

Interim Strategy for Predator/Prey Management Actions in Support of Mountain Caribou Recovery: Fiscal 07/08 and early fiscal 08/09

Government's recovery goal for mountain caribou is to:

“Halt the decline of mountain caribou within seven years for each Planning Unit and recover mountain caribou to 1995 population levels (2500 animals) across the mountain caribou range within 20 years in those Planning Units with greater than 10 animals.”

To achieve this goal, a mix of management actions, including incremental habitat protection, recreation management and predator-prey management will be required. This mix of specific actions required to achieve recovery will vary in space and time, and there is considerable uncertainty related to the intensity and extent of actions required to achieve the recovery goal (Mountain Caribou Science Team 2006).

This document presents an interim predator strategy and associated actions to be undertaken in late 2007 and early 2008. This is an interim strategy that provides a rationale for actions to be taken immediately, based on currently available information and expert opinion. A full, long-term and integrated predator-prey strategy will be drafted in spring/summer of 2008 based on more extensive consultation with stakeholders and peer review.

An interim strategy is required because the size of many mountain caribou subpopulations is critically low and any delay in the implementation of management actions poses additional risk to these herds. This is particularly true for predator-related actions, because predation is recognized as the limiting factor and greatest proximate threat to mountain caribou (Mountain Caribou Science Team 2005, Wittmer et al. 2005).

Although habitat loss and fragmentation is largely the ultimate cause of mountain caribou declines, additional habitat protection will have no positive effect on mountain caribou demography for many years. As such, predation and not habitat is currently the limiting factor on critically small herds. Without immediate action to reverse population trends by reducing predation losses, some mountain caribou subpopulations may be extirpated before the benefits of additional habitat protection, prey management, and recreation management are realized. Of particular concern are those herds in the planning units 1B (South Purcells), 3A (Columbia South), and 5A (Narrow Lakes). A high level of risk to these herds requires a precautionary approach to predation.

Long-term Goals

The goals of the predator strategy are to:

1. stimulate population growth of mountain caribou within three years; and,
2. maintain a positive growth rate over the long term.

Long-term Objectives

To achieve the population goals outlined by government, predator management actions need to be sufficiently intense to demonstrate within the first two years of the program:

1. caribou calf recruitment >15 per cent in March (as a proportion of the total population);
2. adult survival ≥ 88 per cent per annum; and,
3. population growth ≥ 7 per cent per annum.

If these objectives are not met after two years, the program will be re-evaluated.

The actions outlined in this report represent the first steps towards achieving these goals and objectives. They arose from consultations with agency biologists, Mountain Caribou Science Team members and external experts.

Short-term Objectives

The objectives for the interim strategy are to:

1. implement immediate predator removals in critically endangered subpopulations, where feasible;
2. gather additional information on predator and prey population sizes, distributions and trends, in anticipation of broader actions in the future; and,
3. assess the feasibility of removal techniques in specific areas.

Principles

Several principles underlie the predator management actions:

1. the strategy supports multi-year management programs initiated in regions in previous years;
2. actions must be technically feasible;
3. interim actions are focussed on most critically endangered herds where feasible; and,
4. actions should be based on adaptive management principles, wherever possible.

Mountain Caribou Predator-Prey System

Mountain caribou persist in a complex multi-predator and multi-prey system that varies throughout the range. Wolves are the most significant predators of mountain caribou in the north and cougars are the most significant in the south. Bears are significant predators throughout the range and wolverines are also known to depredate caribou.

The focus of predator management will be on wolves and cougars both, because together they are the most common predators of mountain caribou, and because they are ungulate specialists whose numbers are assumed to have been most strongly influenced by increasing numbers of moose, deer, and elk in and adjacent to mountain caribou habitat.

Predator Management Methods

Predator Population Monitoring

Wolf surveys will be conducted during winter 07/08 in specific planning units to collect baseline information on population size, distribution, trend, and response to any removals.

Wolf numbers will be estimated by collecting track count data from the ground and air, radio telemetry data (in some planning units), interviews with trappers and other knowledgeable residents, and analysis of hunting and trapping data. These data will be integrated to generate late winter population estimates or indices.

There will be extensive radio-collaring of wolves during winter 07/08 and location fixes will be used to generate detailed maps of pack territories throughout most of the mountain caribou range.

Because cougars are solitary and secretive predators, inventory data are much more difficult to collect. As in the past, estimates and indices of population size and trend will be developed from hunter survey data.

Caribou Population Monitoring

It is essential to tie any predator management action to annually measured response variables (caribou recruitment and adult survival). Caribou calf recruitment will be estimated by the number of calves/total herd size during March, 2008. Adult survival will be calculated from population estimates and recruitment data (Hatter and Bergerud 1991), except where there are sufficiently large samples of radio-collared animals in a subpopulation to derive a more reliable estimate through mark-resight analyses.

Complete censuses of all herds are planned every three years (next scheduled for spring 2009), although many herds will continue to be surveyed annually, where warranted and where resources are available (see below for planned 07/08 schedule).

Wolf Removals

There is concern among technical experts that the current goals associated with predator management may not be achieved if options for wolf management are limited to conventional trapping and hunting. Some problems with relying on trapping or snaring alone include:

- removal of entire packs may be possible in some areas with trapping/snaring (if that is the goal - see below), but if unsuccessful could lead to disrupted pack social structures and, ultimately, higher birth rates and perhaps subsequent kill rates on caribou;
- lethal snares/traps can not be used to selectively remove individual pack members;
- snares and traps are seen as less humane than some other options;
- non-target species might be killed with snaring/trapping;
- traps and snares are impractical to set and monitor in remote or inaccessible areas; and,
- traps and snares are impractical in deep snow areas because snow fouls the operation of both devices (although snaring in spring might be practical at den sites - see below).

Although trapping/snaring can be effective, the selective, lethal removal of wolves using these techniques can be considered in only a portion of mountain caribou range. These areas do not always correspond to areas where biologists believe that removals are most critical to the recovery of specific subpopulations of caribou.

Changes to hunting regulations are also not optimal for several reasons:

- hunting can also disrupt pack social structure because entire packs are rarely removed;

- wolves are not a popular game species and the response of hunters to expanded opportunities is limited; and,
- specific areas and packs can not be targeted effectively.

Hunting opportunities play an important role in managing B.C.'s wildlife populations, but changes to hunting regulations alone are unlikely to be sufficient to achieve specific goals related to affecting mountain caribou recovery.

Cougar Removals

In contrast to wolves, conventional hunting techniques using hounds to track and tree cougars are highly effective, and are preferred to reduce cougar populations in support of caribou recovery. Because cougars are such efficient predators, a single cougar can be responsible for many caribou deaths in a short time if a herd is encountered. Therefore, it is important to have ability to contract houndsmen to respond quickly to any reports of caribou kills where cougars are suspected.

Wolf Fertility Control

The goal of fertility control is to reduce or limit a wolf pack to a single alpha pair (the alpha male and female). This results in lower predation rates on ungulates, particularly during summer when wolves are travelling individually or in small groups (two-three pack members).

Previous research has found that a sterilized alpha male and female pair will mate in March, dig a den in May, and defend their territory throughout the year (Spence et al. 1999). This maintains the structure and distribution of wolf packs while reducing the overall density of wolves on the landscape. Of course reducing the number of wolves per pack does not eliminate the mortality risk to caribou. In some circumstances, caribou populations are simply too low to tolerate even very low predation rates.

In terms of methods, the most effective situation is to remove an entire pack first, and then capture the immigrating alpha pair. The captured wolves are then sterilized (surgically or chemically), fitted with radio-collars and monitored monthly to determine their survival rates and territory use. This method is preferred to capturing and sterilizing the alpha pairs in existing packs because the immigrating pair has no pups, and are substantially easier to isolate. Reducing existing packs to the alpha pair may be simpler for packs that have previously collared animals because the social structure of the pack may already be known.

Supporting Research

Isotope analysis can be used to roughly predict the diet of predators. This requires extensive samples of hair and tissue from predators, and samples from all potential prey species. Only a small portion of the necessary prey data has been collected to date and it will take several years to build a reference database over the entire range of mountain caribou. Although isotope analyses provide important diet information, data will not be sufficient to definitively point to wolf packs or individual predators for removal.

MOE will be collecting reference predator and prey samples during winter 2007-8 (and onward) with the intention of using isotope analyses in combination with, predator track

counts, and movement data (provided by radio collars) to help prioritize wolf packs for removal or reduction in future years.

MOE is currently developing standard methods for predator necropsies. Necropsies of predators will indicate, age, gender, relative body condition, reproductive status and body size. These data, if collected over several years, can be used to index population size and trend.

The Role of Primary Prey Management

The primary prey component of the management strategy will be implemented only after demonstrated success of predator-related actions. This is to reduce the probability of prey switching by predators from their primary prey (moose, deer and elk) to mountain caribou, if primary prey numbers are reduced but predator numbers are not (natural reductions in predator numbers can lag prey reductions by several years). Most likely, two years of predator reductions will be required before specific prey reductions are implemented.

The extent, duration and intensity of primary prey reductions required to achieve mountain caribou recovery goals has yet to be developed; however, this will be an important component of the predator-prey strategy that is being developed in early 2008.

Predator Management Actions for late fiscal 07/08 and early 08/09

Hunting regulations for predators have changed for 2007-8 in many parts of mountain caribou range (Appendix I). The objective of recovering caribou was not necessarily the only motivation for these changes. Adjustment of bag limits and season lengths will likely result in some localized benefits to caribou, particularly in summer.

There are no plans to reduce cougars through direct control measures. Cougar numbers are naturally low in the northern portion of caribou range and liberal hunting regulations in the south have resulted in relatively low and stable populations. If evidence of cougar predation on caribou is discovered, attempts will be made to remove animals using conventional hunting techniques in accordance with MOE policy.

In early 2008, wolf removals will continue as part of an ongoing (since 2002) pilot project in the Quesnel Highland Planning Unit (5-B, Wells Gray North), and will be initiated in Narrow Lakes, South Purcells, and potentially Columbia South (in early fiscal 2008-9) according to existing MOE policy for protecting species at risk.

MOE is currently collecting tissue and hair samples from predators and prey throughout mountain caribou range for isotope analyses. In addition, wolf carcasses recovered from control actions will be necropsied.

Subpopulation-specific Management Actions for Late Fiscal 07/08 and Early 08/09

The following table outlines predator/prey management and monitoring actions:

| Subpopulation | Demographic Risk | Monitoring Requirements | Predator Reductions | Other Actions | Comments |
|-------------------------|------------------|--|--|--|---|
| Hart Ranges | low | caribou recruitment survey | none | experimental moose reduction is on-going in the Parsnip | largest caribou subpopulation is stable; therefore, only limited actions are being considered |
| Narrow Lake | high | wolf survey, caribou recruitment survey | Removal by trapping of two wolf packs with territories overlapping caribou ranges | | Small, declining, and isolated mountain caribou herd demands immediate action to reduce the risk of predation |
| North Caribou Mountains | moderate | wolf survey, caribou recruitment survey, radio-collaring of animals in 4 packs | none | sterilization of breeding pair (and sub-dominants) in 4 packs | on-going sterilization project |
| Barkerville | high | wolf survey, caribou recruitment survey, radio-collaring of animals in 3 packs | none | sterilization of breeding pair (and sub-dominants) in 3 packs | on-going sterilization project |
| Wells Gray North | moderate | wolf survey, moose survey, caribou recruitment survey | removal of incidentally trapped wolves that are not candidates for collaring/fertility control | sterilization of breeding pair (and sub-dominants) in 6 packs (currently radio-collared) | on-going sterilization project |
| Wells Gray South | moderate | wolf survey, caribou survey, radio-collaring of animals in 6 packs | none | | deep snow makes removal of wolves by trapping unfeasible |

| Subpopulation | Demographic Risk | Monitoring Requirements | Predator Reductions | Other Actions | Comments |
|----------------------------------|---|---|--|---------------|--|
| Groundhog | high | wolf survey, caribou survey, radio-collaring of animals in 3 packs | none | | deep snow makes removal of wolves by trapping unfeasible |
| Columbia North and South; Frisby | high in Columbia South and Frisby, moderate in Columbia North | wolf survey, caribou survey, radio-collaring of wolves in 3-4 packs, cougar collaring | Potential for wolf removals (1-2 packs) in Columbia South at den sites in early fiscal 2008-9 once snow melts* | | deep snow makes removal of wolves by trapping unfeasible; four wolf packs are currently radio-collared; moose population has been reduced (for other reasons) without concomitant reductions in wolves |
| Nakusp/Duncan | moderate in Nakusp, high in Duncan | wolf survey, caribou survey, moose survey | none | | deep snow makes removal of wolves by trapping unfeasible; at least 5 packs in the area |
| South Purcells | high | wolf survey | Removal by trapping of two wolf packs with territories overlapping caribou ranges | | subpopulation is precariously small (16), in decline, and predation of any kind poses a serious risk to its persistence; augmenting with animals from elsewhere is being considered but predator concerns need to be addressed first. Additional packs in the area but outside of caribou ranges |
| South Selkirks | high | wolf survey, caribou survey | none | | no specific actions because predator populations are considered low |

*Wolf removals at 1-2 den sites might be piloted in spring 2008 (after March 31) in the 3-A planning unit. MOE staff will be exploring the feasibility of such removals and developing methods during fiscal 2007-8.

Literature Cited

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Appendix I. Changes to Predator Seasons in Mountain Caribou Recovery Areas 2007-8

Wolves

Wolf Hunting Season in caribou recovery areas in Region 3 (MUs 3-34 to 3-44) was extended to Aug 1 - June 15 and the bag limit eliminated. Previously, the season was Sept. 10 - March 31 with a bag limit of 3. Bag limits for wolves in caribou recovery areas in Regions 5 (MUs 5-2, 5-15) and 7A (MUs 7-2 to 7-9, 7-16 to 7-18, 7-23) were also eliminated.

The wolf trapping season in Region 3 (same MUs) was extended by one month to March 31. The previous season was Oct. 15 to Feb. 28

Cougars

Cougar Hunting Season in caribou recovery areas in Region 3 (MUs 3-34 to 3-44) opened almost 11 weeks earlier (on Sept. 1). Previously, the season was Nov. 15 - March 31.

Cougar seasons in Region 4 attempt to balance data that suggests past harvest has not been sustainable in some portions of the region with caribou recovery objectives that require minimizing predation risk. The anticipated reduction in harvest will be small.

Bag limits were changed to a bag limit of one cougar for the entire region. Previously the bag limit was two in the West Kootenays, one in East Kootenays. Season dates were changed to Sept. 10 – Feb. 28 or until female quota reached; previously went to March 31 in West Kootenays, Feb. 28 in East Kootenays.

Sub-regional quota: Female quota for MUs 4-1 to 4-4, 4-21 to 4-26, 4-34 to 4-37, 4-40 is 10; for MUs 4-9, 4-14 to 4-19, 4-27 to 4-33, 4-38, 4-39 is 10; for MUs 4-5 to 4-8, 4-20 is 5. Previously East Kootenays was 20, West Kootenays was 25. Three of the four caribou recovery areas in Region 4 occur in the West Kootenay (only three MUs are not in one of these three recovery areas). Three MUs in the East Kootenay are in a caribou recovery area and this regulation will institute a separate quota for these units with the goal of maintaining recent levels of kill.

A new cougar season was opened in Region 7A (MUs 7-2 to 7-9, 7-16 to 7-18, 7-23) from Sept. 10 to March. 31, bag limit two. Compulsory inspection is required.

Black Bears

The spring Black Bear Hunting Season in caribou recovery areas in Region 3 (MUs 3-34 to 3-44) was extended by two weeks to April 1-June 30. Previously, the season was April 1 - June 15.

New trapping seasons for black bear were opened in Region 3 ((MUs 3-34 to 3-44) from Oct. 1 -May 31 and in Region 4 from Oct. 15 - May 15. Trapping season was extended in Region 5 (MUs 5-2 and 5-15) to Oct. 1 - May 30 from Oct. 15 - May 15. Trappers can take two black bears under a trapping licence (in addition to two bears under a hunting licence). Note: Trappers harvesting black bear must use only a firearm or bow, conventional trapping methods (snare, leg-hold traps, etc.) are prohibited.