



NSW National Parks and Wildlife Service

# Kosciuszko offset action plan – *Caladenia montana*

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.

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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: *Caladenia montana*. Tobias Hayashi/DCCEEW

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## Objective

This plan sets out management actions that, when implemented and measured, will deliver biodiversity gains for *Caladenia montana* plants 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 and Transmission Connection, up to 11 hectares of *Caladenia montana* habitat was identified as being impacted.

(Assessments for the Snowy 2.0 Exploratory Works project did not identify any impacts to *Caladenia montana*.) At an estimated 83 individuals per hectare (see Step 1), the impact of the Snowy 2.0 project on *Caladenia montana* is estimated to be a reduction of the population by 913 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 *Caladenia montana* plants in Kosciuszko National Park by 1,096 individuals.**

As this is not a Commonwealth-listed species, this action plan has been approved only by the acting Deputy Secretary, NSW National Parks and Wildlife Service.

# Species overview and key threatening processes

*Caladenia montana* is listed as **vulnerable** under the NSW *Biodiversity Conservation Act 2016*. It is not a listed species under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*.

Table 1 provides a species summary for *Caladenia montana*, including a description of the species, its habitat, and its distribution within Kosciuszko National Park.

**Table 1 Species summary – *Caladenia montana***

Category	Summary
Description	<i>Caladenia montana</i> is a terrestrial orchid with a leaf 80 mm to 120 mm long and 8 mm to 12 mm wide. The flower stem is 100 mm to 250 mm tall, with one flower which is 40 mm to 60 mm across. The flower is greenish cream or cream, sometimes with reddish markings.
Habitat	Flowering occurs from October to January. Flowers are pollinated by wasps.
Distribution and population	<i>Caladenia montana</i> is restricted to high montane areas, 700 m to 1,000 m above sea level, where it grows in well-drained loam soils on slopes and ridges of montane forest among an understorey of shrubs.  The species occurs mainly in the east alps section of the Alpine National Park in Victoria. There are records of <i>Caladenia montana</i> in the Australian Capital Territory and adjacent areas in New South Wales; however, these records have since been verified as being <i>Caladenia fitzgeraldii</i> , a very similar species.

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

Key threatening processes to *Caladenia montana* plants within Kosciuszko National Park are unknown. *Caladenia montana* is classified by the NSW Department of Climate Change, Energy, the Environment and Water as a 'data deficient' species – that is, there is an insufficient understanding of the distribution and/or abundance of the species and insufficient information on the threats it faces.

Threats to *Caladenia montana* are likely to be similar to other *Caladenia* species found in NSW national parks, such as *Caladenia concolor*. These include:

- inappropriate fire regimes
- weeds
- feral herbivores
- feral pigs
- disturbance.

One of the key actions of this action plan is to fill knowledge gaps for this species by conducting targeted surveys in identified suitable *Caladenia montana* habitat within Kosciuszko National Park. Despite the lack of data and understanding of threats for this species, a precautionary approach has been taken with actions listed in Table 2 by addressing potential threats from feral herbivores and weeds.

## 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 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 offset required
- Step 3: measuring and reporting on the biodiversity benefit.

### Step 1: quantifying the impacts on *Caladenia montana* plants and benefits that must be delivered

It is estimated that 913 *Caladenia montana* plants will be impacted by Snowy 2.0 Exploratory Works, Main Works and Transmission Connection. The benefit that must be delivered is therefore the successful and sustainable establishment of an additional 1,095 *Caladenia montana* plants in Kosciuszko National Park (being 120% of the impact). This calculation is based on impacts to 11 hectares of *Caladenia montana* habitat from Snowy 2.0 with an estimated population density of 83 individuals per hectare.

#### Step 1 limitations, assumptions and notes

- In October 2019, specimens of *Caladenia montana* collected from proposed project areas were positively identified by the Australian National Herbarium as a part of targeted surveys for the Snowy 2.0 Main Works environmental assessments.
- Subsequent to this positive identification, additional *Caladenia montana* surveys in Kosciuszko National Park were undertaken by Snowy 2.0-contracted ecologists in November and December 2019 (prior to the 2019–20 bushfires). During this period, all *Caladenia* species had gone to seed and could not be reliably identified. For the purposes of the Snowy 2.0 Main Works environmental assessments, all *Caladenia* species were assumed and recorded as being *Caladenia montana*.
- Due to the lack of previous survey data, the population density cited in this action plan is based on the assumed presence as sighted in the Snowy 2.0 Main Works environmental assessments.
- It is unknown how the 2019–20 bushfires in Kosciuszko National Park impacted the population of *Caladenia montana* in the park.

- Upon completion of actions 1 and 2 (see Table 2 below), and as further information on *Caladenia montana* populations in Kosciuszko National Park becomes available over the life of this action plan, the benefit that must be delivered and any threat abatement works required to be undertaken to support the species will be refined and adjusted in this plan.

## **Step 2: implementing the management actions for *Caladenia montana* plants to deliver the required offset**

Delivering an offset of at least 1,096 additional *Caladenia montana* plants in Kosciuszko National Park will involve the following management interventions:

- identifying an area (or areas) suitable for delivery of the offset (see action 1 in Table 2)
- measuring the current density (or other suitable metric) of *Caladenia montana* at that location (see action 2 in Table 2)
- increasing the number of *Caladenia montana* plants at that location through a targeted series of offset actions such as intensive feral herbivore control and weed control above and beyond core management (see actions 3, 4 and 5 in Table 2).

The Saving our Species program identified that an insufficient understanding of the distribution and/or abundance of *Caladenia montana* in Kosciuszko National Park is currently the biggest threat to managing the species in the park. As a result, this action plan focuses on undertaking surveys in areas identified as potential *Caladenia montana* habitat within Kosciuszko National Park. The surveys will identify and record population information as well as feral animals or weeds that may be impacting their growth or survival.

*Caladenia montana* needs to be in flower to be positively identified. Identification and monitoring of this species is challenging as flowering and visual representation of the species is driven by local environmental conditions.

As suitable habitat is mapped and population information becomes available, offset sites for *Caladenia montana* may also become priority sites 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 2 lists the actions needed to deliver the required biodiversity gains. These include identifying suitable habitat areas and measuring current species density, plant condition and potential threats requiring abatement in those areas.



## Kosciuszko offset action plan – *Caladenia montana*

**Table 2** Management actions for *Caladenia montana* 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 suitability assessments	–	Areas shaded in red (Figure 1), plus any additional sites determined by NPWS	2024 to 2028	NPWS	\$5,000	Underway. The suitability assessments will include size of the sites, accessibility, and presence of <i>Caladenia montana</i> populations. Undertake desktop mapping (as required) to amend the area across which the offset actions are to be delivered.
2	Conduct targeted surveys in identified suitable habitat, to assess plant condition and calculate species density	–	Areas shaded in red (Figure 1), plus any additional sites determined by NPWS	2024 to 2028	NPWS	\$25,000	Underway. Undertake targeted surveys and assess the condition of, and threats to, any <i>Caladenia montana</i> populations located.
3	If required, install and maintain wire protective guards around any identified populations as a result of targeted surveys	Feral herbivores	Areas shaded in blue (in the park) and yellow (nature reserves) (Figure 1), plus any additional sites determined by NPWS	2025 to 2045	NPWS	\$10,000	–
4	As required, additional feral herbivore control in areas identified in Figure 1 (designated <i>Caladenia montana</i> offset areas)	Feral herbivores	Select sites from those in Figure 1 plus any other sites identified by NPWS	2025 to 2045	NPWS	Up to \$3,000 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.

## Kosciuszko offset action plan – *Caladenia montana*

Action number	Action	Threat addressed	Location	When	Who	Total cost (preliminary estimates)	Comment
5	As required, additional weed control in areas identified in Figure 1 (designated <i>Caladenia montana</i> offset areas)	Weeds	All populations	2025 to 2045	NPWS	Up to \$3,000 over a minimum of 20 years	Additional to core weed management.
					<b>Total cost</b>	<b>\$46,000</b>	

## Step 2 limitations, assumptions and notes

- The application of broadleaf herbicides used to target ox-eye daisy is likely to have a negative impact on *Caladenia montana*. Any weed control should be undertaken with caution.
- 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.
- 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 increase in abundance of the species.
- 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 *Caladenia montana*

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, 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 3** Measuring biodiversity benefits to *Caladenia montana*

Attribute to be measured	Metric	Location	Methodology	Monitoring design	Timing	Cost	Frequency of measurement
Population of <i>Caladenia montana</i>	Density	Designated <i>Caladenia montana</i> offset areas	Site visits and individual plant counts	Establish monitoring plots/transects across designated offset areas. Track changes in cover within plots/transects	During the flowering months (spring and summer: October to January)	Up to \$10,000 over a minimum of 20 years for ongoing population monitoring to identify the extent of offset delivered	Annually

### Step 3 limitations, assumptions and notes

- There is currently a significant lack of population information available for *Caladenia montana* in Kosciuszko National Park. To achieve the objective of this action plan, suitable populations must first be located.
- It is expected that the removal of potential threats in the designated offset areas will support an increase in target population numbers. However, if populations are not increasing following threat abatement implementation, then seed collection and plantings will be considered.
- Monitoring of populations which span large areas is inherently difficult and relies to an extent on individual expertise and experience to accurately identify suitable habitat and individuals of a species.

## 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 *Caladenia montana*. 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](http://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.

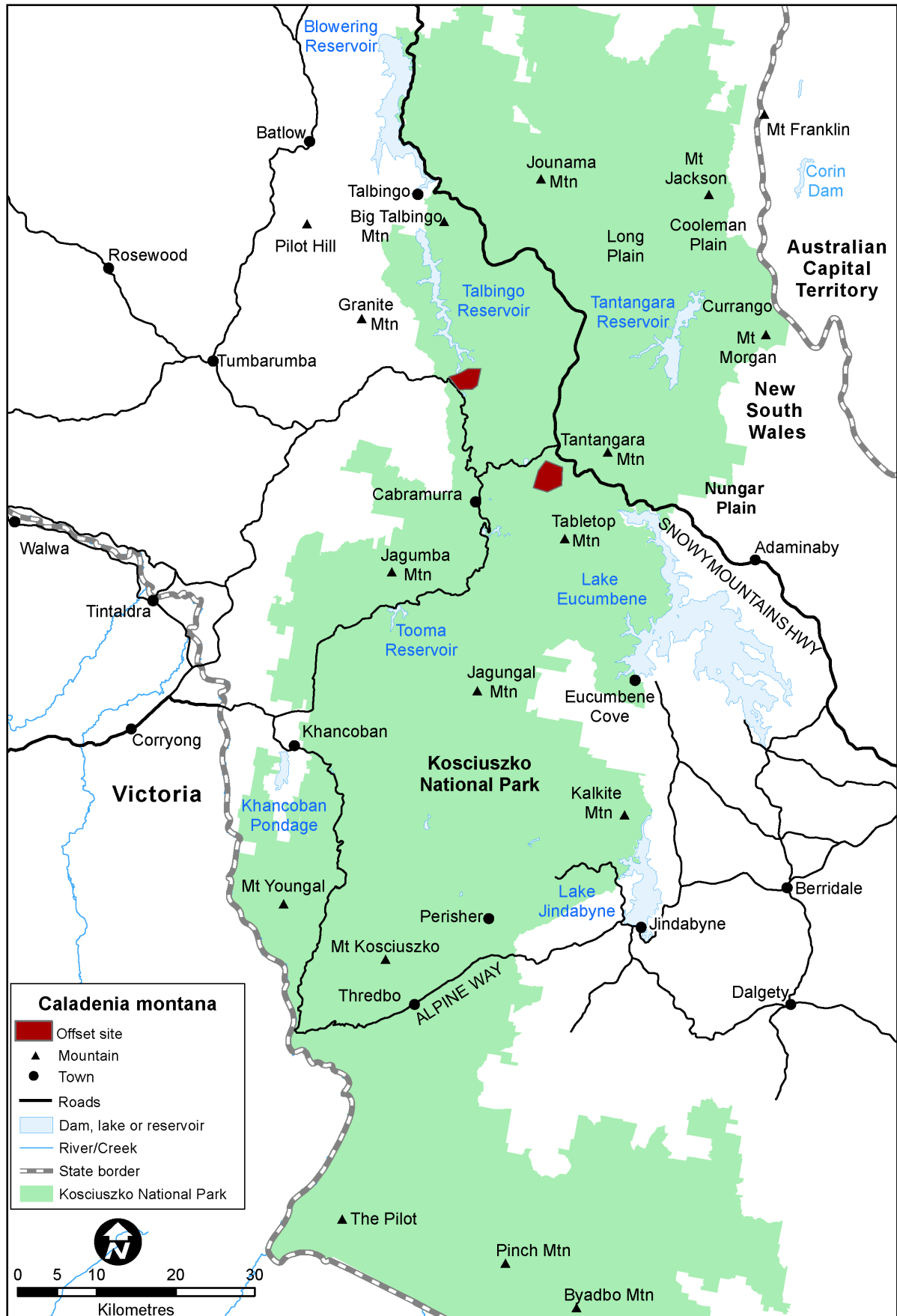
### Adaptive management

Quantifying and measuring the biodiversity benefit for *Caladenia montana* 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

# Kosciuszko offset action plan – *Caladenia montana*



**Figure 1** Proposed *Caladenia montana* offset areas – Kosciuszko National Park



## More information

- Assets of Intergenerational Significance