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ISSUE PAPER: Primary Prey Management

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In British Columbia, biologists and stakeholders are focusing on the causes for declining woodland caribou herds. It is estimated that there are only 16,000 caribou in the province today, congregated in 54 herds, residing in one of three ecotypes: boreal, southern mountain, and northern mountain caribou. All six of the boreal herds and 23 of the southern mountain herds are decreasing with many facing extirpation. Of the herds in BC, 14 have fewer than 25 animals.[1]

One of the main threats to most caribou populations is a high rate of predation by wolves, bears (black and grizzly), wolverine, and cougars that is out of balance from the natural cycle (predator type and numbers vary by herd area). This can happen when natural events (forest fires) and human activity (such as logging) convert large areas of mature forests to young forest landscapes. These young, open forests provide ideal foods for deer, elk, and moose. These ungulate species are the primary prey of wolves and cougar. As these primary prey species move into caribou habitat, they are followed by wolves, which then hunt the caribou as a secondary prey.[2]

Primary prey theory suggests that impacts to secondary prey, in this case caribou, can be mitigated by limiting populations of the primary prey species of moose through more liberal moose hunting seasons. The theory contends that wolves will lose interest in an area when the populations of primary prey drop, and then either die off or disperse to a new area, thus sparing the remaining population of caribou. The theory ignores the fact that even if moose decline, there are a host of other secondary prey species that can sustain predator populations.

Traditionally, caribou live in low densities across large undisturbed areas that allow them to naturally protect themselves from predation. Caribou utilize both high open alpine and low elevation forested habitats surviving on food sources suitable for caribou, but unappealing to most other species. Their diets consist of grasses, sedges, dwarf birch, willow, flowering plants, and, most importantly, a variety of lichen. Due to the deep snow country of many southern mountain caribou herds, they rely on lichens such as witch's hair or old man's beard that thrive in mature forests. Northern caribou herds, however, rely on low-elevation pine lichen (which for many herds has been removed through current logging practices) as well as alpine lichens. As a result, caribou are highly dependent upon old growth forest and alpine areas for critical food sources. The loss of mature forests and alpine regions from logging, other human activity, and forest fires reduces the caribou's main food source, which may affect their health, pregnancy rates, and calf survival.[3] Many old growth areas have transformed into early seral habitats, which has caused moose to colonize historical caribou areas.

Caribou has been a species of special interest to many researchers because of its historical significance, drastic decline, and complex ecological situation. There is significant debate over the nature of relationships in multiple prey systems and the steps forward. Unfortunately, many studies

[1] Provincial Caribou Recovery Program, https://engage.gov.bc.ca/caribou/caribou-recovery-program/ Accessed May 2018

[2] Ibid.

[3] Provincial Caribou Recovery Program, https://engage.gov.bc.ca/caribou/caribou-recovery-program/ Accessed May 2018

"rely on predator control and monitoring programs that have not been executed over large enough areas or for adequate lengths of time."[4]

Multiple prey systems represent one of the most complex relationships in nature, whereas primary prey theory is a simplistic, passive approach to recovery that does not actually address the immediacy of high predator populations. The primary prey theory is not new, nor has it been proven to be effective (Parsnip and Revelstoke) and only effective when used in conjunction with predator control.

In 2002, BC's Ministry of Water, Land and Air Protection released a report entitled *A Strategy for the Recovery of Mountain Caribou in British Columbia* outlining a plan to support the revitalization of caribou populations in southeastern BC. The report refers to alternate prey theory (a.k.a. primary prey) but admits that the benefits of this approach remain largely speculative. It is now 2020 and that theory has been proven ineffective and the Bridger (2019) report shows that predator management works for caribou in BC.

The GOABC agrees that predator populations will grow in proportion to primary prey populations and that mortality of secondary prey will be incidental. In the case of caribou, they are somewhat protected by their low densities but, in the event of an encounter, caribou do not use escape terrain well and are easier for wolves to kill than moose. Studies have consistently predicted that caribou populations will decline when wolf density exceeds approximately eight animals per 1,000 km^2.

If alternate prey management was successful in reducing moose populations, there would still be a lag time between the decline of moose and the decline of the wolf population. During this period, a high population of wolves would result in an increase in the rate of incidental mortality of caribou.[5] Since caribou reproduce at a low rate, depensatory predation is particularly damaging for caribou populations held at very low densities. Populations could fall below the critical density threshold when moose populations have been reduced and predator populations are still high.

Primary prey theory is a product of social and political pressure to save caribou without having to conduct wolf control. However, after more than 15 years of research, we can conclude that the theory does not work without wolf control. Furthermore, there are volumes of peer reviewed research that clearly demonstrates the positive response caribou populations have to wolf control.

Timing of management measures is critical. In the current framework, all meaningful action is done reactively once a herd is at the point of no return. If we want to sustain caribou on the landscape in good numbers, then we must manage the things we can at the right period in time. This means managing predation and habitat prior to a herd declining. Ultimately, if we want woodland caribou in British Columbia, we need to ensure they have mature and contiguous forests, and predator management. Resources injected into primary prey theory are wasted. Caribou populations are at a critical point and need strong, decisive action to recover. If the desired wolf density is eight wolves per 1,000 km^2, government will need to take the appropriate action to ensure this target is not exceeded.

Please call Scott Ellis, Executive Director of GOABC, at 604-541-6332 if you have any questions.

[4] Robert Bruce Lessard, "Conservation of woodland caribou (Raniger tarandus caribou) in west-central Alberta: a simulation analysis of multi-species predator-prey systems." (PhD diss., University of Alberta, 2005).
[5] Ibid., 98.