NSW Legislative Council inquiry into proposed aerial shooting of brumbies in Kosciuszko National Park

Submission by the
Invasive Species Council

October 2023

Document details

Invasive Species Council. 2023. NSW Legislative Council inquiry into proposed aerial shooting of brumbies in Kosciuszko National Park: Submission by the Invasive Species Council.

About the Invasive Species Council

The Invasive Species Council was formed in 2002 to advocate for stronger laws, policies, and programs to keep Australian biodiversity safe from weeds, feral animals, exotic pathogens, and other invaders. It is a not-for-profit charitable organisation, funded predominantly by donations from supporters and philanthropic organisations.

Intellectual property rights

Inquiries

Invasive Species Council
Contact: Advocacy Manager, Invasive Species Council
Address: PO Box 818, Katoomba NSW 2780, Australia
ABN: 27 101 522 829
Web: invasives.org.au
Email: contact@invasives.org.au

Summary

The Invasive Species Council appreciates the opportunity to make a submission to this inquiry into the management of feral horses in Kosciuszko National Park.

We strongly support the use of aerial shooting, when undertaken by highly trained professionals using standard protocols, as one of the available control methods for feral horses in Kosciuszko National Park.

The devastating impact of feral horses in Kosciuszko National Park on the natural and indigenous cultural values of the region has been well documented (NSW TSSC 2018, Australian Academy of Sciences 2021, Commonwealth TSSC 2023). The rapid growth of the feral horse population has also been well documented through regular NSW Government population surveys using best practice scientific methodologies for counting wildlife populations over large areas.

Streams that were once lined by precious sphagnum moss are now scarred erosion channels. The habitat of critically endangered animals, like the northern corroboree frog and mountain pygmy possum, is being severely damaged. Rare alpine daisies and orchids that are found nowhere else in the world are directly at risk of extinction due to feral horse impacts.

With the population so high, thousands of feral horses need to be removed annually to reduce numbers and stop our National Park becoming a horse paddock. No one likes to see animals killed, but the sad reality is that we have a choice to make between urgently reducing feral horses or accepting the decline and extinction of our native wildlife.

With good planning, adequate resources, appropriate methods and consistent control, significant reduction of feral horses from Kosciuszko National Park is still possible. However, every year that control is delayed or deferred will increase the number of animals required to be removed and the cost of an effective control program.

It is abundantly clear that with currently available control techniques the current management plan is off-track to reach the target of 3,000 horses by June 2027. While there has been an encouraging increase in the rate of removals since the commencement of the new plan in February 2022, it is still below the population growth rate and far below levels required to rapidly reduce the population in this time frame. This lack of progress will continue to be the case while resources are inadequate to the scale of the task, aerial shooting is not being utilised and so-called passive methods such as rehoming or fertility control are being promoted as alternatives.

Aerial shooting, when undertaken by highly trained professionals using standard protocols, is a safe, humane, effective and essential tool for feral animal control. It is routinely used across the state by both the National Parks and Wildlife Service and Local Land Services to protect our wildlife from the impacts of feral animals.

In the past 3 years alone, 239,034 feral pigs, feral deer and other feral animals were removed by NSW government agencies using aerial shooting. This includes 9,794 feral pigs, deer and other feral animals in the Southern Ranges National Park Region, which includes Kosciuszko National Park. At

least 245 feral horses have been removed by Local Land Services using aerial shooting in this time.

NSW remains the only jurisdiction where feral horses are currently afforded legal protection inside a national park and national heritage place. Ultimately, this law must be changed if we are to properly protect the native wildlife and alpine ecosystems in Kosciuszko National Park.

This issue has been subject to numerous inquiries, reports, public consultation processes and scientific assessments. To assist the Committee with your inquiry, the Invasive Species Council has attached:

1. Commonwealth Threatened Species Scientific Committee submission to the Senate Inquiry into the impacts and management of feral horses in the Australian Alps, April 2023
2. Review by ecologist Dr Don Fletcher of Claire Galea's 'Independent biostatistical report on the Brumby population in the Kosciuszko National Park', provided to the Senate Inquiry into the impacts and management of feral horses in the Australian Alps, October 2023
3. Literature review on humaneness and effectiveness of aerial shooting of feral horses, August 2023, provided by the NSW Government in answers to Questions on Notice to the Senate Inquiry into the impacts and management of feral horses in the Australian Alps, September 2023
4. Annotated bibliography of key documents for the Senate Inquiry into Impacts and management of feral horses in the Australian Alps compiled by the Invasive Species Council, April 2023
5. Invasive Species Council submission to the Senate Inquiry into the impacts and management of feral horses in the Australian Alps, April 2023
6. 'MO request for information Feral animal control over the last three years' provided to Invasive Species Council by the NSW Government, September 2023
7. 'DOT POINTS ADVICE - LLS aerial cull programs' provided to the Invasive Species Council by the NSW Government, September 2023
8. Reining in feral horses in Kosciuszko National Park, Frontier Economics, January 2021

About the Invasive Species Council

The Invasive Species Council advocates for stronger laws, policies, and programs to keep Australian biodiversity safe from weeds, feral animals, exotic pathogens, and other invaders. We have considerable policy, community and on-ground knowledge and experience associated with the impacts of feral horses in Australia, particularly in the Australian Alps and Kosciuszko National Park.

The Invasive Species Council is extremely concerned about the significant growth in the population and devastating impact of feral horses in Kosciuszko National Park over recent decades and the failure of the NSW Government to take adequate action. As a result, we have been directly engaged in raising political and community awareness of the issue and the solutions that are required.

As part of this work, the Invasive Species Council founded the Reclaim Kosci campaign in 2018, with the National Parks Association of the ACT, National Parks Association of NSW, Colong Foundation for Wilderness, and the Nature Conservation Council of NSW. This campaign is supported by over 20 community groups including the Australian Conservation Foundation, Bushwalking NSW, the Australian Wildlife Society, Native Fish Australia, and the Australian Association of Bush Regenerators

The Invasive Species Council has supported a broad chorus of community voices calling for action on feral horses, including:

- Over 100 scientists signing the Kosciuszko Science Accord
- More than 500 walkers involved in a 560km protest trek from Sydney to Mt Kosciuszko
- Over 12,000 people in 2019 and more than 15,000 people in 2021 signing petitions delivered to the NSW Parliament calling for action
- Aboriginal people from four major western catchments holding a historic Narjong Water Healing ceremony in the headwaters of the Murrumbidgee River

The impact of feral horses in Kosciuszko National Park

> *"New evidence of impacts by feral horses in Australia's alpine parks systems confirms they endanger threatened species and extensively damage critically endangered bog communities that could take millennia to recover. These impacts…accumulate over time, even when only a small number of feral horses (~100) are present."*
>
> - Driscoll, D.A., Worboys, G.L., Allan, H. et al. (2019) Impacts of feral horses in the Australian Alps and evidence-based solutions. Ecological Management & Restoration, 20, 63– 72.

Australia's ecosystems have evolved in the absence of heavy, hard-hooved animals such as feral horses. The current Alps-wide population of feral horses is estimated to exceed 20,000, with the vast majority of these estimated to occur in Kosciuszko National Park in NSW (over 18,500 at the most recent NSW government survey in 2022)[1].

The impacts of feral horses are particularly severe in sensitive alpine ecosystems, where they are causing serious long-term damage (AAS 2021). Feral horses can destroy these delicate ecosystems through selective grazing, trampling, and pugging and compaction leading to the degradation of waterways and streambanks, the creation of bare ground and multiple track formation. Faecal matter from feral horses pollutes alpine streams and facilitates the distribution of weed seeds.

The observed direct impact of feral horses on the precious biodiversity values of the Australian Alps is alarming. In areas where feral horses are regularly present, it is common to see the complete destruction of alpine sphagnum moss beds, turning them into muddy holes. These impacts also alter the ecosystem processes governing water quality and supply for the sources of the Murray, Snowy and Murrumbidgee Rivers.

Restoration and recovery of these habitats, once feral horses are removed, will take decades, and require significant investment. Feral horses cause significant damage in areas that have been recently burnt in bushfires. These areas are at their most vulnerable stage and struggle to recover while being trampled and grazed by feral horses.

There are at least 28 threatened species listed under the EPBC Act in the Australian Alps where feral horses are identified as a direct threat to the survival of the species (See Table 1). This number is likely to be higher as updated information on species threats becomes available.

There are also two threatened ecological communities listed under the EPBC Act for which feral horses are identified as an ongoing threat - the endangered alpine sphagnum bogs and fens and the critically endangered river-flat eucalypt forest.

Feral horses have been listed as a key threatening process by the NSW Threatened Species Scientific Committee under the Biodiversity Conservation Act. 'Degradation and loss of habitats caused by feral horses' is listed as a potentially threatening process under the Victorian Flora and Fauna Guarantee Act 1988.

Feral horses can have adverse impacts on Aboriginal heritage sites, either by directly damaging culturally important attributes of the site or by exposing them to damage through the removal of

[1] The surveys of feral horse numbers are based on best practice scientific methods for counting wildlife populations of large areas. For further information see Attachment 2.

vegetation by grazing and soil disturbance from trampling (Parks Victoria 2018). The environmental impacts of horses from trampling of streambanks and the creation of bare ground through grazing and wallowing will inevitably damage archaeological sites.

Disturbance to Aboriginal cultural sites by horses has been observed and recorded where feral horses are known to occur in moderate to high densities (Parks Victoria 2018). Concern around the physical damage caused to Aboriginal heritage sites by wild horses through trampling and erosion of physical sites (e.g., artefact scatters) was noted during the assessment of the community's understanding of park values and its views on wild horse management in Kosciuszko National Park (Straight Talk 2015).

The economic impact of feral horses is also severe. Analysis from Frontier Economics (Attachment 8) released in 2021 found that the failure to reduce feral horse numbers in Kosciuszko National Park is costing the NSW economy up to $50 million a year.

For further information about the impact of feral horses on threatened species see Attachment 1.

Case study of an impacted species:

Broad-toothed Rat - *Mastacomys fuscus*

- Vulnerable: *Environment Protection and Biodiversity Conservation Act 1999*
- Vulnerable: NSW *Biodiversity Conservation Act 2016*
- Near Threatened: IUCN RedList

The broad-toothed rat is a native, chubby-cheeked mammal with long dense fur. They make their home in the dense vegetation of the alpine and sub-alpine regions of south-eastern Australia. They have a ringed tail and a gentle demeanour when handled.

Their distribution has been highly fragmented due to clearing for roads, ski runs and building developments. These mammals rely on high rainfall, cool summers, cold winters, and a dense ground cover of grasses, sedges, and shrubs. They live in a complex of runways through dense wet grass, sedge, or heath habitat, usually within 15m of a watercourse.

Feral horses occupying their small and specific habitat in the Australian Alps out-compete the broad-toothed rat for food (native grasses) and trample their remaining nesting areas. The presence of feral horses is directly related to the decline of broad-toothed rat populations. In areas of habitat severely impacted by feral horses, no evidence of this species was found at all.

Table 1: EPBC listed species and communities in the Australian Alps directly impacted by feral horses

EPBC listed flora (Total = 15 species)	**EPBC Status**
Mauve Burr-daisy (Calotis glandulosa)	V
Shining Cudweed (Argyrotegium nitidulum)	V
Kiandra greenhood (Pterostylis oreophila)	CE
Anemone Buttercup (Ranunculus anemoneus)	V
Monaro Golden Daisy (Rutidosis leiolepis)	V
Prasophyllum bagoense	CE
Brandy Marys Leek-orchid (Prasophyllum innubum)	CE
Kelton's Leek Orchid (Prasophyllum keltonii)	CE
Clover Glycine (Glycine latrobeana)	V
Rice flower (Pimelea bracteata)	CE
Pale pomaderris (Pomaderris pallida)	V
Feldmark grass (Rytidosperma pumilum)	V
Swamp everlasting (Xerochrysum palustra)	V
Brindabella midge orchid (Corunastylis ectopa)	CE
Pale Golden Moths orchid (Diuris ochroma)	V
EPBC listed fauna (Total = 13 species)	**EPBC Status**
Alpine Tree Frog (Litoria verreauxii alpina)	V
Broad-toothed Rat (Mastacomys fuscus)	V
Smoky Mouse (Pseudomys fumeus)	E
Southern Corroboree Frog (Pseudophryne corroboree)	CE
Northern Corroboree Frog (Pseudophryne pengilleyi)	CE
Alpine She-oak Skink (Cyclodomorphus praealtus)	E
Guthega Skink (Liopholis guthega)	E
Alpine bog skink (Pseudemoia cryodroma)	E
Spotted tree frog (Litoria spenceri)	CE
Stocky galaxias (Galaxias tantangara)	CE
Mountain Skink (Liopholis montana)	E
Kosciuszko Galaxias (Galaxias supremus)	CE
Dargo Galaxia (Galaxias mungadhan)	CE
EPBC listed ecological communities (Total = 2 communities)	**EPBC status**
Alpine Sphagnum Bogs and Associated Fens	E
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	CE

V = Vulnerable, E = Endangered, CE = Critically Endangered

The current management plan is on track to fail

The latest survey conducted by the NSW National Parks and Wildlife Service (NPWS) of feral horse populations in Kosciuszko National Park **found that there are an estimated 18,814 horses.** The survey had a 95% confidence interval of between 14,501 and 23,535 feral horses (NSW Government 2023). This represents an increase of more than 30% in just two years - rising from an average estimate of 14,380 in spring 2020 (NSW Government 2020).

Delay, inaction, and inadequate control efforts have seen the feral horse population in Kosciuszko National Park increase consistently over the past two decades at an **average annual growth rate of 15 per cent per year**. The only meaningful population reductions occurred following severe bushfires in 2002/3 and 2019/20. The population recovered rapidly following these events and continued to grow.

Removals have consistently been well below the population growth rate, and thus insufficient to control the growth or spread of feral horses. All removals by NPWS prior to 2022 were through passive trapping and removal to knackery or rehoming. At least 300 feral horses were trapped and then re-released in 2020.

Feral horse removals under the new management plan commenced in February 2022, with 859 horses removed in 2022 and a further 1,342 removed in 2023 from January to August. While this is an important and welcome increase in the rate of removal, with only 3,620 feral horses removed in total between 2002 and 2020, it is still well below the population growth rate required to keep the population stable, let alone reduce it in line with the management plan.

How many feral horses need to be removed to reduce the population?

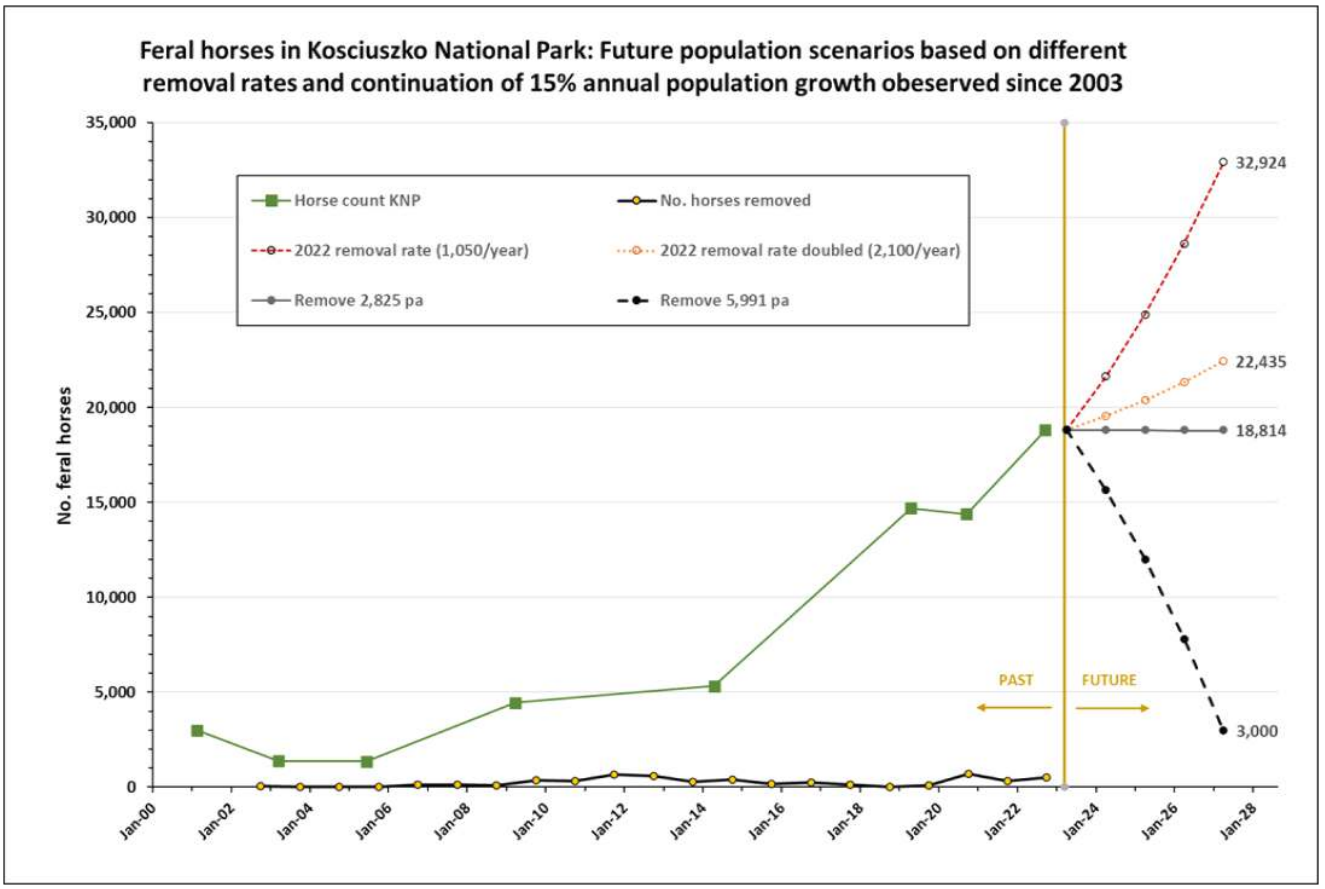
The Invasive Species Council has been provided with independent modelling regarding the expected feral horse population depending on the rate of removal achieved by the NSW Government.

The modelling is based on an annual population growth rate of 15%, which is the average growth rate since 2003. It assumes that business as usual in NSW would be an annual reduction of 1,050 horses per year[1].

The modelling finds that:

- At the 2022 rate of removal of 1,050/year[2], the population could reach ~32,900 by 2027.
- Just to keep the population stable (i.e., stop the population from growing), 2,825 horses will have to be removed every year.
- To reach the target population of 3,000 by 2027, 5,991 horses will have to be removed annually.
- At a higher 18% annual population growth rate, 6,419 will have to be removed per year to reach 3,000 by 2027.
- Delaying action will increase the cost, damage and number of horses killed. For example, a 3- year delay in reaching 3,000 will mean an extra 6-7,000 horses have to be removed.

[2] Based on the NPWS figures of 525 removed for the second half of 2022



Best practice approaches to population reduction

Kosciuszko National Park is a vast area of mostly rugged terrain and wilderness areas. High peaks and steep forested slopes are interspersed with open high grasslands and herbfields. Access by vehicle is limited in many areas. This terrain is challenging for invasive species management and, as such, a range of methods are required to be effective. There are several humane, proven, and efficient methods available to control feral horse numbers.

Shooting is best practice

Shooting by professionals is the most humane and cost-effective way of culling the feral horse population. There are established codes of practice and standard operating procedures in place that, if followed, ensure a safe, clean, and humane kill in the field (Sharp 2011, Sharp 2016).

Professional shooters have access to technology such as thermal imaging devices and suppressors that ensure efficiency. This is best practice to ensure the animal is quickly dispatched in the wild.

By contrast, being chased or trapped then transported, often for long distances over rough tracks, to sale yards, holding pens for selective rehoming or, in most cases, to be ultimately killed in an abattoir, can be distressing and slow. Live capture is also very expensive and hazardous for the operator.

Ground shooting can be effective

Ground shooting by professional pest controllers is an important tool to humanely cull feral horses, where access makes this feasible. This is particularly applicable to the more open plains in the Australian Alps.

A recent independent animal welfare review of the NSW Government's feral horse control management plan for Kosciuszko National Park found that for ground shooting:

- "The Standard Operating Procedure has been followed in detail, and the implementation has resulted in better than expected welfare outcomes (<1% of horses not killed immediately), which has been verified by a highly skilled independent observer."
- "The welfare outcomes are better than predicted based on best practice by the AWA. The skill of the operators was key to this success."
- "There was no evidence of non-kill shots having been taken".

Ground shooting provides a humane and cost-effective way of reducing or removing feral horses and is an essential tool for feral horse control.

Aerial shooting is routine, humane and vital for rapid population reduction

Aerial shooting is an effective method for controlling or eliminating feral horses in remote and inaccessible locations, particularly where feral horse densities are high. Helicopters provide the opportunity for professional shooters to locate horses to secure a quick and humane kill.

Aerial shooting is the only feasible option to cull large numbers of dispersed feral horses in otherwise inaccessible regions of the Australian Alps. It is doubtful that feral horse numbers will be effectively reduced, or even kept at a stable population, in Kosciuszko National Park without aerial shooting.

Aerial shooting of feral horses is a primary control method for extensive feral horse populations in the Northern Territory (NTG 2015), Queensland (QGBQ 2016) and Western Australia (KRBA 2016). In Kosciuszko National Park and throughout NSW, feral deer, pigs, and goats are currently controlled through aerial shooting. The ACT also deploys aerial shooting of feral horses.

In an assessment of the cost-effectiveness of various feral horse control methods in the Australian Alps, aerial culling was found to be three to six times cheaper than mustering (and trapping). It was also more effective in every scenario modelled. The results unequivocally suggest aerial culling as the most cost-effective strategy to effectively control horses within the range of currently realistic scenarios (Beeton & Johnson 2019).

Trapping and live removal of feral horses cost over $1,116 per horse in Kosciuszko National Park (OEH 2016), while aerial shooting was estimated to be $85.50 per horse if used in the Australian Alps (Beeton & Johnson 2019) and found to be $143 per horse when used at the Singleton Army Base (Newcastle Herald 2019).

The Australian Veterinary Association puts forward that (free range) shooting of feral horses is considered more humane than capture and removal as the animals are not subject to the stresses of mustering, yarding, and long-distance transport (AVA 2018).

Aerial culling is demonstrably a cost-effective and humane option for feral horse control when carried out in accordance with established best practice protocols and operating procedures. While some in the community will never accept aerial shooting as a control measure for feral horses, it is shown that general community concerns or anxiety can be moderated if people are properly informed of the facts and evidence and involved in decision processes (OEH 2015).

Aerial shooting by NSW Government agencies in the past 3 years

These statistics have been drawn from the data for aerial shooting, ground shooting and trapping by NSW Local Land Services (LLS) and NSW National Parks and Wildlife Service over the financial years from 2020/21, 2021/22 and 2022/23 (See attachments 6 and 7).

All feral animals

- A total of 271,959 feral animals were killed across NSW using aerial shooting, ground shooting and trapping by NPWS and LLS over the financial years from 2020/21, 2021/22 and 2022/23
- Of these, 88% were through aerial shooting (239,034) compared to 6% for ground shooting (15,378) and 6% for trapping (17,547)
- 57,991 removed by NPWS with 87% of these using aerial shooting
- 184,627 removed by LLS with 89% of these using aerial shooting
- There was a 288% increase in total removals between 2020/21 and 2022/23 (51,619 to 148,650)

Feral deer

- A total of 32,362 feral deer killed across NSW using all three methods by NPWS and LLS over the financial years from 2020/21, 2021/22 and 2022/23
- Of these, 84% were through aerial shooting (27,138) compared to 14% for ground shooting (4,652) and 2% for trapping (572)
- 11,468 removed by NPWS with 94% of these using aerial shooting
- 15,762 removed by LLS with 74% of these using aerial shooting
- Feral deer were 20% of total NPWS removals and 9% of total LLS removals
- There was a 148% increase in total removals between 2020/21 and 2022/23 (8,797 to 12,996)

Feral pigs

- A total of 191,952 feral pigs killed across NSW using all three methods by NPWS and LLS over the financial years from 2020/21, 2021/22 and 2022/23
- Of these, 91% were through aerial shooting (173,923) compared to 2% for ground shooting (3,947) and 7% for trapping (14,082)
- 21,654 removed by NPWS with 84% of these using aerial shooting
- 157,888 removed by LLS with 92% of these using aerial shooting
- Feral pigs were 37% of total NPWS removals and 86% of total LLS removals
- There was a 413% increase in total removals between 2020/21 and 2022/23 (28,763 to 118,660)

All other feral animals

- A total of 47,645 other feral animals killed across NSW using all three methods by NPWS and LLS over the financial years from 2020/21, 2021/22 and 2022/23
- Of these, 80% were through aerial shooting (37,973) compared to 14% for ground shooting (6,779) and 6% for trapping (2,893)
- 24,869 removed by NPWS with 86% of these using aerial shooting
- 10,977 removed by LLS with 70% of these using aerial shooting
- Other feral animals were 43% of total NPWS removals and 6% of total LLS removals
- There was a 121% increase in total removals between 2020/21 and 2022/23 (14,059 to 47,645)

Trapping and transporting is poor practice

Live trapping and transporting have been the main method of feral horse control deployed in Kosciuszko National Park prior to the commencement of the new management plan in 2022. Live trapping is time consuming, expensive, and risky for the operators. Traps are also easily and routinely interfered with by those opposed to feral horse control.

Feral horses are frequently injured during the trapping process and transporting feral horses is stressful for otherwise wild animals. Trapped horses are then yarded, with some possibly sent for rehoming but the majority sent to be killed in an abattoir. This process is not best practice for the welfare of the animal, the safety of controllers, or the cost of the operation.

In areas of high feral horse populations, with good road access for floating or trucking horses, trapping, and transporting may be a feasible option. The clear evidence to date is that it has been ineffective in reducing numbers.

Trapping and culling is an option

Once feral horses are trapped, they may also be euthanised on site. This is particularly used where humane transport options are limited. This may be an option in areas of high feral horse populations, where luring horses to traps and humanely euthanising them on site is more effective than shooting in the open. Trapping may be assisted by aerial mustering of feral horses into trap yards or paddocks.

Trapping and rehoming is expensive and not an effective control method

Trapping and rehoming of feral horses has been used in the Kosciuszko National Park for more than a decade. It has consistently failed to reduce the feral horse population. Aside from the logistical difficulties and costs, the demand for captured feral horses to be rehomed is too low relative to the required annual removals from the feral horse population.

Feral horses are often poorly bred and in bad condition. Offering captured feral horses for rehoming is also expensive and stressful for the horses being trapped and transported. There may be cases for rehoming where there are reliable rehoming options for selected horses, but this is a social program and not to be confused with a control program.

Fencing (Asset protection) is not an alternative to eradication

Where important high value natural or cultural assets are being impacted heavily by feral horses it may be necessary to fence areas until the feral horse population can be eradicated. Fencing is expensive to build and maintain and unsightly in an otherwise outstanding natural environment.

This should be a temporary measure only and not an alternative to population reduction.

Fertility control is not viable

Fertility control as a management tool is only effective for a small, geographically isolated population of feral horses where the management outcome sought is to maintain the population at its current size. It is not a viable option to reduce the feral horse population in the Alps.

Fertility control agents can be used to manage reproduction rates of individual horses if the agent can be administered effectively, and individual horses can be identified and re-treated when required. It is generally only practical in small, confined populations where horse densities are already low, and the objective is to gradually reduce or maintain the population at a low density. Fertility control as a sole

management approach for reducing feral horse population size is not an effective strategy (Hobbs & Hinds 2018).

Animal welfare

In an assessment of the overall welfare impact of all the known feral horse control methods carried out for the review of the Wild Horse Management Plan for Kosciuszko National Park, aerial shooting was found to have a moderate overall welfare impact when carried out using best practice methods.

Live capture by trapping is also moderate but the loading and transport of wild horses over long journeys was assessed as having a severe impact on overall welfare of horses (OEH 2014).

Of the in situ lethal control methods assessed, aerial shooting under a 'best practice scenario' has the lowest overall animal welfare impact (ITRG 2016).

For further information on the animal welfare assessment of aerial shooting please see Attachment 3.

References

Australian Academy of Sciences (2021) Feral Horses Evidence Brief

AVA (2018). *Submission from the Australian Veterinary Association to the Protection of the Alpine National Park – Feral Horse Strategic Action Plan 2018-2020*.

Beeton, N. & Johnson, C. (2019). *Modelling Horse Management in the Australian Alps*. Ecological Management and Restoration. Vol 20, Issue 1. Feral Horses in the Australian Alps.

Commonwealth (TSSC) Threatened Species Scientific Committee (2023) *Submission from the Threatened Species Scientific Committee to the Inquiry into the Impacts and Management of Feral Horses in the Australian Alps The Senate Environment and Communications References Committee*

Hobbs, R. & Hinds, L. (2018). *Could current fertility control methods be effective for landscape-scale management of populations of wild horses (Equus caballus) in Australia?* CSIRO Wildlife Research.

ITRG. (2016). *Final report of the Independent Technical Reference Group: Supplementary to the Kosciuszko National Park Wild Horse Management Plan*. Report by the Independent Technical Reference Group to the Office of Environment and Heritage NSW, Sydney.

Newcastle Herald. (2019). *Department of Defence contractor kills 235 feral horses during aerial cull at Singleton Army Base*: quote from Department of Defence, online March 4, 2019.

NSW Government (2023) 2022 Kosciuszko National Park Wild Horse Survey results

NSW Government (2020) *The results of a survey of the wild horse populations in the Kosciuszko National Park October-November 2020*

NSW (TSSC) Threatened Species Scientific Committee (2018) Habitat degradation and loss by feral horses (Equus caballus) Linnaeus 1758 - key threatening process

OEH. (2014). *Assessing the humaneness of wild horse management methods Kosciuszko National Park Wild Horse Management Plan.* A report on the outcomes of a humaneness assessment panel assembled on behalf of the Independent Technical Reference Group (ITRG) Office of Environment and Heritage NSW.

Parks Victoria. (2018). Protection of the Alpine National Park: Feral Horse Strategic Action Plan 2018–2021. Victorian State Government.

OEH. (2015). *Community Engagement Report Wild Horse Management Plan Review.* Straight Talk. Office of Environment and Heritage NSW.

Sharp, Trudy (2011) Aerial shooting of feral horses. Standard Operating Procedure. PestSmart website. https://pestsmart.org.au/toolkit-resource/aerial-shooting-of-feral-horses/

Sharp, Trudy (2016) Ground shooting of feral horses. Standard Operating Procedure. PestSmart website. https://pestsmart.org.au/toolkit-resource/ground-shooting-of-feral-horses/

Straight Talk. (2015). Community Engagement Report Wild Horse Management Plan Review. A report to NSW National Parks and Wildlife Service (NPWS), a division of the NSW Office of Environment and Heritage (OEH)