

Woodland Caribou

(*Rangifer tarandus caribou*)

State Status: Endangered, 1982

Federal Status: Endangered, 1984

Recovery Plans: Federal, 1994



Figure 1. Woodland caribou.

Woodland caribou in southeastern British Columbia, northeastern Washington, and northern Idaho are a unique ecotype of caribou distinguished from other woodland caribou by their winter diet consisting almost exclusively of arboreal lichens. This trait allows them to inhabit the deep snow areas in the Selkirk Mountains above 4,000 ft, and these caribou are often referred to as “mountain caribou”.

Selkirk Mountain woodland caribou are medium-sized members of the deer family with males weighing up to 600 pounds and females 300 pounds. Caribou are distinguished from other members of the deer family by their large concave hooves, which allow them to walk snowshoe-style across deep snow. They also have distinctive antlers, which both sexes drop annually. Males possess larger antlers with one or two brow tines called “shovels” that extend over the face.

The mountain caribou population has been divided into 18 subpopulations (Wittmer et al. 2005), with the South Selkirk animals comprising the southern-most subpopulation and the only one that extends into the United States. Unlike the barren ground caribou that form large aggregations, woodland caribou form relatively small groups. Herd size ranges from single females during calving up to ~25 animals during late winter; small groups of 2-5 animals are typical during spring and summer.

Population status. Historically, woodland caribou ranged throughout much of Canada, and the northeastern, north-central, and northwestern U.S. The southern limit of woodland caribou range has contracted considerably since the 1800s due to overhunting, cutting of old growth forests, and a northward range expansion of the white-tailed deer. White-tailed deer are hosts to a parasitic meningeal worm, *Elaphostrongylus tenuis*, that is fatal to woodland caribou. Mountain caribou historically ranged as far south as the Salmon River in Idaho (Figure 2). In the 1950s, the Selkirk population was estimated



Figure 2. Historical and current range of mountain caribou (USFWS 2011).

at 100 animals. The last confirmed report of a caribou in Montana occurred in 1958. Since the 1960s, they have been restricted to the Selkirk Mountains of northeastern Washington, northern Idaho, and southeastern British Columbia. By the early 1980s this population had declined to 25-30 individuals.

Wakkinen et al. (1996) developed a census technique for the mountain caribou that has been used in recent years. This involves a 2-stage sampling effort: a "pre-census" fixed wing flight to determine caribou distribution and a "census" flight using a helicopter to count and classify individuals. The South Selkirks contained a minimum of 27 caribou in 2012, with 4 of these observed in the U.S., down from 36 in 2011 and 43 in 2010. Recruitment in the South Selkirks continued to be low (7%), with only 3 calves observed (Table 1; Degroot and Wakkinen 2012).

Habitat and limiting factors. Mountain caribou habitat is defined as old-growth forests of Engelmann spruce/subalpine fir and western redcedar/western hemlock, generally more than 100–150 years old. These forests support abundant arboreal lichens on which mountain caribou forage for up to 6 months of the year (Rominger 1995). The fall and early winter diet consists largely of dried grasses, sedges, huckleberry leaves, willow and dwarf birch tips, and arboreal lichens (Rominger and Oldemeyer 1989, Rominger et al. 1996).

Mountain caribou populations have been adversely affected by predation and habitat change as a result of timber harvest, fire, human settlement, roads and reservoirs. Mountain caribou avoid predators by spreading out over large areas of their high elevations habitat (USFWS 1994). In winter, predators follow

Table 1. Winter census, South Selkirk woodland caribou, 2002-2010 (DeGroot and Wakkinen 2012).

Year	Total (U.S.)
2002	34 (2)
2003	41 ^a (1)
2004	33 (3)
2005	35 ^b (2)
2006	34-38 (1)
2007	43-44 (2)
2008 ^c	46 (3)
2009 ^c	46 (3)
2010 ^c	43 (2)
2011 ^c	36 (0)
2012 ^c	27 (4)

^a Likely some double counting and therefore not a reliable count.

^b Not a complete census, must be considered a minimum count.

^c Combination fixed wing/helicopter survey.

deer, elk and moose to lower elevations, leaving the subalpine forests to caribou. In summer, when other ungulates and predators are more common in the high country, mountain caribou are relatively rare and spread out, which makes them infrequent prey of bears, wolves, and cougars (Wittmer 2004, 2007).

A shift in the predator-prey dynamics within the range of mountain caribou has been hypothesized as a major factor in the decline of mountain caribou (Rettie and Messier 1998, Wittmer et al. 2005). Timber harvest and fire result in the creation of young forest and edge habitat suitable for deer, elk, and moose. The higher densities of other ungulates in turn support higher predator densities leading to increased predation on adult female caribou (Wittmer et al. 2007). Wittmer et al. (2005) found predation to be the primary cause of mortality in 11 of 13 subpopulations and predation predominantly occurred during summer. Potential management actions to address high predation include managing for lower numbers of predators or their alternate prey, or managing habitat for the same result (Mountain Caribou Science Team 2005).

In a literature review, Mitchell and Hamilton (2007) reported that some research suggests that snowmobiles can displace caribou from winter habitat and have contributed to the caribou decline in British Columbia, while other literature suggests that the effects are unknown or pose little threat to the population (Wilson and Hamilton 2003, Seip et al. 2007). Compared to predation and the direct and indirect effects of habitat change, current levels of disturbance are considered a less significant (although additive) threat to the viability of mountain caribou (Mountain Caribou Science Team 2005).

Conservation activities. The USFWS Selkirk Mountain Woodland Caribou Recovery Plan was developed in 1985 and updated in 1994, and a BC Recovery Strategy was written in 2002 (USFWS1994, Mountain Caribou Technical Advisory Committee 2002). As part of the recovery plan, caribou were translocated from British Columbia to Washington to establish caribou in the western portion of the Selkirk Ecosystem (Almack 1998). Between 1996 and 1998, 43 animals were translocated; 32 in Washington and 11 just north of the border in B.C. Unfortunately, the augmentation effort coincided with a high mountain lion population in the Selkirk ecosystem, and mortality from predation and other causes was high (>50%; USFWS 2011).

A previous herd augmentation effort led by Idaho Fish and Game involved transplanting caribou from healthy populations in British Columbia to Idaho. A total of 60 caribou were transplanted: 24 in 1987; 24 in 1988; and 12 in 1990. Although neither the 1987-1990, nor the 1996-1998 1998 augmentations resulted in a long-term improvement in caribou distribution, the effort succeeded in maintaining and enhancing the number of caribou in the population as a whole.

In May 2011, some caribou habitat areas near Revelstoke, BC were closed to snowmobiles. In November 2011, the USFWS proposed designating critical habitat for the Selkirk woodland caribou in Boundary and Bonner counties in Idaho, and Pend Oreille County in Washington; the final rule was published in November 2012 (USFWS 2012). The rule designates 30,010 ac of national forest lands at or above 5,000 ft elevation as critical habitat.

In May 2012, a petition was filed by the Pacific Legal Foundation, representing Bonner County, Idaho, and the Idaho State Snowmobile Association, requesting that the southern Selkirk population be removed from federal listing on the grounds that it is not a listable entity. In response, the USFWS published a 90-day finding indicating that they would conduct a 12 month status review (USFWS 2012b).



Figure 3. Woodland caribou observed during aerial surveys in the southern Selkirk Mountains (from DeGroot and Wakkinen 2012).

Climate change. Climate change will likely alter the distribution and abundance of suitable caribou habitat, and will also change snow depths and persistence, which affect the seasonal movements of mountain caribou. The potential effects of climate change depend on the interaction, not only of seasonal temperatures and snowfall patterns, but also occurrence of wildfires, outbreaks of forest insects, and diseases (Mountain Caribou Science Team 2005). Although there is considerable uncertainty about the future effects of climate change, warmer and drier conditions generally favor deer, elk and moose, exacerbating changes in habitat and predation of caribou.

Partners and cooperators: U.S. Fish and Wildlife Service, Idaho Department of Fish and Game, U.S.

Forest Service Colville National Forest, British Columbia Ministry of Environment, Fish and Wildlife Compensation Program-Columbia Basin, University of British Columbia, Washington State University.

Literature Cited

- Almack, J. A., 1998. Mountain Caribou Recovery in the southern Selkirk Mountains of Washington, Idaho, and British Columbia. Progress report, October 1995-September 1998. Washington Department of Fish and Wildlife, Olympia, 45 pp.
- DeGroot, L. and W. Wakkinen. 2012. Woodland Caribou Census: South Selkirk Mountains. British Columbia Ministry of Natural Resource Operations and Idaho Department of Fish & Game. 6 pp
- Mitchell, S. and D. Hamilton. 2007. Snowmobiling and Mountain Caribou: a Literature Review of stewardship Practices. Version 4.0. Nanuq Consulting Ltd. Nelson, BC. Prepared for: Eileen Fletcher, Tourism Action Society for the Kootenays, Revelstoke, BC.
- Mountain Caribou Science Team. 2005. Mountain Caribou in British Columbia: A Situation Analysis. 19 May 2005.
- Mountain Caribou Technical Advisory Committee. 2002. A Strategy for the Recovery of Mountain Caribou in British Columbia. British Columbia, Ministry of Water, Land and Air Protection. 85 pp.
- Rettie, W.J. and F. Messier. 1998. Dynamics of woodland caribou populations at the southern limit of their range in Saskatchewan. *Canadian Journal of Zoology*, 76:251– 259.
- Rominger, E.M. 1995. Late winter foraging ecology of woodland caribou. Ph.D. Dissertation, Washington State University, Pullman, Washington. 68 pp.
- Rominger, E.M. and J.L. Oldemeyer. 1989. Early-winter habitat of woodland caribou, Selkirk Mountains, British Columbia. *Journal of Wildlife Management* 53: 238–243.
- Rominger, E.M., C.T. Robins, and M.A. Evans, 1996. Winter foraging ecology of woodland caribou in northeastern Washington. *Journal of Wildlife Management* 60:719–728.
- Seip, D. R., C. J. Johnson, and G. S. Watts. 2007. Displacement of Mountain Caribou from Winter Habitat by Snowmobiles. *Journal of Wildlife Management* 71:1539–1544.
- USFWS. 1994. Recovery Plan for Woodland Caribou in the Selkirk Mountains. Portland, Oregon. 71 pp.
- USFWS. 2012a. Designation of Critical Habitat for the Southern Selkirk Mountains Population of Woodland Caribou (*Rangifer tarandus caribou*): Final rule. *Federal Register* 77(229):71042-71082.
- USFWS. 2012b. Endangered and Threatened Wildlife and Plants; 90-Day Finding on a Petition To Delist the Southern Selkirk Mountains Population of Woodland Caribou. *Federal Register* 77(244): 75091-75093.
- Wakkinen, W., L. DeGroot, R. Clarke, and T. Hill. 2010. 2010 Woodland Caribou Census: South Selkirk Mountains. Idaho Fish & Game, British Columbia Ministry of Environment, and Fish and Wildlife Compensation Program – Columbia Basin. 7 pp.
- Wakkinen, W., B.B., Compton, P. Zager, and J.R. Skalski, 1996. A Census Technique for Monitoring Woodland Caribou. Idaho Department of Fish and Game, Bonners Ferry, ID.
- Wilson, S. F., and D. Hamilton, 2003. Cumulative effects of habitat change and backcountry recreation on mountain caribou in the Central Selkirk Mountains. *EcoLogic Report Series No. 10*. Prepared for; BC Ministry of Sustainable Resource Management, Nelson, Canadian Mountain Holidays, Banff AB, and Pope & Talbot Ltd., Nakusp BC.
- Wittmer, H. U. 2004. Mechanisms underlying the decline of mountain caribou (*Rangifer tarandus caribou*) in British Columbia. Ph.D. Dissertation. University of British Columbia, Victoria.
- Wittmer, H. U., A. R. E. Sinclair, and B. N. McLellan. 2005. The role of predation in the decline and extirpation of woodland caribou. *Oecologia* 144:257–267.
- Wittmer, H.U., B.N. McLellan, R. Serrouya, and C. D. Apps. 2007. Changes in landscape composition influence the decline of a threatened woodland caribou population. *Journal of Animal Ecology* 76:568–579.