



TAHR CONTROL OPERATIONAL PLAN 2020/2021

GAME ANIMAL COUNCIL
SUBMISSION

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Game Animal Council
NEW ZEALAND

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Game Animal Council functions

The Game Animal Council is a statutory agency established under the Game Animal Council Act 2013. The Council's functions under the Act include:

- advise and make recommendations to the Minister
- raise awareness of the views of the hunting sector
- liaise with hunters, hunting organisations, representatives of tangata whenua, local authorities, landowners, the New Zealand Conservation Authority, conservation boards, and the Department of Conservation to improve hunting opportunities:

In her letter of expectation, The Minister of Conservation has directed the Game Animal Council to work with the Department of Conservation and others to develop a plan that will support DOC to bring the tahr population within the limits of the 1993 Himalayan Thar Control Plan (HTCP). The Minister has also requested the GAC recognise the interests of hunting sector stakeholders, the significance of biodiversity, and the need to avert decline in indigenous species. The Minister has asked the GAC to continue to manage competing interests and to nurture the goodwill of the hunting sector towards conservation.

The purpose of the current consultation is to assist with design of the 2020/2021 annual operational tahr plan that contributes towards achievement of objectives specified in the HTCP. To that end, this advice addresses only the 2020/2021 operational plan (Henceforth "Operational Plan"), which seeks to reduce tahr numbers on Public Conservation Land, and not the HTCP *per se*. However, the Council appends some points for context and consideration in future HTCP-related decision making.

Department of Conservation Principles for operational plan development

In 2018 the Department proposed the following principles to guide development of annual operational tahr control plans. The TPILG wholeheartedly supported adoption of the principles. The GAC believes they provide a valuable guide to finalisation of the current operational plan.

Principle One: Partnership

The Department of Conservation (DOC) has an active co management partnership with Ngāi Tahu under the Principles of Te Tiriti o Waitangi, strengthened further by the Ngāi Tahu Claims Settlement Act. The Department will operate in a programme partnership with all stakeholders to work together to achieve the outcome sought. Regular Tahr Plan Implementation Liaison Group meetings are held to update and share information and support decision-making.

Principle Two: Status of the Himalayan Thar Control Plan 1993

The Himalayan Thar Control Plan (HTCP) 1993 is the guiding statutory document under the Wild Animal Control Act 1977 for managing the tahr population.

Principle Three: Phased approach to Implementation

The control programme for tahr is to operate under a phased approach at a management unit scale:

control operations → monitor → report → review → revise if necessary

Principle Four: Information sharing and transparency

Data and information will be shared openly between all parties to achieve the objectives of the plan. The control and monitoring efforts of all parties are recorded and reported. The DOC website will display all the information collected by all stakeholders.

Principle Five: Increased effort is required to meet the Plan objectives.

The control effort will be undertaken, based on the following Himalayan Tahr Control Plan objectives.

- A. To provide for recreational, commercial, guided hunting and Departmental control as means of maintaining tahr at, or below, target levels.
- B. Scientific information is the basis for assessing vegetation condition and tahr population to inform management decisions.
- C. To prevent expansion of the breeding range of tahr control activity outside of the feral range of tahr is a priority.
- D. The protection of known, high value, ecological sites which are at risk to tahr impacts with each management unit is a priority.
- E. Tahr will be controlled over time to a level at, or below, the intervention density set for each management unit within the HTCP as informed by scientific research and monitoring
- F. The most efficient and effective control methods for tahr population reduction will be used, including concerted effort by recreational and commercial stakeholders, and DOC control.

The Game Animal Council lauds the Operational Plan's intent to progress research into tahr-related matters that will be of significant assistance in guiding future operational plan development.

DOC aerial tahr control

While the Operational Plan clearly identifies the quantum of DOC control activity (specified as hours of flying time), and the various groups who contribute to tahr control on PCL in each MU, there are several important omissions:

- Justification for the number of hours of DOC aerial control in each MU
- PCL tahr population targets for each MU
- Identification of, and reasons for, priority control locations within each MU
- Timing of DOC control operations

Clarification of these matters may have prevented some misunderstanding and would have formed a sound basis for discussion of the effects of the Operational Plan. A full agenda, and a focus on the overall quantum of proposed DOC control activity, at the previous TPILG meeting prevented discussion of these matters. The Council recommends that future draft operational plans should lay these matters out clearly, ensure there is adequate time prior to the TPILG for their consideration, and devote adequate time to their discussion at TPILG to consider the broad range of perspectives represented on the TPILG.

In its consideration of the implications of the Operational Plan, key items considered by the Game Animal Council, informed by consultation with the hunting sector, included:

- Where tahr density should be reduced
- The quantum of tahr density reduction
- The appropriate timing of tahr density reduction activities
- Who should control tahr
- Which animals to target

The Game Animal Council has considered three main evaluative criteria:

- The effects of tahr control on the natural environment
- The effects of tahr control on the hunting sector
- The effects of tahr control on future control requirements

Previous engagement

The Department engaged with the Game Animal Council prior to release of the Department's original proposed plan. The Council's advice and opinions during that engagement were made on the expectation that the Department's operations would be of a similar scale to the 2019/2020 operations. The proposed plan that emerged subsequent to that engagement entailed a very large increase in Department tahr control activity, making the information the Council provided in the previous consultation largely irrelevant. The same will be true for other consultees. Consequently, it is the Council's opinion that the information the Department obtained from that earlier engagement activity should largely be set aside.

Responsibility

The Council notes the strong public interest in tahr management resulting from recent and ongoing legal actions, which has generated heated opinions on both sides. Some commentators have opined, "hunters have failed". The Council refutes that rhetoric and wishes to see it corrected. The HTCP is clear where responsibility lies. With the exception of AATH offsets, the hunting sector does not have an obligation to monitor or control tahr numbers, the Department does. Despite that, the Tahr Interest Group has a long history of organising tahr culls at the participants' own expense in locations directed by the Department. Recreational hunters kill large numbers of tahr for which they do not receive recognition. The provisions in the HTCP that transfer responsibility for tahr control to hunters (Section 5.1) have never been applied.

The Game Animal Council Act provides an opportunity to change hunting sector responsibility through establishment of herds of special interest. The New Zealand Tahr Foundation was established with that express purpose. However, that opportunity has been removed against the hunting sector's wishes. Like many other objectives, COVID-19 has prevented the commercial hunting sector from removing bulls from the national parks this year, which was part of the 2019/2020 operational plan. That is not a failure by the hunting sector, it was completely outside their control.

Identification of the need for and effects of Departmental tahr control requires knowledge of all or some of the following at the Management Unit level, and in some cases at finer scale (location, for short):

1. The approximate density/number of tahr at that location now.
2. The approximate density/number of tahr (by demographic group) that Departmental control will remove from that location.
3. The density/number of tahr and herd demographics at that location after Departmental control.

Operational Plan objectives

The HTCP specifies intervention densities for tahr in each of the management units. The Operational Plan proposes tahr density control only on public conservation land (PCL). Consequently, the Council's advice addresses the specific density in each management unit. The Council has established target tahr populations consistent with those densities and Manaaki Whenua estimates of the areas of PCL in each management unit.

The Council notes that work is progressing to guide future achievement of HTCP densities on land of other tenures, but control activity on those lands is not part of the Operational Plan.

Stopping point

Should Departmental control occur, a "**stopping point**" for control is required for each management unit – essentially the intervention density. Effective implementation depends on availability of a near real-time measure of the remaining tahr density in each management unit. Stopping point identification was not a matter considered by the Game Animal Council in previous engagement because the Council's (erroneously) envisaged scale of operations for the 2020/21 year were at a level that did not trigger the need for a stopping point, whereas the scale of currently proposed operations does.

The current (Ramsey & Forsyth) tahr density-estimation method is not appropriate for near real-time population estimation because it:

- is extremely imprecise for the herd as a whole, but even more so at the management unit level (After 4 years of surveying (117 plots) the estimated population range divided by the mean for the various management units ranged from 1.1 to 2.46. For the first two years of data collection it ranged from 1.42 to 5.96)
- entails tahr counts from three, temporally-spaced, helicopter flights to each site
- depends on surveying a large number of sites
- entails long data-analysis delays

This presents something of a problem. Residual population estimation must be either (i) “seat of the pants”, based on live observation, which clearly has a number of issues, or (ii) based on some population projection that accounts for population additions and withdrawals and accounts for imprecision and uncertainties¹. Population projection can be formal (it is a widely applied branch of science with an abundant academic literature, including numerous ungulate applications), or it can be informal.

The Department appears to have adopted an extremely simplistic form of informal population projection to justify its planned operations. Clearly, members of the hunting community are doing likewise and reaching different conclusions. Lack of robust population projections questions the ability of the Department to act appropriately in real-time. Later in this submission the Council offers its own population projections, based on parameters drawn from peer-reviewed scientific literature.

Urgency

Department (and other) claims for urgency of action to reduce the tahr population draw on three matters:

1. An impending birth pulse
2. Exponential tahr population-growth rates of up to 28%
3. Threats to valued vegetation species (particularly *Ranunculus Lyallii*)

Birth pulse:

The number of breeding females in the herd drives the number of births. Recent control activities, which have targeted tahr not identifiable as males, have substantially reduced the number of breeding females.

Exponential growth:

The Department’s claim of exponential tahr population-growth rates of up to 28% contributes to the Department’s informal population projection, supposedly offered as an indicator of the effects of each “birth pulse”. Exponential growth does not go on forever and fauna populations more typically follow a sigmoid growth function for which the growth rate is highest at very low populations and declines to zero at carrying capacity. Dr Parkes has modelled population-dependent growth for tahr using such a sigmoid (logistic) function.

Scientific estimates of growth rates from various tahr populations fall in the range from zero to 28% in the absence of hunting. Some of those estimates include effects of immigration. Parkes (1988) used a “working figure” for the inherent growth-rate of 24%. However, in his logistic model growth at 24% applies only at extremely low densities when there are not many tahr to multiply, so the high growth rate is not a problem. It is impossible for a population to increase at anything near 24% if it is male dominated, as is now the case in the national parks, and increasingly elsewhere. The current tahr-population growth rate will be much less than 24%, particularly if the population is male-biased.

As well as additions (the birth pulse), population projections should account for all removals. While the Department considers recorded hunting mortality, two sources it excludes from consideration are unrecorded hunting mortality (recreational hunting) and natural mortality. Tahr do not live to an old age,

¹ A further possibility, not yet explored in detail, is observations of changes in nanny/bull ratios subsequent to culling of known number of animals from particular demographic groups.

the estimated natural annual mortality rate for tahr kids exceeds 50%, and for mature female tahr is about 20% (Caughley 1967, 1970). The mortality rate for mature males, which seldom reach eleven years of age, is somewhat higher again² (Tustin *pers. comm.*).

Threats to vegetation:

No evidence has been provided by anyone that tahr at current densities threaten any vegetation species. While tahr are known to have significant localised effects at very high densities (as experienced in the 1970s), research conducted since the implementation of the HTCP has not identified any specific threats. Despite claims of its imminent demise, the threat status for *Ranunculus lyallii* is “not threatened”. It is common, even where tahr densities are high. Diet studies have shown that *R. lyallii* is an extremely minor component of tahr diet, and is eaten much more by other herbivores. This claim, like those for other floral species, simply does not stand up to scientific scrutiny. At the TPILG meeting on 3rd August 2020, no-one made any claims that any species is in imminent threat from tahr.

The Game Animal Council agrees that tahr populations exceed intervention densities in some MUs, but concludes there is no imminent threat, either to the environment or of a significant population increase, that would support the need for urgent action. Consequently, there is no case for putting aside the phased approach of Principle Three: *Phased approach to Implementation*.

Longer-term implications

Herd demographics determine future recruitment. Tahr are highly polygynous, so few males are required to service the females. Consequently, reductions in male tahr numbers have little, if any, effect on the number of births. Few female tahr breed until they are three years old, but each female will have several offspring during her life. Her female offspring will have several offspring. Furthermore, nannies have a significantly lower natural mortality rate than bulls.

To illustrate the importance of demographics, consider two absurdly extreme cases (i) a herd containing 100 adult females and 1 adult male, and a herd containing 1 adult female and 100 adult males. Assuming 100% breeding success the numbers of animals added to each herd in the birth pulse will be:

- (i) 100 births
- (ii) 1 birth

Clearly (abstracting from deaths, which will be lower in herd (i)), herd (i) will have an extremely high growth rate, whereas herd (ii) will be unable to sustain itself. Managing herd demographics can have a substantial effect and can contribute to long term population effects. Populations can continue to shrink after termination of control when control targets females. The corollary is that selectively targeting females and achieving target densities now will result in future populations significantly below target densities. In other words, there is no need for immediate target-density attainment if females are targeted and doing so sufficiently skews the sex ratio.

Culling nannies not only reduces the herd size now (as does culling bulls), but it has two future effects that are different to bull culling:

² In over 5,000 autopsies completed by Ken Tustin, the oldest male was 14 years, the oldest female was 22 years. Median age at death for female tahr is 6 years (Caughley 1967)

- longer suppression of the population because nanny tahr live much longer (bulls not shot are more likely to die of natural causes than are nannies)
- a reduction in future recruitment (only nannies have kids and their productivity is essentially independent of bull numbers)

In other words, shooting a bull or a nanny is irrelevant if all that matters is how many tahr exist at the conclusion of this year's cull. That is extremely myopic thinking. Shooting a bull or a nanny has a highly significant differential effect on both the number of tahr existing in subsequent years, and herd demographics. Shooting a nanny reduces the future population by much more than one. A bull-biased population is better for hunters, reduces future population size, and reduces requirements for future control work.

To summarise:

- Any near real-time assessment of the current number of tahr in each MU is likely to be inaccurate and imprecise.
- The estimates for the tahr population in each MU for the period 2016-2019 are extremely imprecise (broad credible limits) and do not necessarily represent the populations at the end of the data collection period.
- There is incomplete information on additions and subtractions to each MU population during and since data collection for the Ramsey & Forsyth population estimates, making contemporary population projections difficult. However, sensitivity analysis can identify the importance of key assumptions in these models.
- There is no imperative for urgent population reductions.
- Controlling nanny tahr is the key to long-term population management and environmental effects.

The Council's conclusion is that the currently proposed scale of tahr control has the potential to overshoot the limits specified in the HTCP in some management units. These uncertain situations are where adaptive management is of particular benefit, suggesting a "go quietly, monitor, and adapt" approach, consistent with the department's principles. Control effort should focus on female tahr, but should recognise the effects on future recruitment and not go too far.

It is important to recognise that the target-density approach to allocation of culling effort does not take account of other criteria. The Council proposes the following hierarchy, consistent with the HTCP, to consider when deciding where to target tahr control. In order from highest importance these are:

1. places of particular environmental concern (which may not have particularly high tahr numbers, but where the environment is particularly susceptible to tahr)
2. tahr population hotspots
3. places where it is difficult for the hunting sector to harvest tahr and
4. overall management unit density.

The Operational Plan does not address any of these matters, although they may have played an important role in decision-making and simply not communicated. The Game Animal Council recommends these matters should be considered in finalising the Operational Plan, and they should be clearly communicated in future draft plans.

We now turn to consideration of tahr control at specific locations.

National Parks (MU4)

It is obvious that tahr numbers in MU4 currently exceed those specified in the HTCP. However, significant tahr control in 2018 and 2019 (4,000 tahr not recognisable as bulls from an estimate of 7,666 tahr in 2016-2018) has had a major effect on population, herd demographics and reproductive capacity.

The Council sought to discuss the impacts of herd demographics and illustrated the importance of doing so in earlier engagement, an offer not taken up by the Department. The initial information provided by the GAC appears in Annex 2 of the material supplied for the current meeting. The information the Council supplied anticipated a significantly smaller amount of Departmental control than proposed in the Operational Plan, and focussed on the issue of killing bulls, so these projections offer limited information on outcomes if the current plan proceeds.

The HTCP enables the Department to kill bulls in the national parks, confirmed by the recent court ruling. However, the important question is not whether it is legal to kill bulls in the park, but whether it is desirable to do so. It is the Council's opinion that killing bulls would prolong the time taken to achieve the purposes of the HTCP. It would also create adverse effects for the hunting sector.

The Council reaffirms that shooting bulls has no effect on reproduction, which is the driver both of future environmental effects and the quantum of control required in the future. Leaving them, even temporarily, may avoid or reduce the need for future Department control of bulls.

Shooting bulls now has adverse effects for commercial and recreational hunters. Bulls are of high commercial value, which will be important for COVID recovery. The historic harvest of bulls from the parks is not a guide to annual bull harvest once the border opens because nearly all bookings have been carried forward, effectively doubling harvest upon re-opening. Attaining a bull tahr trophy in the stunning national park environment is an aspiration for many recreational hunters. In short, the bulls have high value to the hunting sector, but have little importance for future environmental effects. If time spent culling bulls reduces the number of nannies culled, there is a significant opportunity cost to the environment from culling bulls.

The strategy that hastens achievement of HTCP objectives in national parks is to cull as many nannies as possible.

The Council notes the lack of scientific evidence to support the need for immediate culling of all tahr in the national parks. However, it notes a number of unsubstantiated claims in the media. An example is a claim that eliminating tahr in the national parks is necessary to protect the *Aciphylla* weevil. Since that extremely rare weevil is not found in either park, culling tahr in the parks will not have any effect on the weevil. Further, claims that tahr threaten *Ranunculus* and *Veronica* species in the parks are not substantiated by either the official threat status, or by scientific research. Consequently, there does not appear to be any environmental imperative to remove all tahr from the national parks immediately, even if the aim is eventual elimination.

Because of:

- the demographic effects,
- the opportunity cost of culling bulls,

- the lack of an environmental imperative to immediately eliminate all tahr from the national parks, and
- the recreational and commercial benefits to the hunting community from them harvesting the remaining bulls

The Game Animal Council's advice to the Department is to avoid culling bulls in the national parks, and certainly to avoid "going out of the way" to do so.

Suggested focus locations

1. True left of the Copland round to Misty Peak
2. True left bottom of Horace Walker
3. Douglas/Clue to Lame Duck Flat
4. True left of Callery
5. Waikukupa and Omoeroa faces
6. Cook River

About half of the proposed control hours in MU4 have been undertaken already. To allow hunters access to some tahr hunting in this MU, and for them to make a contribution to controlling bulls, the remainder of the control work in this unit should be postponed until June 2021. If bulls must be shot, and recreational hunters and guides are unable to do so in time, then it is most efficient to consider commercial uses of them, rather than shooting to waste.

Where it prevents shooting to waste, the Council recommends consideration of commercial live capture, cape harvest, WARO or other uses from aerial harvest.

Tahr outside the feral range and in exclusion zones

The HTCP wisely gives top priority to controlling tahr in these areas. Large and small tahr populations remain outside the feral range. They are a significant potential threat to treasured environments (such as Fiordland National Park). Range expansion and increases in tahr populations outside the feral range will result in significant future control costs for the Department. Benjamin Franklin's adage that an ounce of prevention is worth a pound of cure applies well in this situation. Containing and shrinking the perimeter is vital.

The Game Animal Council recommends an expansion of tahr control effort outside the feral range, particularly in the south, and expansion of effort in the exclusion zones beyond the 168 hours last year.

Management Units outside the national parks

Introduction

Alongside other place-related considerations, a primary focus in these management units is to attain the intervention densities. The Ramsey & Forsyth (2019) PCL tahr density estimates over the period 2016-2019 in these units are shown in Table 1.

Table 1:

MU	PCL area (km ²)	Intervention density (tahr km ⁻²)	N _{PCL}	PCL: Lower credible limit (tahr km ⁻²) [N _{PCL}]	PCL: Central measure (tahr km ⁻²) [N _{PCL}]	PCL: Upper credible limit (tahr km ⁻²) [N _{PCL}]	Approx. number shot on PCL by DOC in 2019
1	939	2.5	2,347	4.8 [3,721]	8.1 [6,182]	13.4 [10,269]	2504
2	813	2.0	1,626	2.5 [2,033]	5.3 [4,357]	11.3 [9,335]	240
3	1,422	2.0	2,844	6.0 [5,142]	10.0 [8,663]	16.9 [14,596]	1526
5	802	2.5	1,604	3.8 [1,757]	10.8 [4,950]	30.3 [13,951]	1532
6	674	1.5	1,011	2.3 [1,552]	4.6 [3,096]	9.1 [6,176]	1094
7	593	1.0	593	0.1 [65]	0.3 [169]	0.7 [438]	57

- PCL areas are from Appendix 3 in Manaaki Whenua (2019) *Overview of the current state of tahr knowledge*. PCL = Area – (concessions + defence + freehold).
- Numbers of tahr shot by others in each MU are unknown.
- Excludes MU4, addressed in a previous section, and exclusion zones.
- Credible limit estimates cannot be added to provide “overall” credible limits.

To clarify the “gap” between PCL densities and intervention densities, the Council has estimated the PCL populations that are consistent with the HTCP intervention densities in each MU (using land area estimates from Manaaki Whenua) and compared those with the Ramsey & Forsyth population estimates. We also factored in recent control activity.

For example, the intervention density of 2.5 tahr km⁻² in MU1 multiplied by the 939 ha of PCL results in an “intervention population” of 2,347 tahr. Prior to the 2019 cull, this would have resulted in a “gap” of 1,374 tahr to the lower credible population limit, and a much bigger gap (3,835 tahr) to the central measure.

The Ramsey & Forsyth tahr population estimates cover four years, so whether they are representative of the population in 2019 depends on whether populations in each MU were static or not over that period. The data analysis did not assess that and, given the high variance in the data, and the relatively small samples within each MU each year, would be unlikely to shed light on existence, direction or magnitude of density change within MUs. Ramsey & Forsyth note that this may be possible with additional data in the future.

Departmental tahr control has occurred in all these management units in 2019, resulting in a significantly increased harvest in addition to “normal harvests”. In addition, some culling occurred in parts of MU5 in 2018. All Departmental control has targeted tahr that are not-identifiable as males, which will have reduced reproductive capacity disproportionately to the population reductions since the period the Ramsey & Forsyth estimates apply to.

The Council’s population projections are exploratory in nature. They make a number of assumptions, the significance of which can be tested by sensitivity analysis, but we have not done so. The projections start from the central population estimates, which are imprecise. They include known culling kills in 2019, but other kills are estimates, although generally small in comparison to DOC’s kills. Birth pulses are included, based on data from peer-reviewed scientific evidence, as is natural mortality.

The projections are sensitive to the estimates of DOC aerial mortality derived from helicopter hours. The Council has adopted the rate of 30 per hour the Department suggested at the June 2020 TPILG meeting. Kill rates are highly dependent on animal behaviour, snow conditions, time of year and other factors, so are extremely hard to predict, and are not a robust indicator of tahr densities.

The Department reports a somewhat higher kill rate than 30 tahr/hour in MU4 in July 2020. The AATH offset kill rate for 2019 was very much higher than that. Conversely, kill rates in low density and heavily vegetated areas are likely to be much lower. This factor, by itself is a cause for caution, with higher than anticipated kill rates having the potential to drive populations well below the intervention densities.

The Council welcomes the opportunity to work with the Department to explore variants on these assumptions if that would be of assistance.

It is important to allocate Departmental tahr-control effort, both within the management units and between units, to ensure the best environmental outcomes, to reduce future control costs, and to maximise benefits to the hunting community from the remaining tahr population. For all these reasons, control should target female tahr as far as possible. However, demographic effects are important, and mitigate against immediate attainment of HTCP-specified densities. Dramatic reduction in nanny numbers will, in some cases, result in continuing population decline, even without future culling. This means the HTCP target densities can be met in the relatively near future without culling to target densities level now. The Council is unaware of any imperative to attain the limits of the HTCP in the 2020-2021 year. Recognising that bull tahr need to be at least seven years old to attain trophy status, reduced recruitment from dramatic reduction in the nanny population will have unnecessary ongoing effects on trophy production for the next decade.

The Game Animal Council endorses the Department’s phased approach (Principle 3), which relies on monitoring after significant control work to assess the need for additional work. This is particularly important given the proposed scale of control in 2020/2021. The Council advocates monitoring effects of culling in management units 1 and 6 after the initial 125-hour program (noting that this initial phase is 50% more than the September-November 2019 program).

Recommendations for each management unit include reducing female kid groups to a maximum of 10. The Council notes some ambiguity about this criterion as groups form and disperse on a regular basis and there is no guidance on what defines a “group”.

There is considerable confusion about the maximum localised density of 5 tahr km⁻² because the area this density applies to has never been defined. One interpretation, inconsistent with the maximum group size criterion, is that any group of five breaches the local density criterion. This is clearly not what the writers of the plan intended. Past plans have ignored this criterion because it is unworkable. The Council recommends continuation of that practice.

There will be some transfer of recreational and commercial hunting pressure as a result of implementation of this plan, particularly with the effective loss of hunting opportunities in MU4. Claims that access to hunting on non-PCL areas will mitigate loss of PCL hunting do not recognise the difficulty and/or cost of obtaining access to non-PCL lands. MU1 and MU3, which are highly popular recreational hunting areas, will likely experience a significant increase in use. This increase in recreational use will increase recreational harvest, and therefore decrease reliance on DOC control.

The Game Animal Council recommends areas in MUs 1 & 3 that are readily accessible to recreational hunters do not receive DOC control, which should be concentrated on difficult to access areas within these MUs where recreational hunting has least effect.

There is considerable uncertainty about current tahr densities in each management unit. Culling has reduced the densities and changed the demographic structure of the tahr populations in those units. Consistent with the Department's staged approach (Principle 3) and adaptive management principles in general, the Council recommends monitoring the effects of the 125 hours of culling undertaken prior to finalisation of the Operational Plan. This is particularly important in MUs 1 and 6.

MU1: South Rakaia/Rangitata

- The PCL lower credible limit estimated for the period 2016-2019 exceeds the PCL intervention density in MU1.
- If the R&F lower bound estimates applied, it is highly likely that with control activity to date MU1 is already below PCL intervention density. Anecdotal evidence suggests that is not the case.
- Population projections are based on the Ramsey & Forsyth (2019) central population estimate, assumed to apply in Autumn 2019 (N = 6,182).
- DOC culled approximately 2,500 female and juvenile tahr in this management unit in 2019.

MU1 PCL		Start of the year		Harvests		
Year	Total Population estimate @ start of year	Recognisable bulls	Nannies & Juveniles	DOC N&J control	All recognisable bull kills	Non control Nanny & Juv kills
2019	6,182	1,034	5,148	2,504	200	200
2020	3,408	707	2,701	750	200	200
2021	2,378	444	1,935	0	150	200
2022	2,210	293	1,917	0	150	200
2023	2,084	187	1,897			
PCL Target		2,347				

- PCL control activity to date is unlikely to have attained the PCL intervention density at the central population estimate.
- Proposed control of 25 hours at 30 tahr/hour will result in removal of about 750 tahr not recognisable as males.
- This quantum of control is likely to reduce the PCL density to at or below the HTCP-target.
- A higher kill rate will almost certainly drive density below the HTCP-target.
- **Monitoring and an adaptive control strategy will be particularly important in this MU.**
- Demographic effects mean the tahr population will continue to decline in subsequent years.
- Target females, juveniles and non-identifiable males.
- Reduce female-kid groups to 10.

The Game Animal Council recommends reducing the hours of control in MU1 pending monitoring of post-cull tahr density.

DOC aerial control location prioritisation

- Areas that are readily accessible to recreational hunters should not receive DOC control.
- Priority locations: difficult to access areas where recreational hunting has least effect.

MU2: South Whitcombe/Wanganui/Whataroa

- The PCL lower credible limit estimated for the period 2016-2019 exceeds the PCL intervention density in MU2.
- If the R&F lower bound estimates applied, it is possible that with control activity to date MU2 is already below intervention density. Anecdotal evidence suggests that is not the case.
- Population projections are based on the Ramsey & Forsyth (2019) central population estimate, assumed to apply in Autumn 2019 (N = 4,357).
- DOC culled approximately 240 female and juvenile tahr in this management unit in 2019.

MU2 PCL		Start of the year		Harvests		
Year	Total Population estimate @ start of year	Recognisable bulls	Nannies & Juveniles	DOC N&J control	All recognisable bull kills	Non control Nanny & Juv kills
2019	4,357	1,307	3,050	240	200	150
2020	3,849	910	2,939	750	200	150
2021	2,853	600	2,253	0	150	100
2022	2,803	424	2,379	0	150	100
2023	2,826	307	2,519			
PCL Target		1,626				

- Control activity to date is insufficient to have attained the PCL intervention density at the central population estimate.
- Proposed control of 25 hours at 30 tahr/hour will result in removal of about 750 tahr not recognisable as males.
- This is unlikely to attain the HTCP PCL target density immediately, but demographic change effects may result in attainment of the target density in the near future.
- A kill rate greater than 30 tahr/hour has the potential to drive the population to the intervention density.
- Target females, juveniles and non-identifiable males.
- Reduce female-kid groups to 10.

DOC aerial control priority locations:

1. Aciphylla Creek faces
2. True left of Lambert Creek
3. Willberg Range around Avalon Peak
4. Adams Range northern faces
5. Bettison Faces
6. True left of the Perth below the Scone

MU3: Gammack/Two Thumb

- The PCL lower credible limit estimated for the period 2016-2019 exceeds the PCL intervention density in MU3. Subsequent control activity has been insufficient to achieve the tahr population density specified in the HTCP.
- Population projections are based on the Ramsey & Forsyth (2019) central population estimate, assumed to apply in Autumn 2019 (N = 8,663).
- DOC culled over 1,500 female and juvenile tahr in this management unit in 2019.

MU3 PCL		Start of the year		Harvests		
Year	Total Population estimate @ start of year	Recognisable bulls	Nannies & Juveniles	DOC N& J control	All recognisable bull kills	Non control Nanny & Juv kills
2019	8,663	2,599	6,064	1,526	200	300
2020	6,577	1,894	4,683	600	200	300
2021	5,557	1,377	4,180	0	150	300
2022	5,343	1,055	4,288	0	150	300
2023	5,242	835	4,406			
PCL Target		2,844				

- Proposed control of 20 hours at 30 tahr/hour will result in removal of about 600 tahr not recognisable as males.
- There were high kill rates in this MU in 2019, so there is every possibility that DOC will kill many more tahr than anticipated.
- This quantum of control is highly unlikely to attain the HTCP PCL target density.
- Target females, juveniles and non-identifiable males.
- Reduce female-kid groups to 10.

DOC aerial control location prioritisation

- Areas that are readily accessible to recreational hunters should not receive DOC control,
- Priority locations: difficult to access areas where recreational hunting has least effect.

MU5: Ben Ohau

- The PCL lower credible limit estimated for the period 2016-2019 exceeds the PCL intervention density in MU5.
- If the R&F lower bound estimates applied, it would be highly likely that with control activity to date MU5 is already below intervention density. Anecdotal evidence suggests that is not the case.
- Population projections are based on the Ramsey & Forsyth (2019) central population estimate, assumed to apply in Autumn 2019 (N = 4,950).
- DOC culled over 1,500 female and juvenile tahr in this management unit in 2019.

MU5 PCL	Start of the year			Harvests		
	Total Population estimate @ start of year	Recognisable bulls	Nannies & Juveniles	DOC N&J control	All recognisable bull kills	Non control Nanny & Juv kills
Year						
2019	4,950	1,485	3,465	1,532	100	150
2020	3,030	1,060	1,970	300	100	150
2021	2,429	749	1,680	0	50	150
2022	2,257	567	1,690	0	50	150
2023	2,142	440	1,702			
PCL Target	1,604					

- Proposed control of 10 hours at 30 tahr/hour will result in removal of about 300 tahr not recognisable as males.
- This will not attain the HTCP target density on PCL but demographic effects will suppress recruitment.
- However, the Council understands there were high kill rates in parts of this MU in 2019, so DOC may kill more tahr than modelled in 2020.
- Target females, juveniles and non-identifiable males.
- Reduce female-kid groups to 10.

DOC aerial control priority locations:

- Ben Ohau Range
- Neumann Range

MU6: Landsborough

- The PCL lower credible limit estimated for the period 2016-2019 exceeds the PCL intervention density in MU6.
- If the R&F lower bound estimates applied, it would be highly likely that with control activity to date MU6 is already below intervention density. Anecdotal evidence suggests that is not the case.
- Population projections are based on the Ramsey & Forsyth (2019) central population estimate, assumed to apply in Autumn 2019 (N=3,096).
- DOC culled approximately 1,100 female and juvenile tahr in this management unit in 2019.

MU6 PCL	Start of the year			Harvests		
Year	Total Population estimate @ start of year	Recognisable bulls	Nannies & Juveniles	DOC N& J control	All recognisable bull kills	Non control Nanny & Juv kills
2019	3,096	929	2,167	1,094	50	50
2020	1,798	667	1,131	1,200	50	50
2021	432	432	0	0	10	0
2022	295	295	0	0	10	0
2023	200	200	0			
PCL Target	1,011					

- Proposed control of 40 hours at 30 tahr/hour will result in removal of about 1,200 tahr not recognisable as males.
- Low tahr density may limit the kill rate, although not in hotspot areas.
- This quantum of control is likely to eliminate all non-male tahr from MU6 by 2021.
- Remaining resident male tahr numbers will steadily decline thereafter.
- Some remaining males will emigrate to other MUS in search of nannies.
- Target females, juveniles and non-identifiable males.
- Reduce female-kid groups to 10.
- There are localised high-populations in this MU, where control should be targeted.

The Game Animal Council recommends a substantial reduction in planned control in MU6 because the current proposal will reduce the tahr population well below the HTCP-specified target.

DOC aerial control priority Locations

- True left of Jacobs
- Parts of the Landsborough (e.g. Zora)

MU7: Wills/Makarora/Hunter

- The PCL upper credible limit for MU7 is below the intervention density. However, it is not above the numerical limit specified in the HTCP, which is inconsistent with the target density.
- Tahr control is not required in MU7 to meet the HTCP PCL density objective.
- Population projections are based on the Ramsey & Forsyth (2019) central population estimate, assumed to apply in Autumn 2019 (N=169).
- DOC culled 57 female and juvenile tahr in this management unit in 2019.

MU7 PCL	Start of the year			Harvests		
Year	Total Population estimate @ start of year	Recognisable bulls	Nannies & Juveniles	DOC N&J control	All recognisable bull kills	Non control Nanny & Juv kills
2019	169	51	118	57	10	10
2020	88	31	57	600	10	10
2021	15	15	0	0	10	10
2022	3	3	0	0	10	10
2023	0	0	0			
PCL Target	593					

- Proposed control of 20 hours, even at a very low success rate, is highly likely to eliminate all non-male tahr from MU7.
- Tahr extermination occurs even if the 2019 tahr population was at the Ramsey & Forsyth upper credible limit
- The small number of remaining resident male tahr would die or emigrate over the next few years.

The Game Animal Council recommends cancellation of the planned aerial control in MU7.

Concluding comment

Based on the central R&F population estimates, the biggest “surplus densities” are in MUs 2 and 3, where the bulk of culling should occur. Indeed, under all density/population estimate scenarios, the biggest reductions should occur in MU2 and MU3, with about 50% more harvest in MU3 than in MU2.

Timing

The Operational Plan was silent on when operations would take place. Late winter/spring are the times when there is least disruption to the hunting sector, and other backcountry users. Snow conditions at these times facilitate culling.

Animal welfare considerations mean there should not be any control work from mid-November until the end of February.

Delaying remaining control work in MU4 to June 2021 is desirable. Significant reductions in tahr numbers in MU4, particularly of males, will mean there is little incentive for hunters to be there at that time, mitigating the adverse effects anticipated if control work were undertaken at that time in other MUs. It would also provide the opportunity for hunting in the interim.

Several recent DOC tahr control operations have resulted in DOC contractors shooting tahr in the immediate vicinity of hunters. A tahr hunting trip can be a major undertaking, and involves considerable planning and expense, so these encounters are particularly disappointing. There is also potential for disruption of other PCL users.

Better communications of dates and locations of aerial control activities would avoid many such conflicts. While it is recognised that weather and security mean it is not possible to identify precise dates of operations in particular areas, many of these effects can be mitigated, at least in part, by an indication of planned operation windows for particular locations or MUs. The Council notes some attempts to mitigate these effects by cull operators who have contacted other helicopter operators in the vicinity to avoid operating in areas where they have dropped clients. While meritorious, this approach fails to account for the vast majority of PCL users, who do not use aerial access.

Tahr Kill Reporting App

The Council is concerned that conflict around adoption of the Operational Plan has resulted in loss of the goodwill the Department and the Council had worked hard to establish between the hunting community and the Department. Unfortunately, one of the casualties may be recreational hunters' willingness to use the tahr kill reporting app. This will significantly increase the difficulty of monitoring recreational tahr harvests, which the HTCP requires. It is in everyone's interests that the App has wide uptake. The Council will work with the hunting community to facilitate that. Adoption of the Council's recommendations contained in this submission will facilitate that process.