will be established and reported, from which a trajectory can be assessed in future. Species' trends and trajectories will be analysed over time using statistical approaches alongside information provided by experts.
- A threatened species status report with data trends will be published annually from 2024. However, the species trajectory can only be determined after 5 years of consistent data collection, or across a timescale relevant to the species ecology.

On-park distribution mapping

A key deliverable in the framework is to map the on-park distribution of each threatened species, based on a combination of observational records, distribution modelling and expert advice. An example of a distribution model for the eastern bristlebird (*Dasyornis brachypterus*) is shown in Figure 2. Understanding the on-park distributions of species will be critical in identifying populations to monitor, track and dedicate conservation efforts, to ensure we meet the objective of zero extinctions on NPWS estate.

Species distribution models can help us to identify areas in which we can direct targeted survey work to validate a species' occurrence and distribution on-park and inform current and future distribution under different climate scenarios. As of July 2024 the distribution has been mapped for 347 threatened species that occur on-park. In addition, discrete areas of threatened species habitat have been mapped and declared as Assets of Intergenerational Significance (AIS).

A range of species distribution models and maps are available which have been developed for various purposes within the department and externally. The NPWS is committed to working with our partners to establish a repository of threatened species distribution models, which will help to inform future decisions on reserve acquisition and threatened species management in NSW national parks.

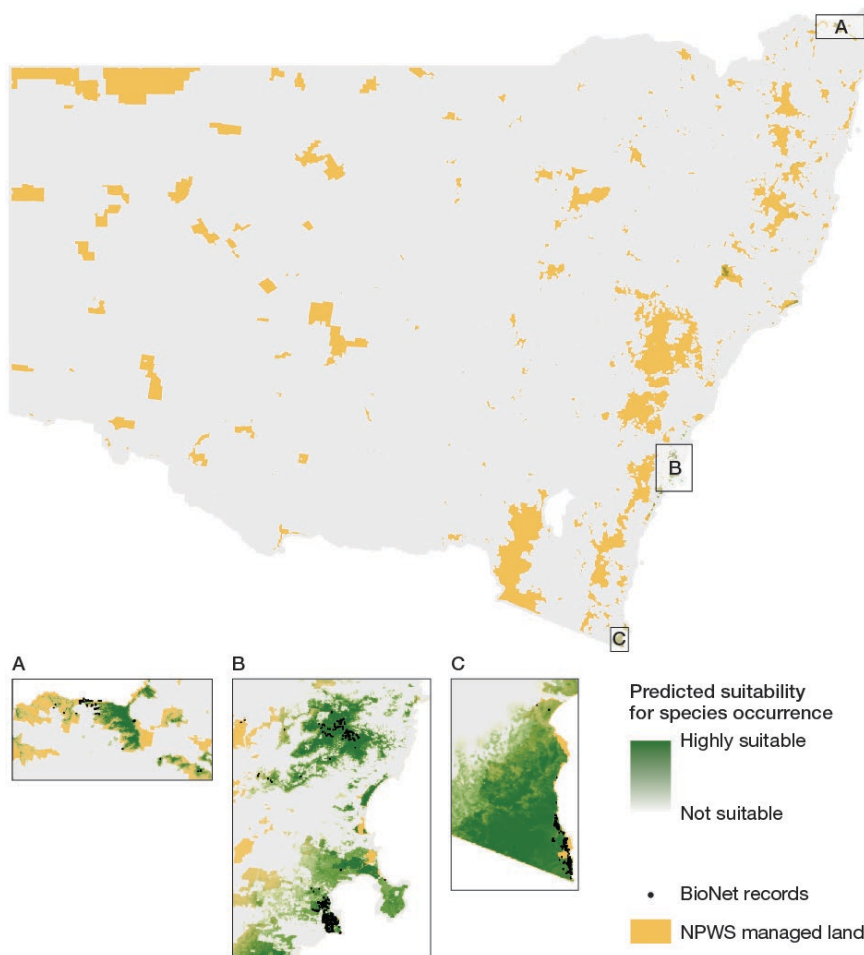


Figure 2 Species distribution model for the eastern bristlebird (*Dasyornis brachypterus*)

Assets of Intergenerational Significance

The bushfires of 2019–20 burnt through almost 40% of the NSW national park estate. These unprecedented fires led to the NSW Bushfire Inquiry, which recognised the need to identify and better protect the most important natural and cultural assets across the national park estate.

The NPW Act was subsequently amended to allow the Minister for the Environment to declare land on the national park estate as AIS. The declaration triggers a legal requirement to identify risks to the AIS site, take action to reduce those risks, and report on the health and condition of declared value.

AIS declared land has enhanced legal protections under the NPW Act. It is an offence for a person to harm, damage or disturb an environmental or cultural value of any land declared as AIS.

Declaring land as AIS enables the NPWS to focus efforts on protecting values that are most at risk and that require specific management for long-term protection and persistence. The declaration of AIS is based on the best available scientific data and knowledge of the species' distribution and habitat at the time of declaration.

Currently, declarations are focused on the protection of threatened species habitat; however, additional values will be considered in future.

The NPWS continues to declare land with exceptional environment value as AIS. The publicly accessible online interactive map shows information on declared AIS across NSW.



AIS interpretation project

The NPWS has been undertaking a project to raise awareness and foster greater public appreciation of threatened species, focusing on those with habitat declared as AIS, through interpretation. Interpretation in this context means a physical or digital project that provokes curiosity, deeper understanding, education and awareness in those who engage with it.

Conceptual planning for NPWS interpretation projects promoting over 25 threatened species declared as AIS, as well as other threatened species, is well underway, with some projects already being completed.

Concepts range from physical interpretations such as different styles of signage, sculptures, murals and audio signs, to digital interpretations such as videos, 360-degree virtual experiences, audio tours, upgrades to the AIS online interactive map and new threatened species profile pages available on the NPWS website. Projects are spread across NSW with a range of trees, shrubs and other herbaceous plants, frogs, lizards, birds and mammals represented.

Border Ranges 360 experiences

Innovative digital storytelling technology has been piloted by the NPWS to create an immersive experience using 360-degree interactive images of Border Ranges National Park. These images aim to raise awareness of the AIS program and threatened species by spotlighting some of the ancient landscapes and unique plants and animals protected within the World Heritage-listed park.

As you ‘explore’ the landscapes, which range from rainforest to rocky escarpment habitat, engaging pop-ups offer quirky and interesting facts, images and audio about the endangered and enigmatic animals protected within these habitats. You can meet and learn more about threatened species, like the endangered eastern bristlebird and Fleay’s barred frog, as well as vulnerable species like the Albert’s lyrebird and spotted-tailed quoll.

Through this dynamic content we can show why places like Border Ranges National Park are special and highlight the irreplaceable natural values that they protect. Using technology to bring national parks into people’s loungerooms is a fantastic way to raise awareness about these important natural assets and make them accessible to everyone.

The experiences have an impressive 88% average engagement rate on the NPWS website and are successfully drawing people in to learn more.



**View from the Pinnacle lookout, Border Ranges National Park.
Photo: John Spencer/DCCEEW**

Conservation action plans

Under the *National Parks and Wildlife Regulation 2019* (NSW), the NPWS is required to prepare a conservation action plan (CAP) for all AIS declared lands within 90 days of a declaration. Each CAP must be publicly exhibited for a minimum of 14 days.

The CAPs must identify:

- the environmental and cultural values of the land
- key risks to those values
- management activities to address and mitigate risks
- requirements for measuring and reporting on the health and condition of the declared land.

Key risks differ among species depending on factors such as habitat requirements, geographical location, presence of invasive species, and any other environmental factors that pose a risk to the environmental values of the land. These conservation activities may include integrating species-specific requirements into NPWS and NSW Government bushfire planning, implementation of hygiene management plans, and the delivery of feral animal and weed control.

Over the 2021–22 and 2022–23 financial years, a total of 111 CAPs prescribing priority activities for 99 species were approved and published on the department's website. CAPs for the remaining 9 species are either undergoing public exhibition or additional stakeholder consultation.

The NPWS is required to implement conservation activities for declared AIS in accordance with the approved CAP to ensure the protection of declared threatened species habitat in NSW national parks.

The NPWS is delivering targeted actions for all threatened species where habitat is declared as AIS. Many of these actions are integrated with the SoS program. Dedicated actions include, among others:

- weed control
- targeted feral animal control
- fire management
- development of hygiene plans and testing for plant pathogens (phytophthora) to mitigate the introduction of the plant disease
- track upgrades to prevent vehicular access near AIS sites

seed collection and germination trials to determine the viability of establishing ex-situ populations.

Threatened species monitoring was undertaken to understand the status of the species at the AIS site which will help determine species' trajectories over time.

Securing a future for *Leionema westonii*

Leionema westonii is a small shrub that grows up to 70 cm tall and is endemic to NSW. It was first discovered in 2004 and by 8 December 2021 was listed as critically endangered in the BC Act. It is known from a single population in Oxley Wild Rivers National Park, approximately 40 km east of Walcha on the New England Tablelands. It grows in a relatively flat area dominated by *Eucalyptus campanulata*, *Allocasuarina littoralis* and *Poa siberiana*.

The bushfires of 2019–20 burnt through the New England Tablelands region, impacting the species habitat. Following these bushfires, surveys were undertaken to assess post-fire recovery of *Leionema westonii*. Surveys carried out during this time failed to identify any recovery of this species and it was feared to be extinct.

However, hope was not lost! Surveys during 2022 located 151 individual plants, all resprouting from horizontal underground plant stems. Further surveys conducted in 2023 found 156 individual plants within the site. The collection of this data helps the NPWS manage the species and identify and address threats.

The NPWS has declared 79 ha of *Leionema westonii* habitat as AIS to protect this species into the future. Management actions include implementing appropriate fire management, feral animal control, ex-situ management, and emergency response during environmental events such as drought.



Leionema westonii. Photo: Lachlan Copeland/DCCEEW

Protecting important habitat for the Wollemi pine

The Wollemi pine (*Wollemia nobilis*) is a rainforest tree that grows up to 40 m tall. It is the sole living representative of an ancient genus and is critically endangered, with evidence of a long-term continuing population decline.

During the devastating 2019–20 bushfire season, the wild population was impacted by fire for the first time since its discovery in 1994. Most adult trees survived the fires with their upper canopies intact. However, the population was still impacted to varying degrees, including damage to, and loss of, several large trunks, scorching of lower canopies, and likely elimination of a seedling and juvenile bank comprising several hundred individuals.

The population is being closely monitored and will need to be protected from fire for an extended period (50 to 100 years or more) to facilitate recovery. Declaration of Wollemi pine critical habitat as AIS triggered additional legal requirements relating to fire management, disease risk and the management of public access.

Conservation activities to protect the AIS declared land have also seen 2 translocated populations established in 2019 and augmented in 2021. Measurements on the health and condition of these populations indicates they are progressing well, with many of the translocated saplings exhibiting above-average growth throughout 2022–23 (up to 60 cm per year) due to the favourable La Niña conditions.



Wollemi pine (*Wollemia nobilis*). Photo: Jaime Plaza/Botanic Gardens Trust

Fire management

The NSW 2019–20 Bushfire Inquiry recommended implementing a revised process for bushfire risk management plans that incorporates new modelling and methods for quantifying risk. These plans provide information on the bushfire risk to environmental and cultural assets and outline how land managers and firefighting authorities can strategically manage these risks. The Bushfire Inquiry also highlighted a need to improve the way we identify and protect priority assets, declared as AIS, well in advance of bushfire or other emergency events.

To support statutory bushfire risk management planning, the NPWS provides bushfire risk information to 53 bushfire management committees (BFMCs) across NSW. Information about threatened species is communicated to BFMCs through environmental asset profile reports and bushfire risk maps. These reports and maps draw on the best available data and quantitative risk analysis methodologies. This information is used by BFMCs to determine focus areas for mitigating the risk of bushfire impact to threatened species both on- and off-park over the next 5 years.

To achieve integration of AIS as an asset to be protected during fire suppression operations, the NPWS worked collaboratively with the NSW Rural Fire Service (RFS) to embed AIS fire guidance into emergency planning systems. When land is declared as AIS, the spatial information is integrated into the RFS Incident Control Online (ICON) management systems. This integration ensures that incident management teams can rapidly identify declared AIS to ensure their protection in planned and unplanned fires. Currently, a program of work is underway to develop pre-incident plans for the most vulnerable AIS sites. These pre-incident plans will provide incident management teams and fire crews with time-critical information needed to plan suppression operations for minimal impact.

Understanding the vulnerability of AIS to future bushfire impact has been a critical knowledge gap. To address this gap, the NPWS formed a multi-disciplinary team to model the effects of historical fire regimes and the severity of a future fire on the threatened species carrying capacity of AIS sites. The AIS vulnerability analysis enables NPWS staff to determine which AIS to focus on, both in the development of strategic risk management plans and in the triage of assets to be protected during fire suppression operations.

The department will continue to work closely with the RFS to ensure AIS are fully integrated into all facets of fire management in NSW.

Protecting environmental assets during bushfires

In September 2021 a fire started near Fiddletown Creek in Marramarra National Park. The fire encroached on AIS declared land that protected habitat for *Asterolasia elegans*.

This triggered an immediate response from NPWS staff, seeking species-specific information to provide to the incident management team. This enabled the team to quickly establish an effective exclusion zone as part of the response effort. This rapid response was pivotal in successfully protecting the site from the approaching bushfire.

As a result of this event, it was recognised that all land declared as AIS needs to be accessible to fire planners both within the NPWS and externally. The NPWS has since worked with the other fire management authorities to embed the AIS spatial information into emergency management systems, ensuring that our most important environmental assets can be rapidly identified and protected during planned and unplanned fires.

In March 2023 a wildfire event at Yarra Station in Nombinnie Nature Reserve threatened the habitat of the red-lored whistler. Using the AIS information available in the fire management systems, the incident management team quickly determined that the fire was threatening the AIS declared land. Through the availability of species fire guidance, the team was able to determine the best strategy for successfully suppressing the fire without causing impact to the species habitat.

Using the collaborative efforts of incident management teams, species experts and operational response protocols that are embedded in the declaration of AIS, we can effectively work to protect our priority assets during fire events, leading to positive biodiversity outcomes.



NPWS staff responding to a fire at Fiddletown Creek, Marramarra National Park.
Photo: Peter Taseski/DCCEEW

Feral predator-free areas

The NPWS is establishing a network of feral-predator-free areas (FPFAs) to enable the return of mammal species that had become extinct in NSW. Predation by feral cats and foxes is the key driver of native mammal decline and extinctions in Australia. The FPFA program aims to reintroduce over a dozen 'extinct' mammal species and prevent further extinctions by protecting our most vulnerable species from the threat of predation and competition from feral animals.

Since 2016 the NPWS has managed 3 FPFAs across more than 19,000 ha in partnership with the Australian Wildlife Conservancy (AWC) and Wild Deserts (a consortium comprising the University of New South Wales, Sydney and Ecological Horizons). The operation of these 3 sites – located at Mallee Cliffs National Park, Pilliga State Conservation Area and Sturt National Park – has led the way for reintroductions of small- to medium-size mammals since 2018–19.

The 2021–22 financial year saw 4 locally extinct species reintroduced into these partnership FPFAs: the brush-tailed bettong, the red-tailed phascogale, Mitchell's hopping mouse and the golden bandicoot. Following this success, an additional locally extinct species, the burrowing bettong, was released alongside the plains rat, which is listed as vulnerable under the BC Act.

In addition, 2 species were reintroduced to a new FPFA established by the NPWS at Yiraaldiya National Park in western Sydney (Figure 3). The eastern bettong was reintroduced in 2023. The return of the eastern bettong is particularly significant because it had been extinct in NSW for more than 100 years. The koala was also reintroduced to Yiraaldiya National Park as part of an initiative to better manage the meta-population of koalas in the Greater Sydney region.

By 30 June 2023, 12 species listed as extinct in NSW had been returned to NSW national parks. The NPWS continues to work in collaboration with our partners, AWC and Wild Deserts, to meet the target of reintroducing 13 locally extinct mammal species, with the western quoll, or chuditch, due for release into Sturt National Park in 2024.

Expanding our network of FPFAs

Building on the success of the existing FPFA partnership projects, the NPWS is working to triple the size of the current network to a total of 65,000 ha. The NPWS is leading the planning and delivery of the project, building upon the experience gained from the 3 existing FPFAs in the national parks system.

This project is one of the most significant threatened fauna restoration projects in NSW history. When combined with the partnership projects, the program will reintroduce a total of 33 locally extinct species and provide a measurable conservation benefit for at least another 45 threatened species. These sites will not only reduce the extinction risk to threatened species but also create a unique visitor experience by providing an opportunity for visitors to see rare and endangered native animals in the wild and free from the threat of predation by feral animals.

The additional FPFAs in the NSW national parks system are in various stages of development at Yiraaldiya National Park, Yathong Nature Reserve, Ngambaa Nature Reserve and Nungatta in South-East Forest National Park (Figure 3). Once completed, they will bring the total fox- and cat-free area in NSW national parks to approximately 65,000 ha. Planning is underway to carry out translocations of several more species into these areas, including the smoky mouse, the New Holland mouse, the eastern bettong, the rufous bettong, the koala, the long-footed potoroo, the parma wallaby, the brush-tailed rock-wallaby and the greater bilby.

Turning back the tide of extinction

Removing cats and foxes from national parks land and returning locally extinct wildlife



3 current feral predator-free area partnership projects



Feral cats kill more than **1.5 billion** native Australian animals every year.



4 new sites, tripling the area of fenced cat-and-fox-free land to nearly **65,000 ha**



28 locally extinct species will return to national parks on 4 new sites
Over **50** threatened species will benefit

This project has been assisted by the Environment Trust

Figure 3 Map of feral predator-free areas across New South Wales

Plains rat reintroduction to Pilliga State Conservation Area

A feral predator-free area (FPFA) has been established in Pilliga State Conservation Area in north-western NSW in partnership between the NPWS and Australian Wildlife Conservancy. The plains rat (*Pseudomys australis*), a rodent currently threatened in the wild in NSW, has been reintroduced into this area, along with 4 other species listed as extinct in the state.

In June 2023, 196 captive-bred plains rats were reintroduced into the FPFA; however, these individuals got off to a shaky start, suffering high mortality in the early days following release.

Through a well-coordinated post-release monitoring strategy and prompt adaptive management, the animals have since been able to settle into purpose-built soft-release pens. This provided the species with greater opportunity to establish burrow systems to keep them safe from what was discovered to be an unexpected native predator, the yellow-footed antechinus.

The species is now successfully breeding, and a trial has been initiated to open the pens to a larger management area to assess the likelihood of the species' ongoing persistence and its future management at the site. The initial assessment has been promising, with camera trap images revealing a female plains rat outside the management area co-existing with native predators.

Reintroductions of native species are complex. The ability to recognise when to commence an adaptive management strategy, as well as apply lessons learned, will become increasingly valuable to the FPFA program. The NPWS will continue to work with its partners towards increasing the FPFA network, establishing insurance populations and reintroducing species that haven't been seen in the NSW landscape in over 100 years.



Left and upper right: Plains rat (*Pseudomys australis*) released in June 2023. Lower right: Plains rat alongside 2 pups born within the FPFA. Photo: Kristal Jollie/AWC

Feral animal and weed control

Weeds and feral animals pose some of the greatest threats to biodiversity in NSW, and our threatened plants and animals are particularly vulnerable. To combat these threats, the NPWS is delivering the largest feral animal control program in the state's history and has prioritised the delivery of strategic weed programs across the reserve system, as highlighted in Figure 4. While feral animal and weed control programs are delivered at a landscape scale, they are also designed to deliver targeted protection for threatened species. Examples include removing feral goats to protect threatened plants such as *Bossiaea fragrans* in Abercrombie Karst Conservation Reserve; baiting for foxes in the Blue Mountains National Park to protect brush-tailed rock-wallaby; and the removal of Bitou bush to protect Gould's petrel (*Pterodroma leucoptera leucoptera*) on Broughton Island Nature Reserve.

In the 2021–22 financial year, annual performance targets were exceeded with over 54,900 ha of weed control implemented, nearly half of this targeted at protecting threatened species. To control feral animals, over 28,000 km of aerial baiting and over 1,400 hours of aerial shooting were implemented. Shooting, trapping and mustering alone removed well over 38,000 feral animals from the park estate.

Building on this progress, these strategic programs again surpassed the annual targets for the 2022–23 financial year, with completion of over 57,400 ha of weed control, including 30,198 ha for threatened species conservation; over 30,400 km of aerial baiting; over 1,490 hours of aerial shooting; and over 27,700 ground baits laid, along with 199 ground shooting days and over 14,200 trap nights. Over 47,700 feral animals were removed from the park estate by aerial shooting, ground shooting, mustering and trapping.

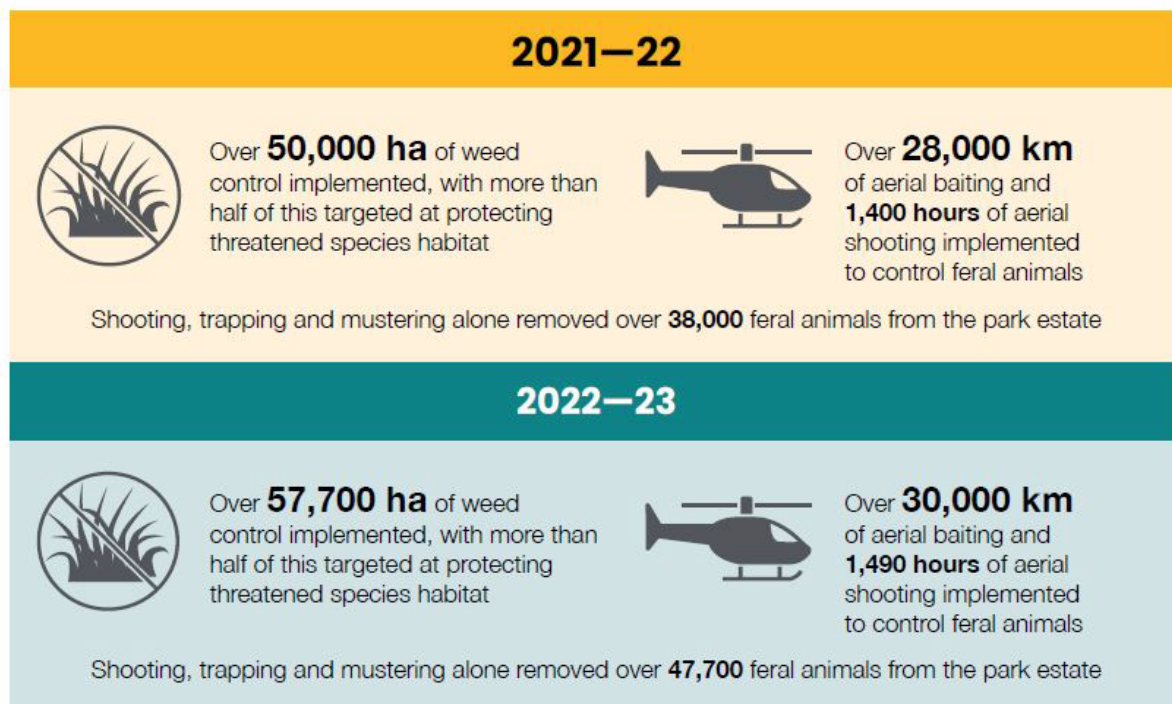


Figure 4 Feral animal and weed control activities, 2021–22 and 2022–23

Reserve establishment and land acquisition

The NPWS leads an active land acquisition program to establish new national parks and add land to existing reserves, as shown in Figure 5. This program contributes to the conservation of threatened species and ecological communities by removing the threat of habitat destruction, and actively controlling risks such as feral animals, weeds and frequent fire. The acquisition program seeks to improve habitat viability, secure threatened species populations, and provide opportunities for climate change adaptation and refugia from extreme weather events.

In the 2021–22 financial year a total of 161,231 ha was acquired, including:

- 121,390 ha at Avenel Station near Broken Hill, a remote and ecologically diverse ecosystem which protects threatened species such as the dusky hopping mouse
- 87 ha added to Koukandowie Nature Reserve, which secures additional habitat for the endangered brush-tailed rock-wallaby
- 2,078 ha of koala habitat adjoining Bundjalung National Park, Macanally State Conservation Area and Killabakh Nature Reserve
- an additional 37,676 ha of private land for addition to 23 other reserves.

The purchase of Avenel Station is the second-largest acquisition in NPWS history. The acquisition comprises numerous arid ecosystems that were not previously protected. This land supports habitat for an estimated 30 threatened plants and animals, including the Australian bustard, the dusky hopping-mouse, the eastern fat-tailed gecko and the yellow-keeled swainsona.

In the 2022–23 financial year, a total of 483,577 ha was acquired, securing habitat for 74 threatened fauna species and 20 threatened flora species. This included:

- 33,903 ha at Brindigabba Station, supporting critical wetland habitat and increased protection for one of Australia's most poorly protected bioregions in NSW, which contains the threatened lancewood (*Acacia petraea*), not previously protected within the NSW national parks system
- 437,394 ha at Thurloo Downs, the largest acquisition in NSW national parks history, containing exceptional biodiversity values not found in any other national park
- 10,431 ha of koala habitat for addition to 11 reserves, including Captains Creek Nature Reserve, Undoo Nature Reserve and Werrikimbe National Park
- 1,849 ha of additional land for 25 reserves.

The purchase of Thurloo Downs is the largest single acquisition in NPWS history. It contains areas of arid zone wetlands that meet the requirements for listing as a Wetland of International Importance under the Ramsar Convention. The estate has exceptional biodiversity value and fills important gaps in the national park estate by protecting landscapes and ecosystems not found in any other national park. Around 50 threatened species are expected to be on the estate, including the Australian bustard, the flock bronzewing, the grey grasswren, the plains wanderer, the black falcon, the pink cockatoo, the eastern grass owl, the white-fronted chat, the stripe-faced dunnart, the little pied bat, the sandy inland mouse, the crowned gecko, the woma python and several threatened plants.

The reserve establishment and land acquisition program will continue to target critical habitats and core areas in each bioregion that are important for the long-term survival of threatened species.

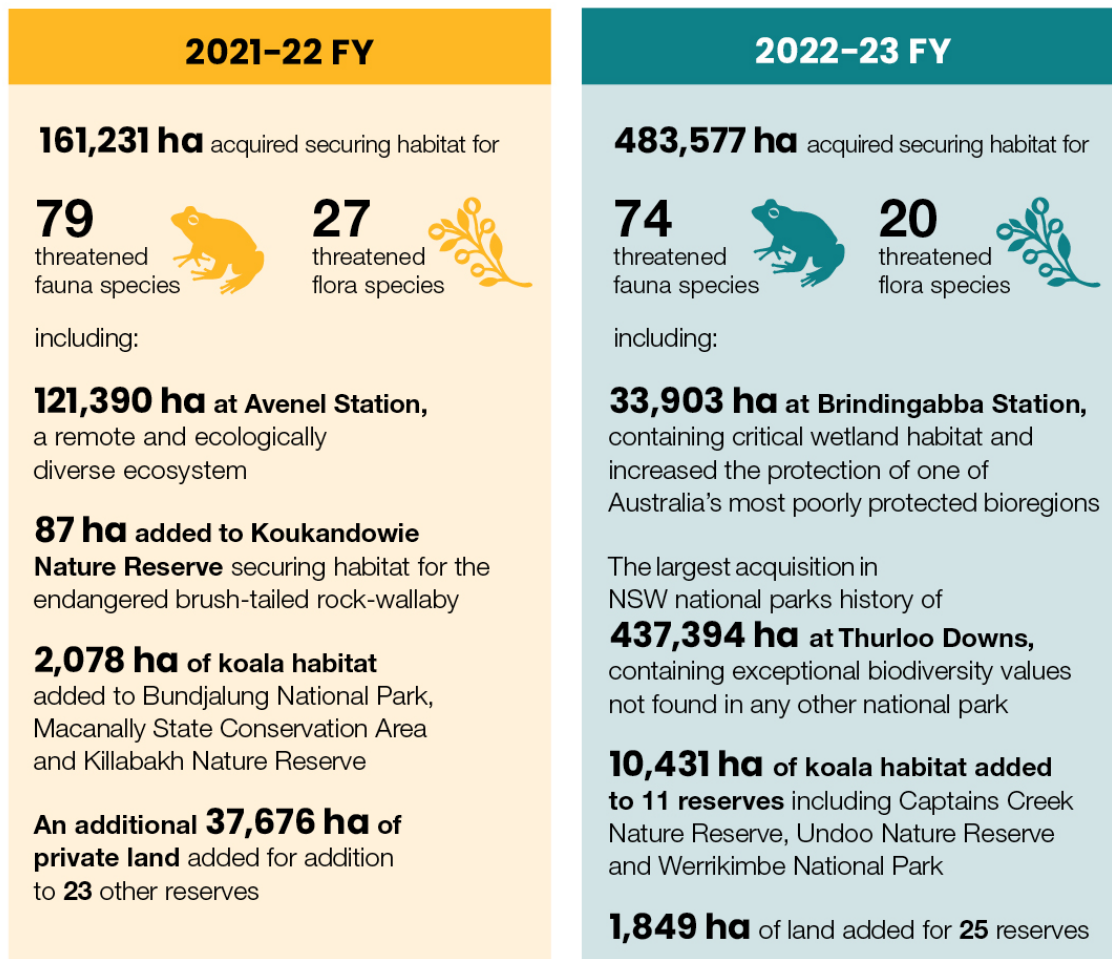


Figure 5 Reserve establishment and land acquisition, 2021–22 and 2022–23

NSW Koala Strategy

The NPWS has been restoring koala habitat across NSW from the Border Ranges in the north to the Snowy River in the south, totalling 4,800 ha across 52 national parks and reserves. Over 45,500 trees have been planted, 3,638 ha of weeds controlled, and 5 culturally informed burns completed as part of actions under the NSW Koala Strategy.

Using thermal drone technology, a previously unrecorded population of koalas at Coolah Tops National Park has been discovered, with 43 koalas detected. Further monitoring is planned for implementation across the state, including in areas declared as AIS for the koala, to help determine population baselines and trajectories.

In the 1970s, the NPWS released about 20 koalas at Narrandera within Murrumbidgee Valley Nature Reserve in a community effort to re-establish the extinct colony. Our koala team is still researching this koala population 50 years on, finding them to be chlamydia-free and genetically diverse, with almost 300 koalas being detected using drones and audio detection devices.

In the state’s first koala conservation translocation in 50 years, koalas have been reintroduced to Yiraaldiya National Park FPFA in the heart of Western Sydney. The NPWS will assess the suitability of other sites across NSW for koala translocations to help conserve the species.

Securing koala habitat in NSW national parks

Koalas are one of Australia's most iconic animals, recognisable around the world. However, koala populations are under increasing pressure and have declined in NSW over the last 20 years.

The NPWS land acquisition program is targeting some of the most important areas in NSW for koala conservation, with over 2,000 additional ha protected in 2021–22 and over 10,500 additional ha protected in 2022–23, securing habitat for up to 200 individual koalas across 3 locations.

In northern NSW, koala habitat of 752 ha adjoins Bundjalung National Park, also home to brush-tailed phascogales. In southern NSW, habitat of 1,052 ha adjoins a secure forested corridor in Macanally State Conservation Area. This corridor links the tablelands with coastal forests, facilitating a safe passage across the landscape of koalas and other species, which supports healthy populations of species.

On the mid-north coast, an area of 201 ha connects 2 separate sections of Killabakh Nature Reserve. This comprises high-quality and intensively used koala habitat, and also contains 2 threatened plant species, scrub turpentine and Manning yellow solanum, and 18 other threatened fauna species including the long-nosed potoroo, the brush-tailed phascogale and the sooty owl.

West of Port Macquarie, a site of 4,450 ha linking 4 existing NPWS reserves was purchased in 2023. As well as providing habitat for koalas, the site also includes habitat for the endangered Hastings River mouse and the spotted-tailed quoll, and various hollow-dependent species.

Securing additional habitat for koalas not only ensures their future as a species but also benefits a wide range of other threatened species, habitats and ecosystems.



Koalas (*Phascolarctos cinereus*). Photo: Dan Lunney/DCCEEW

Saving our Species

Funding from the Saving our Species (SoS) program has contributed to the management of 175 threatened entities including 146 plants and animals on the national park estate. Continued support from the SoS program, and collaboration with staff in the Biodiversity, Conservation and Science group in the department, as well as external SoS partners, is recognised as vitally important to the management of threatened species on the national park estate, as part of a broader landscape-scale approach to the restoration of species.

Protecting our beach-nesting birds

The NSW coast is home to many birds, but only a few species are beach-nesting. In 2022–23 NPWS and department staff, volunteers and contractors recorded over 9,000 observations of beach-nesting birds along the coast from Tweed Heads in northern NSW to Greenglade near the Victorian border.

Hooded plovers, hooded dotterels, beach stone-curlews, little terns and pied oystercatchers all nest along our beaches. Their breeding success is poor, and their numbers are declining due to increasing threats. Nest inundation from storm surges, fox predation and disturbance from recreational activities are the primary causes of population decline.

The impacts of various threats on breeding activity and fledging rates, and our success in managing these threats, vary significantly between sites and seasons. Data have shown greater fledging rates for little terns and hooded dotterel at sites where fox control has been implemented. In 2022–23, supported by funding from the SoS program, the NPWS delivered fox control across nesting areas to reduce fox predation and give these species a better chance at survival; data on the outcome of this intervention are currently being analysed.

Volunteers play a critical role in engaging people on the beach about beach-nesting birds. A dedicated ‘Share the Shore’ campaign, funded by the SoS program, was implemented across social media and other online platforms to inform NSW beachgoers about beach-nesting birds and to encourage beachgoers to take simple steps to minimise their impacts. The campaign reached more than 910,000 people.



Hooded plovers (*Thinornis cucullatus*). Photo: Jodie Dunn/DCCEEW

Ecological Health Performance Scorecards

The NPWS Ecological Health Performance Scorecards program, is a world-leading ecological health measurement and reporting program. The program aims to establish a consistent monitoring framework across all national parks, providing data on species, biodiversity and ecological health. From 2024, scorecards will be published annually, reporting on the status and trends of indicator species including threatened and declining species, ecological processes, and risks such as feral animal populations, weed occupancy and fire impacts. This information will inform on-park management decision-making and contribute to securing positive conservation outcomes.

The pilot program includes 8 national park aggregates (Figure 6) that undertake park-wide surveillance monitoring, supplemented by more targeted monitoring for indicator species or risks. The program will measure and report on the population, or similar metric, for a range of threatened species across these 8 park aggregations, including the koala, the greater glider, the forest owls, the spotted-tailed quoll, the pilotbird, the grey grasswren, the eastern pygmy possum and many other threatened reptile, amphibian and plant species.

In the 2021–22 financial year, 100 sites covering 673,790 ha at Kosciuszko and 40 sites covering 18,912 ha at Royal–Heathcote–Garawarra national parks were established.

During 2022–23, the program successfully deployed and retrieved data from 46 sites covering almost 48,000 ha in Myall Lakes. A further 68 sites covering over 243,700 ha in the Northern Forests were established and set to be completed in early 2024. Engagement and site stratification are underway for the Greater Blue Mountains site, which is planned to cover 842,388 ha.

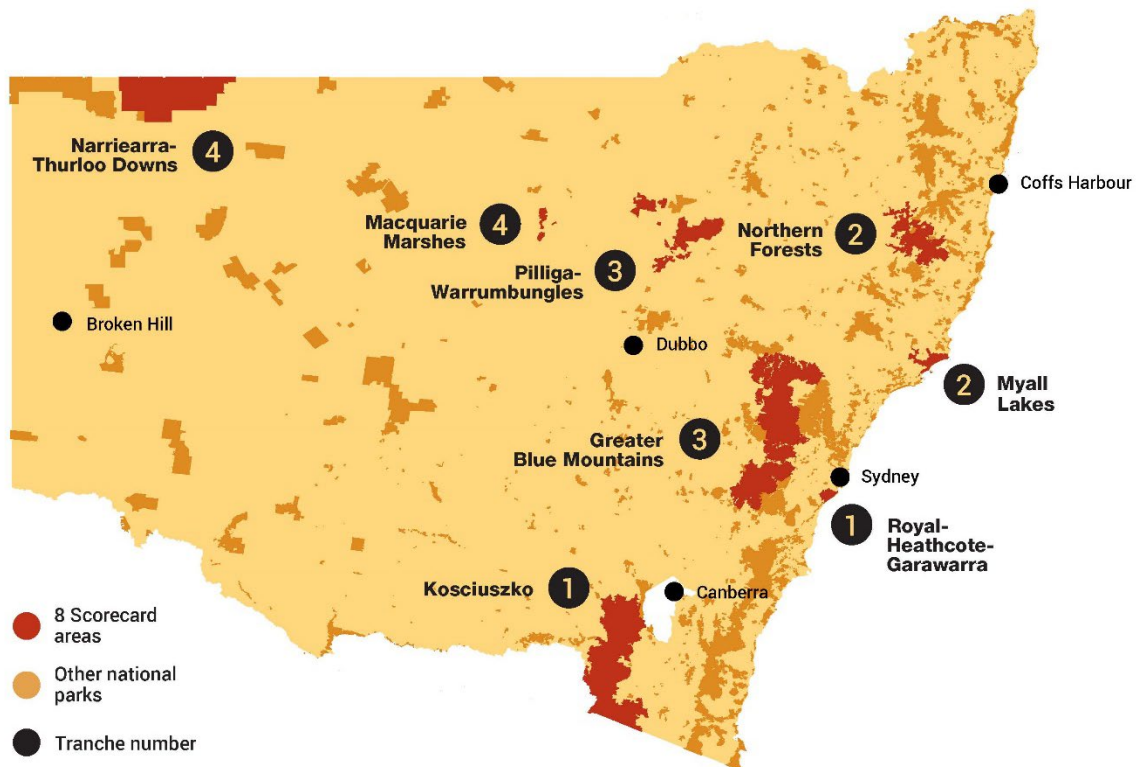


Figure 6 Map of the current and planned scorecard sites across New South Wales

Achieving zero extinctions into the future

Through implementing the framework, the NPWS will contribute to a renewed global commitment to prevent extinctions and promote the restoration of biodiversity. The table below identifies our commitments to achieve the objectives of this framework.

Table 3 Next steps: commitments to achieving the 8 framework actions

No.	Framework action	Our commitments
1.	Establish and maintain an inventory of threatened species on the national park estate	Maintain the existing inventory through regular data maintenance. Improve the validity and accuracy of the inventory by implementing the first stage of data improvements.
2.	Map the on-park distribution of each threatened species	Initiate additional mapping and modelling for threatened species, as required, to further refine the number of threatened species represented on-park and their distributions. Distinguish between species with discrete populations on-park and widespread or landscape species, to determine appropriate management plans.
3.	Declare and manage important habitat as Assets of Intergenerational Significance (AIS)	Declare additional AIS to protect habitat for more threatened species in NSW national parks. Develop CAPs and audit their implementation. Undertake a risk assessment to identify those threatened species on the national park estate that are at greatest risk of extinction and have not yet been declared as AIS.
4.	Improve the integration of threatened species objectives in the design and delivery of landscape-scale park management actions and in land acquisition decisions	Continue delivering effective landscape-scale management action that integrates threatened species considerations, in particular: <ul style="list-style-type: none"> • integration of threatened species requirements into fire planning and response systems • delivery of the largest feral animal control program in NSW history • implementation of strategic weed control programs. Continue to develop and implement a targeted network of FPFAs to deliver significant benefits for threatened species populations. Continue the expansion of the NPWS reserve system to protect additional threatened species, considering the need to secure habitat for threatened species not currently represented on the park estate and those that will benefit from securing their habitat (such as those which have low representation in the reserve system, critically endangered species or other priority species), as well as change refugia considerations.

Threatened Species Framework annual report, 2021–22 and 2022–23

No.	Framework action	Our commitments
5.	Report against targets	<p>Improve the integrity of threatened species data collected, increasing the number of species for which we can report an on-park population trajectory.</p> <p>Ensure all threatened species monitoring on the national park estate is consistent with the new threatened species monitoring protocol.</p> <p>Audit monitoring data to assess the availability of threatened species population estimates and identify data deficiencies.</p> <p>Establish baseline status reports for threatened species with existing population estimates, from which a trajectory for the species can be assessed.</p>
6.	Integrate activities with Saving our Species, Koala Strategy and other programs	<p>Continue to work in partnership to deliver the NSW Government's Saving our Species program on-park</p> <p>Continue to prioritise and implement feral animal and weed management at key sites for threatened species.</p> <p>Ensure species monitoring under this framework is integrated with the NPWS ecological health monitoring (Scorecards) program.</p>
7.	Deliver NPWS threatened species research strategy	<p>Develop and implement a long-term threatened species research strategy for national parks.</p>
8.	Implement a data management plan	<p>Develop and implement a data management plan, working with our partners.</p>

More information

[Global Biodiversity Framework](#)

[NSW BioNet Atlas](#)

[NPWS Assets of Intergenerational Significance interactive map](#)

[NPWS Border Ranges 360 experiences](#)

[NPWS ecological health monitoring \(scorecards\) program](#)

NSW Department of Planning, Industry and Environment (2021) [NPWS Threatened Species Framework: zero extinctions – national parks as a stronghold for threatened species recovery](#)

NSW Environment Protection Authority (2021) [NSW state of the environment report](#)

[Threatened species action plan 2022–2032](#)



The NSW National Parks and Wildlife Service acknowledges those who have contributed to this report. Thank you for your commitment to helping threatened species in New South Wales.