Report on the Himalayan Tahr Control Programme 2022/2023

Department of Conservation staff monitoring tussock grasslands as part of a long-term study of tahr browse impact, Te Kahui Kaupeka Conservation Park Canterbury.

Context

The management of Himalayan tahr (tahr) on Public Conservation Land (PCL) is guided by the Himalayan Thar Management Policy (the Policy) 1991 and Himalayan Thar Control Plan (HTCP) 1993. The Policy sets a maximum population of 10,000 tahr across lands of all tenure throughout the feral range, and the HTCP stipulates individual maximum tahr population densities for each of seven designated Management Units (MU), based on factors including location, vegetation, and recreational use. It also outlines expectations for monitoring tahr populations and vegetation condition to inform future tahr management.

The HTCP 1993 is implemented through annual operational plans that identify management actions for each MU. As the Department's (DOC) Himalayan tahr management work is led as a national programme, one annual operational plan is prepared for the entirety of the programme, and a single annual report provided to the New Zealand Conservation Authority (the Authority).

2022/2023 Operational Delivery

Delivery of the Tahr Control Operational Plan (TCOP) 2022/23

The TCOP 2022/23 was developed by the tahr programme in partnership with Te Rūnanga o Ngāi Tahu and through engagement with the Tahr Plan Implementation Liaison Group (TPILG) and DOC's Regional Operations Group. Table 1 below outlines the number of tahr controlled over the full 2022/23 year within the management units and across each control type. This excludes some aspects of recreational hunting where no data is available.

Table 1: Number of tahr controlled (on PCL) within Management Units

Year 1 July – 30 June	DOC	AATH trophies	AATH 'environmental offsets'	Ballot hunters	Tahr Carcass Recovery	Organised recreational hunters	Other	Total
2018/19	168	264	0	619	400	63	244[1]	1758
2019/20	7238[1]	8	2936[2]	726	421	0	60[3]	11389
2020/21	7481[1]	17	0	889	0	0	60[3]	8447
2021/22	5750[1]	43	0	843	0	182	144[3]	6962
2022/23	5256[1]	62[4]	415[5]	913	0	412	158	7216

[1] Includes contracted control; [2] Includes control not undertaken in 2018/19; [3] Zero Invasive Predators programme; [4] at the time of writing, not all 2022/23 returns were complete – data from completed returns are reported here and the final total will be updated in the 2023/24 report to the NZCA; [5] includes some offsets conducted inside the feral range but outside management units, but reported here for consistency.

Under the 2022/23 TCOP, the equivalent of 312 hours of official aerial tahr control were delivered. Control was delivered through a variety of methods, including DOC staff and contracted aerial control and DOC staff and contracted ground-based control. The undertaking of Aerial Assisted Trophy Hunting (AATH) offset control was also directed (led) by the Department; under the conditions of their permits, AATH operators are required to control 5 female/juvenile tahr for each wild animal trophy they take on public conservation land. The resulting number of tahr removed in each Management Unit, inside the feral range but outside the management units, and outside the feral range are detailed in the 2022/23 row of Table 2 below. Maps outlining the locations of DOC's official control operations in 2022/23 are available on DOC's "Himalayan tahr sightings and control maps"[1] page.

Table 2 - Tahr removed by Department-led Control

Year 1 July – 30 June	MU 1	MU 2	MU 3	MU 4	MU 5	MU 6	MU 7	INSIDE FERAL RANGE, OUTSIDE UNITS	OUTSIDE FERAL RANGE	TOTAL
2018/19	168	0	0	0	0	0	0	NA	387	555
2019/20	2113	246	1603	3675	1278	1332	58	NA	517	10822
2020/21	555	1038	641	3299	241	1697	10	NA	265	7746
2021/22	0	873	187	3007	111	1572	0	196	449	6395
2022/23	406	832	334	2706	116	1277	0	322	390	6383

List of Management Units: MU 1 Rakaia / Rangitata; MU 2 South Whitcombe / Whataroa; MU 3 Gammack / Two Thumb; MU 4 Westland Tai Poutini NP/ Aoraki Mt Cook NP; MU 5 Ben Ohau; MU 6 Landsborough; MU 7 Hunter / Wills. Outside Feral Range is inclusive of tahr removed in the Northern and Southern Exclusion Zones.
Note: The numbers of tahr removed across all management units for these five years are sourced through DOC-led control made up of a mixture of contract control, AATH environmental contributions and DOC control. Not recorded on this table are tahr across all management units that have been removed by AATH trophy concessions, ballots, tahr carcass recovery, Zero Invasive Predators programmes and organised hunts (see Table 1).

[1] http://www.doc.govt.nz/parks-and-recreation/things-to-do/hunting/what-to-hunt/tahr/tahr-control-operations/tahr-sightings-maps/

Comparison with prior years

The operational effort delivered in 2022/23 (312 hours) was greater than planned under the TCOP (290 hours), this was largely due to coordinated multi-species control operations (e.g. goats and tahr) in areas outside the feral range. The 312 hours was an increase from 283 hours of control delivered in 2021/22 and similar to the 309 hours in 2020/21.

The total number of tahr removed by DOC-led control in 2022/23 was similar to 2021/22 (Tables 1 and 2). While official control numbers were lower, additional effort in directing AATH offsets and facilitating coordinated recreational hunting opportunities, led to a very similar DOC-led total and slightly higher overall control total from known sources. The control total was still lower than 2020/21 and 2019/20. The reduction compared to those earlier seasons can be attributed to a number of factors:

- The relatively small number of AATH environmental offsets available in 2022/23, compared with 2019/20, in which 2936 offsets contributed 27% of the 2019/20 control total.
- Changes in operational focus between years:
    - In 2022/23, a higher proportion of official control effort (45%, compared with 33% in 2021/22 and 23% in 2020/21) was dedicated to control outside the feral range, where tahr densities (and therefore control numbers) are low.
    - Correspondingly, as the level of control investment within National Parks was maintained in 2022/23, fewer hours of control were conducted in Management Units that had previously yielded higher numbers of tahr per hour of control (e.g. MU1 and MU3).
- A reduction in the number of tahr encountered and controlled in some areas:
    - 2022/23 showed the first substantial decline in catch per unit effort within Management Unit 4a (Westland Tai Poutini National Park). Across 66.1 hours of aerial control, an average of 24.2 tahr were controlled per hour. In comparison, 31.9 and 31.0 tahr were controlled per hour in 2021/22 (69.2 hours) and 2020/21 (70.7 hours) respectively. These data, alongside observations from DOC staff and TPILG members suggest a substantial decrease in the density of tahr in parts of MU4a.

Implementation of ground-based control

In response to observations of tahr utilising forest and sub-alpine scrub habitats on the West Coast, which reduced the effectiveness of traditional aerial control, the Department conducted a ground-based control trial in MU6 (Landsborough) in March 2022. With funding equivalent to approximately 6.8 hours of aerial hunting time, a total of 284 female and juvenile tahr were removed at a comparable cost per animal to traditional aerial control, with the additional benefits of:

- Targeting many animals that may not have been sighted during aerial control;
- Targeting animals in a different way, reducing the potential for learned evasion behaviours (e.g. moving into cover to avoid helicopters) to be effective.

Based on that operation, the level of ground-based effort on the West Coast was increased to the equivalent of approximately 15 hours of aerial hunting time, within the 2022/23 TCOP. In March 2023 a return operation in the Hooker-Landsborough wilderness are (MU6 - Landsborough) was expanded, and this time removed 436 female and juvenile tahr. A new operation within the Adams Wilderness Area (MU2 – South Whitcombe/Whataroa) controlled 486 female and juvenile tahr.

The 2023 ground-based operations streamlined their operational approach based on the 2022 trial and also operated in new areas where dense tahr populations were encountered. Due to inclement weather shortening one operation, some areas of lower density and/or harder hunting were not covered. This combination of environmental and operational factors led to the operations being substantially more efficient than most aerial control (in terms of $'s per tahr), and it was considered that the observed benefits of ground based control from 2022 (see above) were maintained.

In an operational environment where helicopter costs have substantially increased in recent years, and may continue to do so, the implementation of ground-based control in West Coast environments appears to be an effective supplement to aerial hunting.

Tahr control outside the feral range and inside the feral range, outside management units

Control of tahr numbers outside the identified feral range is key to preventing range expansion and the creation of new populations. Based on an external review of outside feral range operations in 2021, the programme increased effort in outside feral range control. A particular focus was placed on reducing the risk of expansion to the north or south of the feral range along the Southern Alps, where mountainous terrain would suit tahr and a number of National Parks are located (Arthur's Pass, Mt Aspiring, Fiordland).

During 139 hours of aerial control effort, a total of 390 tahr were controlled outside the feral range over the period 1 July 2022 to 30 June 2023. This contrasts with 449 tahr controlled outside the feral range in 2021/22, from 86 hours of control, despite the operational areas and relative effort in those areas across the two years being broadly similar. The substantial increase in effort required to control tahr in these areas is considered a positive development; changes in 'catch per unit effort' (i.e. the amount of effort required to control each tahr) are widely used as a simple measure of changes in wildlife abundance. A change from approximately 5.2 tahr per hour in 2021/22 to 2.8 tahr per hour in 2022/23 suggests a substantial decrease in tahr abundance in the areas targeted outside the feral range.

The change in catch per unit effort was most pronounced the Northern Exclusion Zone (NEZ), one of the areas where a decision was made in 2021/22 to substantially increase investment. The results in Table 3 suggest that with concerted effort in the NEZ, tahr densities have been substantially reduced in the space of two years.

Table 3: Summary of aerial control effort and number of tahr controlled in the Northern Exclusion Zone from 2020/21 to 2022/23.

Tahr Control Operational Plan	Hours of aerial control in the NEZ	Number of tahr controlled	Catch per unit effort (tahr per hour)
2020/21	6.3	49	7.8
2021/22	24.9	210	8.4
2022/23	39.4	143	3.6

Appendix 1 provides a map with details on the number of tahr controlled in specific areas outside the feral range over this time period.

In 2021/22 the TCOP included the tahr programme's first allocation of aerial control to specifically target tahr inside the feral range but outside the management units. These operations were aimed at reducing the potential for movement of tahr to outside the feral range. 196 tahr were removed from inside the feral range, outside the management units, with a focus on the southern and north-western areas inside the feral range.

In 2023/23 this approach was again taken, targeting similar areas but moving further to the south-eastern portion of the feral range in response to reports of increased tahr presence toward the Lindis Pass. 322 tahr were controlled in 20 hours of aerial hunting within the feral range, outside the management units.

Appendix 2 provides a map with details on the number of tahr controlled in specific areas inside the feral range but outside the management units during 2022/23 operations.

Game Animal Council control mid-point meeting

Continuing the operating and consultation rhythm established in 2020, the Department met with representatives of the Game Animal Council on 5 August 2022 to discuss operational details of the first half of official tahr control for 2022/23. DOC considered the Council's advice in determining the operational detail of work for the remaining control effort.

COVID-19

The COVID-19 pandemic had a less pronounced effect on delivery of official control in 2022/23 compared to 2020/21 and 2021/22, as no lockdowns were experienced. However, staff and contractor operational availability was, at various times throughout the season, impacted by isolation requirements. Ultimately, through flexible scheduling and contingency planning, control was completed. However, in some areas this was later in the season than ideal (e.g. snow conditions were no longer optimal for control).

Relationships and Engagement

Relationship with Te Rūnanga o Ngāi Tahu

During 2022/23, DOC and Ngāi Tahu continued their commitment to developing the Treaty partnership in relation to tahr management. This included continued work together to facilitate the further development of a proposal for hunter-led management of Management Unit 1 (South Rakaia/Upper Rangitata, see below) between the Game Animal Council and the local papatipu Rūnanga (Te Rūnanga o Arowhenua).

Tahr Plan Implementation Liaison Group (TPILG)

The TPILG liaises with DOC, presenting the views of various stakeholders and entities with interests in tahr management. Membership includes representatives from Te Rūnanga o Ngāi Tahu, statutory boards and authorities (including the Authority), the recreational and commercial hunting sector, farming bodies, outdoor recreation groups and Forest & Bird.

A total of four TPILG meetings were held during 2022/23. The first was an update on early progress under TCOP 2022/23, as well as wrapping up TCOP 2021/22, on the 25th of July (MS Teams). In September (16th) a meeting was held in Christchurch to provide further updates and also to develop an approach for the Group to potentially explore various requests from members for a longer-term/more strategic conversation around the tahr programme (cf. focusing purely on the TCOP).

The December 2022 (9th) and March (10th) TPILG meetings were centred around the development and review of the 2023/24 TCOP; that engagement also included two rounds of written submissions in January and late-March of 2023. At the December 2022 meeting (MS Teams), members were provided with contextual material to consider and a timeline for TCOP development and feedback, to inform any written submissions they wished to make to the Department prior to drafting of the TCOP; those submissions were due by 27 January 2023 (4 submissions were received). The draft plan was then circulated to the TPILG on the 21 February to facilitate feedback on the draft at the March 2022 meeting. Members had until 31 March to provide additional written feedback on the draft after the meeting (4 submissions were received). Feedback from these meetings and written submissions helped to refine the 2023/24 plan, with the final TCOP 2023/24 being released on 12 June 2023.

In association with the March 10 meeting, TPILG members and a number of external subject matter experts, took part in a facilitated workshop to map the tahr system, with a view to understanding where

it was functioning well and where improvements could be made. The action from the workshop was to hold a follow up workshop at which the system map was used as the basis for a more details policy-level discussion of tahr management/control.

Hunter-led Management of Management Unit 1 (South Rakaia/Upper Rangitata)

The 2021/22 TCOP included a commitment to exploring the option of hunter-led management of Management Unit 1 (MU1). Management of tahr populations by hunters is specifically contemplated in section 5 of the HTCP 1993. MU1 is mentioned specifically as one of the most popular with recreational hunters; it is also the closest to the South Island's major population Centre (Christchurch).

A project team comprised of members from the Game Animal Council (GAC) Te Rūnanga o Ngāi Tahu and the local papatipu Rūnanga (Te Rūnanga o Arowhenua), assisted by DOC staff, have developed a Te Whakatakanga (mission statement) for this work in 2021/22. Development continued during 2022/23 with more detailed engagement of relevant hunting-sector groups and local landholders. The intention is for the project team to develop a proposal that could be incorporated within a Community Agreement with the Department. Any proposal approved for implementation must contribute to working towards the goals of the HTCP 1993.

Recreational Hunters

DOC seeks to encourage hunters to shoot tahr. In 2022/23 DOC continued to work with the recreational hunting sector to improve the availability of information on both control activity and observations of tahr. This included posting maps of control effort and the locations of observed identifiable males to DOC's website[2] and by providing email updates to current hunting permit holders (see below).

The West Coast tahr ballots are a valuable recreational contribution to tahr control, focused in the Hooker/Landsborough and Adams wilderness areas. Since 2021, over 800 tahr per year have been controlled during the ballots, with the number exceeding 900 (913) for the first time in 2023.

In 2022/23 the Department again worked with the New Zealand Tahr Foundation to facilitate the Foundation's delivery of organised recreational hunts in MU6 (Landsborough). In addition to a return to the Jacobs/Makaawhio River Valley, hunters were also positioned in the Mahitahi River in March 2023. The operations removed 249 and 163 mainly mature females from those areas respectively; control focused on forest and scrub habitat where aerial control is less effective than in the alpine environment. In total 594 tahr have been controlled through this initiative since March 2022 (see Table 1, 'Organised recreational hunters').

Information Management

Electronic verification tool and Tablet Data System

In the 2022/23 year the tahr programme continued utilising its electronic verification tool for remote monitoring of control operations, with digital cameras fitted to the rear step of helicopters used for aerial control to take a series of high speed still photographs with geo-referencing each time a firearm is discharged. The programme's tablet-based data recording system also continued in 2022/23, allowing control effort data to be electronically recorded as it occurs.

[2] http://www.doc.govt.nz/parks-and-recreation/things-to-do/hunting/what-to-hunt/tahr/tahr-control-operations/tahr-sightings-maps/

Updates to Hunting Stakeholders

In 2022/23 DOC continued providing tahr programme updates regularly through its website to encourage and enable recreational hunters to contribute to tahr control. This includes providing information on where identifiable male tahr have been seen during official control operations to assist hunters to plan, locate and shoot identifiable male tahr. Updates are also provided during the season when official control work in each area is complete to give hunters certainty on areas they can hunt tahr knowing Departmental control for the year is complete.

Email updates to current hunting permit holders also continued in 2022/23 (having commenced in 2020/21). These emails connect hunting stakeholders with new tahr programme information as it becomes available, including provision of direct links to the website content outlined above. In the 2022/23 year, email updates to current hunting permit holders were provided on:

- 14 September 2022
- 16 January 2023

Research Updates

Research and Monitoring Strategy

In the 2020/21 year, a research and monitoring strategy for tahr was completed to support the implementation of the HTCP 1993 and based around six research themes:

- Tahr population dynamics and ecology
- Environmental impacts of tahr
- Hunting and control
- Socio/economic considerations of values and costs
- Site based management, i.e. tahr and other introduced mammals in alpine ecosystems
- Research with no direct implication for tahr management

Under the research and monitoring strategy, the following lines of research and monitoring have been implemented:

Estate condition trend

Ongoing monitoring of estate condition in the tahr feral range occurs through the national monitoring system (Tier 1), along with additional longer-term monitoring of grassland plots. A range of reports examining the impacts of tahr were provided in the 2019/20 report to the Authority.

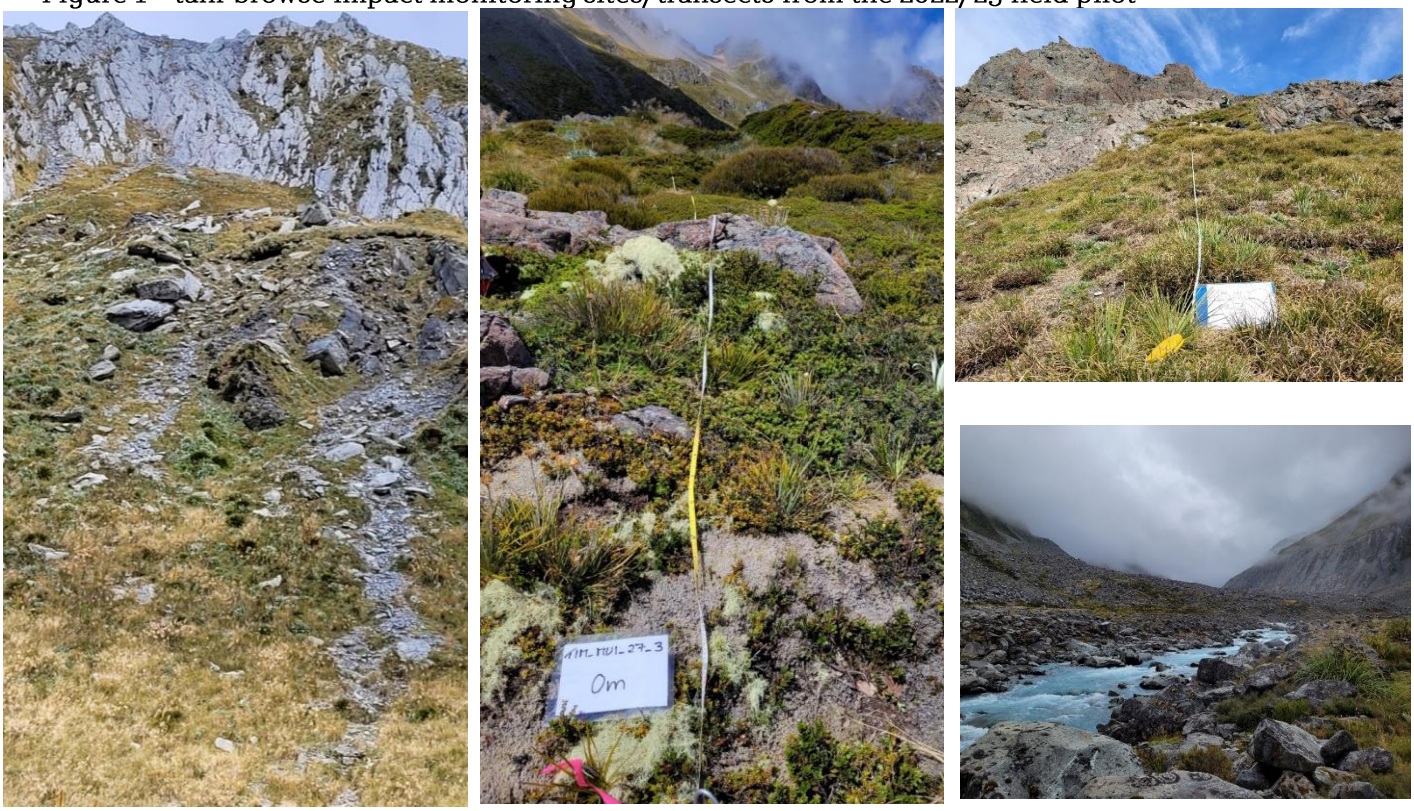
In the 2022/23 year, the final third of the historic grassland plots, which represent the longest running vegetation survey in the tahr feral range, were re-measured. The data have been prepared for analysis, which is expected to be undertaken during 2023/24.

Tahr browse - rapid impact assessment method

In 2021/22, drawing on a number of the themes identified in the research and monitoring strategy (outlined above), work began to develop and trial a rapid impact assessment method for tahr browse. The over-arching aim was to provide information regarding tahr impacts on a time-scale that could inform annual or inter-annual management actions (as opposed to the more comprehensive but less responsive longer term estate condition trend monitoring provided by Tier 1 and historic grassland plots).

During 2022/23, building on the workshops, the formation of a technical advisory group and three small-scale field pilots, a substantial field pilot-trial was undertaken. Across MUs 1 and 2, 60 sites were established, with 3-5 transects per site; data was collected for a total of 223 transects (see Figure 1). The draft methodology was tested and refined. The resulting data are currently being jointly analysed by DOC and Manaaki Whenua Landcare Research and recommendations regarding the method are expected in late 2023.

Figure 1 – tahr browse impact monitoring sites/transects from the 2022/23 field pilot



Understanding tahr populations

The total population of tahr on PCL was estimated through aerial surveys undertaken during 2016 – 2019, compiled in Ramsey and Forsyth's September 2019 report: *Estimates of Himalayan Tahr (Hemitragus jemlahicus) Abundance in New Zealand: Results from Aerial Surveys*. These estimates were summarised in DOC's 2019/2020 report to the Authority on the Himalayan Tahr Control Programme.

As reported in the Department's 2021/21 report to the Authority, further aerial surveys were conducted in the South Rakaia/Upper Rangitata (MU1) and Gammack/Two Thumb (MU3) management units during February – May 2021. The results of these surveys were analysed and published during the 2021/22 year: *Abundance of Himalayan Tahr in the South Rakaia/Upper Rangitata and Gammack/Two Thumb Management Units*.

From February to May of 2023, flights were conducted within the Management Units to provide survey data with which to update the estimate of the overall tahr population within the Management Units. 42 sites from the 2016-2019 work were surveyed twice during the time period. The data from those surveys have been analysed and will be published in a technical report in 2023 (at the time of writing that report is under peer review).

Outlook and Plans for Next Year

TPILG discussions

In 2022/23 two workshops were held with the TPILG, focusing on strategic thinking for future tahr management/control. That series of facilitated workshops is continuing in 2023/24.

In December 2023 engagement on the 2024/25 TCOP will commence and is expected to again span 4-5 months, including 2 meetings (December 2023 and March 2024) and two opportunities for written submissions.

Population estimates and vegetation monitoring

As referenced above, an updated overall estimate of the tahr population is expected in 2023. This will form an important component of planning future tahr control operations, within the remaining 2023/24 TCOP period and beyond. Similarly, analysis of two lines of vegetation monitoring data (variable area tussock plots, and the tahr browse impact method pilot) may provide important context regarding vegetation condition.

AATH offsets

2023 is the first fully operational AATH season since 2019, due to COVID-19 impacts on tourism. Indications from the guiding industry are that demand in 2023 and 2024 is very high due to a back-log of clients from 2020 onwards. The April 2023 activity returns from AATH concessionaires reflected this increased activity: 209 wild animal trophies were taken from PCL, requiring 1,045 environmental offsets. Substantially more trophies have been taken in the second half of the season (to August 2023) and final reporting is expected soon. This represents a substantial contribution to tahr control to be managed in the 2023/24 and 2024/25 TCOPs. The 2023/24 TCOP included AATH offsets into its operational model, based forecast trophy/offset numbers provided by the New Zealand Professional Hunting Guides Association after a survey of their members.

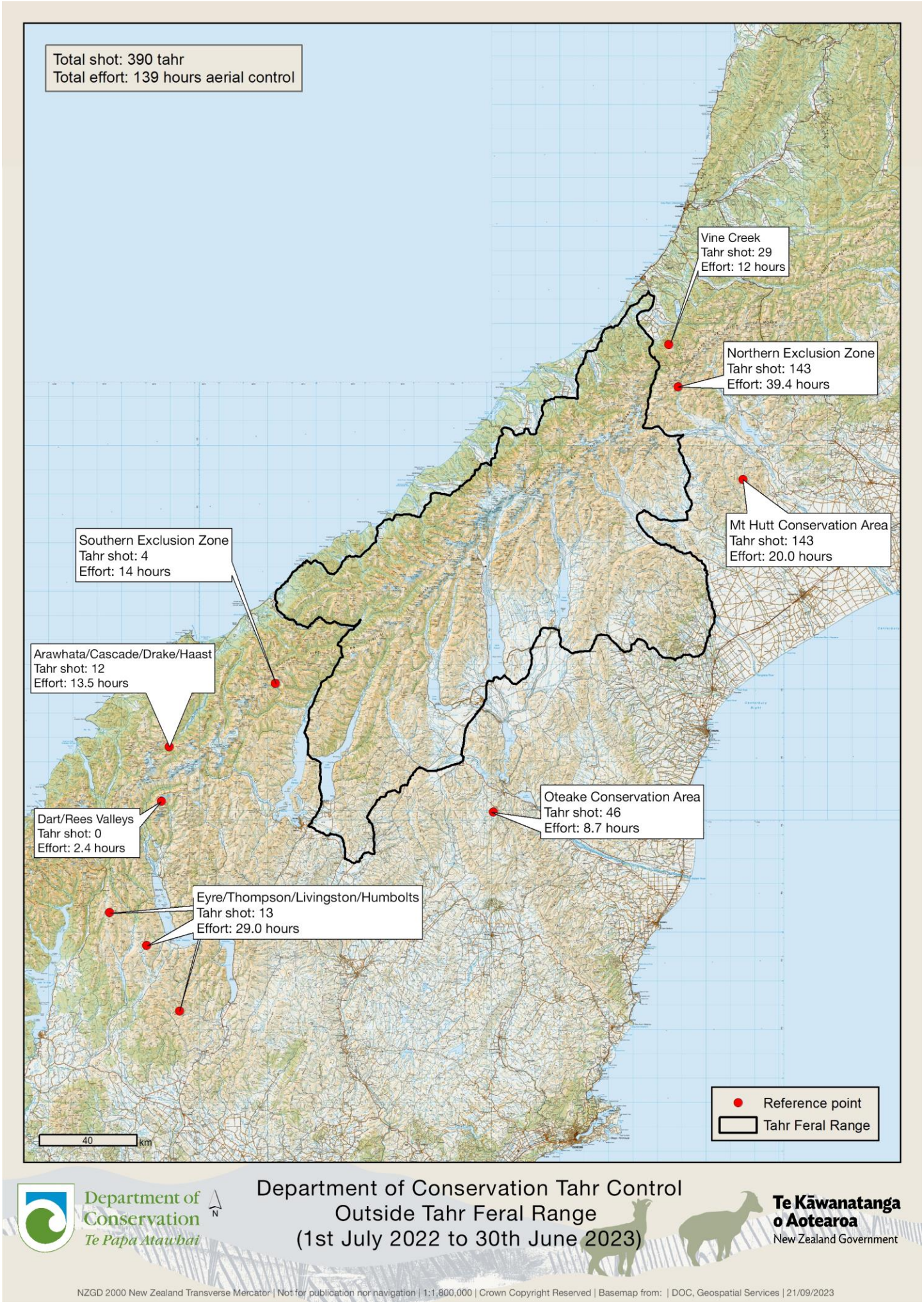
Recreational Hunters

From 2021 to 2023 the West Coast tahr ballots were extended to 11-12 weeks (cf. 8-10 weeks prior to 2021), to provide hunters the opportunity to fulfil ballot opportunities missed due to COVID-19 in 2020 and 2021. This also included roll-over of ballots affected by COVID-19 in the 2020/21 year. These longer ballot periods resulted in ballots running until mid-July. In 2022 and 2023 the uptake of the late periods was low. Options for optimising the ballot contributions to tahr control are currently being considered.

Financial Summary (1 July 2022 to 30 June 2023)

Operational delivery costs for the 2022/23 financial year were approximately $720,000.

Appendix 1. Department of Conservation tahr control outside the feral range 2022/23



Appendix 2. Department of Conservation tahr control inside the feral range but outside the MUs 2022/23