



NSW National Parks and Wildlife Service

# Kosciuszko offset action plan – mauve burr-daisy

Kosciuszko Offset Project



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This resource may contain images or names of deceased persons in photographs or historical content.

© 2024 State of NSW and Department of Climate Change, Energy, the Environment and Water

With the exception of photographs, the State of NSW and Department of Climate Change, Energy, the Environment and Water (the department) are pleased to allow this material to be reproduced in whole or in part for educational and non-commercial use, provided the meaning is unchanged and its source, publisher and authorship are acknowledged. Specific permission is required to reproduce photographs.

Learn more about our copyright and disclaimer at [www.environment.nsw.gov.au/copyright](http://www.environment.nsw.gov.au/copyright)

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

Cover photo: Mauve burr-daisy. Erika Roper/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](mailto:info@environment.nsw.gov.au)  
Website: [www.environment.nsw.gov.au](http://www.environment.nsw.gov.au)

ISBN 978 1 923357 42 6  
EH 2025/0016  
January 2025



Find out more about your environment at:

[environment.nsw.gov.au](http://environment.nsw.gov.au)

# Contents

Objective	1
Species overview and key threatening processes	2
Kosciuszko Offset Strategy: metrics-based approach	4
Step 1: quantifying the impacts on mauve burr-daisies and benefits that must be delivered	4
Step 2: implementing the management actions for mauve burr-daisies to deliver the required offset	5
Step 3: measuring and reporting on the biodiversity benefit to mauve burr-daisies	7
Governance	10
Reporting	10
Adaptive management	10
Approvals	11
More information	13

## List of tables

Table 1	Species summary – mauve burr-daisy	2
Table 2	Key threatening processes to mauve burr-daisies in Kosciuszko National Park	3
Table 3	Management actions for mauve burr-daisies to deliver the required offset in Kosciuszko National Park	6
Table 4	Measuring biodiversity benefits to mauve burr-daisies	8

## List of figures

Figure 1	Mauve burr-daisy offset areas – Kosciuszko National Park	12
----------	--	----

## Objective

This plan sets out management actions that, when implemented and measured, will deliver biodiversity gains for the mauve burr-daisy (*Calotis glandulosa*) 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 assessments for Main Works, up to 21.8 hectares of mauve burr-daisy habitat was identified as being impacted. (Assessments for the Snowy 2.0 Exploratory Works and Transmission Connection projects did not identify any impacts to the mauve burr-daisy.) At an estimated 217 individuals per hectare (see Step 1), the impact of the Snowy 2.0 project on the mauve burr-daisy is estimated to be a reduction of the population by 4,731 individuals.

To deliver the 120% biodiversity gain identified under the Kosciuszko Offset Strategy, the objective of this action plan is to **increase the population of mauve burr-daisies in Kosciuszko National Park by 5,678 individuals.**

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 Deputy Secretary, NSW National Parks and Wildlife Service.

# Species overview and key threatening processes

The mauve burr-daisy is listed as **vulnerable** under the NSW *Biodiversity Conservation Act 2016* and **vulnerable** under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*.

Table 1 provides a species summary for the mauve burr-daisy, including a description of the species, its habitat and its distribution within Kosciuszko National Park.

**Table 1 Species summary – mauve burr-daisy**

Category	Summary
Description	The mauve burr-daisy is a sprawling, branched herb that grows up to 20 cm tall and up to 1 m wide. The soft, bright green, hairy leaves have indented edges. Leaves are up to 3 cm long and 9 mm wide. The 2 cm wide flower-heads are solitary, mauve, and have a yellow centre. Flowers may also be white, blue or pink. They appear in spring and summer. Flowers are followed by a head of brown burrs that may stick to clothing and animals' coats.
Habitat	Found in montane and subalpine grasslands in the Australian Alps, as well as montane grasslands and snow gum ( <i>Eucalyptus pauciflora</i> ) and spider gum ( <i>Eucalyptus lacrimans</i> ) woodlands within the South Eastern Highlands. It appears to be a coloniser of bare patches, often occurring on roadsides and scalds.
Distribution and population	<p>Distribution of the mauve burr-daisy centres on the Monaro and Kosciuszko regions, along with 3 known sites in the upper Shoalhaven catchment and unconfirmed outliers in the Wingecarribee region. There are old and possibly unreliable records of mauve burr-daisy occurring near Oberon, Dubbo and Mount Imlay.</p> <p>The precise population is unknown, however there are likely to be tens of thousands of plants in the Kosciuszko region, with many thousands in the upper Shoalhaven and Monaro. Kosciuszko populations range from small (about 50 plants) to several thousand, with Shoalhaven and Monaro populations ranging from isolated plants to groups in the low thousands.</p>

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

## Kosciuszko offset action plan – mauve burr-daisy

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

**Table 2 Key threatening processes to mauve burr-daisies in Kosciuszko National Park**

Threat	Description
Disturbance	Loss and degradation of habitat and/or populations from road works (particularly widening or rerouting).
Weeds	Habitat degradation and competition through invasion, establishment, intensification and spread of weeds (such as ox-eye daisy) to the extent that recruitment or establishment of plants is impaired.
Feral herbivores	Damage to individual plants and degradation of mauve burr-daisy habitat by introduced herbivores such as deer, rabbits and horses, through grazing, trampling, digging, wallowing and spread of weeds.
Feral pigs	Damage to individual plants and degradation of mauve burr-daisy habitat by feral pigs through grazing, trampling, digging, wallowing and spread of weeds.

Source: Saving our Species and personal communication NSW Department 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 it 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 the NSW National Parks and Wildlife Service will apply to the delivery of biodiversity offsets. 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 mauve burr-daisies and benefits that must be delivered

It is estimated that 4,731 mauve burr-daisies will be impacted by Snowy 2.0 Main Works. The benefit that must be delivered is the successful and sustainable establishment of an additional 5,678 mauve burr-daisies in Kosciuszko National Park (being 120% of the impact). This calculation is based on impacts to 21.8 hectares of mauve burr-daisy habitat from Snowy 2.0 with an estimated population density of 217 individuals per hectare.

### Step 1 limitations, assumptions and notes

- The estimate of 217 individuals per hectare is an average based on the former Department of Planning and Environment plot sampling in Nungar Plain undertaken in 2018 and 2020 under the Saving our Species program (individual species count surveys). This population density figure is an extrapolation that relies on the accuracy and consistency of recording undertaken by ecologists.
- The species was found in clusters across a wide range, occupying only small sections of suitable habitat.
- It is expected that numbers are significantly higher than the estimated population density cited in this action plan, however due to a lack of research, population figures are mostly unknown for Kosciuszko National Park.



## Step 2: implementing the management actions for mauve burr-daisies to deliver the required offset

Delivering an offset of at least 5,678 additional mauve burr-daisies in Kosciuszko National Park will involve the following management interventions:

- identifying an area (or areas) of suitable habitat for delivery of the offset (see action 1 in Table 3)
- increasing the number of mauve burr-daisies through a targeted series of offset actions such as intensive control of feral herbivores and weeds above and beyond core management (see actions 2, 3 and 4 in Table 3).

The mauve burr-daisy is part of the Saving our Species program, which has identified 5 priority management sites across New South Wales. Only 2 of these priority sites are located in Kosciuszko National Park (Kellys Plain and Nungar Plain). (Outside of the Saving our Species program, populations have been recorded in other areas of Kosciuszko National Park.)

It is proposed to use Nungar Plain as a designated offset area but not Kellys Plain, as Kelly's Plain currently has a heavy infestation of ox-eye daisy which, when extensively sprayed with herbicide, is likely to harm the mauve burr-daisies. Instead, Gulf Plain within Kosciuszko National Park will be used as a second offset area under this action plan, as mauve burr-daisy populations are known to exist in this location and are less affected by weeds such as ox-eye daisy.

While the proposed offset site at Nungar Plain is within an identified Saving our Species mauve burr-daisy site, there are no current or planned actions for the species under Saving our Species. Therefore, all actions under this offset action plan are additional to the Saving our Species program.

Plot sampling surveys were conducted by the former Department of Planning and Environment at Nungar Plain in 2018 and 2020. Plot sampling is a common methodology used in ecology to estimate the number of individuals in a plant population (population density).

These surveys involved the selection and count of 6 plots within the Nungar Plain survey area (see Figure 1). Plots were chosen based on optimal habitat and the presence of clusters of mauve burr-daisies. Over the 2 survey years, an average of 217 individuals were found within these plots. Because mauve burr-daisies can occur in clusters, and sites of clusters can often be more than one hectare apart, this action plan has used the average of 217 mauve burr-daisies per hectare as an estimate of population density.

The proposed offset sites in Figure 1 (Nungar Plain and Gulf Plain) are identified under the Assets of Intergenerational Significance (AIS) program. Actions under this action plan may, where appropriate, occur within AIS sites where offset funds are used to benefit the species, and actions go above and beyond those identified under the AIS program.

Table 3 lists the actions needed to deliver the required biodiversity gains. These include identifying suitable habitat areas and addressing the identified key threatening processes (Table 2).

## Kosciuszko offset action plan – mauve burr-daisy

**Table 3 Management actions for mauve burr-daisies to deliver the required offset in Kosciuszko National Park**

Action number	Action	Threat addressed	Location	When	Who	Total cost (preliminary estimates)	Comment
1	Conduct site visits to confirm offset polygons, estimated species density figures and threat abatement measures	–	Areas shaded in yellow (Figure 1)	2023 to 2024	NSW National Parks and Wildlife Service (NPWS)	\$0	Completed. In November 2023, NPWS confirmed suitable habitat areas (Nungar Plain and Gulf Plain) in collaboration with the Saving our Species program. These site visits confirmed species presence. Part of generating baseline information.
2	Additional feral horse, rabbit, deer and pig control in areas identified in action 1 (designated mauve burr-daisy offset areas)	Feral herbivores	Designated mauve burr-daisy offset areas	2025 to 2045	Integrated into existing feral herbivore control programs	Up to \$10,000 over a minimum of 20 years	Additional to core feral herbivore management. Horse removal will be consistent with the Kosciuszko National Park Wild Horse Heritage Management Plan.
3	Additional weed control in areas identified in action 1 (designated mauve burr-daisy offset areas)	Weeds	Designated mauve burr-daisy offset areas	2025 to 2045	Integrated into existing weed control programs	Up to \$10,000 over a minimum of 20 years	Additional to core weed management. Consider enhanced spraying for ox-eye daisy which compromises habitat and out-competes mauve burr-daisy. For the next 20 years as a minimum.
4	Additional monitoring of feral animal numbers	Feral herbivores	Designated mauve burr-daisy offset areas	2025 to 2045	Integrate into existing feral animal monitoring	Up to \$2,000 over a minimum of 20 years	As required, implement monitoring to measure and track feral animal densities in the designated mauve burr-daisy offset areas consistent with NPWS protocols.
<b>Total</b>						<b>\$22,000</b>	

### Step 2 limitations, assumptions and notes

- The application of broadleaf herbicides used to target ox-eye daisy is likely to have a damaging effect on mauve burr-daisies. Any weed control should be done with caution and in consultation with NSW National Parks and Wildlife Service weed control officers.
- Fire protection and burning is not listed as an action in this action plan as the species can do well with and without fire events. If drought conditions do not follow a fire event, fire would be expected to support population growth. The natural occurrence of fire is expected to be sufficient.
- Seed collection and planting is currently not considered under this action plan as threat management should be adequate to allow for the natural occurrence and enhancement of the species.
- Threat control strategies and actions will continue to evolve throughout the life of this action plan. This 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.
- 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.

### Step 3: measuring and reporting on the biodiversity benefit to mauve burr-daisies

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 measuring 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, then other metrics (such as extrapolation of plot surveys) 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 as part of the adaptive management approach under the Kosciuszko Offset Strategy.

**Table 4 Measuring biodiversity benefits to mauve burr-daisies**

Attribute to be measured	Metric	Location	Methodology	Monitoring design	Timing	Cost	Frequency of measurement
Population of mauve burr-daisies	Density	Designated mauve burr-daisy offset areas	Site visits and plot surveys	Establish monitoring plots/transects across designated offset areas. Track changes in cover within plots/transects	During the active months (summer: January to March)	Up to \$25,000 over 20 years for ongoing population monitoring	Annually

**Step 3 limitations, assumptions and notes**

- It is expected that the removal of threats in the designated offset areas will support an increase in target population numbers. However, if populations are not increasing after threat-abatement implementation, then seed collection and plantings will be considered.
- Monitoring of populations that span large areas is inherently difficult and relies on the experience of the officer to accurately identify suitable habitat and individual species.
- Reproductive plants (ones which are flowering) are more indicative of a healthy population, however surveys under this action plan will focus on the presence of all mauve burr-daisies to be consistent with previous surveys conducted in 2018 and 2020.

## Governance

### Reporting

As required under Snowy 2.0 approvals, The NSW National Parks and Wildlife Service 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 number of mauve burr-daisies. The report will be provided to the Commonwealth Department of Climate Change, Energy, the Environment and Water, and published on the National Parks and Wildlife Service 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

Measuring the biodiversity benefit for mauve burr-daisies focuses on the increased number of individual plants as an indicator rather than improvement to the health and functionality of the species community as a whole. Together with the influence of natural variability, it is anticipated there will be a level of uncertainty in relation to the biodiversity benefit additional plants will bring to the overall population. This uncertainty will be addressed by applying an adaptive approach, including reviewing and updating monitoring and condition improvement 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	September 2024
Date approved – NSW National Parks and Wildlife Service	26 September 2024
Approved by	Atticus Fleming, Deputy Secretary NSW National Parks and Wildlife Service
Date for review	September 2029

# Kosciuszko offset action plan – mauve burr-daisy

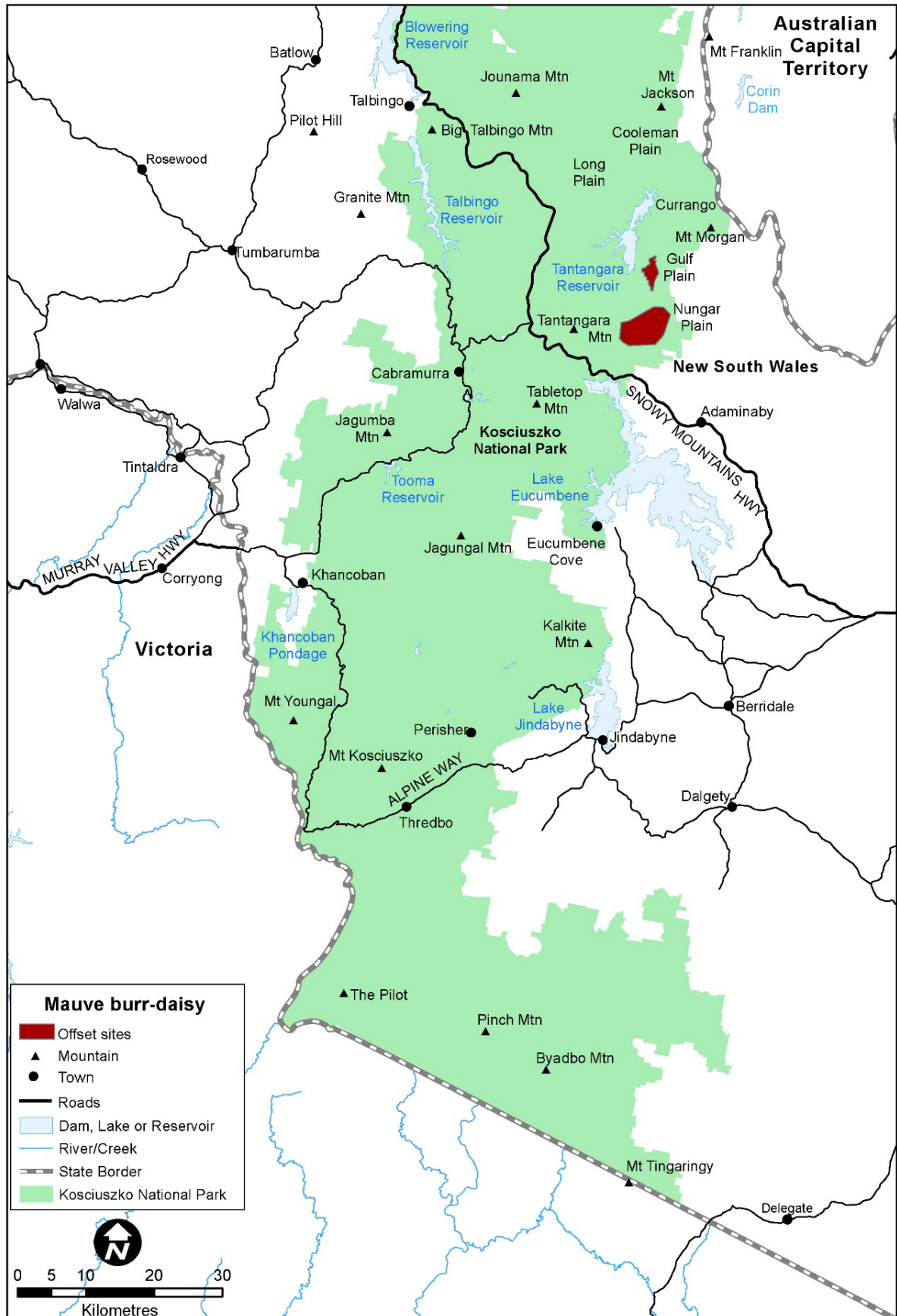


Figure 1 Mauve burr-daisy offset areas – Kosciuszko National Park



## More information

- [Assets of Intergenerational Significance](#)