NSW National Parks and Wildlife Service

# Barrington Tops National Park and Barrington Tops State Conservation Area

## Feral horse management plan

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This resource may contain images or names of deceased persons in photographs or historical content.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

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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
Website: www.environment.nsw.gov.au

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# 1. Preface

This plan outlines National Parks and Wildlife Service's (NPWS) management actions to remove feral horses to address their impacts on the conservation values of Barrington Tops National Park and Barrington Tops State Conservation Area, and to address public safety risks. It delivers on a high priority action in the *Barrington Tops National Park, Mount Royal National Park and Barrington Tops State Conservation Area plan of management* (NPWS 2022).

In this plan, Barrington Tops National Park and Barrington Tops State Conservation Area are collectively referred to as 'the park'.

# 2. Statutory context

This plan is consistent with objects of the *National Parks and Wildlife Act 1974* where NPWS has statutory obligations for the conservation of nature, ecosystems and biological diversity. Regarding section 72AA of the Act, the plan of management for the park (NPWS 2022) identifies that a feral horse management plan will be developed and implemented to remove feral horses from the park. Action 7.2.15 (high priority) states:

> Develop and implement a Feral Horse Management Plan to remove feral horses from the planning area… based on the guidelines outlined in the English Report, (English 2003 [*sic*[1]]). The plan will include options for removal of feral horses, techniques for monitoring the impact and number of feral horses, and the process for community consultation.
>
> *(NPWS 2022)*

The NSW *Biosecurity Act 2015* obliges landholders to prevent, eliminate or minimise biosecurity risks. The Local Land Services' draft *Hunter regional strategic pest animal plan 2024–2028* (LLS 2024) describes the impacts of feral horses as:

> … large, hoofed animals that spread weeds and can have serious impacts on plants, wetlands, streams and native animals, especially in sensitive environments. Native species and habitats threatened by feral horses include Montane Wetlands and the Broad-toothed Rat.
>
> *(LLS 2024)*

The pest animal plan outlines the responsibilities for government land managers to take proactive actions to implement control and lead a positive example of successful control.

The NSW Threatened Species Scientific Committee listed habitat degradation and loss by feral horses as a key threatening process under the *Biodiversity Conservation Act 2016*. Feral horses are also included in the Novel biota and their impact on biodiversity key threatening process listing under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*.

# 3. Purpose and aim of this plan

Considering NPWS' statutory obligations to control feral animals, this plan outlines how NPWS will control feral horses in the park to protect natural, cultural and recreational values, including World Heritage values, and how the population and impact of horses will be monitored. The plan aims to aid environmental recovery and conservation outcomes by removing all feral horses from the park as far as practicable, recognising that ongoing control will be required.

A range of control methods have been considered and are outlined in this plan. A 'do nothing' approach is not an option due to unacceptable impacts on conservation values and inconsistency with the park's values and purpose.

This plan supplements other current NPWS feral animal control programs targeting feral pigs, foxes, deer and other species in the area.

# 4. Background to the feral horse population

The Barrington Tops feral horse population likely originated from historical summer grazing (Mort 1983; Randell et al. 2003).

Feral horse numbers and distribution have increased over time. Early horse distribution can be inferred from the literature. Hartley (1993) refers to about 50 horses removed from Edwards Swamp in 1974. Based on impacts, Mort (1983) indicated feral horses were previously confined to Polblue, Horse and Butchers swamps. A 1996 survey of feral horses by NPWS and University of New England estimated numbers to be below 50, with low and localised impacts (NPWS 1996).

A 2023 aerial survey assessed population density and partial distribution of feral horses across NPWS estate on the plateau. It estimated a density of 4.2 horses per square kilometre and a population of 505 feral horses within the park, with a range of 263 to 973 horses at a 95% confidence interval (Körtner and Mahon 2023). This estimate does not include adjoining tenures.

The 2020 bushfires impacted local subalpine vegetation and horses have since been observed in these areas, including the park's southern swamps. Based on staff observations and NPWS survey points, the feral horse population extends to the north-east along Barrington Tops Forest Road, and beyond Gummi Falls towards the Manning River camping area in Barrington Tops State Forest (see map in Appendix A).

With increased horse numbers and their expanded distribution, undesirable and unsafe interactions with visitors and environmental impacts have also increased. NPWS actions to date have been limited to euthanising injured and aggressive individual horses that were presenting safety concerns. There have been no management actions to reduce the horse population, with subsequent increases in the feral horse population along with associated impacts.

# 5. Environmental values and feral horse impacts

The park has many outstanding values which contributed to its gazettal and subsequent expansion. Many of these values are impacted or threatened by feral horses.

## 5.1 World heritage and wilderness values

The park includes the southern extent of the World Heritage listed Gondwana Rainforests of Australia. The Gondwana Rainforests comprise outstanding biodiversity and natural heritage of international significance, with species diversity of value to science and the community. Approximately 4,000 hectares of the World Heritage site within the park intersect with the feral horse extent, and downstream impacts are also a risk due to catchment degradation.

More than 75% of the park is declared wilderness, with diverse communities providing high-quality habitat for numerous threatened species, and pristine rivers, waterfalls and gorges. It also provides for self-reliant recreation like remote area walking and camping. Under the *Wilderness Act 1987*, these areas are managed to restore and protect plant and animal communities, preserve their capacity to evolve without significant human impacts, and provide for solitude and appropriate self-reliant recreation.

## 5.2 Water catchment values including water quality

The Barrington Tops forms catchments of the Hunter and Manning river systems and includes parts of the drinking water catchments for the Hunter-Newcastle and Mid North Coast regions. The Barrington River is a major contributor to the Manning River, partly as the swamps act as a landscape water store, soaking up rainfall and snowmelt and slowly releasing water over time. Protecting these wetlands and their unique values is a key focus for this plan. Concerns for water quality from impacts by large feral animals have been expressed by water authorities and catchment management authorities.

Feral horse damage to alpine bogs and riparian zones degrades water quality and increases flow rate variability in mountain catchments. Peat soils take thousands of years to accumulate but can be rapidly degraded by hard-hooved animals (Driscoll et al. 2019). The sphagnum and stream edges in Beean Beean swamp show clear evidence of trampling damage (Photo 1).

Beean Beean Creek has been heavily modified to a broader, shallower creek with pugging, collapsing stream bank walls, and exposed areas of bog (Photo 2).

**Photo 1** **Trampling damage by feral horses to Beean Beean swamp. NPWS/DCCEEW**

**Photo 2** **Stream bank and grazing damage by feral horses to Beean Beean Creek. NPWS/DCCEEW**

## 5.3 Scientific values and research

There is a long history of scientific study in the park dating back to 1937. Investigations focused on the area's natural heritage long before it was gazetted as national park. There have been many studies relating to threatened species, feral animal management and recreation. The scientific community maintains a strong affiliation with the park.

Scientific evidence also details feral animal impacts on alpine and subalpine environments, including from hard-hoofed animals like horses (see Section 10. References). These studies are peer-reviewed and published in scientific literature. They show selective grazing alters species composition and is associated with soil erosion, stream bank degradation, soil compaction and wallowing (Smart 2019). Multiple studies demonstrate feral horses damage vegetation, degrade stream morphology and threaten alpine communities. These are consistent with international evidence of significant declines in plant biomass by 34%, soil stability by 32%, and a 15% decline in plant abundance, where horses are present (Driscoll et al. 2019). The science is robust and supports this plan's objective to remove feral horses from the park.

## 5.4 Natural heritage values

The park peaks at 1,586 metres above sea level, which is the highest point outside of the Australian Alps. It is an important water catchment for the Hunter and Manning rivers. This subalpine environment contains a high concentration of rare and threatened species and is isolated from similar habitat. Some of these species are found nowhere else, and many species are at the southern or northern limit of their distribution. The diverse vegetation supports a similarly diverse abundance of animals, with more than 325 recorded vertebrate species (NPWS 2022).

NPWS implements a broad range of conservation, land management, and weed and feral animal management operations to maintain the park's values under its adopted plan of management (NPWS 2022).

The NSW Biodiversity Conservation Act lists feral horses as a key threat to biota, with habitat degradation and loss by feral horses listed as a key threatening process. This recognises negative feral horse impacts on wetlands, watercourses and riparian systems, and alteration in vegetation (NSW Threatened Species Scientific Committee 2018).

Impacts have been recorded for the Barrington Tops (Smart 2019). The *Kosciuszko National Park wild horse heritage management plan: as amended October 2023* (NPWS 2023) also gives 3 directly applicable examples of horse impacts (Table 1).

**Table 1 Natural features impacted by feral horses**

| Feature | Impacts |
|---|---|
| Peat-forming bogs and fens | Trampling of bogs and bank-holding vegetation, and soil loss; changes to hydrology; channelling resulting in drainage line and wetland draining and drying; loss of wetland plants which require well-aerated soils. |
| Waterways | Trampling, increased run-off and sediment impacts water quality for life cycle maintenance of aquatic flora/fauna and drinking water supplies. |
| Broad-toothed rat | Degrade habitat by grazing and trampling native grasses, altering vegetation structure and reducing grass height. Evidence suggests that as negative horse impacts increase, presence of broad-toothed rat decreases. |

Source: *Kosciuszko National Park wild horse heritage management plan: as amended October 2023*, Box 2 (NPWS 2023).

At Barrington Tops for example, feral horses at Little Murray cause extensive damage to the creek and surrounds (Photo 3). Horses also occupy the camping area here and pose a risk to public safety.

**Photo 3** **Trampling damage by feral horses to stream bed in Little Murray Creek, Barrington Tops National Park. NPWS/DCCEEW**

## 5.5 Threatened species values

Appendix B lists some of the threatened species and ecological communities impacted by horses in the park (along with their scientific names).

The park's subalpine wetlands are an endangered ecological community and part of the Montane peatlands and swamps of the New England Tableland, NSW North Coast, Sydney Basin, South East Corner, South Eastern Highlands and Australian Alps bioregions endangered ecological community listing (NSW Threatened Species Scientific Committee 2004).

They are the only type of wetland containing more than trace amounts of the peat-forming mosses known as sphagnum. The park's wetlands cover about 370 hectares and have high biodiversity, including sedge tussocks and sphagnum moss. Several swamps uniquely have deep narrow channels (originally) with low sediment transport, constant stream flow, and a low gradient with dense bank and floodplain vegetation. These wetlands include threatened species and deposits which provide evidence of vegetation changes over time.

A total of 42 fauna species in the park are listed as threatened and many are largely endemic to north-east New South Wales. High-quality habitat exists for several frog species in the swamp and woodland areas, including the threatened Booroolong frog. Other threatened species include invertebrates such as the rare butterfly subspecies *Pseudalmenus chlorinda barringtonensis*, and a small isopod crustacean *Crenoicus harrisoni* that exists nowhere else in the world. The endangered broad-toothed rat exists only in quality habitat around montane swamps and is at its northern limit in the park. It is isolated from the only other population of broad-toothed rat, 500 kilometres south in the Australian Alps. It is an alpine species whose habitat of grasses, sedges and heaths is impacted by feral horses.

The threatened shrubs broad-leaved pepperbush and fragrant pepperbush occur on higher elevations. Several threatened orchid species occur around the montane swamps including veined doubletail, Polblue eyebright and the greenhood orchid.

These key threatened species in the montane swamps are indicators of the health of the wetland and the broader water supply catchments that are important for regional communities and downstream industries.

There is evidence that the feral horse population is having a significant detrimental impact on the environment of the park, including threatened species and ecological communities. Between 2018 and 2022 NPWS surveys across 2,350 hectares of the Barrington Plateau recorded feral horse impacts at 836 survey points (36% of points surveyed) (NPWS 2018–2022). These surveys focused on sensitive areas such as montane peatlands and swamps, and the habitat of threatened fauna including the broad-toothed rat and the many-bristled crayfish. A total of 660 survey points recorded impact scores of 'moderate to high' in one or more horse impact categories.

A University of Newcastle (UoN) research project (Smart 2019) assessed horse impacts on montane swamps and drainage lines on the Barrington Plateau. Grazing and trampling were shown to alter vegetation height, composition and structure; and to degrade stream banks due to constant trampling leading to vegetation death, pugging, bank pedestals and collapse.

A current UoN PhD research project is studying feral horse impacts on the broad-toothed rat. Other studies include UoN research on the habitat of the threatened Davies tree frog and factors affecting the threatened shrub fragrant pepperbush. Impacts such as grazing and trampling are observed during monitoring of threatened species, including the veined doubletail orchid and the broad-toothed rat.

## 5.6 Risk of weed spread and pathogens

Feral horses contribute to the spread of 2 weeds of concern in the park.

Yorkshire fog (*Holcus lanatus*) occurs in disturbed sites along road edges and wetter areas. As a pasture grass it is preferentially grazed and dispersed by feral horses. The weed will potentially compete with several threatened ground orchid species, including veined doubletail, which occur around the montane peatland and swamps.

Scotch broom (*Cytisus scoparius*) is a major weed at Barrington Tops. Its spread is associated with grazing, fire and trail development. Feral horses are observed to use broom thickets and can spread its seed (NPWS 2022).

Sampling in 2023 found the dieback-causing root fungus *Phytophthora cinnamomi* had spread outside of its existing quarantine area to several local swamps, affecting *Epacris* plants which are habitat for the broad-toothed rat. There is risk of spread of *Phytophthora* in mud on the hooves of large feral animals. Feral pigs are known vectors and have an existing NPWS control program (OEH 2012a). Horses also pose a risk via soil disturbance on creeks and swamps (NPWS 2022). Feral horses may also carry other pathogens such as *Cryptosporidium*, which can spread to humans via contaminated water sources (OEH 2012b).

## 5.7 Aboriginal cultural heritage values

The area now covered by the park is the traditional Country of the Gringai/Guringai People, and culturally connected with the adjoining Biripi, Worimi, and Wonaruah peoples. Aboriginal people have a deep and ongoing attachment to this Country and active interests in the park's management. The park is a cultural landscape with important food and medicinal species, territories, ancient sites and formations, camping areas and prominent landscapes. The lands, waters and biodiversity are integral to the cultural learning and continued connection linking Aboriginal people to this Country.

Feral horses are having a negative, worsening and cumulative impact on Country and Aboriginal cultural values in the park and across the Barrington Plateau.

## 5.8 Recreation and social values

The park has diverse visitor opportunities. The park's World Heritage values make it an important contributor to local and regional economies through tourism.

Opinions vary about feral horses at Barrington Tops. Some visitors enjoy seeing horses here, while for many others their presence conflicts with visitor expectations for a protected natural environment and key values of national parks and wilderness. An understanding of these views is based on feedback via the NPWS website, and correspondence and phone calls from visitors concerned to see feral horses and impacts in the park.

Increasing visitation to the park combined with increasing horse numbers has resulted in more negative and unsafe interactions between visitors and feral horses. NPWS has recorded reported interactions, including people being aggressively challenged by stallions, horses running through campgrounds and pushing up against tents, and vehicle near-misses and a collision. The traffic safety risk posed by horses is recognised in the *Hunter regional strategic pest animal management plan 2018–2023* (LLS 2018). Campers have reported horses trampling through camping areas at night and horses fighting in camping areas around visitors' tents.

Increasing feral horse populations will lead to an increased potential for injury to visitors.

There are also impacts on the visitor experience, with complaints received about horse manure in waterways and on popular walking tracks including at Polblue. Camping areas like Little Murray are affected, with horse wallows on grassy campground areas. There are reports of people approaching or attempting to feed feral horses and not being aware of the safety risks despite warning signs provided.

# 6. Relationship to other feral animal programs

Feral horse control and management will be integrated with other feral animal and weed control programs, including many that are long-running and active in the park. This integrated approach is consistent with the *Hunter regional strategic pest animal management plan* (LLS 2018) and *Hunter regional strategic weed management plan* (LLS 2023), which also identify the need for cross-tenure actions.

# 7. Process for community consultation

The park's plan of management requires that this feral horse management plan include the process for community consultation.

Initial community and stakeholder engagement on NPWS' intent to remove feral horses from the park began with the release of the park's first draft plan of management in 1989 (NPWS 1989). Feral horse control was included as a priority action in the draft plan. The planning process continued to identify detrimental horse impacts and the need for control as a management issue through to the plan's adoption in 2010 (NPWS 2010). Concerns over detrimental horse impacts were raised by respondents to the draft plan and have continued to be raised since.

The plan of management was re-exhibited with draft amendments in 2020. No submissions specifically supporting retention of horses were received during either exhibition period. The development of a feral horse management plan to 'remove horses from the planning area' is identified as a high priority in the current adopted plan of management (NPWS 2022).

Further, in 2024 Local Land Services (LLS) publicly exhibited the draft *Hunter regional strategic pest animal management plan 2024–2028* (LLS 2024). The final draft plan identifies the need to implement feral horse controls to remove horses from NPWS reserves including Barrington Tops National Park in accordance with NPWS management plans and horse management policies and procedures. The LLS has advised that community and stakeholders were supportive of the draft plan. There were no submissions or community comments related to retaining, protecting or rehoming feral horses from Barrington Tops National Park.

Considering the above, engagement on the draft of this plan was targeted to relevant stakeholder groups and individuals who collectively represent a cross-section of interests. This included scientists (UoN researchers currently involved in studies on Barrington Tops National Park), the peak animal welfare group Royal Society for the Prevention of Cruelty to Animals (RSPCA), representative stakeholder groups such as the NPWS Hunter Central Coast Regional Advisory Committee, Hunter LLS, and neighbouring land agencies (NSW Forestry Corporation and Hunter Water). The regional advisory committee has a specific role in representing community views to NPWS in relation to national park management issues.

Community, neighbours and other stakeholders will be notified regarding operational matters including park closures, consistent with notification processes in NPWS standard operating procedures. This feral horse management plan will be made available on the department's website. Results of monitoring associated with the plan's implementation (see Section 9. Monitoring and evaluation) will also be made publicly available.

Additional, targeted community consultation will be undertaken in relation to rehoming activities.

# 8. Control methods

## 8.1 Control options to be implemented

The control options outlined in Table 2 will be implemented in the park.

**Table 2 Control options to be implemented**

| Control method | Application |
|---|---|
| Aerial shooting | Feasible and consistent with high animal welfare standards, especially across large or inaccessible areas. Preferred option including for in and around the *Phytophthora* quarantine area to reduce risk of pathogen transmission. |
| Ground shooting | Feasible and consistent with high animal welfare standards, especially relevant for isolated horses or smaller groups and for ongoing follow-up operations. Option for follow-up in the *Phytophthora* area where hygiene needs can be met. |
| Trapping for removal to rehome | Where there is a pre-identified demand for feral horses from approved individuals and organisations. Feasible and effective for smaller groups within areas that are safely accessible by vehicle/truck/trailer. Not suitable for feral horses within or around |

| Control method | Application |
|---|---|
| | the *Phytophthora* quarantine area and other areas known to be impacted by *Phytophthora*. |

Feral horse control in the park will be staged as follows:

1. Aerial and ground shooting in and around the *Phytophthora* quarantine area and the park's high-value ecological assets and visitor precincts (September 2024).
2. Trapping to provide horses for rehoming from other areas of the park will be undertaken where there is a pre-identified demand for feral horses from approved individuals and organisations. This stage requires lead time for trapping infrastructure to be set up, systems to be established, potential rehomers to be engaged, and other needs (before September 2025).
3. Aerial and ground shooting across the park (September 2025).
4. Ongoing maintenance via aerial and ground shooting to maintain eradication across the park.

In addition to ongoing annual control programs, NPWS will continue to target other feral animals, including pigs and deer, as part of an integrated management program.

## 8.2 Considerations for selection of control methods

### 8.2.1 Standard operating procedures

Control methods must be in accordance with the relevant approved NPWS statewide standard operating procedures for feral horse control and be consistent with high animal welfare standards.

### 8.2.2 Phytophthora quarantine area and other site constraints

Removal of horses in and around the *Phytophthora* quarantine area and the park's high-value ecological assets and visitor precincts is the highest priority in this plan.

The *Phytophthora* quarantine area has restricted access for people and vehicles to reduce risk of pathogen transmission, and public access is not permitted. The quarantine area is situated south of Barrington Tops Forest Road (see map in Appendix A) and has known feral horse populations within its boundaries. Aerial shooting is preferred in the quarantine area and surrounding area to reduce the potential spread of this soil-borne pathogen (which causes plant dieback) by vehicles or foot.

Trapping for removal to rehome feral horses will be prioritised for areas of the park that are safely accessible by vehicles and are outside of the *Phytophthora* quarantine area and other areas known to be impacted by *Phytophthora*.

Access to many areas of the plateau is limited due to the remoteness, steep terrain and World Heritage values of the park.

### 8.2.3 Animal welfare

Animal welfare is a priority in all NPWS animal management programs. All adopted control methods will be consistent with relevant state/federal animal welfare legislation, regulations, codes of practice, and NPWS standard operating procedures. The NPWS statewide standard operating procedures have been developed taking into account advice from the RSPCA.

The report on the management of feral horses in NSW national parks (English 2001) was considered in the development of this plan and it highlights the limitations if considering non-lethal methods of control. Only small numbers of captured horses can be rehomed, as evidenced in the trapping programs at Kosciusko National Park.

### 8.2.4 Carcass management

A carcass management plan will be developed following appropriate environmental assessment. It is likely that most carcasses will be left in situ, except for carcasses likely to pose a risk to waterways or in visitor precincts and immediately adjacent to roads and walking tracks. This is the standard practice for feral animal control on public and private land, consistent with other control programs including those for feral deer, goats and pigs.

NPWS control of feral pigs and wild dogs will continue concurrently to address potential increased activity by feral animal scavenger species.

## 8.3 Other control options considered and not adopted

The full range of other control methods were carefully considered in developing this plan, including mustering into yards, killing in trap yards by shooting or tranquilisation followed by lethal control, and reproductive control. These methods have not been adopted here due to risks and constraints such as accessibility, potential for poor animal welfare outcomes, risks of spread of *Phytophthora*, inefficiency/ineffectiveness, limited potential to meet plan objectives, the time required, and specialised resources and skills needed.

# 9. Monitoring and evaluation

The technique used for the initial survey of the horse population for this plan is outlined by Körtner and Mahon (2023). This design will be reviewed in accordance with NPWS-wide protocols for feral herbivore surveys. Further surveys will be conducted to measure and report reductions in the horse population.

To detect future horse incursions, ongoing monitoring of feral horse presence will occur via a combination of installed motion cameras and observations, in line with the plan's intention to reduce the horse population and maintain it on park to as close to zero as practicable.

Monitoring environmental impacts to date has occurred as outlined above. In future, monitoring of threatened species and ecological communities will occur in accordance with a NPWS threatened species monitoring protocol (in preparation). This will contribute to measuring the recovery of the park in response to horse control.

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# Appendix A

## Distribution of feral horses in the park

Figure 1 is based on staff observations and NPWS survey points. It shows the approximate distribution of feral horses across 10,000 to 12,000 hectares of Barrington Tops National Park and Barrington Tops State Conservation Area.

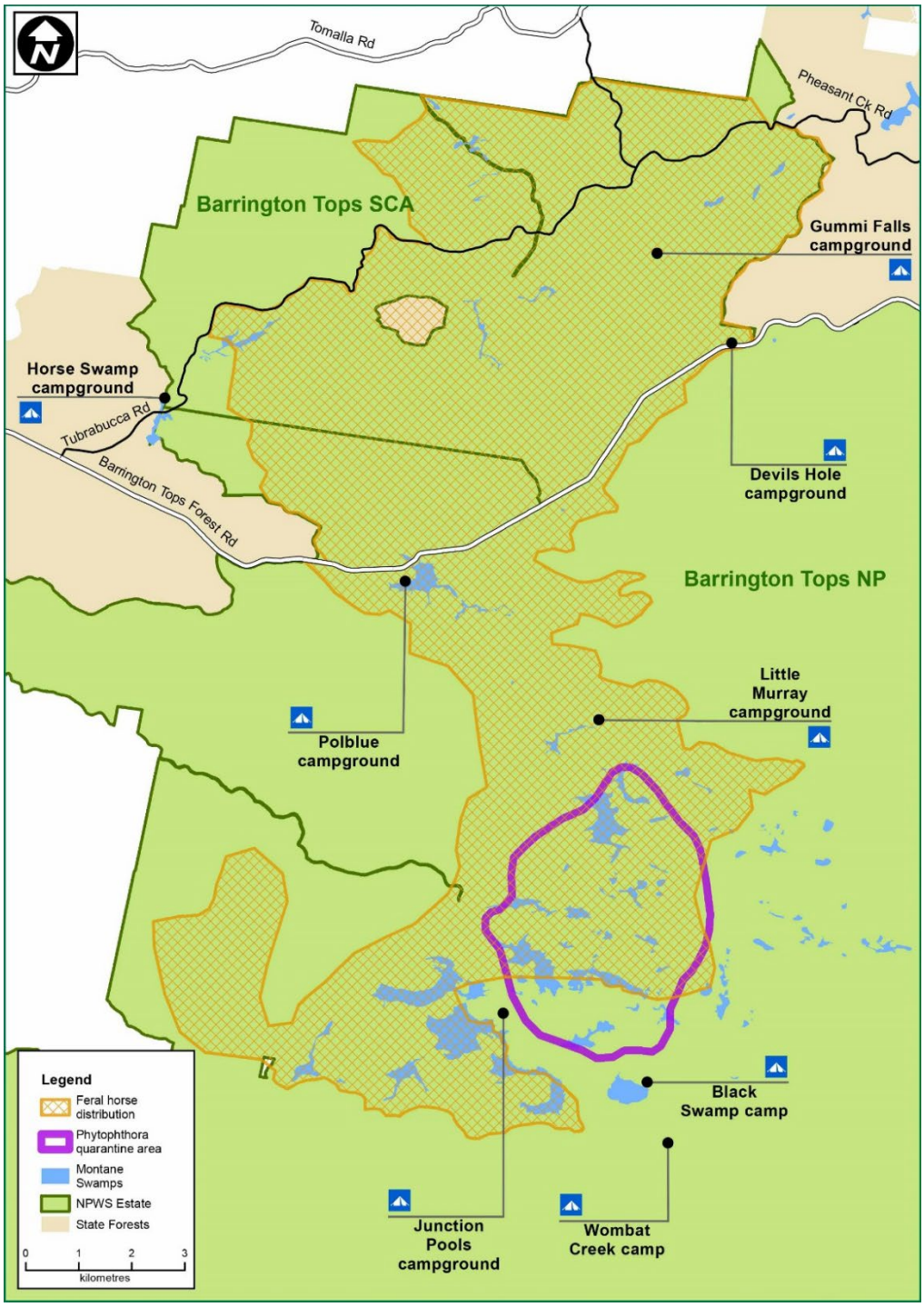


**Figure 1** **Mapped distribution of feral horses in the Barrington Tops National Park and State Conservation Area**

# Appendix B

## Selected list of threatened species impacted by horses in the park

**Table 3 Selected list of threatened species impacted by horses in the park**

| Threatened species or community | Scientific name | Type |
|---|---|---|
| Booroolong frog | *Litoria booroolongensis* | Amphibian |
| Broad-leaved pepperbush | *Tasmannia purpurascens* | Shrub |
| Broad-toothed rat | *Mastacomys fuscus* | Mammal |
| Davies tree frog | *Litoria daviesae* | Amphibian |
| Fragrant pepperbush | *Tasmannia glaucifolia* | Shrub |
| Greenhood orchid | *Pterostylis riparia* (formerly *Pterostylis* sp. D.) | Terrestrial orchid |
| Polblue eyebright | *Euphrasia ciliolata* | Terrestrial orchid |
| Veined doubletail | *Diuris venosa* | Terrestrial orchid |
| Montane Peatlands and Swamps of the New England Tableland, NSW North Coast, Sydney Basin, South East Corner, South Eastern Highlands and Australian Alps bioregions endangered ecological community | Not applicable | Endangered ecological community |