NSW National Parks and Wildlife Service

Kosciuszko offset action plan – gang-gang cockatoo

Kosciuszko Offset Project

environment.nsw.gov.au

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.

This resource may contain images or names of deceased persons in photographs or historical content.

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

Cover photo: Gang-gang cockatoo. Jacinda Dromgold/DCCEEW

Published by:
Environment and Heritage
Department of Climate Change,
Energy, the Environment and Water
Locked Bag 5022, Parramatta NSW 2124
Phone: +61 2 9995 5000 (switchboard)
Phone: 1300 361 967 (Environment and Heritage enquiries)
TTY users: phone 133 677, then ask for 1300 361 967
Speak and listen users: phone 1300 555 727, then ask for 1300 361 967
Email: info@environment.nsw.gov.au
Website: www.environment.nsw.gov.au

ISBN 978-1-923516-46-5
EH 2025/0259
August 2025

NSW GOVERNMENT

Find out more about your environment at:

environment.nsw.gov.au

Contents

List of tables

List of figures

Objective

This plan sets out management actions that, when implemented and measured, will deliver biodiversity gains for the gang-gang cockatoo (*Callocephalon fimbriatum*) within Kosciuszko National Park.

The Kosciuszko Offset Strategy 2023 sets out a framework for the development of offset action plans. It is based on a clear objective – to deliver a biodiversity gain in the park equivalent to 120% of the biodiversity loss identified in the Snowy 2.0 environmental assessments.

In the Snowy 2.0 environmental assessment for Exploratory Works, Main Works and Transmission Connection, up to 57 hectares of gang-gang cockatoo habitat was identified as being impacted. At an estimated 0.015 individuals per hectare (see Step 1), the impact of the Snowy 2.0 project on the gang-gang cockatoo is estimated to be a reduction of the population by 1 individual.

To deliver the 120% biodiversity gain identified under the Kosciuszko Offset Strategy, the objective of this action plan is to **increase the population of gang-gang cockatoos in Kosciuszko National Park by 2 individuals**.

It is recognised that by implementing the actions under this plan, the potential increase in the gang-gang cockatoo population in the park may be greater than 2 individuals. It is also recognised that it may be difficult to attribute such a small biodiversity gain directly to the implementation of this action plan, notwithstanding that implementation of the planned actions will benefit the species.

The impacts to this species were not identified as being Commonwealth matters of national environmental significance under the Snowy 2.0 assessments. Therefore, this action plan has been approved only by the acting Deputy Secretary, NSW National Parks and Wildlife Service.

Species overview and key threatening processes

The gang-gang cockatoo is listed as **endangered** under the NSW *Biodiversity Conservation Act 2016* and **endangered** under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*.

Table 1 provides a species summary for the gang-gang cockatoo, including a description of the species, its habitat, its preferred food sources and its distribution within Kosciuszko National Park.

Table 1 Species summary – gang-gang cockatoo

Category	Summary
Description	Gang-gang cockatoos are one of the more distinctive members of Australia's avifauna. They are primarily slate-grey, with the males easily identified by their scarlet head and wispy crest. Females have a grey head, crest and feathers edged with salmon pink on the underbelly. They range in length from 32 cm to 37 cm, with a wingspan of 62 cm to 76 cm. Their call has been likened to a creaking gate or cork being pulled from a bottle.
Habitat	In spring and summer, gang-gang cockatoos are generally found in tall mountain forests and woodlands, particularly in heavily timbered and mature wet sclerophyll forests. Nests are located in eucalypts, in hollows that are 10 cm in diameter or larger and at least 9 m above the ground. The Snowy 2.0 project area contains suitable breeding habitat to support this species and the species was recorded within the survey area during environmental assessments for the project.
Diet	The gang-gang cockatoo feeds on seeds obtained in trees and shrubs, mostly from eucalypts and wattles. It also eats seeds of some introduced trees and shrubs around human settlements in winter, and insect larvae from galls and sawflies.
Distribution and population	The gang-gang cockatoo was found to be common throughout the Snowy 2.0 Main Works survey area, with the species observed foraging at numerous locations. The species was observed to be most common in subalpine woodlands such as at the top of Lobs Hole Ravine Road and Marica in Kosciuszko National Park. It is also found in riparian areas at lower elevations close to the Yarrangobilly River, and in dry sclerophyll forests at Marica.

Source: Saving our Species and personal communication NSW Department of Climate Change, Energy, the Environment and Water, Biodiversity Conservation Division; Snowy 2.0 Exploratory Works, Main Works and Transmission Connection environmental assessments.

Table 2 provides a list of key threatening processes to gang-gang cockatoos within Kosciuszko National Park that will be addressed via cost-effective management actions (see Table 3).

Table 2 Key threatening processes to gang-gang cockatoos in Kosciuszko National Park

Threat	Description
Pathogens, diseases and microorganisms	*Psittacine circovirus* disease ('beak and feather' or 'bald cocky' disease)
Anthropogenic climate change	Climate change impacts to habitat suitability and distribution
Inappropriate fire regimes	Loss of key breeding and foraging habitat from intensive wildfire events and inappropriate hazard reduction burns
Weeds	The natural germination of key food sources is impacted through invasion, establishment, intensification and spread of weeds such as blackberry, St John's wort, thistle and viper's bugloss

Source: Saving our Species and personal communication NSW Department of Climate Change, Energy, the Environment and Water, Biodiversity Conservation Division

Kosciuszko Offset Strategy: metrics-based approach

The Kosciuszko Offset Strategy requires expenditure of Snowy 2.0 offset funds to deliver biodiversity gains for Kosciuszko National Park equivalent to 120% of the loss for threatened species, threatened ecological communities, and ecosystems impacted by the Snowy 2.0 project. The benchmark of 120% has been set because this is considered achievable over the life of this action plan and can be demonstrated as a biodiversity gain.

In setting an objective to exceed the statutory requirements, the strategy recognised the difficulties in measuring biodiversity gains and the inherent fluctuations in biodiversity over time. This benchmark provides a margin that will increase confidence that the minimum statutory requirements are being met. The strategy takes a metrics-based approach that will be applied to the delivery of biodiversity offsets by the NSW National Parks and Wildlife Service (NPWS). This will be achieved by following a 3-step process:

Step 1: quantifying the impacts and benefits that must be delivered

Step 2: implementing actions to deliver the required offset

Step 3: measuring and reporting on the biodiversity benefit.

Step 1: quantifying the impacts on gang-gang cockatoos and benefits that must be delivered

It is estimated that one gang-gang cockatoo will be impacted by Snowy 2.0 Exploratory Works, Main Works and Transmission Connection projects. The benefit that must be delivered is the successful and sustainable establishment of an additional 2 gang-gang cockatoos in Kosciuszko National Park (being >120% of the impact). This calculation is based on impacts to 57 hectares of gang-gang cockatoo habitat from Snowy 2.0 with an estimated population density of 0.015 individuals per hectare.

Step 1 limitations, assumptions and notes

- The methodology in the dot-points below is based on expert departmental species knowledge.
- The Snowy 2.0 environmental assessments were the first significant surveys conducted for this species in Kosciuszko National Park. However, these surveys were not used to estimate population density under this action plan, as sightings were assumed and no nests were confirmed as a part of this work.
- The Snowy 2.0 surveys conducted in 2018 and 2019 occurred before the 2019–20 bushfires in Kosciuszko National Park. It is estimated in the Commonwealth *Conservation advice for* Callocephalon fimbriatum *(gang-gang cockatoo)*, that the impact of the fires has reduced the carrying capacity of areas occupied by the species by 40%, with an overall population reduction of 10%. As a result of the bushfires, the gang-gang cockatoo was listed as endangered in New South Wales in March 2022 (it was previously listed as vulnerable).
- The population density figure used in this action plan is based on an area of occupancy of 1.55 individuals per square kilometre (0.015 individuals per hectare). This is based on

the Commonwealth conservation advice for gang-gang cockatoos. This figure accounts for the assumed reduction in population due to the 2019–20 bushfires.

- This population density figure recognises that the species density within one hectare of suitable habitat is variable across the park.
- Upon completion of actions 1 to 5 (which include monitoring actions – see Table 3), and as further studies and information on gang-gang cockatoo populations and densities in Kosciuszko National Park become available over the life of the action plan, the benefit that must be delivered will be refined and adjusted accordingly.

Step 2: implementing the management actions for gang-gang cockatoos to deliver the required offset

Delivering an offset of at least 2 additional gang-gang cockatoos in Kosciuszko National Park will involve the following management interventions:

- identifying an area (or areas) of suitable habitat for delivery of the offset, measuring the current density (or other suitable metric such as occupancy) of gang-gang cockatoos at that location, and identifying the target density and thus the required area across which the offset actions are to be delivered (see actions 1 and 2 in Table 3)
- increasing the density (or other suitable metric) of gang-gang cockatoos at that location through a targeted series of offset actions such as the removal of weeds, planting of foraging habitat, and protection of unburnt habitat sites (see actions 3, 4 and 5 in Table 3).

The population density figure used in this action plan is based on the Commonwealth's conservation advice for gang-gang cockatoos. There is a lack of information post the 2019–20 bushfires on gang-gang cockatoo occupancy, abundance and distribution in Kosciuszko National Park.

In that advice, the gang-gang cockatoo was estimated to have an extent of occurrence and area of occupancy of 400,000 square kilometres and 30,000 square kilometres respectively. Given the extent of this distribution and occupancy, and the relatively low estimated population density per hectare, monitoring actions are unlikely to identify individuals of the species consistently within the park in known habitat areas.

Gang-gang cockatoos are monogamous and can produce 2 young per breeding cycle, which occurs from October to December. Multiple nests used by different breeding pairs can be found within a few hundred metres of each other. Gang-gang cockatoos have been recorded using the same roosting and nesting sites for multiple years.

This action plan will focus on:

- surveys to establish areas of high activity during the breeding season and, if possible, locating and protecting existing nests (see action 1 in Table 3)
- conducting weed removal at sites where the natural germination of foraging habitat is being impacted (see action 3 in Table 3)
- planting foraging habitat to increase food availability at sites with high activity (see action 4 in Table 3).

The preliminary offset sites in Figure 1 have been chosen based on abundance data from records made during the Snowy 2.0 Main Works assessment in 2019, and from available Bionet data in 2023. This includes both burnt and unburnt sites.

Table 3 lists the actions needed to deliver the required biodiversity gains. Once species presence has been determined, population density figures may need to be reevaluated to ensure the delivery of the offset is equivalent to the impact.

Table 3 Management actions for gang-gang cockatoos to deliver the required offset in Kosciuszko National Park

Action number	Action	Threat addressed	Location	When	Who	Total cost (preliminary estimates)	Comment
1	Conduct rapid diurnal surveys in identified habitat areas (Figure 1) to confirm and calculate species occupancy, locate nest hollows for protection (if possible) and identify suitable locations for rehabilitation (actions 3 and 4)	–	Area shaded in red (Figure 1)	2024 to 2028	NPWS	$10,000	Underway. Part of generating baseline information.
2	Undertake a desktop assessment to determine the required areas across which the offset actions will be delivered	–	Offset sites identified in action 1, plus any other sites identified by NPWS	2025 to 2028	NPWS	$0	Based on the results of action 1. Part of generating baseline information.
3	As required, undertake weed removal to increase the natural regeneration of foraging habitat	Weeds	Designated gang-gang cockatoo offset areas	2025 to 2045	NPWS	Up to $200,000 over a minimum of 20 years	Some weeds, such as blackberry, St John's wort, thistle and viper's bugloss can become so dense that they impact the natural germination of key food sources such as wattles. When this occurs in breeding habitat it can impact the availability of food and thus successful breeding events. The removal of weeds at areas of high foraging activities during breeding periods (October to December) is assumed to be

Action number	Action	Threat addressed	Location	When	Who	Total cost (preliminary estimates)	Comment
							adequate to support the 120% biodiversity gain.
4	As required, plant foraging habitat (wattles) at sites identified in actions 1 and 3, and monitor for species presence and nearby nest hollows	Inappropriate fire regimes Anthropogenic climate change	Designated gang-gang cockatoo offset areas	2025 to 2045	NPWS	Up to $200,000 over a minimum of 20 years	Planting foraging habitat will only provide a benefit to this species when the trees are old enough to flower and produce seed. Increased food availability at sites with high activity (as determined in actions 1 and 3) during key breeding periods (October to December) is assumed to be adequate to support the 120% biodiversity gain.
5	Protection of unburnt habitat sites identified in surveys as being suitable gang-gang cockatoo habitat	Inappropriate fire regimes	Designated gang-gang cockatoo offset areas	2025 to 2045	NPWS	Up to $10,000 over a minimum of 20 years	Work with fire planning officers to implement additional measures to ensure adequate unburnt habitat in designated gang-gang cockatoo areas, as appropriate. Monitoring gang-gang cockatoos and ensuring nesting trees are protected from fire should be adequate to support the 120% biodiversity gain.
					Total cost	**$420,000**	

Step 2 limitations, assumptions and notes

- Threat control strategies and actions will continue to evolve throughout the life of this action plan. The plan will be updated as new information, knowledge and management techniques become available.
- Costs identified above will be revised as required, taking into account the relative cost-effectiveness of different measures.
- The success of using occupancy as an approximation for density is a rapidly developing field and will continue to be evaluated through the life of this plan. Occupancy may be used as a secondary or interim metric if required, or an alternative approach to measuring density may be implemented.
- Actions under this plan will not apply to sites directly impacted by Snowy 2.0 construction activities. Snowy Hydro Limited is required under planning approvals to undertake habitat rehabilitation at these sites. Reintroducing gang-gang cockatoos into Snowy 2.0 project sites is outside the scope and timeframe of this project and action plan.

Step 3: measuring and reporting on the biodiversity benefit to gang-gang cockatoos

The Kosciuszko Offset Strategy states that each action plan must describe how the required biodiversity benefit (offset) will be measured. This involves setting out the attributes to be measured and the methodology, timing and other details relevant to monitoring. A hierarchical approach is being taken to measure the biodiversity benefit.

1. The population density of a species is the desirable measurement attribute.
2. If this is not feasible due to challenges such as difficulty in detecting populations due to low numbers or species secrecy, then other metrics combined with modelling will be considered instead.
3. If the attribute and monitoring design in (1) or (2) above is not working, then the attribute being measured will be revisited and another metric considered.

Any changes to metrics over time will be updated in the action plan and reported on as part of the adaptive management approach under the Kosciuszko Offset Strategy.

Table 4 Measuring biodiversity benefits to gang-gang cockatoos

Attribute to be measured	Metric	Location	Methodology	Monitoring design	Timing	Cost	Frequency of measurement
Population	Occupancy (as an approximation of density)	Designated gang-gang cockatoo offset areas	Observational and auditory surveys	Rapid diurnal bird surveys will be carried out using auditory and visual point survey counts every 500 m	During the active seasons (spring to autumn)	Up to $250,000 over a minimum of 20 years for ongoing population monitoring to identify the extent of the offset delivered	Annually

Step 3 limitations, assumptions and notes

- Gang-gang cockatoos are difficult to find due to their large area of occupancy. This makes it difficult to undertake a direct population count of the species. The density estimate (occupancy) will continue to be an estimate based on sightings data collected in the field.
- The challenges with monitoring a low-density species across large landscapes are well recognised. Advanced statistical approaches using presence/absence data, such as occupancy rates, have alleviated some of these challenges, and in some cases have allowed population density/abundance estimates of reasonable accuracy.

Governance

Reporting

As required under Snowy 2.0 approvals, NPWS must monitor, evaluate and publicly report on progress of the implementation program and the effectiveness of the specific projects and actions. They will prepare an annual report on the Snowy 2.0 biodiversity offset program for Kosciuszko National Park and its implementation, including progress with achieving the required increase in the population of the gang-gang cockatoo. The report will be provided to the Commonwealth Department of Climate Change, Energy, the Environment and Water, and published on the environment.nsw.gov.au website within 3 months of the end of each financial year.

The annual report will:

- detail the expenditure from the biodiversity offset fund on agreed actions under the Kosciuszko offset action plans
- outline any interest earned and reinvested into the offset program
- provide details about the conservation actions carried out for each approved threatened species, threatened ecological community and threatened ecosystem action plan such as:
    - the type of conservation action implemented – for example, feral animal control, habitat restoration
    - the geographic extent and location of the conservation actions
    - the proportion of the proposed conservation actions achieved, and proportion yet to be achieved
    - an analysis and summary of monitoring data
    - future conservation actions, with key timeframes including intended completion
- include details on progress towards each action plan objective
- document where adaptive management principles have been applied to each action plan to improve their effectiveness.

Adaptive management

Quantifying and measuring the biodiversity benefit for gang-gang cockatoos may present significant technical challenges. Together with the influence of natural variability, it is anticipated there will be a level of uncertainty to both measuring and interpreting biodiversity benefits relevant to the species. This uncertainty will be addressed by applying an adaptive approach, including reviewing and updating density numbers, monitoring methodologies and strategies as new information, data or technology become available. At a minimum, action plans will be reviewed every 5 years.

Approvals

Date/approval	
Date prepared	February 2025
Date approved	April 2025
Approved by	Naomi Stephens, Acting Deputy Secretary, NSW National Parks and Wildlife Service
Date for review	February 2030

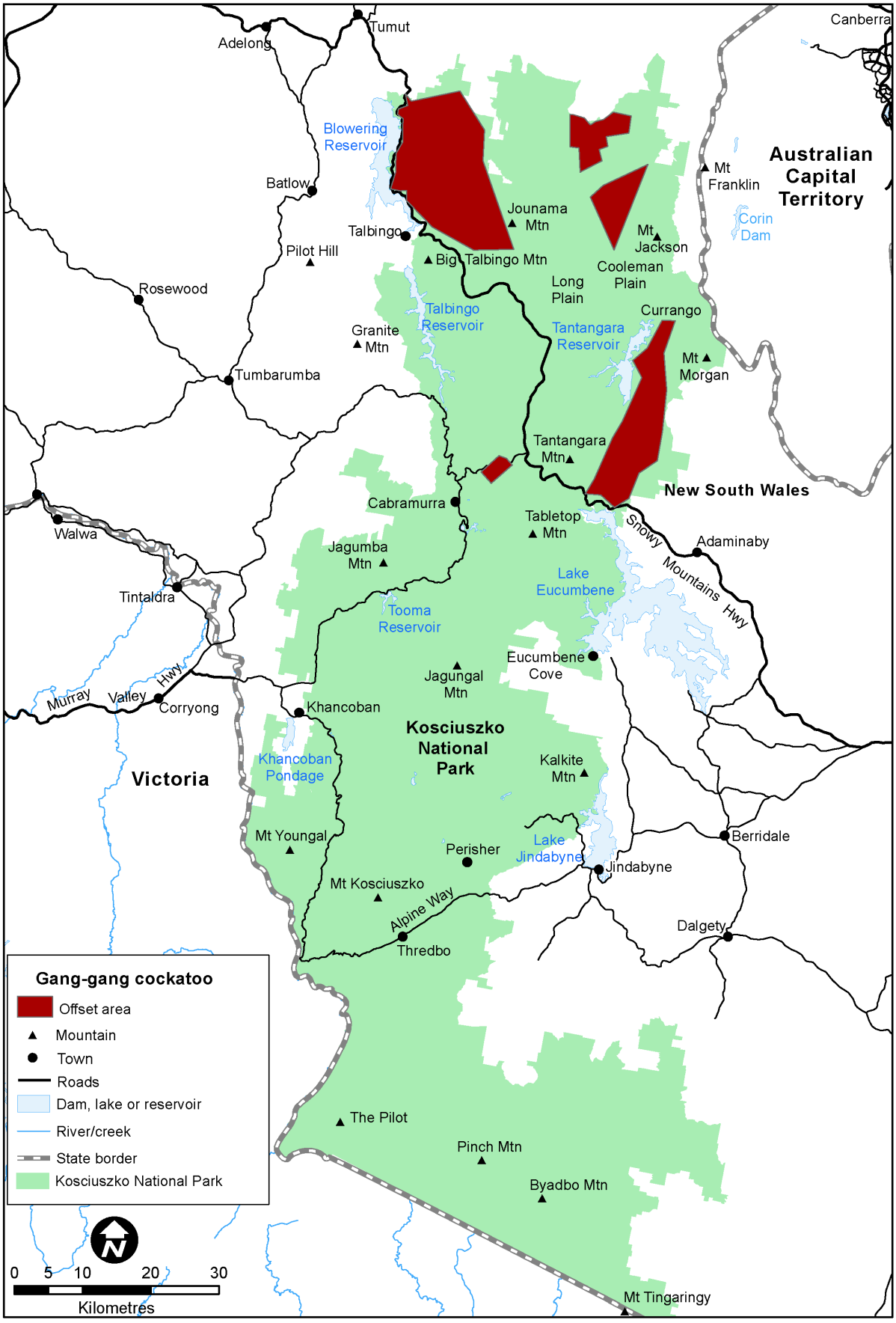

Figure 1 Gang-gang cockatoo offset areas – Kosciuszko National Park

More information

- Assets of Intergenerational Significance