



NSW National Parks and Wildlife Service

# Kosciuszko offset action plan – Kiandra leek orchid

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.

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### 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)

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## Objective

This plan sets out management actions that, when implemented and measured, will deliver biodiversity gains for the Kiandra leek orchid (*Prasophyllum retroflexum*) 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 6 hectares of Kiandra leek orchid habitat was identified as being impacted by the project. (Assessments for the Snowy 2.0 Exploratory Works and Transmission Connection projects did not identify any impacts to the Kiandra leek orchid.) At an estimated 27 individuals per hectare (refer to 'Kosciuszko Offset Strategy: metrics-based approach' – Step 1), the impact of the Snowy 2.0 project on the Kiandra leek orchid is estimated to be a reduction of the population by 162 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 Kiandra leek orchid in Kosciuszko National Park by 195 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 Kiandra leek orchid 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 Kiandra leek orchid, including a description of the species, its habitat and its distribution within Kosciuszko National Park.

**Table 1 Species summary – Kiandra leek orchid**

Category	Summary
Description	<p>Kiandra leek orchid flowers open very widely and are green with deep purple stripes and blotches, or they may be completely purple. They are sweet-smelling and are arranged densely in a single spike of up to 80 flowers. The single hollow leaf is up to 30 cm tall. Flowering has been recorded in Kosciuszko National Park from October to December. Flowers are followed by a fleshy seed capsule.</p> <p><i>Prasophyllum</i> is a genus of relatively inconspicuous ground orchids with single clustered spikes of small flowers that are non-resupinate (upside down relative to most other orchids) and a single tubular leaf. This leaf distinguishes them from the very similar midge orchid genus (<i>Genoplesium</i>) which has recently been created by splitting <i>Prasophyllum</i>.</p>
Habitat	The species occurs in subalpine grasslands and woodlands. Plants retreat into subterranean tubers after fruiting, so are not visible above ground.
Distribution and population	All populations are thought to occur within Kosciuszko National Park in the Long Plain, Kiandra and Tantangara areas.

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

## Kosciuszko offset action plan – Kiandra leek orchid

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

**Table 2 Key threatening processes to Kiandra leek orchids in Kosciuszko National Park**

Threat	Description
Feral herbivores	Horses graze the species and promote the spread of ox-eye daisy (which displaces native plants and grasses), as well as trampling the area causing direct damage and disturbance. Grazing and substrate disturbance from rabbits causes adult mortality and changes the habitat to more shrubby conditions.
Feral pigs	Pigs rooting for food cause direct damage to the species and to the surrounding habitat.
Weeds	Habitat degradation and competition through invasion, establishment, intensification and spread of weeds (particularly ox-eye daisy) to the extent that recruitment or establishment of plants is impaired.

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 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 National Parks and Wildlife Service. 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 Kiandra leek orchids and benefits that must be delivered

It is estimated that 162 Kiandra leek orchids will be impacted by Snowy 2.0 Main Works. The benefit that must be delivered is the successful and sustainable establishment of an additional 195 Kiandra leek orchids in Kosciuszko National Park (being 120% of the impact). This calculation is based on impacts to 6 hectares of Kiandra leek orchid habitat from Snowy 2.0 with an estimated population density of 27 individuals per hectare.

### Step 1 limitations, assumptions and notes

- The estimate of 27 Kiandra leek orchids per hectare is an average of 20 clusters found during the Snowy 2.0 Main Works environmental assessments. This population density figure is an extrapolation which relies on the accuracy and consistency of recordings undertaken by Snowy 2.0 consultant ecologists.
- The population density figure represented in this action plan recognises that the species density within one hectare of suitable habitat is variable.
- Populations can be clustered and occupy only small sections of suitable habitat.
- Due to the lack of species research in non-Snowy 2.0 populations, accurate density and distribution figures are mostly unknown for Kosciuszko National Park. This action plan will be updated accordingly if additional surveys result in an adjustment of the population density estimates.



## Step 2: implementing the management actions for Kiandra leek orchids to deliver the required offset

Delivering an offset of at least 195 additional Kiandra leek orchids 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)
- undertaking population extent surveys in Nungar Plain to further refine the population density figure in this action plan
- increasing the number of Kiandra leek orchids through a targeted series of offset actions such as intensive feral herbivore and weed control above and beyond core management (see actions 2, 3 and 4 in Table 3).

The Kiandra leek orchid is part of the Saving our Species program, which has identified 2 priority management sites in Kosciuszko National Park at Kellys Plain and Nungar Plain. Saving our Species has also identified conservation actions to manage the critical threats to the species such as controlling feral pigs and ox-eye daisy. This action plan will use Nungar Plain as a designated offset area but not Kellys Plain. Kellys Plain has a heavy infestation of ox-eye daisy that when sprayed intensively with herbicide is likely to have a detrimental impact on Kiandra leek orchid.

While the proposed offset site at Nungar Plain is within an identified Saving our Species Kiandra leek orchid site, the identified Saving our Species actions are not currently funded. Therefore, all actions under this offset action plan are additional to the Saving our Species program.

The number of plants per hectare represented in this action plan was derived from the Snowy 2.0 Main Works environmental assessments. These assessments were the first significant monitoring of the species in Kosciuszko National Park and identified the species in the Tantangara area. The known distribution of this species is limited to these targeted surveys.

Nungar Plain is also identified as a Kiandra leek orchid priority site 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, measuring the current species condition in those areas, and addressing the identified key threatening processes (Table 2).

## Kosciuszko offset action plan – Kiandra leek orchid

**Table 3 Management actions for Kiandra leek orchids 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 condition and suitability of Nungar Plain as the core offset area for Kiandra leek orchid	–	Area shaded in yellow (Figure 1)	2023 to 2024	NSW National Parks and Wildlife Service (NPWS)	\$1,500	Completed. In collaboration with Saving our Species, surveys of Nungar Plain were completed in November and December 2023 following the positive identification of Kiandra leek orchids. As a result of this work, the location of Nungar Plain monitoring plot was determined (Figure 1).
2	Undertake population extent surveys	–	Designated Kiandra leek orchid offset area	2025 to 2026	NPWS	\$5,000	Population extent surveys at 3 separate plots within Nungar Plain. These surveys will complement the surveys undertaken as part of the Snowy 2.0 Main Works environmental assessments. These additional surveys will allow the population density figure to be refined under this action plan if necessary.
3	Additional feral horse, rabbit and pig control in the area identified in action 1	Feral herbivores	Designated Kiandra leek orchid offset area	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.
4	Additional weed control in the area identified in action 1	Weeds	Designated Kiandra leek orchid offset area	2025 to 2045	Integrated into existing weed control programs	Up to \$10,000 over a minimum of 20 years	Additional to core weed management. Enhanced spraying for ox-eye daisy which compromises habitat and out-competes Kiandra leek orchid. For the next 20 years as a minimum.
5	Additional monitoring of feral animal numbers	Feral herbivores	Designated Kiandra leek orchid offset area	2025 to 2045	Integrate into existing feral animal monitoring	Up to \$1,500 over a minimum of 20 years	As required, implement monitoring to measure and track feral animal densities in the designated Kiandra leek orchid offset areas, consistent with NPWS protocols.
<b>Total cost</b>						<b>\$28,000</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 the Kiandra leek orchid. Any weed control will be done with caution and in consultation with National Parks and Wildlife Service weed control officers.
- 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.
- Kiandra leek orchid can only be positively identified when it is in flower. Identification and monitoring of this species is therefore challenging, as flowering and visual representation of the species is driven by local environmental conditions.
- Fire protection and burning is not listed as an action in this plan as the species does well both with and without fire events. If fire events are not followed by drought conditions, then fire would be expected to support population growth. The natural occurrence of fire is expected to be sufficient.
- Threat control strategies and actions will continue to evolve throughout the life of this action plan. The plan will be updated accordingly 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 Kiandra leek orchids

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.

- i. The population density of a species is the desirable measurement attribute.
- ii. If this is not feasible due to challenges such as difficulty in detecting populations due to low numbers or underground tubers, then other metrics (such as vegetation condition) will be considered instead.
- iii. If the attribute and monitoring design in (i) or (ii) 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 Kiandra leek orchids**

Attribute to be measured	Metric	Location	Methodology	Monitoring design	Timing	Cost	Frequency of measurement
Number of Kiandra leaf orchids	Density	Designated Kiandra leek orchid offset area	Site visits and individual plant counts	Establish monitoring plots/transects across designated offset areas. Track changes in cover within plots/transects	During the active flowering months (summer: October to December)	Up to \$30,000 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 area 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 somewhat on the individual's expertise and experience to accurately identify suitable habitat and individual species.

## Governance

### Reporting

As required under Snowy 2.0 approvals, the 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 population of Kiandra leek orchids. 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 to occur, with key timeframes including intended completion
- include details on progress towards each action plan objective that has been delivered
- 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 Kiandra leek orchids 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 to them. 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 becomes available. At a minimum, action plans will be reviewed every 5 years.

## Approvals

Date/approval	
Date prepared	September 2024
Date approved – National Parks and Wildlife Service	27 September 2024
Approved by	Atticus Fleming, Deputy Secretary National Parks and Wildlife Service
Date for review	September 2029



# Kosciuszko offset action plan – Kiandra leek orchid

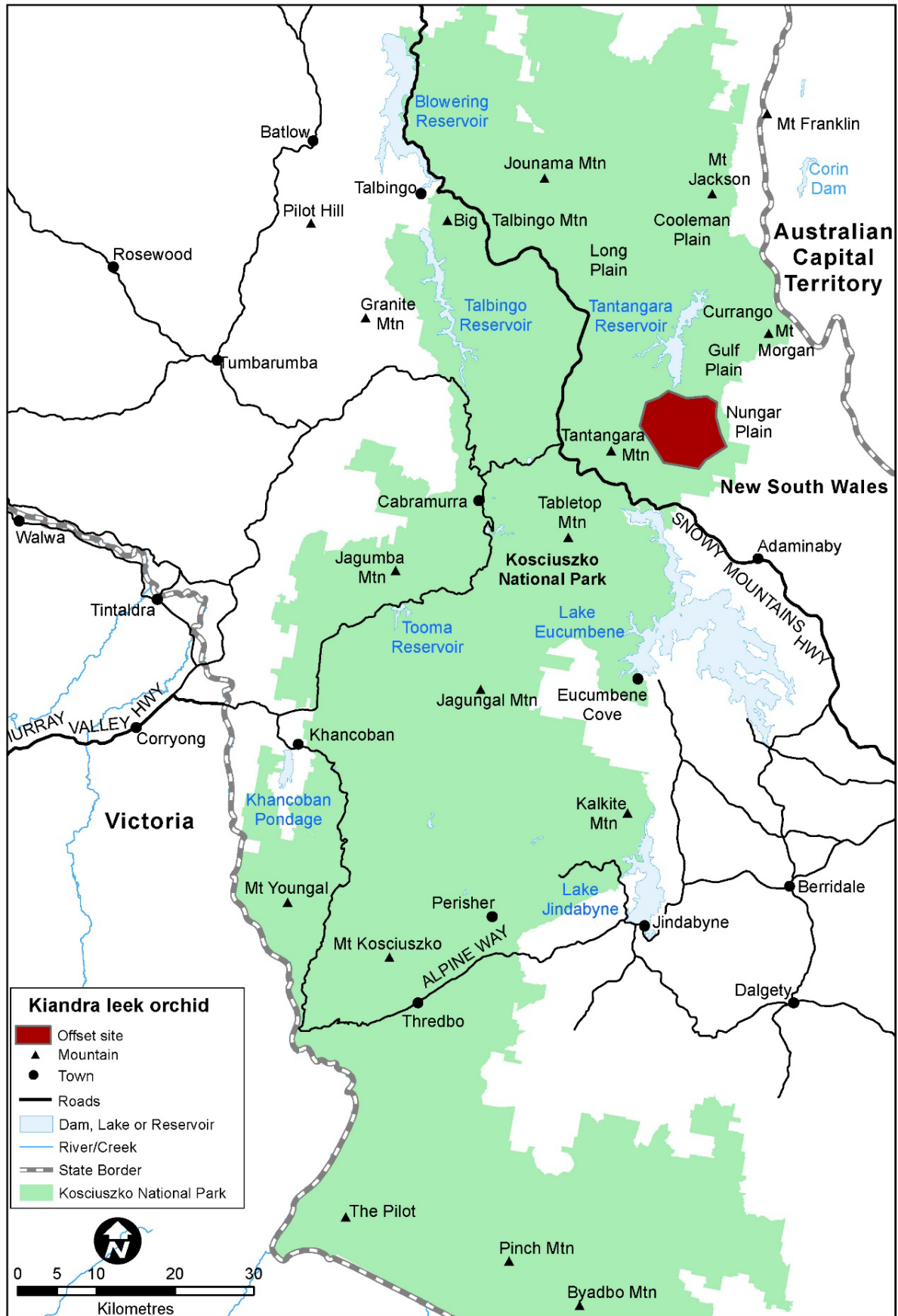


Figure 1 Proposed Kiandra leek orchid offset area – Kosciuszko National Park

## More information

- [Assets of Intergenerational Significance](#)