Management Options and Related Actions for Mountain Caribou in British Columbia

Mountain Caribou Science Team *19 July 2006*

Purpose

The purpose of this report is to describe the broad-scale actions that the Mountain Caribou Science Team considers necessary to meet defined management options for mountain caribou, using consistent criteria and definitions.

Methods

Review of Existing Information

In developing actions the Science Team drew heavily on previous work by Recovery Implementation Groups, land-use planning processes, as well as outcomes of research and related management undertaken by various members of the Team. Primary scientific literature, much of which was published by Science Team members, also informed the development of actions.

Definition of Management Options

The Science Team developed a series of options that defined different goals related to mountain caribou management, from maintaining current practices to achieving fully self-sustaining populations. Within these options the Science Team developed *strategies* that consisted of a series of management *actions* that they considered necessary to achieve the option.

Options and related actions were defined for large, contiguous "planning units" rather than for individual subpopulations. The current, fragmented distribution of mountain caribou subpopulations is an artefact of the ecotype's continuing decline, and recovery will require actions outside their current, occupied range.

Status Quo:

Continue existing land use commitments, recreation and hunting policy (including ongoing actions that are directed at maintaining or recovering mountain caribou, but excluding time-limited actions such as planned transplants or temporary moratoria), regardless of population status and trend. Take no incremental actions that require policy changes (e.g., future herd augmentation, predator control, expanded primary prey management, new recreational zoning or additional habitat protection).

Maintain Current Population:

Strategies that include whatever actions are necessary to ensure that a planning unit population remains at or above its current size for the next 20 years.

Maintain Population with Resilience:

Strategies to maintain or increase a planning unit population to 75-100 animals, which is the minimum that is able to withstand fluctuations in random events and environmental variables and, if the population begins to decline, to persist while the causes of decline are investigated and revised strategies are developed and implemented. The goal would be to maintain populations at least at their current levels or, where necessary, to increase them to 75-100 animals. Note that due to this small size, a subpopulation will likely decline to where it

is highly vulnerable before appropriate management actions are developed and applied. As a result, management will likely need to be aggressive at times.

Assisted Long-term Sustaining:

Strategies applied in sufficient intensity and duration to achieve a population that is able to withstand random events and other environmental variables with ongoing habitat management and protection, management of backcountry recreation and relatively low but sustainable populations of specific caribou predators and their primary prey (through a mix of hunting and habitat management; targets have yet to be determined). Planning unit populations are sufficiently large and widespread to ensure regular exchange of animals with other planning units (i.e., a functioning metapopulation).

Self-sustaining Population:

Restoring and maintaining habitat conditions that allow mountain caribou populations within planning units to withstand random events and other environmental variables without the need for long-term, predator-prey management.

Approach to Strategy Development

Mountain caribou subpopulations have been fragmenting and declining for many decades. The immediate challenge in mountain caribou recovery is to reverse this decline. The actions required to establish an increasing population ("recovery phase") are generally the same among all management options that result in recovery. The principal distinction among options is the quantity (i.e., extent) and quality of habitat that is recovered. The recovery phase is expected to last for 60-100 years, after which less intense management effort will be required ("maintenance phase").

Principles and Assumptions

The development of strategies was based on the following principles and assumptions:

1. Strategies associated with all options except *status quo* were designed to maintain or increase the current spatial distribution of mountain caribou within planning units.
2. Ongoing monitoring of mountain caribou must be sufficient to detect relatively small population changes (15-20% within 3 years). Predators and associated primary prey populations also need to be monitored in sample areas.
3. Management actions will need to be implemented immediately when required (e.g., predator management or control actions, caribou herd augmentation).
4. Because of the considerable uncertainty, possible climate change effects were not specifically considered in the development of strategies. Although the extent and distribution of caribou habitat is expected to change over the decades required for mountain caribou recovery, climate changes are unlikely to be sufficient to threaten the overall viability of the mountain caribou ecotype, although more intense management actions might be required (e.g., greater fire suppression, additional predator management or control).
5. Although strategies were developed independently for different planning units, the likelihood of successful recovery depends very much on the recovery of subpopulations in neighbouring planning units (i.e., metapopulation dynamics).

Management Actions and Targets

Possible management actions were categorized by the type of activity and for specific targets or type of action

(Table 1).

Table 1. Management actions and associated targets considered by the Mountain Caribou Science Team.

Management Action	Target	Comments
Recreation Management	Snowmobiling	
	Heli-skiing	
	Snowcat skiing	
	Backcountry skiing	
	Resorts	
Primary prey population management	Mule deer	
	White-tailed deer	
	Elk	
	Moose	
Primary prey habitat management	Operating restrictions	
	Reserves	
Caribou population management	Augmentation	Refers to translocating caribou from a large northern caribou subpopulation into a small mountain caribou subpopulation
	Maternity pens	Temporarily placing pregnant cows in enclosures to prevent the loss of calves and cows during calving
	Captive breeding	
Caribou habitat management	Operating restrictions	
	Reserves	
Predator population management	Black bears	Grizzly bears and wolverines were also identified as important predators, but their conservation status means that they are unlikely to be the initial focus of population management actions; however, their populations could be reduced, if necessary
	Cougar	
	Wolf	

Intensity, Duration and Extent of Management Actions

Management actions were categorized according to their estimated intensity, extent (area affected) and duration. These were broad-scale estimates and were associated with considerable uncertainty. The actions will need to be refined through additional analysis, research and adaptive management trials as the recovery process proceeds. Some actions were proposed for an entire planning unit while others were proposed for smaller areas within planning units, which often corresponded to the range currently occupied by an isolated subpopulation.

Results

Feasibility of Management Options

It was the Science Team's opinion that not all management options would result in the long-term persistence of mountain caribou within a planning unit (Table 2). Current management (i.e., the *status quo* option) was considered inadequate to ensure persistence of resident mountain caribou in any planning units. Maintaining the current population in planning units with very small subpopulations (e.g., <75 animals) was considered infeasible because of the impractical resources required to closely monitor and respond aggressively to any detected decline in the size of subpopulations so close to extirpation.

Conversely, achieving a self-sustaining population in some planning units was also considered infeasible, usually because the recovery of sufficient habitat to support a relatively large population was unlikely, given significant and essentially permanent landscape changes.

In the following sections current management is presented only in general terms. Describing in detail all current management actions related to mountain caribou was beyond the scope of this document.

Table 2. Estimated feasibility of management options by planning unit (feasible +, infeasible -).

Planning Unit[1]	Status quo	Maintain Current Population	Maintain Population with Resilience	Assisted Long-term Sustaining	Self-sustaining
1A Southwest Kootenay	-	-	+	+	-
1B Southeast Kootenay	-	-	+	+	-
2A South Monashee	-	-	+	-	-
2B Central Kootenay	-	+	+	+	+
3A Revelstoke-Shuswap	-	+	+	+	+
3B Kinbasket	-	-	+	-	-
4A Wells Gray-Thompson	-	+	+	+	+
4B Mount Robson	+[2]	-	-	-	-
5A Upper Fraser	-	+(-[3])	+	+	+
5B Quesnel Highland	-	+(-[4])	+	+	+
6 Hart Ranges	-	+	+	+	+

[1]Planning unit names differ from those in recent mountain caribou recovery documents; these names better reflect the geographic area of each planning unit
[2]No subpopulations are resident in this planning unit but adjacent subpopulations use the area
[3]Narrow Lakes subpopulation
[4]Barkerville subpopulation

Recreation Management

The following actions apply to all management options likely to result in mountain caribou recovery.

Snowmobiling:

The Science Team drafted additional closures related to snowmobiling activity. Maps of proposed closures were prepared for planning units 4A-6B as part of the Cariboo and Hart Mountains Recovery Implementation Plan. In addition, the following areas were identified for closure to snowmobiling activities, in addition to closures already in place (enforcement required):

- 1B Southeast Kootenay: headwaters of Moyie River and Kid Creek and from head of Meachen Creek through upper Kianuko and Sanca creeks
- 2A South Monashee: Blanket Glacier and immediately surrounding subalpine; ridge north of Greenbush Lake and around Joss Mountain
- 2B Central Kootenay: Silvercup Ridge
- 3A Revelstoke-Shuswap: North portion of Frisby, Sale, south portion of Keystone, Caribou basin, north of Downie on the east side of the Revelstoke reservoir and on the west side north of Frisby (much of this area is already closed). The area in upper Seymour River including the north end of Anstey Ridge, to Pettipiece Pass then up to Blais Creek and west to Mount Grace and the broad plateau to the west of Mt. Grace; north portion of Queest Mountain.

Boundaries of these proposed closures have been drafted for planning unit 3A but not for 1B, 2A or 2B.

Heli and Snow-cat Skiing and Resorts:

Consistent with the Cariboo and Hart Mountains RIG document, the only suggested change in current heli- or snow-cat skiing tenures is a reduction in the size (approximately 25%) of one heli-ski operation. In addition, a closure on the northern end of Anstey Mountains was suggested. Tenure operators in other areas are expected to following operating guidelines designed to minimize interactions with mountain caribou.

The Cariboo and Hart Mountains RIG identified a series of areas where helicopter activity should be restricted and no new tenures granted. In other parts of mountain caribou range, the Science Team assumed that there would be no new tenures granted within caribou management zones; however, refined mapping is planned to reduce the extent of this restriction.

Backcountry Skiing:

There were no areas identified for immediate restrictions to backcountry skiing; however, the Science Team expressed concern that use was increasing in several areas and restrictions might be needed in the future.

Primary Prey Population Management

For all management options likely to result in mountain caribou recovery, the Science Team suggested changes in hunting management sufficient to reduce primary prey populations (i.e., non-caribou ungulates such as moose, elk and deer) throughout the range of mountain caribou to generally lower but stable numbers. This is occurring in some areas (e.g., moose in Revelstoke), but populations will need to be reduced over larger areas or to a greater degree than can be accomplished with current regulations. There is uncertainty in the ability of hunters to sufficiently decrease numbers of some species.

Primary Prey Habitat Management

Managing primary prey habitat to support mountain caribou recovery involves limiting the abundance of shrub and young forest habitat within and adjacent to mountain caribou habitat. In general, maintaining and restoring mountain caribou habitat will result in sufficient reductions of primary prey habitat within caribou range.

Where the goal is a self-sustaining population of mountain caribou, extensive habitat surrounding caribou range

will need to be managed for a forest age distribution that provides habitat for only relatively small populations of moose, elk and deer.

Predator Population Management

For all management options likely to result in mountain caribou recovery, the Science Team suggested extensive predator management throughout the range of mountain caribou. This would involve more liberal hunting of cougars and wolves, as well as black bears in the 1A Southwest Kootenay planning unit. The targeted removal of individuals (cougars) or packs (wolves) would also be required in some areas. If the self-sustaining option is chosen, predator-prey management would be necessasry until the habitat has recovered. Other options would require the use of ongoing predator-prey management, though to a lesser degree when primary prey habitats are limited.

Caribou Population Management

The Science Team concluded that augmentation is likely required for recovery of mountain caribou populations in the following planning units (not listed in order of priority):

- 1A Southwest Kootenay
- 1B Southeast Kootenay
- 2A South Monashee
- 2B Central Kootenay (Duncan subpopulation)

In addition, augmentation might be considered in the Columbia South and Kinbasket subpopulations of 3A Revelstoke-Shuswap and 3B Kinbasket planning units, respectively.

Caribou Habitat Management

The following section summarizes suggested habitat management for options likely to result in mountain caribou recovery, beyond what is currently being managed as caribou habitat in each planning unit. Current (*status quo*) and proposed caribou management zones (under the management option associated with the greatest incremental change, referred to as “maximum recovery”) are illustrated in Appendix I.

Population Connectivity:

If *assisted long-term sustaining* is the option selected for one or more of the southern planning units (1A to 3B), then additional connectivity habitat will be required to help ensure that some animals move between existing subpopulations. The extent of these connectivity zones depends on the relative isolation of a subpopulation and features of the landscape (terrain ruggedness, lakes and reservoirs, roads, etc.). The specific management practices for these areas have yet to be drafted because little is known about the habitat requirements of dispersing caribou, but the intent is to create conditions that allow mountain caribou to move freely between different subpopulations.

1A Southwest Kootenay:

The Science Team suggested that additional no-harvest areas be secured in the 1A Southwest Kootenay planning unit for all management options except status quo. Most of the area is privately owned but a small portion is crown forest.

1B Southeast Kootenay:

For the *maintain with resilience* option the Science Team suggested that harvesting end within the bounds of all

current Kootenay-Boundary Higher Level Plan linework except connectivity corridors. For the *assisted long-term sustaining* option, reverting to pre-Higher Level Plan draft linework (by Utzig and Kinley) with no harvesting was suggested.

2A South Monashee:

All management options that are likely to result in recovery of mountain caribou in the Monashee planning unit will require fairly large additional areas to be managed as caribou habitat with no forest harvesting.

2B Central Kootenay:

The Science Team estimated that no additional habitat management would be required to maintain the current population of mountain caribou in this planning unit, or to achieve the *maintain with resilience* option. The *assisted long-term sustaining* option would likely require a 40% mature/old forest retention requirement in medium and high capability habitats within the current modified harvest zone, in addition to maintaining the no-harvest zones currently in place. To achieve a fully self-sustaining subpopulation would require no forest harvesting in all medium and high capability habitats of the current modified harvest zone in addition to the current no-harvest zones.

3A Revelstoke-Shuswap:

No additional habitat management beyond current practices within habitats defined by the 2005 caribou habitat linework for the Revelstoke portion was suggested for this planning unit for the *maintain current population* and *maintain with resilience* recovery options; however, habitat management in the Salmon Arm portion of the planning unit may be inadequate, depending on the outcomes of current discussions.

For the *assisted long-term sustaining* recovery option, reduced forest harvesting within the latest (2005) linework may be needed, particularly in areas capable of supporting deer and moose. Moving to the *self-sustaining* option where no predator management would eventually be needed requires the elimination of forest harvesting within the 2005 linework as well as in ungulate winter range.

3B Kinbasket:

No additional habitat management was suggested for this planning unit, although additional connectivity habitat is proposed within 2B Central Kootenay and 3A Revelstoke-Shuswap to ensure exchange of animals with subpopulations to the south. In addition, substantial connectivity habitat might be required to connect with the 3A Revelstoke-Shuswap subpopulations.

4A Wells Gray-Thompson, 5A Upper Fraser, 5B Quesnel Highland, 6 Hart Ranges:

The Science Team's actions reflect the Cariboo and Hart Mountains recovery implementation plan, which recommended no harvest within “core” habitat for the *assisted long-term sustaining* option. Moving to the *self-sustaining* recovery option would require managing the forest age distribution of large areas adjacent to mountain caribou range.

4B Mount Robson:

There is no subpopulation that resides entirely within the Mount Robson planning unit and the Science Team did not suggest re-establishing a subpopulation there; however subpopulations of adjacent planning units range into the planning unit.

Conclusions

The following conclusions can be drawn from the Science Team's management options and related actions:

- Incremental caribou habitat requirements are relatively small for the *maintain current population*, *maintain with resilience*, and *assisted long-term sustaining* options for most planning units (where these options are considered feasible); the exceptions are 1A Southwest Kootenay and 2A South Monashee;
- Management options likely to result in mountain caribou recovery rely heavily on predator and prey population management, as well as restrictions on motorized winter recreation;
- The principal distinction between the *assisted long-term sustaining* and *self-sustaining* options is the extent to which hunting versus habitat management is used to limit populations of mountain caribou predators and their primary prey;
- Achieving a self-sustaining population throughout the entire range of mountain caribou is infeasible;
- Achieving self-sustaining subpopulations will require maintaining an older forest age distribution than currently exists adjacent to mountain caribou range.