

Investigating feral herbivore impacts on Aboriginal cultural values in the Snowy River Valley in Kosciuszko National Park

In brief

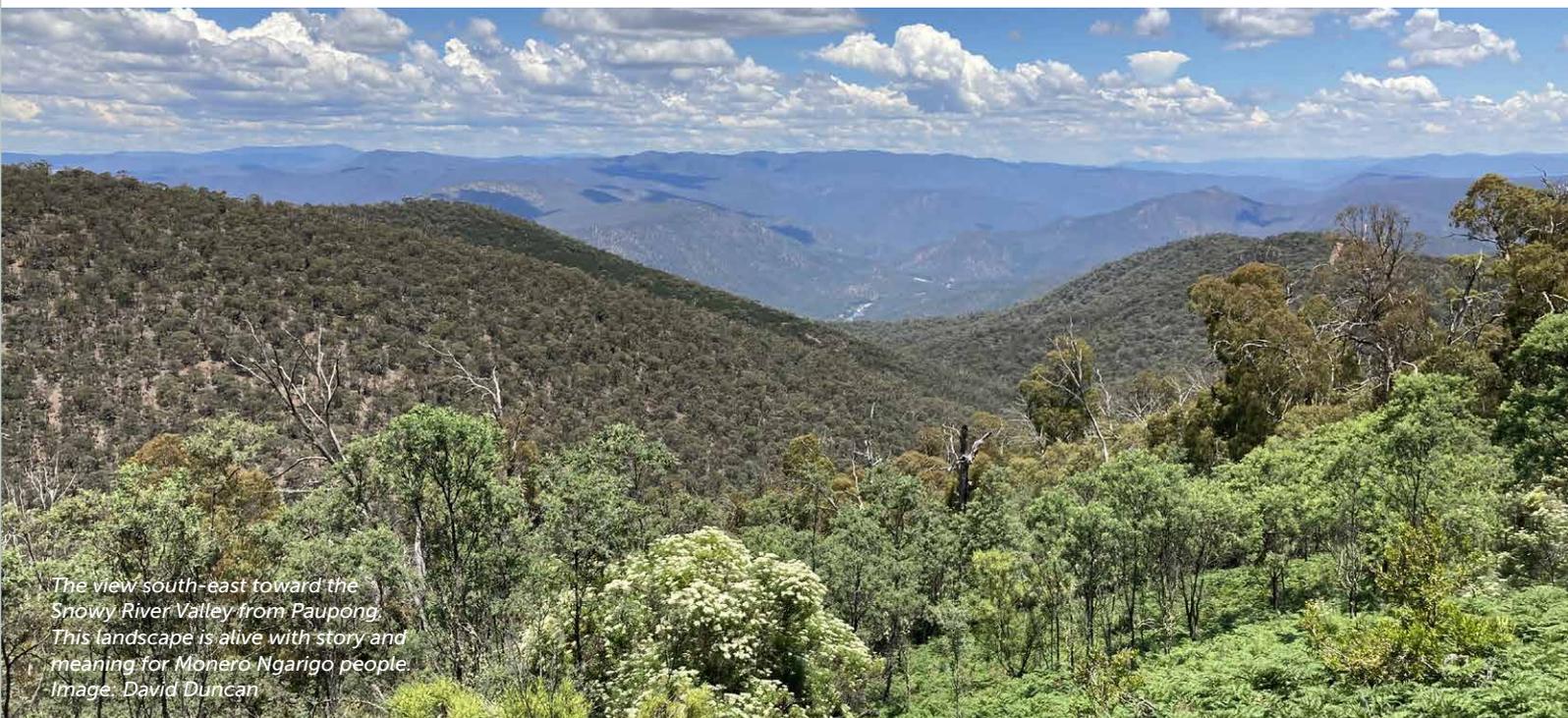
Introduced herbivore species such as deer and horses are formally recognised as posing direct or indirect threats to many threatened species and ecological communities in Australia; however, the impacts of feral herbivores on Aboriginal cultural values remain largely unexplored. Further, few ecological studies have investigated the impacts of threatening processes on Aboriginal cultural values.

We developed a case study to explore the relationship between introduced vertebrate herbivores and significant cultural values

of Country for Monero Ngarigo people, the Traditional Custodians of the land where the Snowy River Valley winds through southern Kosciuszko National Park in New South Wales. The entire southern Kosciuszko National Park has great cultural importance as a living landscape to the Ngarigo people. There are a range of culturally significant species in the landscape, and we identified one tree species – the kurrajong (*Brachychiton populneus*) – that exemplified the living connection to Country. This is a culturally significant species

for many Traditional Custodian groups, and it would be an ideal cultural value on which to study herbivore impacts.

We have demonstrated a process for scoping out an investigation of the impact of feral herbivores on significant Aboriginal cultural values in southern Kosciuszko National Park. This scoping process has culminated in a research proposal that will ultimately allow land managers to provide evidence-based management of wild herbivore populations according to a set of clearly articulated objectives.



The view south-east toward the Snowy River Valley from Paupong. This landscape is alive with story and meaning for Monero Ngarigo people. Image: David Duncan



Background

In Australia, introduced herbivore species such as buffalo, cattle, deer, goats, horses, pigs, rabbits and sheep are recognised as posing direct or indirect threats to many of threatened species and ecological communities. Federal and state environmental laws provide well-defined instruments such as: Listing to recognise species and ecological communities at risk and their *Key Threatening Processes*; and then *Recovery Plans*, *Conservation Advices* and *Threat Abatement Plans* to manage the threats to those entities.

Introduced herbivore species also threaten significant cultural values of Country for Aboriginal and Torres Strait Islander people. These tangible and intangible values span basic necessities such as food and water through to the essence of spirituality and belief

systems, but the institutional and knowledge frameworks to identify and support management of ecological threats to cultural values and heritage are generally lacking or poorly developed.

The frameworks used by the government to manage the environment may not be the same as frameworks focusing on culture and Traditional Ecological Knowledge. However, the case of feral herbivore management may offer possible synergies between the two approaches. Having a better understanding of which significant cultural values are threatened by herbivores, where the threats are taking place, what kinds of threat are posed, and how those impacts relate to herbivore density would allow management agencies to identify how they can direct herbivore management

activities for maximum benefit to threatened species, ecological communities and significant Indigenous cultural values.

We developed a case study to explore the relationship between two invasive herbivores, horses and deer, and significant cultural values of country for Monero Ngarigo people, the Traditional Custodians of the land where the Snowy River Valley winds through southern Kosciuszko National Park in New South Wales. The growing impact of feral horses and deer on Kosciuszko National Park and the Australian Alps environment is well known. An investigation of tangible and intangible Aboriginal cultural values in Kosciuszko National Park recommended investigation of culturally significant species as a way to evaluate horse impacts on the Aboriginal cultural landscape.



Research aims

We set out to scope a study of the effects of invasive herbivores on significant Aboriginal cultural values in the Snowy River Valley, Kosciuszko National Park. An important step towards addressing our main aim was to consider the tangible and intangible values the Snowy River Valley has for Traditional Custodians. We then aimed to identify which cultural values could be feasible to use in a study on herbivore impacts.

LEFT: The highly palatable herb Glycine tabacina successfully set fruit in 2020 after reduction of herbivore densities from drought (horses) and population control (deer). Image: David Duncan

What we did

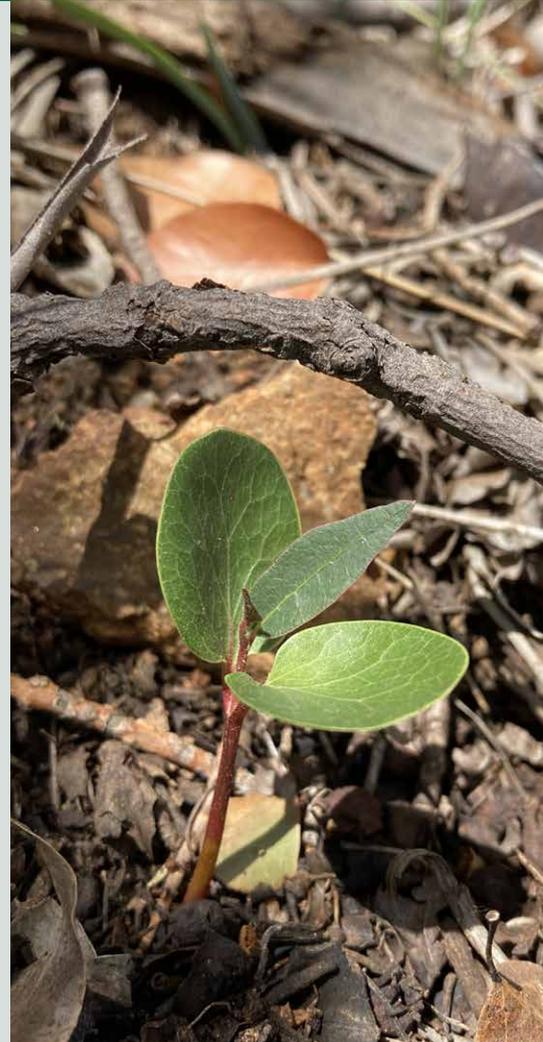
To develop our case study, we first reviewed existing information on the herbivores in the Snowy River Valley of Kosciuszko National Park area and the trends in herbivore abundance. We also consulted with field ecologists who had worked in the area to obtain their observations of herbivore impacts on the ecosystem.

We conducted a literature review and consulted management plans and other data and documents to understand the tangible and intangible values of the Snowy River Valley for Traditional Custodians.

We also commenced a consultative process regarding significant cultural values with Traditional Custodians.

Once briefed on some of the broad and specific cultural values the Snowy River Valley held for Traditional Custodians, we undertook a field visit to decide which cultural values would be sensitive to herbivore activity, and therefore useful to study. Finally, we developed a detailed research proposal outlining how we plan to assess the impacts of herbivores on a culturally significant tree species.

RIGHT: This was the only kurrajong seedling we observed during our three-day fieldtrip. The first leaves (cotyledons) are distinct in colour and shape from the still-expanding set of true leaves. Image: David Duncan



Key findings

Feral herbivores

The landscape of the lower Snowy River has been increasingly impacted by feral herbivores. In the 1980s, ecologist Ian Pulsford and Chris Griffith (archaeologist, ranger and Monero man) established a long-term study of herbivore impacts on the Critically Endangered White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grasslands (also known as box-gum grassy woodlands). The study aimed to understand impacts from rabbits, kangaroos and wallabies, but repeat visits to the study sites found an increasing dominance by feral horses and deer. The impacts

of feral herbivores are more severe around wetter areas, but are visible in all parts of Kosciuszko, from valley floors to dry stony ridges.

Data from the New South Wales Department of Primary Industries show that there has been substantial range expansions by feral deer and horse from 2009 to 2020, with other recent studies emphasising the growing impact from feral horses on the natural environment in and around the high country. Anecdotal reports suggested that horse densities in Kosciuszko National Park were reduced by the droughts that culminated in the 2019–20 megafires. A repeat field survey

in 2020 estimated a population of over 14,000 horses, which is more than 17 times higher than the maximum recommended for the park by technical experts. Densities in the southern section of the park were reduced by the drought to greater extent, but are still estimated at around one horse per square kilometre.

Identifying significant cultural values for Traditional Custodians

A comprehensive assessment of the significant tangible and intangible values for Traditional Custodians in this area was beyond the scope of our project. What we undertook can be considered an indicative

Key findings (continued)

assessment of the potential breadth of these values.

The Snowy Mountains area is rich in artifacts: quarries, stone tools and scar trees, which together comprise the most widely appreciated form of cultural heritage. Many such items have been souvenired, but not all of them and not from all areas. Spatial models of the distribution of Aboriginal sites generated from the location of registered artifacts generally reflect a pattern of decreasing likelihood of encounter as you move away from the valley floor. The park's management tried to protect sensitive Aboriginal artifacts from the threat of the 2019–20 fires. One action they took was to rake litter away from the base of important scar and signal trees throughout the valley.

We were also interested in exploring living aspects of the cultural connection. The whole area of Southern Kosciuszko National Park has great cultural importance as a living landscape, and the more specific values mentioned here have a place and context in that living landscape. The area contains important places associated with story, ceremony and burial, and a Traditional Custodian inducted in lore would observe those elements overlooking the landscape.

The river itself is a resource of immeasurable cultural value, with a range of direct and indirect links to other important places, species and resources. The nearby mountains have the springs and soaks that mark the birthplace of the mighty Murrumbidgee and Murray Rivers, which are more than a symbolic connection to neighbouring Aboriginal lands.

A range of culturally significant species occupy the landscape, for example, emu, wombat, lyrebird, microbats, vanilla lilies and the kurrajong tree. Like this sample list, culturally significant species are not necessarily those highlighted by state or federal threatened species lists; rather, their significance may be linked to totems, story places, medicine, tucker, fibre, gum, tool-making, environmental sensing or seasonal indicators.

Scoping field trip

We undertook a brief reconnaissance trip to consider what significant cultural value or values would be appropriate indicators for accessing herbivore impacts. Signs of herbivores' presence were abundant from the valley floor through to the ridge tops in December 2020; however, all our local informants commented on how the landscape was looking better than it had in recent years.

The combination of reduced horse and deer densities and the breaking of drought conditions in 2020 had allowed some palatable native species to resprout or germinate from seed and put on one full season's growth in some areas. This indicates the ecosystem had retained some capacity to regenerate in response to the improved conditions of increased soil moisture and reduced herbivore density.

Kurrajong (Brachychiton populneus)

In many locations there was one tree species that exemplified the living connection to country – kurrajong. Kurrajong is a culturally significant species for many Traditional Custodian groups

throughout its distribution. At the very least, kurrajong seems an important resource that contributed to sustaining people: the provision of food, fibre, gum and the possibility of water in hard times are some of the most commonly mentioned attributes of the species. The canopy of large kurrajong trees can provide cooler and moister conditions than the surrounding rain-shadow woodlands. It is thought that the kurrajong were placed in certain locations by Monero-Ngarigo people, either through translocation of seedlings or dispersal of seed. This perhaps in part explains the current-day distribution of large old kurrajong dotted through the lower Snowy River valley, including up into the drier slopes.

As kurrajong is a culturally significant species, we thought it would be an ideal cultural value on which to study herbivore impacts. The species has palatable foliage as a juvenile and adult plant, so it would be sensitive to browsing pressure. It is known for being capable of recruiting and spreading even under an established tree canopy, so we expected it to respond positively to release from browsing pressure. The seedlings are distinctive (see photo on previous page) and easy to distinguish from co-occurring species.

The study could be augmented with tree-ring analysis of mature individuals to approximately age the other mature kurrajong trees in the area. Such data could then be related to estimated dates of key historical events such as pastoralism, rabbit invasion and horse and deer population expansion.



A mature kurrajong tree.
Image: David Duncan

Key findings (continued)

Proposed study

We have demonstrated a process to scope out a new investigation of the impact of feral herbivores on significant Aboriginal cultural values in southern Kosciuszko National Park. The scoping process has culminated in a field research proposal that that would test for a relationship between the amount of herbivore activity and the regeneration and population trajectory for a culturally significant tree species, the kurrajong.

If feral herbivores affect the number and age of plants then, all else being equal, higher herbivore activity will reliably 'predict' sites where veteran kurrajong are accompanied by few seedlings and saplings, and those saplings will show signs of having been repeatedly browsed or damaged.

Our study proposes seedling and sapling searches around veteran trees on sheltered and exposed slopes and the valley floor (see Figure 1), combined with herbivore activity measures through dung counts.



The study could be augmented by taking cores from trunks of existing trees in order to date past establishment events and relate those to grazing events and climate from the colonial period.

We began engagement and consultation with Traditional Custodians early in this scoping process but, even so, this project will seek more engagement should it proceed. The Advisory Committee that represents Monero-Ngarigo people under

the southern Kosciuszko National Park co-management Memorandum of Understanding is undergoing renewal, and an approach could be developed once the new membership is established. The proposal benefited from extended consultation with the park's management and ecologists working in the area. The resulting investigation will benefit from maintaining and expanding that intellectual engagement and collaboration.

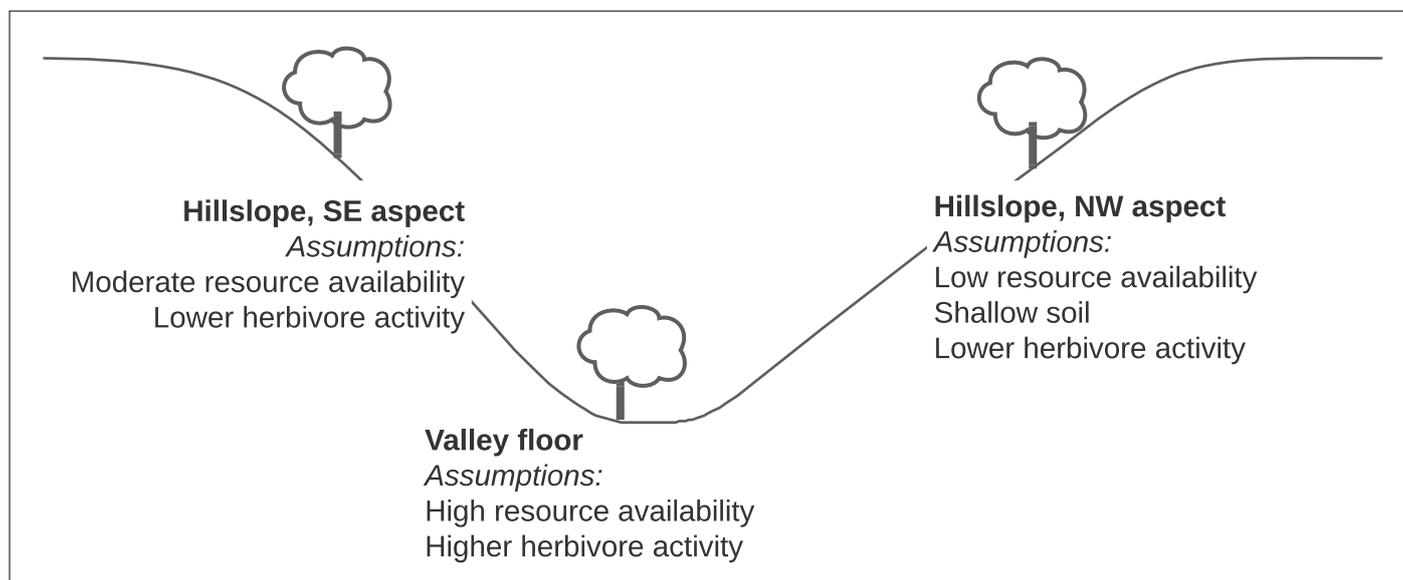


Figure 1: A summary of what we predict to find in our proposed herbivory study. Image David Duncan



Implications

There are few ecological studies of the impacts of threatening processes on significant Aboriginal cultural values. Cost-effective management of herbivore threats to such values can be informed by studies that establish the relationship between herbivore density and impact on that value, and studies that document the benefit of reducing or removing herbivore impacts on recovery of those values.

The findings of this research should help managers traverse, with evidence, what are highly politicised and ideological

debates about the management of populations of feral herbivores where their presence and or abundance are inconsistent with protection of significant Aboriginal cultural values, as well as Australia's commitments to conserve threatened species and ecological communities. While the control of feral deer populations is less controversial, such as that undertaken after the 2019–20 wildfires, momentum toward evidence-based management of feral horses both in New South Wales and Victoria remains emotive and politicised.

It is important that park managers can resume their progress toward evidence-based management of wild herbivore populations according to clearly articulated objectives. In December 2020, we saw important glimpses of ecological recovery in southern Kosciusko National Park in the wake of drought and megafires. If herbivore populations are allowed to expand again, the damage to significant Aboriginal cultural values of the landscape, including to kurrajong populations and in addition to important ecological values, could be extremely costly to reverse.

Further reading

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Further Information

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