

Deer management and monitoring in the Wapiti Area of Fiordland National Park

History, lessons learned and areas for improvement

Long-term population trends

Wapiti and red deer were introduced to Fiordland in the early 1900s and had reached peak densities by the 1960s. Helicopter-based commercial venison recovery from the 1970s to 1990s significantly reduced numbers in the Fiordland Wapiti Herd of Special Interest Area (the Wapiti Area). However, since 2000, populations have increased again due to a decline in commercial recovery,¹ mirroring national trends linked to reduced government culling and venison profitability.²

Deer are the main browsers in the Wapiti Area. They selectively feed on certain alpine and forest plants, especially those with large, soft, nutrient-rich leaves and low chemical defences, such as alpine herbs and trees like puahou / five finger and kāpuka / broadleaf (Figure 1). There are many documented cases around Aotearoa New Zealand, including in the Wapiti Area, which illustrate that selective deer browsing changes the structure and composition of plant communities. Plants eaten by deer play key roles in forest and alpine ecosystem recovery, slope stability, nutrient cycling, and providing food and shelter for native species.³



Figure 1: Alpine parts of the Wapiti Area that are typically occupied by deer. Photo: George Ledgard

¹ Ewans RE. 2010. Deer impacts in alpine grasslands of Fiordland National Park: a report on the measurement of alpine browse transects between 2006 and 2009. Te Anau: Department of Conservation; p. 31. doc.govt.nz/documents/conservation/threats-and-impacts/animal-pests/southland/deer-impacts-in-alpine-grasslands-of-fiordland-national-park.pdf

² Leathwick JR, Byrom AE. 2023. The rise and rise of predator control: a panacea, or a distraction from conservation goals? New Zealand Journal of Ecology. 47(1):1–15. doi.org/10.20417/nzjecol.47.3515

³ Forsyth DM, Wilmshurst JM, Allen RB, Coomes DA. 2010. Impacts of introduced deer and extinct moa on New Zealand ecosystems. New Zealand Journal of Ecology. 34(1):48–65. jstor.org/stable/24060713

Collaborative management

The Fiordland Wapiti Foundation, established in 1993, manages wapiti and carries out conservation work in Fiordland National Park. Since 2005, it has controlled 900–1,100 wild deer annually and managed recreational hunting during key periods like the wapiti bugle under a community agreement with the Department of Conservation Te Papa Atawhai (DOC). The Foundation also carries out predator trapping, bird surveys and facility maintenance in this area.

The primary purpose of deer management within the Wapiti Area is to allow browsed native plants to regenerate, and DOC monitors the area to determine if the Foundation's activities are meeting this objective. The Foundation then adapts its management based on the monitoring results and recommendations.

Monitoring

DOC has been monitoring deer browse on selected alpine plant species in the Wapiti Area since 2006. Monitoring across 20 sites in the alpine zone is used to track the abundance of deer and browse levels on three deer-preferred alpine herb species (Figure 2). Low levels of browse and stable or increasing numbers of monitored plants indicate that deer are having less effect on these plants and their associated alpine communities and that regeneration is likely to occur.

We have also monitored deer effects on forest plant seedlings at three catchments within the Wapiti Area since 2010. In these catchments, we use the seedling ratio index (SRI) to monitor regeneration of deer-preferred species. A positive ratio of tall to short seedlings indicates successful regeneration, while a negative ratio suggests suppression by deer.

Fiordland is covered by our national biodiversity state and trend monitoring network. This programme began in 2011 and monitors key biodiversity variables at nearly 1,400 sites set at 8 km intervals across all public conservation land. Within the Wapiti Area, there are 8 monitoring sites in alpine, non-woody habitats and 23 sites in woody, forested habitats (Figure 3).

Deer activity data are collected by counting the number of faecal pellets at monitoring locations, with increasing numbers indicating an increase in deer activity. We monitor activity at all sites in forest and alpine ecosystems in the Wapiti Area, and at every site in the national network.



Figure 2: Deer browse on Mount Cook buttercup (left) and white snow marguerite (right). Photos: Richard Ewans

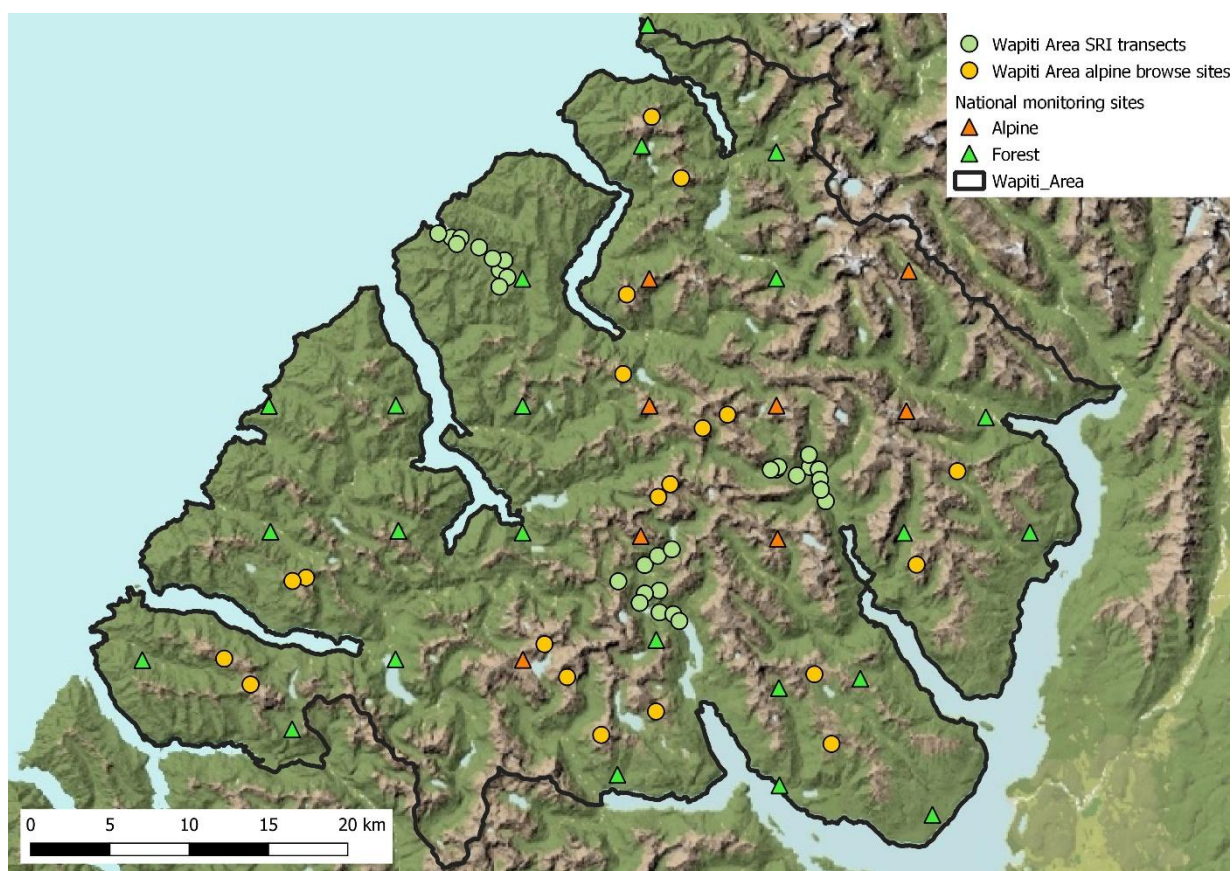


Figure 3: National monitoring, alpine browse and forest (SRI) monitoring sites in the Wapiti Area of Fiordland National Park.

What we have learned

From 2006 to 2024, browse levels in monitored alpine areas were correlated with deer activity (that is, browse increased with increasing numbers of pellet groups). Browse levels fluctuated over time, but overall plant abundance did not change, meaning that monitored plant species were persisting at these locations despite being browsed. Data collected between 2014–2017 showed that 17% of plants were browsed compared with 18% in the 2019–2020 data collection period. In 2021, we reset the target from $\leq 20\%$ to $\leq 10\%$ browse, aiming to further reduce deer impacts. In 2024, this target was met in the Wapiti Area, with a browse level of 8% (Figure 4).

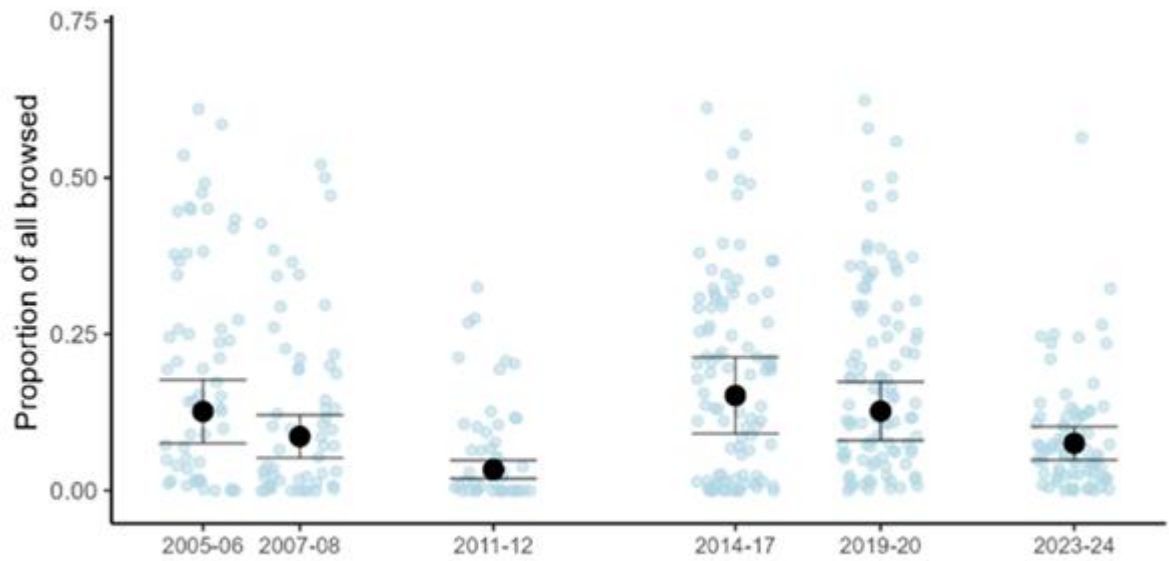


Figure 4: Average proportion of monitored plants browsed in the Wapiti Area between 2005/06 and 2023/24.

In the forested parts of the Wapiti Area, the SRI for species preferred by deer improved from -0.25 to -0.1 over 12 years of monitoring, indicating that regeneration was improving but deer were still stifling the recovery of these preferred plants. Of the three catchments monitored, one showed an increasing SRI trend over the monitoring period while the others remained stable, highlighting the inter-catchment variability in forest responses within the Wapiti Area.

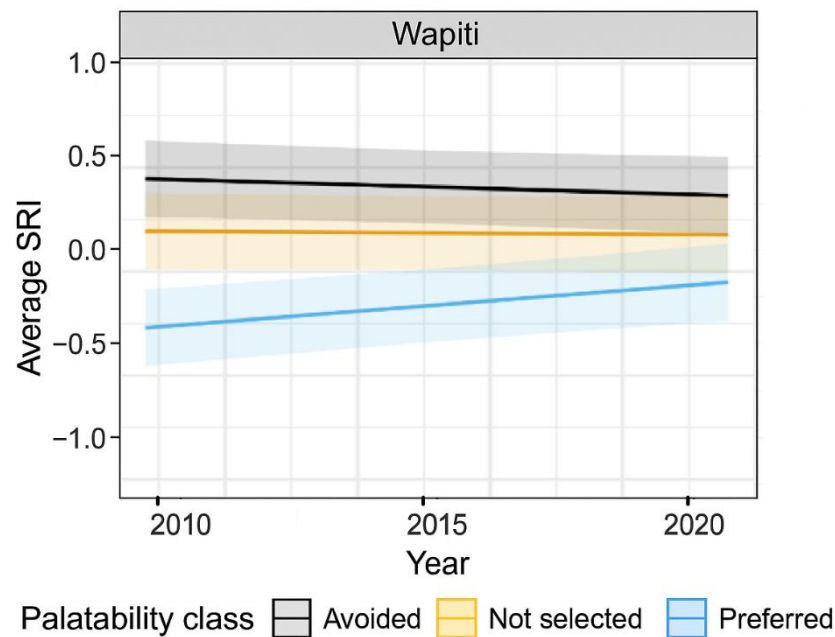


Figure 5: Average SRI trends for the three palatability classes across the three monitored catchments in the Wapiti Area. Ribbons represent 95% confidence envelopes.

Separate deer activity monitoring carried out as part of our national biodiversity state and trend monitoring network since 2012 has shown a consistent increase in deer activity in forested parts of the Wapiti Area and elsewhere in Fiordland National Park.

Overall, the Wapiti Area has shown fluctuations in alpine plant browse, with a recent reduction to below target levels and improving forest regeneration despite increasing deer activity levels. While the alpine target for browse reductions has been achieved, it is a priority to further improve the regeneration of palatable species in the forest.

Future improvements

Monitoring to date has helped us understand the effects of the Fiordland Wapiti Foundation's management activities on deer impacts in the Wapiti Area. However, we can improve our monitoring by increasing the number of representative forest monitoring sites and finding better ways to measure regeneration at our alpine monitoring locations.

We are currently reviewing our monitoring methods so that we can better assess the effects of management strategies across different areas. Ultimately, this will allow us to improve the evaluation of management performance against targets and objectives and help inform adaptive management to improve outcomes.

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[Wapiti deer proposal for a Herd of Special Interest](#)