



## Stopping the Population Decline of B.C. Mountain Goats

February 14, 2025

Current management practices for the British Columbia (B.C.) mountain goat hunt may be contributing to a decline in the population of mountain goats in B.C. That decline is a threat to the mountain goat sport hunting industry, the indigenous hunt and all the social and economic activities derived from those hunts. The decline is also contrary to B.C. provincial guidelines of 2010 (Province of BC 2010) that state:

*“The management goal for mountain goats in British Columbia is to maintain viable, healthy and productive populations of mountain goats throughout their native range in British Columbia.”*

Section 2.3 of the B.C. Procedure Manual for Mountain Goat Harvest Management (Province of BC 2014) states that:

*“Unless contrary management objectives have been identified, hunted mountain goat populations should be managed to avoid population declines.”*

We predict that a decline in population will continue unless the main contributing factors are identified and new practices are adopted to make the hunt sustainable. The factors contributing directly or indirectly to the decline in mountain goat populations include:

- Inadequate demographic data
- Recreation and the hunt
- Sub-populations
- Population survey methods
- Disruption during the rut
- Sustenance hunt
- Excessive harvest rate
- Harassment by helicopters

## **Inadequate Demographic Data**

The mountain goat hunt in B.C. is basically a hunt for adult mountain goats. But hunt managers have no way of knowing exactly how many adults there are in each population management unit (PMU).

Aerial population surveys record all mountain goats observed on a survey flight as either kids or adults. The term “kid” is defined by the B.C. government as – “any mountain goat with horns less than 10 cm in length”. While the dictionary definition of the term “adult” is “fully grown” or “sexually mature”, the B.C. government has decided to expand the definition of adult to include juveniles that are neither fully grown nor sexually mature. The result is that aerial population surveys falsely claim to have an accurate count of adults, when the actual total under the term “adults” includes both adults and juveniles. Changes to the definition of the word “adult” makes an understanding of the actual situation on the mountain that much more difficult.

The term “juvenile” should be formally defined for mountain goats in B.C. We recommend that the maximum age of juveniles be defined as 3.5 years. While it is possible for juveniles of 2.5 years to give birth in May/June of the third year, research shows that the number of births at that age are far less than for primiparity in May/June of the fourth year (Festa-Bianchet, M., & Côté, S. D. 2008). Research also shows that the age of primiparity for mountain goat populations in many areas of B.C. is increasing (Rice, Larue and Festa-Bianchet, 2021).

Compulsory Inspection is required for each harvested mountain goat. Despite the accuracy of the inspection, the data reveals no reliable information about the true number of mountain goats still alive on the mountain, yet this data is used to help determine the next annual harvest. Planning a hunt using previous harvest data is a guessing game with no guarantee. If hunt managers guess wrong and set the harvest too high, hunters are capable of finding and harvesting every allocated mountain goat. But the responsibility for avoiding a decline in mountain goat population rests with the hunt managers, not the hunters.

Not only is the data from current aerial population surveys inadequate, but there are simply not enough aerial surveys. A classic case is revealed in the Babine Mountains Provincial Park survey of 2022 (Turney, 2022).

This survey was the first population count in the park for 19 years, since 2003. In those 19 years, the population declined from 220 to 164 for loss of 56, close to a 25% loss. Even more alarming, the population over a longer period from 1995 to 2022 declined from 326 to 164 for a loss of 162, close to 50%. Apparently, hunt managers in 2003 did not reduce the harvest rate after learning about the earlier population decline from 1995 to 2003.

While no one was paying attention to the causes of the population loss at the time, it seems reasonable to assume that the mountain goat population was barely able to maintain their numbers with all the

losses of population due directly or indirectly to intensive recreation, predation, disease, avalanches and other random natural hazards.

To repeat, according to the B.C. official policy noted above, managed populations are not supposed to decline over time.

*“...hunted mountain goat populations should be managed to avoid population declines”*

The total harvest of 171 goats from 1995 to 2022 is close enough to the published loss of population of 162 in the same period to deduce that there was never room for the hunt, never a surplus to be harvested. Our opinion is that the hunt was largely additive. We can reasonably predict that continuing the hunt at current harvest rates will slowly but surely reduce the population until the population is so low that the hunt is no longer viable.

### **Recreation and the hunt**

The *Procedure Manual for Mountain Goat Harvest Management* in B.C. (Province of BC 2014) outlines the factors that hunt managers must consider when determining the harvest rate for each hunt. Motorized and non-motorized recreation are not mentioned in the manual but are increasingly affecting mountain goat populations. Recreation can disrupt mountain goats and displace the goats from their preferred habitat. Recreation can interrupt feeding, rest, sleep and rumination. Stress hormones in the herd can increase, affecting the health of individual mountain goats and reducing reproduction.

Hunters can also disrupt and displace mountain goats. Mountain goats know if they are being hunted. We have often observed that mountain goat alarm responses are greater when the goats are hunted than when not hunted. If intensive recreation and a hunt take place together in one area, mountain goats are unable to differentiate between hikers and hunters. Alarm responses to all humans are at the higher level reserved for hunters.

The solution is two-fold. Recreation access that directly interferes with mountain goats should be managed. And hunting in areas of high recreation use should be minimized or cancelled if the combination of recreation and hunting regularly disturbs and/or displaces mountain goats. By eliminating hunting in high-value recreation areas, mountain goats are better able to positively habituate to the presence of humans without being fearful.

Ungulate Winter Range (UWR) Orders have been established across many areas in B.C. with new Orders coming on stream. The Orders often require deactivation of new logging roads close to mountain goat terrain as soon as possible after logging is completed. The intent of the regulation is to protect mountain goat winter habitat from disturbance by recreation that is facilitated by the construction of new high-elevation logging roads. It is important that forest licence holders follow the UWR regulations, and that enforcement is provided. This is an example of a regulation that is effective in protecting mountain goats.

## **Sub-populations**

Hunt managers sometime treat the population of an entire mountain range as one herd to calculate the next year's harvest. That ignores the fact that the population of a large mountain range is made up of small herds or sub-populations, each with their own area. Most winter home ranges are made up of a small winter home, a winter feed area and the trail that connects the two. In summer, the herd leaves the winter home and moves across a large summer feed area. At the first snowfall, the herd moves back to the winter home.

Herds are loyal to their home. If one sub-population suffers a steep decline in population or extirpation, it could take years or decades for neighbouring herds to move into the empty area. The result is a reduction of effective habitat in the short term for the entire mountain goat population.

Ideally, hunt managers should know how many mountain goats are in each sub-population and the location of the winter home for each herd. Where does the herd go in summer? Is each herd healthy with adequate numbers of mature males and mature females? All this data is key to avoiding an overharvest in one or more sub-populations. Otherwise, herds that are close to a road and easy to hunt may suffer a catastrophic harvest of adults, without the hunt managers being aware. A loss of adults may mean lower reproduction for the herd. Adults act as mentors to young members of a herd. Without key adults, a herd may struggle to find the best feed, shelter and escape terrain.

Knowledge about a catastrophic loss in one or more sub-populations may be diluted and/or lost in the hunt data for an entire mountain range. Hunt managers may only learn after the fact, when the total population shows a significant decline.

## **Population survey methods**

The current methods for conducting aerial population surveys need to be updated. We have developed the BC Mountain Goat Society's *Smithers Method* (BCMGS 1) that replaces manual data entry with automated geo-referencing of all data. The Smithers Method supplements written data with high-resolution photos that can be analyzed post-flight to determine not only the number of mountain goats observed but also the gender and age of many of the mountain goats using social context. The *Smithers Method* also records all speech in the helicopter for the entire flight for a permanent record of all spoken observations by the crew. The audio is accompanied by video from a camera facing forward in the helicopter. The video of the passing terrain establishes a visual context for the flight and is also geo-referenced. The flight video can be combined with the audio and the photos for a complete media record of the survey flight.

## **Disruption during the rut**

Mountain goat rut behaviour starts in the middle of October and extends to the first week of December with a peak around November 17. These dates apply to central B.C. The dates of the rut in other parts of the province may vary slightly. During the rut, mature males often travel from their own herd to other herds and back home again. The influx of males from outside a sub-population increases the number of

choices of a mate available to mature females and may compensate for a shortage of eligible males. The transfer of genes from herd to herd is vital for minimizing the effects of inbreeding.

Currently, the mountain goat hunting season in many parts of B.C. is open until November 15. In other parts of the province, the season extends to February 28. Hunters are roaming widely across mountain goat habitat during the rut. At the same time, mature male mountain goats are travelling between herds. Hunters may disrupt and/or displace mature male mountain goats that are travelling during the rut. Any interference with the rut may result in less pregnancies in spring. Mature males that are harvested during the rut may be coming from another herd, including herds in protected areas.

The solution is simple. The hunt should end in advance of the rut in all regions of B.C. The disruption of the rut is too high a price to pay for an extended hunt season.

### **Sustenance hunting**

We have a report that some hunters are harvesting juvenile mountain goats for the meat, with no interest in trophies.

"However, I can roughly estimate, from the hunters I talk to each year, that at least half of the harvests are of juveniles." (Gary McQuaid, personal comment, 2023)

Mountain goats develop considerable muscle strength by time they are adults. As a result, meat of adult mountain goats has a reputation for being tough. For meat that is less tough, some mountain goat hunters are targeting juveniles in a sustenance hunt. Of course, hunt managers have no way to prescribe how hunters use their harvest, but managers should be concerned about sustenance hunting.

The difference between a trophy hunt and a sustenance hunt is demand. A trophy hunter needs a minimum of one good mountain goat in a lifetime for a trophy. But a sustenance hunter may harvest one mountain goat every year for decades, simply to fill the freezer. Each sustenance hunter has the ability over time to significantly and directly affect the mountain goat population. If sustenance hunters harvest a substantial portion of the total harvest, other hunters may not get a chance to hunt. Is sustenance hunting a problem? Should bag limits be limited for each hunter's lifetime?

The problem is that the B.C. Big Game Harvest Statistics (Province of BC 2024b) do not report the harvest of juveniles. Instead, juveniles are included in the adult column, even though juveniles are not adults. Combining juveniles and adults hides the harvest numbers for both adult or juvenile age classes, and makes management decisions, and review of those decisions, more difficult.

### **Excessive harvest rate**

In B.C., populations of 50 or fewer mountain goats are not hunted. At that population threshold, the calculation includes adults and juveniles only and does not include kids.

For populations of more than 50 and less than 100, a 2% harvest rate applies. But at that 2% threshold, B.C. policy suddenly shifts. The calculation for the harvest no longer counts only adults and juveniles. Now the calculation applies to all members of the herd including kids.

For populations of 100 or more, a maximum harvest rate of 3% applies, again including all kids. The problem with including kids in any hunt calculation is that the number of kids in the herd can vary widely over the year. A loss of 50% of the kids over the first winter is not unusual. Any calculation of the hunt that includes kids may be completely inaccurate by the time the next hunt occurs.

The calculation of a harvest should be based on the true number of adults and juveniles and should never include kids.

There is also evidence that the current harvest rates are excessive and not sustainable. Low recruitment rate, lack of density dependence, and high loss of young mountain goats in the first two years may mean that some mountain goat herds are barely able to maintain their numbers, even before human activities are added. The current maximum harvest rates in B.C. are too high according to several mountain goat experts:

- “I support the reduction from 3 to 2%.” (Steeve Côté, personal comment 2022)
- “I agree with Steeve that the reduction to 2% allows to remain on the safe side. I think that the recommendations of 1% for 50-100 individuals and 2% for >100 is a good recommendation for populations that are in good shape. ...would suggest even lower rates for populations that are declining. (Sandra Hamel, personal comment 2022)
- “(reduction of harvest rate from 3% to 2%) looks good to me as well” (Marco Festa-Bianchet, personal comment 2022)

### **Helicopter harassment**

Some local helicopter pilots are quick to notice mountain goats while flying across alpine. A dip and turn over the mountain goats, the goats scatter in panic and the pilot is proud to show off some local wildlife to his or her passengers. The problem is that mountain goats do not habituate to helicopter flights at close range. Repeated harassment by helicopters can increase the sensitivity of the goats to disturbance. Stress hormones can build, affecting health, reproduction and mountain goat populations. Repeated helicopter flights can force mountain goats to leave an area, reducing the available effective habitat. (Côté, S. D. et al 2013)

The solution is for B.C. to increase enforcement of Section 27(3) of the B.C. Wildlife Act (Province of BC 2024) that provides that harassment of wildlife by a motorized vehicle, including helicopters, is prohibited. All helicopter pilots should be reminded regularly that low level flights that alarm or panic mountain goats are illegal and not acceptable for any reason, except for official government surveys.

## **Helicopter-based commercial backcountry recreation**

Helicopter-based Commercial Backcountry Recreation, most notably heli skiing, is very popular and operations are common across many remote mountain areas in B.C. As part of the management plan for each operation, a wildlife mitigation strategy is signed off by a qualified biologist and then assessed for approval by the provincial government. Annual performance reviews, at least for heli ski operations, are conducted by a consulting biologist and submitted to the provincial government. Two outstanding problems currently exist:

1. There are heli ski tenures that are not required to comply with established mountain goat habitat mapping until their tenure is renewed, and that can be many years down the road.
2. There is a lack of government follow-up with many heli ski operators regarding their annual performance reviews.

Heli skiing has the potential of disturbing and displacing many populations of mountain goats across remote mountains in B.C. All this can happen without witnesses and may only be revealed when the population of mountain goats in the area declines.

Our BC Mountain Goat Society now offers independent third-party certification of heli skiing companies. To qualify for certification, each heli skiing operation records all heli skiing flights during the ski season. Our in-house wildlife biologist, a mountain goat expert, reviews all flight records from the past winter ski season. Upon review and approval, the certified company is permitted to display our “Certified Mountain Goat Friendly” logo for display on their web site advertising for one season. Each year, our expert reviews the company flight records to qualify for re-certification for the next ski season.

(See BCMGS 2 for more information)

## **Helicopter-based industrial activity**

Helicopter flights in support of mining and prospecting carried out in the mountains of B.C. can disturb and/or displace mountain goats, often with no witnesses to assess damage to the herds. All commercial helicopter operations should follow the same standards that apply to recreation-based helicopter use near mountain goat habitat.

## **Solutions**

### **Research**

There is a need for a long-term research study of a hunted mountain goat population in B.C. The research project at Caw Ridge in Alberta since 1989 (Festa-Bianchet, M., & Côté, S. D., 2008) resulted in world-class knowledge about a mountain goat population that was not hunted. It’s now time for B.C. to step up and fund a multi-year study of a representative hunted mountain goat population.

## **Policy update**

*The Management Plan for Mountain Goat in British Columbia, 2010*, (Province of BC 2010) needs to be updated to account for new threats to mountain goats that include wind farms, heli-tourism, intensive recreation access and climate change.

## **The photo hunt**

There are many hunters who participate in a guided hunt for the opportunity to be out in wilderness, using their skills to stalk wildlife. Pulling the trigger and seeing the target animal collapse ends the fun, and the work begins. These hunters would be just as happy to have a life-size photo of their target animal on the wall rather than a trophy head. They would be pleased to know that their target animal is on the mountain, alive and still contributing their genes to the herd. When these hunters go fishing, they may use catch and release, an alien idea decades ago and an accepted practice now.

Photo hunts and mountain goats go together. Guiding a client close enough to a mountain goat to get an outstanding camera image requires all the skills necessary for a lethal hunt or more. Photo hunts are a perfect fit for guide-outfitters and employ all the resources that guides normally use to keep their clients entertained. Photo hunts are not constrained by the increasing scarcity of mountain goat populations. If done right, a photo hunt can be conducted without any appreciable disturbance to the mountain goats, and it takes a professional guide to make it all work.

## **Recommendations**

### **Inadequate demographic methods**

We recommend:

- Changes to the definitions of English words contrary to common usage should be discontinued. Instead, the proper word should be used. (e.g. non-kid instead of “adult”)
- Thresholds for changes in harvest rates based on population should be based solely on the number of adults and juveniles in a herd and should never include kids. The number of kids that survive may vary greatly and is not stable enough to use for hunt calculations.
- All mountain goats presented to Compulsory Inspection should have their age determined as closely as possible and recorded according to the following thresholds:
  - Kid - less than one year of age.
  - Juvenile – one year to 3.5 years of age.
  - Adult – more than 3.5 years of age.
- Each juvenile mountain goat harvested should be reported in the B.C. Big Game Harvest Statistics under the juvenile column.
- Hunter harvest data should not be used to determine subsequent harvest rates. Instead, harvest rates should rely on reliable data gathered in advance of each hunt.



- Inventory data should be updated every 5 years for each Population Management Unit (PMU), otherwise the hunt for that Unit should be suspended until updated inventory data is available.

### **Recreation and the hunt**

We recommend:

- That hunting in PMUs with high levels of recreation use be discontinued to allow mountain goats to habituate to non-consumptive human presence.

### **Sub-populations**

We recommend:

- That hunt managers gather data about sub-populations on large mountain ranges.
- That the hunt on large mountain ranges with multiple sub-populations may need to be subdivided into smaller PMUs.

### **Survey methods**

We recommend:

- Adoption of our BC Mountain Goat Society *Smithers Method* (BCMGS 1) as the next advance in survey technology.

### **Disruption during the rut**

We recommend:

- That the end date for the mountain goat hunt in B.C. be changed to November 1 across all PMUs.

### **Excessive harvest rate**

We recommend:

- Maximum harvest rates for populations with more than 50 adults and juveniles and less than 100 adults and juveniles be revised to 1%.
- Maximum harvest rates for populations with more than 100 adults and juveniles be revised to 2%.
- There is no requirement that a hunt must take place each year. A hunt year may be followed by one or more years of no hunt to allow the population to rebound.

### **Helicopter harassment**

We recommend:

- That Section 27(3), Use of Conveyance, BC Wildlife Act (Province of BC 2024) be strictly enforced to deter helicopters from harassing mountain goats.
- That all helicopter pilots in B.C. should be notified on a regular basis that harassment of mountain goats is illegal and will not be tolerated.

### **Helicopter-based commercial backcountry recreation**

We recommend:

- That tenure mitigation strategies must be up-dated bi-annually to take into consideration up-dated habitat mapping and any modifications of operations (e.g. additions of ski runs and primary flight paths).
- That B.C. staff meet annually with tenure holders to discuss the previous season's performance and improvements for the up-coming season.

### **Helicopter-based industrial activity**

We recommend:

That helicopter support of mining and prospecting activity in mountain goat habitat should follow the same standards applied to recreation-based helicopter operations and no-fly zones be established at certain times of year.

### **Research and management policy**

We recommend:

- The *Management Plan for Mountain Goat in British Columbia, 2010* (Province of BC 2010), needs updating to account for new threats to the sustainability of mountain goats.
- There is a need for a long-term research study of a hunted mountain goat population in B.C. It's now time for B.C. to step up and fund a long-term study of a hunted mountain goat population.

### **The photo hunt**

We recommend:

- That the B.C. Wildlife Act be modified as needed to allow and encourage guide-outfitters to add photo hunts to the services they provide.

### **Summary**

There are many new and significant threats to the sustainability of mountain goat herds in B.C. There is also strong evidence that the mountain goat population in B.C. is in decline. The severe decline of the mountain goat population in the Babine Mountains Provincial Park serves as a warning that management of the B.C. mountain goat hunt needs an overhaul. Changes to the management of the

hunt are necessary to maintain the hunt and to keep mountain goat populations from decline at the same time.

Jim Easterday, Director

Len Vanderstar, R.P.Bio, Director

BC Mountain Goat Society

Smithers BC

[mtgoats@bcnorth.ca](mailto:mtgoats@bcnorth.ca)

[www.mtgoats.ca](http://www.mtgoats.ca)

[www.bcmountaingoatsociety.ca](http://www.bcmountaingoatsociety.ca)

Acknowledgements: Thanks to Sandra Hamel, Steeve Côté, Marco Festa-Bianchet, Gary McQuaid for their comments, edits and suggestions.

References:

BCMGS 1, **Smithers Method – Counting Mountain Goats**, BC Mountain Goat Society, 2024, [Download here](#)

BCMGS 2, **Heli skiing Certification**, BC Mountain Goat Society, 2024 [Link here](#)

Côté, S. D., Hamel S., St-Louis A., Mainguy, J. **Do Mountain Goats Habituate to Helicopter Disturbance?**, 2013

Festa-Bianchet, M., & Côté, S. D. (2008). Mountain goats: Ecology, behavior, and conservation of an alpine ungulate. Washington, DC: Island Press.

Province of BC 2010, **Management Plan for the Mountain Goat (*Oreamnos Americanus*) in British Columbia**, 2010, British Columbia Management Plan Series [Download here](#)

Province of BC 2014, **Procedure Manual**, Mountain Goat Harvest Management, 2014

Province of BC 2024, **Wildlife Act**, 2024 [Link here](#)

Province of BC 2024b, **Big Game Harvest Statistics for Province** [Link here](#)

Rice C., Larue B., and Festa-Bianchet M., **Variation in age of primiparity in mountain goats (*Oreamnos americanus*) estimated from horn growth increments**, 2021

Turney, L. 2022, **Mountain Goat Inventory - Go79, Babine Mountains Provincial Park (LEH 6-08F)**, March 2022. Unpublished report prepared for BC Parks, Ministry of Environment and Climate Change Strategy and BC Fish and Wildlife Ministry of Forests, Lands and Natural Resource Operations, and Regional Development by Ardea Biological Consulting Ltd., Smithers, BC. 14 pages. [Download here](#).

