

# Wild Animals Management Programme

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Monitoring Himalayan Tahr  
populations in New Zealand



Department of  
Conservation  
*Te Papa Atawhai*



Te Kāwanatanga  
o Aotearoa  
New Zealand Government

## Why do we need tahr population estimates?

To manage tahr in the Southern Alps/Kā Tiritiri o te Moana consistent with the Himalayan Tahr Control Plan or HTCP (Department of Conservation 1993), we need estimates of the tahr population.

- The HTCP outlines when action needs to be taken to manage tahr populations. It sets specific numbers of tahr per km<sup>2</sup> for seven management units (MU) and two exclusion zones.
- The plan also sets a limit on total population

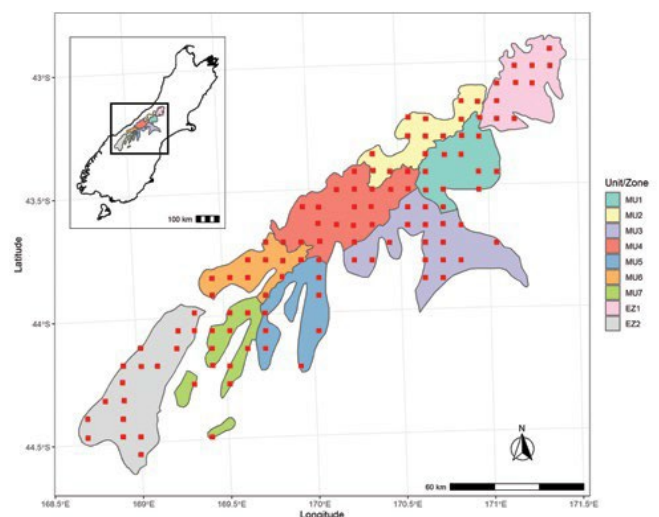
to no more than 10,000 animals.

- Since 2016 DOC has conducted three series of aerial surveys: two to provide information on the overall tahr population on Public Conservation Land (PCL) and one focused on two specific MUs.
- Linking estimates of tahr numbers with data about vegetation condition helps decide where and when to focus management effectively.

## We used the following methods to estimate tahr abundance:

- Data collection: Aerial surveys based on an established protocol for tahr in alpine environments (Department of Conservation, 2023) were conducted on three occasions:
- From 2016 to 2019, 117 plots were surveyed to provide an initial estimate of the tahr population on PCL across the MUs and Exclusion Zones.
- In early 2021, 43 plots were surveyed across MU1 (South Rakaia and Upper Rangitata) and MU3 (Gammack/Two Thumb), two of the most accessible and popular tahr hunting areas. 2016-19 plots were re-surveyed and additional plots were added to provide better data at the MU level.
- In early 2023, 43 plots were surveyed across all 7 MUs. These were a randomly selected sub-set of the initial 117 plots. This streamlined approach was designed to estimate the total population on PCL across the 7 MUs while working within our resource constraints.

- Analysis: counts of tahr from the aerial surveys were used to estimate abundance using an established wildlife modelling approach known as 'open N-mixture modelling' (Dail & Madsen 2011).
- The 2019, 2021 and 2023 reports are available from the DOC website: <https://www.doc.govt.nz/parks-and-recreation/things-to-do/hunting/what-to-hunt/tahr/tahr-and-conservation/>



▲ Figure 1. Location of the seven tahr management units (MU1–7) and two exclusion zones (EZ1–2), and 117 aerial survey plots from 2019 (Ramsey and Forsyth, 2019).



Cover image: DOC staff undertaking vegetation surveys of tahr impacts in alpine tussock grassland. Understanding browsing impacts, alongside tahr numbers, is key to informing management decisions.

## What the monitoring shows

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- Between 2016-2019, the total number of tahr on PCL was estimated to be between 26,522 and 44,821 (a mean of 34,478; Ramsey and Forsyth, 2019; Ramsey et al., 2022).
- The total abundance of tahr in MU1 in 2021 was estimated to be between 4740 and 9150 (a mean of 6600). In MU3 it was estimated to be between 6200 and 14,150 (a mean of 9350; Ramsey and Forsyth, 2021).
- The total abundance of tahr within the MUs in 2023 was estimated to be between 22,100 and 40,150 (a mean of 29,800; Ramsey, 2023).
- The 2019 and 2023 surveys aimed to estimate the total population. Substantial tahr control was carried out between the surveys. Comparing these estimates suggests the overall tahr population across the MUs likely decreased slightly between 2019 and 2023.
- It is also important to note that the Department's preferential control of female and juvenile tahr has likely changed the breeding structure. This suggests the current population has a reduced reproductive capacity compared to the 2019 population.
- The modelling process also produces sub-estimates for each MU based on the overall population estimates from 2019 and 2023. However, because of the sample design these estimates are less precise than the overall population estimate. There are also sampling differences between the 2019 and 2023 surveys due to resource constraints, which can affect comparisons between 2019 and 2023.
- Consequently, we don't solely rely on MU level estimates from 2019 and 2023, or comparisons between them. Instead, we consider them within a larger context. This includes data from DOC control operations and observations by hunters and other outdoor users, all of which help us make informed management decisions.



Photo: Dylan Higgison

## How this informs management

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- While estimated tahr densities varied a lot in MUs, on average, there were more tahr than the limits set by the Himalayan Tahr Control Plan for all MUs except MU7.
- From 2019 and 2023, the estimated total populations substantially exceed the statutory limit of 10,000 animals, even at the lower end of their range (95% confidence interval); this means that under the HTCP, DOC needs to undertake control.
- These figures, amongst a broad range of operational factors, help guide decisions on where and when to apply available tahr management resources.

# Can we improve our understanding of tahr populations and their impacts?

- Due to the small number of population survey plots in management units in 2019 and 2023, there is high uncertainty around the estimated density/abundance of tahr at the management unit level.
- The more intensive MU sampling approach in 2021 demonstrated that MU-level population estimates with improved precision can be obtained but these are resource-intensive.
- To make our estimates of how many tahr there are more precise, we could gather more information about exactly where our survey plots are placed. This could include figuring out which habitats tahr like most

and which ones they avoid. Using more detailed maps showing where tahr are likely to be found throughout the area may assist.

- Demographic population modelling, which predicts population changes based on known and estimated birth and death rates, could be a cost-effective way of supplementing periodic survey data.
- It's not just about knowing how many tahr there are; understanding their impact is crucial for conservation management. Work is underway to update monitoring of historic vegetation plots, as well as trialing new methods

## References

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Photo: Dylan Higgison