DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

[Docket No. FWS–R1–ES–2012–0097]

[FXES11130900000C2-123-FF09E32000]

RIN 1018–AZ74

Endangered and Threatened Wildlife and Plants; 12-Month Finding on a Petition to Delist the Southern Selkirk Mountains Population of Woodland Caribou and Proposed Rule to Amend the Listing

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Proposed rule; 12-month petition finding.

SUMMARY: We, the U.S. Fish and Wildlife Service (Service), announce a 12-month finding on a petition to delist the southern Selkirk Mountains population of woodland

caribou (*Rangifer tarandus caribou*). This species is currently listed as endangered under the Endangered Species Act of 1973, as amended (Act). After review of the best available scientific and commercial information, we find that delisting the species is not warranted, but rather, a revision to the current listed entity to define a distinct population segment (DPS), consistent with our 1996 distinct population segment policy, is appropriate. As such, we propose to amend the current listing of the southern Selkirk Mountains population of woodland caribou by defining the Southern Mountain Caribou DPS, which includes the currently listed southern Selkirk Mountains population of woodland caribou, and we propose to designate the status of the Southern Mountain Caribou DPS as threatened under the Act. If we finalize this rule as proposed, the Southern Mountain Caribou DPS will be listed as threatened under the Act. This DPS includes the currently listed southern Selkirk Mountains population of woodland caribou, a transboundary population that moves between British Columbia, Canada, and northern Idaho and northeastern Washington, United States. We have determined that the approximately 30,010 acres (12,145 hectares) designated as critical habitat on November 28, 2012 (77 FR 71042), for the southern Selkirk Mountains population of woodland caribou is applicable to the U.S. portion of the proposed Southern Mountain Caribou DPS and, as such, reaffirm the existing critical habitat for the DPS should the proposed amendment to the listed entity become final.

DATES: We will accept all comments received or postmarked on or before [INSERT DATE 60 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]. Comments submitted electronically using the Federal eRulemaking Portal (see

ADDRESSES section, below) must be received by 11:59 p.m. Eastern Time on the closing date. We must receive requests for public hearings, in writing, at the address shown in the **FOR FURTHER INFORMATION CONTACT** section by [INSERT DATE 45 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

ADDRESSES: You may submit comments by one of the following methods:

(1) *Electronically*: Go to the Federal eRulemaking Portal: *http://www.regulations.gov*. In the Search field, enter Docket No. FWS–R1–ES–2012–0097, which is the docket number for this rulemaking. Then, in the Search panel on the left side of the screen, under the Document Type heading, click on the Proposed Rules link to locate this document. You may submit a comment by clicking on the blue "Comment Now!" box. If your comments will fit in the provided comment box, please use this feature of *http://www.regulations.gov*, as it is most compatible with our comment review procedures. If you attach your comments as a separate document, our preferred file format is Microsoft Word. If you attach multiple comments (such as form letters), our preferred format is a spreadsheet in Microsoft Excel.

(2) *By hard copy*: Submit by U.S. mail or hand-delivery to: Public Comments Processing, Attn: FWS–R1–ES–2012–0097; Division of Policy and Directives Management; U.S. Fish and Wildlife Service; 4401 N. Fairfax Drive, MS 2042–PDM; Arlington, VA 22203.

We request that you send comments only by the methods described above. We will post all information received on *http://www.regulations.gov*. This generally means that we will post any personal information you provide us (see the **Information Requested** section below for more details).

FOR FURTHER INFORMATION CONTACT: Michael Carrier, State Supervisor, U.S. Fish and Wildlife Service, Idaho Fish and Wildlife Office, 1387 S. Vinnell Way, Room 368, Boise, ID 83709; telephone 208–378–5243; facsimile 208–378–5262. Persons who use a telecommunications device for the deaf (TDD) may call the Federal Information Relay Service (FIRS) at 800–877–8339.

SUPPLEMENTARY INFORMATION:

Executive Summary

Why we need to publish a rule.

- For any petition to revise the Federal Lists of Endangered and Threatened Wildlife and Plants, we are required under the Act to promptly publish a finding in the **Federal Register** within 1 year. Listing, removing, or changing the status of a species as an endangered or threatened species can only be completed by issuing a rule.

- Any proposed or final rule affecting the status of a possible DPS as endangered or threatened under the Act should clearly analyze the action using the following three elements: discreteness of the population segment in relation to the remainder of the taxon to which it belongs; the significance of the population segment to the taxon to which it belongs; and the conservation status of the population segment in relation to the Act's standards for listing.
- Under the Act, any species that is determined to be an endangered or threatened species requires critical habitat to be designated, to the maximum extent prudent and determinable. Designations and revisions of critical habitat can only be completed through rulemaking. Here we propose to reaffirm the designation of approximately 30,010 acres (ac) (12,145 hectares (ha)) in one unit within Boundary County, Idaho, and Pend Oreille County, Washington, as critical habitat for the Southern Mountain Caribou DPS should the proposed amendment to the listed entity become final.

This rule proposes to amend the current listing of the southern Selkirk Mountains population of woodland caribou as follows:

- By defining the Southern Mountain Caribou distinct population segment (DPS), which includes the currently listed southern Selkirk Mountains population of woodland caribou;
- By designating the status of the Southern Mountain Caribou DPS as threatened under the Act; and

- By reaffirming the designation of approximately 30,010 ac (12,145 ha) as critical habitat for the Southern Mountain Caribou DPS.

The basis for our action. The southern Selkirk Mountains woodland caribou was listed under the Act on February 29, 1984 (49 FR 7390). According to our "Policy Regarding the Recognition of Distinct Vertebrate Population Segments Under the Endangered Species Act" (DPS policy; 61 FR 4722, February 7, 1996), the appropriate application of the policy to pre-1996 DPS listings shall be considered in our 5-year reviews. We conducted a DPS analysis during our 2008 5-year review, which concluded that the southern Selkirk Mountains population of woodland caribou met both the discreteness and significance elements of the DPS policy. However, we now recognize that this analysis did not consider the significance of this population relative to the appropriate taxon. The purpose of the DPS policy is to set forth standards for determining which populations of vertebrate organisms that are subsets of species or subspecies may qualify as entities that we may list as endangered or threatened under the Act. In the 2008 5-year review, we assessed the significance of the southern Selkirk Mountains population to the "mountain ecotype" of woodland caribou. The "mountain ecotype" is not a species or subspecies. The appropriate DPS analysis for the southern Selkirk Mountains population of woodland caribou should have been conducted relative to the subspecies woodland caribou (*Rangifer tarandus caribou*). Listing or reclassifying DPSs allows the Service to protect and conserve species and the ecosystems upon which they depend before large-

scale decline occurs that would necessitate listing a species or subspecies throughout its entire range.

We will seek peer review. We are seeking comments from knowledgeable individuals with scientific expertise to review our analysis of the best available scientific and commercial information, review our application of that science, and provide any additional scientific information to improve this proposed rule. We will consider all comments and information received during the comment period, and as a result, our final determination may differ from this proposal.

Information Requested

We intend that any final action resulting from this proposed rule will be based on the best scientific and commercial data available, and be as accurate and as effective as possible. Therefore, we request comments or information from other concerned governmental agencies, Native American tribes, the scientific community, industry, or any other interested parties concerning this proposed rule. We particularly seek comments concerning:

(1) The DPS' biology, range, and population trends, including:

(a) Habitat requirements for feeding, breeding, and sheltering;

(b) Genetics and taxonomy;

(c) Historical and current range, including distribution patterns;

(d) Historical, current, and projected population levels and trends of the local populations of the Southern Mountain Caribou DPS; and

(e) Past and ongoing conservation measures for the DPS, its habitat, or both.

(2) The factors that are the basis for making a listing or delisting determination for a species under section 4(a) of the Act (16 U.S.C. 1531 *et seq*.), which are:

(a) The present or threatened destruction, modification, or curtailment of its habitat or range;

(b) Overutilization for commercial, recreational, scientific, or educational purposes;

(c) Disease or predation;

(d) The inadequacy of existing regulatory mechanisms; or

(e) Other natural or manmade factors affecting its continued existence.

(3) Biological, commercial trade, or other relevant data concerning any threats (or lack thereof) to this DPS and regulations that may be addressing those threats.

(4) Additional information concerning the historical and current status, range, distribution, and population size of this DPS, including the locations of any additional local populations of this DPS.

(5) Current or planned activities in the areas occupied by the DPS and possible impacts of these activities on this DPS.

(6) Information regarding the current status and population trends of the local populations that comprise the Southern Mountain Caribou DPS. This information will be used to determine the status of the DPS as either not warranted for listing, threatened, or endangered.

(7) Information on the projected and reasonably likely impacts of climate change on the Southern Mountain Caribou DPS and its habitat.

Please note that submissions merely stating support for or opposition to the action under consideration without providing supporting information, although noted, will not be considered in making a determination. Section 4(b)(1)(A) of the Act directs that determinations as to whether any species is an endangered or threatened species must be made "solely on the basis of the best scientific and commercial data available."

You may submit your comments and materials concerning this proposed rule by one of the methods listed in the **ADDRESSES** section above. We request that you send comments only by the methods described in the **ADDRESSES** section.

If you submit information via *http://www.regulations.gov*, your entire submission—including any personal identifying information—will be posted on the website. If your submission is made via a hard copy that includes personal identifying information, you may request at the top of your document that we withhold this information from public review. However, we cannot guarantee that we will be able to do so. We will post all hardcopy submissions on *http://www.regulations.gov*. Please include sufficient information with your comments to allow us to verify any scientific or commercial information you include.

Comments and materials we receive, as well as some of the supporting documentation we used in preparing this proposed rule, will be available for public inspection on *http://www.regulations.gov*. All comments, materials, and supporting documentation are available by appointment, during normal business hours, at the Service's Idaho Fish and Wildlife Office (see **FOR FURTHER INFORMATION CONTACT**).

Background

Previous Federal Actions

In 1980, the Service received petitions to list the southern Selkirk Mountains population of woodland caribou as endangered under the Act from the Idaho Department

of Fish and Game (IDFG) and Dean Carrier, a U.S. Forest Service (USFS) staff biologist and former chairman of the International Mountain Caribou Technical Committee (IMCTC). At that time, the population was believed to consist of 13 to 20 animals (48 FR 1722, January 14, 1983). Following a review of the petition and other readily available data, the southern Selkirk Mountains population of the woodland caribou (*Rangifer tarandus caribou*) in northeastern Washington, northern Idaho, and southeastern British Columbia was listed as endangered under the Act's emergency procedures on January 14, 1983 (48 FR 1722). A second emergency rule was published on October 25, 1983 (48 FR 49245). A final rule listing the southern Selkirk Mountains population of woodland caribou (*Rangifer tarandus caribou*) as endangered was published on February 29, 1984 (49 FR 7390). The designation of critical habitat was determined to be not prudent at that time. This determination was based on the conclusion that increased poaching could result from the publication of maps showing areas used by the species. A Selkirk Mountain Caribou Management Plan/Recovery Plan was approved by the Service in 1985 (USFWS 1985). A revised Recovery Plan for Woodland Caribou in the Selkirk Mountains was approved by the Service in 1994 (USFWS 1994).

Notices of 90-day findings on two petitions to delist the southern Selkirk Mountains population of woodland caribou (*Rangifer tarandus caribou*) were published in the **Federal Register** on November 29, 1993 (58 FR 62623), and November 1, 2000 (65 FR 65287). Both petitions were submitted by Mr. Peter B. Wilson, representing the

Greater Bonners Ferry Chamber of Commerce, Bonners Ferry, Idaho. We found that neither petition presented substantial scientific or commercial information indicating that delisting of the southern Selkirk Mountains population of woodland caribou was warranted.

On April 11, 2006, a notice of initiation of 5-year reviews for 70 species in Idaho, Oregon, Washington, Hawaii, and Guam was published in the **Federal Register** (71 FR 18345). This notice included the southern Selkirk Mountains population of woodland caribou. The Southern Selkirk Mountains Caribou Population 5-Year Review was completed December 5, 2008 (USFWS 2008; see *http://www.fws.gov/idaho/Caribou/Tab5References/USFWS_2008a.pdf*).

On December 6, 2002, the Defenders of Wildlife, Lands Council, Selkirk Conservation Alliance, and Center for Biological Diversity (plaintiffs) petitioned the Service to designate critical habitat for the southern Selkirk Mountains population of woodland caribou. On February 10, 2003, we acknowledged receipt of the plaintiffs' petition, and stated we were unable to address the petition at that time due to budgetary constraints. On January 15, 2009, plaintiffs filed a complaint for declaratory and injunctive relief (*Defenders of Wildlife et al.,* v. *Salazar*, CV–09–15–EFS) in Federal district court. This complaint alleged that the Service's failure to make a decision more than 6 years after the petition was submitted violated the Administrative Procedure Act (5 U.S.C. 551–559, 701–706). Following a stipulated settlement agreement, we published a

proposed rule to designate critical habitat on November 30, 2011 (76 FR 74018), and a final rule on November 28, 2012 (77 FR 71042), designating approximately 30,010 acres (12,145 hectares) as critical habitat. The critical habitat is located in Boundary County, Idaho, and Pend Oreille County, Washington. Although the southern Selkirk Mountains woodland caribou local population is a transboundary species with Canada, in accordance with our implementing regulations at 50 CFR 424.12(h), critical habitat was not designated outside of the jurisdiction of the United States.

More recently, we received a petition on May 14, 2012, from the Pacific Legal Foundation, representing Bonner County, Idaho, and the Idaho State Snowmobile Association. The petition requested that the Service "delist the Selkirk caribou population (*Rangifer tarandus caribou*) from the list of endangered species." On December 19, 2012, we published a 90-day finding (77 FR 75091) in response to that petition. Our finding stated that the petition presented substantial information indicating that the current southern Selkirk Mountains population of woodland caribou may not be a listable entity under our 1996 DPS policy (61 FR 4722). We acknowledged that our analysis in the 2008 5-year review did not consider the southern Selkirk Mountains population of woodland caribou relative to the appropriate taxon allowable under our 1996 DPS policy, the subspecies woodland caribou (*Rangifer tarandus caribou*). This proposed rule constitutes our review of the population relative to the appropriate taxon.

Species Information

Taxonomy

All caribou and reindeer worldwide are considered to be the same species (*Rangifer tarandus*). Although they are referred to by different names, they are able to interbreed and produce offspring (Committee on the Status of Endangered Wildlife in Canada (COSEWIC) 2002, p. 9; Hummel and Ray, 2008, p. 31). Caribou are in the Order Artiodactyla (even-toed ungulates) and Family Cervidae (deer) (Integrated Taxonomic Information System (ITIS) 2013, *in litt.*; Mountain Caribou Science Team (MCST) 2005, p. 1; Smithsonian National Museum of Natural History 2013, *in litt.*; COSEWIC 2011, p. 11). In Europe, the common name for *Rangifer tarandus* is reindeer. In North America, the common name for the species is caribou; only the domesticated forms are called reindeer (Cichowski *et al*. 2004, p. 224). For consistency, the term caribou will be used to refer to the species *Rangifer tarandus* in this **Federal Register** document. According to the American Society of Mammalogists' checklist of mammal species of the world (Smithsonian National Museum of Natural History 2013, *in litt.*) and the Integrated Taxonomic Information System (ITIS[1]), 14 subspecies of caribou are currently recognized worldwide, including the subspecies woodland caribou, *Rangifer tarandus caribou*, as defined by Banfield (1961).

[1] ITIS is a database created through a partnership amongst agencies in the United States, Canada, and Mexico, along with other organizations and taxonomic specialists (ITIS 2013, *in litt*.).

The first widely accepted classification below the species level of caribou, *Rangifer tarandus*, in North America was by Banfield in 1961 (Banfield 1961, entire; Shackleton 2010, p. 3; COSEWIC 2011, pp. 11–12). In his revision, Banfield primarily used adult (4 years or older) skull measurements (Banfield 1961, p. 11) to divide *Rangifer tarandus* in North America into four extant and one extinct subspecies: barren-ground caribou – *Rangifer tarandus groenlandicus*, Grant's caribou – *Rangifer tarandus granti*, Peary caribou – *Rangifer tarandus pearyi*, woodland caribou – *Rangifer tarandus caribou*, and Dawson's caribou – *Rangifer tarandus dawsoni* (extinct). Banfield also examined pelage (coat/hide) color, and took measurement of hooves, tarsal glands, and antlers as taxonomic indicators (Banfield 1961, p. 26). However, Banfield noted that antlers were extremely variable among individuals and populations (Banfield 1961, p. 24).

Since the 1960s, much has been learned about caribou ecology, distribution, and genetics, revealing substantial diversity within Banfield's subspecies classifications (Miller *et al*. 2007, p. 16). There has been some debate over the caribou subspecies classification, particularly for the woodland caribou subspecies (*Rangifer tarandus caribou*) (Cronin *et al*. 2005, p. 495). Banfield appeared to use the woodland caribou as a "catch-all" for all North American caribou not included in the other subspecies despite variability in their behavior, ecology, and morphology (Geist 2007, p. 25). Many have proposed alternative classifications to account for variability within and among the various subspecies of caribou. Population units were described with terms such as

"ecotypes" (Bergerud 1996, entire) based on migration patterns and calving strategies, and adaptations to a certain set of environmental conditions. This has caused confusion because there is no universally accepted list of caribou ecotypes or criteria to distinguish caribou ecotypes (COSEWIC 2011, pp. 12–13).

There is also confusion in terminology. For example, in Québec there are migratory and sedentary caribou ecotypes (Boulet *et al*. 2007, p. 4224). Caribou of the sedentary ecotype are generally characterized by relatively little movement between seasonal ranges. They also generally exhibit a dispersed calving strategy, with female caribou giving birth in isolation to avoid predators. Caribou of the migratory ecotype generally move large distances between seasonal ranges. These caribou generally aggregate during calving (COSEWIC 2011, p. 13). In British Columbia, woodland caribou ecotypes are distinguished based on differences in the ecological and physical factors within their ranges. These factors include relative depth of the snowpack, forage availability, and terrain (COSEWIC 2011, p. 13). The term "mountain caribou" is a common ecotype designation used throughout the scientific literature to describe the mountain dwelling/arboreal-lichen feeding woodland caribou local populations found in the mountainous regions of southeastern British Columbia. The mountain caribou is distinguished from other woodland caribou by behavioral and ecological characteristics (MCST 2005, p. 1). The mountain caribou is closely associated with high-elevation, late-successional, or old-growth coniferous forests where their primary winter food, arboreal lichens, occurs. Regardless of efforts to further refine caribou subspecies designations,

Banfield's caribou subspecies classifications, including the woodland caribou subspecies (*Rangifer tarandus caribou*), are still recognized and used today. No alternative subspecies classifications for caribou have been systematically described or broadly accepted (COSEWIC 2011, p. 12).

Species Description

Rangewide, individual caribou (*Rangifer tarandus*) exhibit large variations in their physical and behavioral characteristics (COSEWIC 2011, p. 10). Caribou can be highly variable in color. Their winter pelage varies from nearly white in Arctic caribou such as the Peary caribou, to dark brown in woodland caribou (COSEWIC 2011, pp. 10–11). Both male and female caribou grow antlers, although antlers may be absent in some females. All caribou are adapted to existence in cold winter climates. They have a range of adaptations including thick fur, strong sense of smell (for locating food under snow; Henttonen and Tikhonov 2008, p. 3), large fat stores, a respiratory system that minimizes heat loss during respiration, and an ability to lower metabolism in the winter by decreasing energy expenditure (COSEWIC 2011, p. 11). Caribou are also variable in their diet. They feed on lichens, mosses, grasses, ferns, and shoots and leaves of deciduous shrubs and trees, depending on availability (Henttonen and Tikhonov 2008, p. 3). One of the most distinctive characteristics of all subspecies of caribou is their large, rounded hooves. Their hooves reduce sinking into snow and wetlands, and allow them to walk or stand on hard snowpack to reach tree lichens, and they can use their hooves as

paddles while swimming (COSEWIC 2002, p. 18). All caribou have prominent dew claws just above the hoof.

As previously discussed, Banfield (1961) described five caribou subspecies in North America based on their physical characteristics. Banfield primarily used skull measurements, as well as pelage, antler shape, and hoof shape, to divide *Rangifer tarandus* into four extant and one extinct North American subspecies. Woodland caribou (*Rangifer tarandus caribou*), one of the five subspecies he identified, is the southern-most subspecies in North America. Its range occurs in an east to west band from eastern Newfoundland and northern Quebec all the way into western British Columbia, and as far south as northern Idaho and Washington in the United States. This subspecies classification is still recognized and used by scientific authorities including the American Society of Mammalogists and COSEWIC.

Individual caribou can display tremendous variability in appearance and body form even within the same population (Hummel and Ray 2008, p. 34). Woodland caribou are generally described as dark brown with a white mane and some white on their sides (COSEWIC 2002, p. 18) and have a noticeable band of white hairs (called socks) along the upper edge of each hoof (Shackleton 2010, p. 1). They are larger and darker than both the Peary caribou (*Rangifer tarandus pearyi*) and the barren-ground caribou (*Rangifer tarandus groenlandicus*), which occur in the Northwest Territories and east in Nunavut (Canada 2013, *in litt.*). All caribou can withstand severe cold because their

thick winter coat contains semi-hollow hair with strong insulative properties. However, woodland caribou are susceptible to overheating in summer months as their dark coat absorbs sunlight (COSEWIC 2002, p. 36). Similar to the Peary and barren-ground caribou subspecies, the nose of the woodland caribou is blunt and rather square shaped. In addition, their ears are short, broad, and not pointed. Both sexes have antlers although up to half of females may lack antlers or have one antler. The antlers of woodland caribou are considered to be denser and flatter than those of barren-ground caribou (Canada 2013, *in litt.*). Adult males of woodland caribou are described as having a mane of longer hairs along the bottom of the neck to the chest. During rut, the light color of the neck and mane contrasts with the darker colored body (Shackleton 2010, p. 1). Height of the woodland caribou at the shoulder is a little over 3 to 4 feet (ft) (1.0 to 1.2 meters (m)). Females weigh about 240 to 330 pounds (lbs) (110 to 150 kilograms (kg)) and males about 350 to 460 lbs (160 to 210 kg).

Biology

Reproduction. Woodland caribou are polygynous, with dominant bulls breeding with multiple cows in the fall (Cichowski *et al*. 2004, p. 229). Pregnant females travel to isolated, often rugged areas where predators and other prey animals are limited. Calves are born in late spring into early summer (Cichowski *et al*. 2004, pp. 229–230; COSEWIC 2002, p. 34). A single young is born and is capable of following its mother soon after birth (Shackleton 2010, p. 2). The productivity of caribou is low compared to

other cervids (e.g., deer and moose). Caribou have only one calf per year and most females reproduce for the first time around 3 years of age (Cichowski *et al*. 2004, p. 230; Shackleton 2010, p. 1). Caribou reach sexual maturity at approximately 16 to 28 months of age.

On average, mortality of woodland caribou calves is 50 to 70 percent within their first year. This mortality depends on the abundance of predators or the availability of winter forage during pregnancy, or both (COSEWIC 2002, p. 35). Predation is the most common cause of calf mortality (Shackleton 2010, p. 2). Calf mortality is also linked to the health of the calf at birth (COSEWIC 2002, p. 35). It has been shown that, due to temporal variation in the accessibility of lichens, female caribou may be nutritionally deficient in some years during pregnancy and may be more likely to produce weak calves. Weak calves are likely more susceptible to predation and diseases such as pneumonia. As such, temporal variation in lichen availability may also be driving calf mortality and low calf recruitment in some years (COSEWIC 2002, p. 35).

Habitat Use. Caribou (*Rangifer tarandus*) are the most widespread ungulate species in the world. The ecosystems they have evolved to occupy are highly variable (COSEWIC 2011, p. 11), including the tundra and taiga biomes on all northern continents—North America, Europe, and Asia (Henttonen and Tikhonov 2008, p. 2). Occupied habitats vary from flat and open arctic and subarctic tundra to forested habitat, including high-elevation and steep mountainous slopes (Henttonen and Tikhonov 2008,

p. 3). Variability in habitat occupancy has driven the evolution of many different ecosystem-specific behavioral and migratory traits within the species. For example, caribou in many ecosystems migrate long distances between their calving and wintering grounds. Meanwhile, caribou in other ecosystems are relatively sedentary, making short movements between these areas. Further, caribou in many ecosystems calve in large groups, while others disperse and calve in solitude at high elevations away from potential predators (Bergerud 1996, entire).

Distribution and Abundance

Historically, caribou (*Rangifer tarandus*) populations occurred in nearly all northern latitudes. They have since been extirpated from many areas in Europe and eastern North America (MCST 2005, p. 1). In Banfield's revision (1961), he reported the southern boundary of caribou in the early part of the 19th century to include central Maine and extreme northern New Hampshire and Vermont (Banfield 1961, p. 73). He also noted their occurrence around the Great Lakes in Minnesota, Wisconsin, and Michigan (Banfield 1961, pp. 74–75), and in the northwestern United States in Washington, Idaho, and Montana (Banfield 1961, p. 76). Caribou were reported to be extirpated from Maine after about 1908, from New Hampshire after about 1881, and from Vermont after about 1840 (Banfield 1961, p. 76). The last caribou in Michigan was observed off Isle Royale in 1905, and the last caribou in Wisconsin was observed in about 1840 (Banfield 1961, p. 77). An extensive investigation by Evans (1960, pp. 94–

96) estimated that no more than 100 caribou still lived in the northwestern United States, primarily in northern Idaho. Today, the entire southern Selkirk Mountains population of woodland caribou, the only local caribou population[2] known to have a home range that extends into the contiguous United States, is estimated to consist of only 27 individuals (Ritchie 2013, *in litt*.).

Currently, caribou are restricted to the more northern areas of North America, Russia, and Scandinavia (MCST 2005, p. 1). In North America, caribou occur primarily north of the 50th latitude. The majority of caribou occur in boreal, montane, and arctic environments in Alaska, most Canadian Provinces, and all Canadian Territories except for New Brunswick, Nova Scotia, and Prince Edward Island (COSEWIC 2011, p. 10). The subspecies woodland caribou (*Rangifer tarandus caribou*) occurs in Canada in the southern Yukon; southwestern Northwest Territories; northern, west-central, and southeastern British Columbia; west-central and northern Alberta; boreal portions of Saskatchewan and Manitoba; the boreal and arctic portions of Ontario, Quebec, and Newfoundland; and Labrador; and in the United States in extreme northeastern Washington and northern Idaho (Cichowski *et al*. 2004, pp. 225–226; COSEWIC 2002, p. viii).

[2] Woodland caribou populations can be further broken down into sub-units we are calling "local populations" (also referred to elsewhere as "herds" or "subpopulations"). These local caribou populations represent groupings of individual woodland caribou that have overlapping ranges/movement patterns and commonly breed with one another more frequently than they breed outside of their local population boundary. It is thought that local populations in southern British Columbia are a relatively recent artifact within the population of woodland caribou and that, historically, movement of caribou between local populations was more common. In some cases, local population boundaries have been delineated through telemetry studies.

The southern Selkirk Mountains population of woodland caribou (*Rangifer tarandus caribou*) is the southernmost extant, local population of woodland caribou in North America (Idaho Comprehensive Wildlife Conservation Strategy (IDFG CWCS) IDFG 2005, p. 373; USFWS 2008, p. 12). This population occurs in British Columbia, Canada, and northern Idaho and northeastern Washington, United States. Cichowski *et al*. (2004, p. 226) reported the total population of the woodland caribou subspecies to be over 1 million. The present distribution of woodland caribou in Canada is greatly reduced from historical accounts. Reports indicate that the extent of occurrence in British Columbia populations has decreased by up to 40 percent in the last few centuries (COSEWIC 2002, p. viii).

Evaluation of the Southern Mountain Caribou as a Distinct Population Segment

Introduction and Background

Distinctive, discrete, and significant populations of the woodland caribou have been identified, described, and assessed by the COSEWIC. COSEWIC is composed of qualified wildlife experts drawn from the Federal, provincial, and territorial governments; wildlife management boards; Aboriginal groups; universities; museums; national nongovernmental organizations; and others with expertise in the conservation of wildlife species in Canada. The role of COSEWIC is to assess and classify, using the best

available information, the conservation status of wildlife species, subspecies, and separate populations suspected of being at risk. In addition, they make species status recommendations to the Canadian government and the public. Once COSEWIC makes this recommendation, it is the option of the Canadian Federal government to decide whether a species will be listed under Canada's Species At Risk Act (SARA). For example, the Southern Mountain Caribou, a population of the woodland caribou, is currently designated as "Threatened" under SARA (COSEWIC 2011, Table 1, p. 74). This designation was reached because the population of Southern Mountain Caribou is mostly made up of small, increasingly isolated herds (most of which are in decline) with an estimated range reduction of up to 40 percent from their historical range (COSEWIC 2002, p. 58; COSEWIC 2011, Table 1, p. 74). The Southern Mountain Caribou includes the transboundary southern Selkirk Mountains population of woodland caribou, which is currently listed as endangered under the U.S. Endangered Species Act (Act) and is the subject of this 12-month finding.

Because we now know that the southern Selkirk Mountains population of woodland caribou is a part of the larger Southern Mountain Caribou population, as recognized by COSEWIC, we recognize that our evaluation of the southern Selkirk Mountains population is more appropriately conducted at the scale of the Southern Mountain Caribou population. Therefore, below we evaluate whether, under our DPS policy, the Southern Mountain Caribou population segment of woodland caribou

occurring in British Columbia, Canada, and northeastern Washington and northern Idaho, United States, qualifies as a DPS under the Act.

We completed a 5-year review of the endangered southern Selkirk Mountains population of woodland caribou (*Rangifer tarandus caribou*) in 2008 (see *http://www.fws.gov/idaho/Caribou/Tab5References/USFWS_2008a.pdf*). Because this population was listed prior to the Service's 1996 DPS policy (61 FR 4722), the 5-year review included analysis of this population in relation to the DPS policy. In conducting this DPS analysis, we considered the discreteness and significance of this population in relation to the mountain caribou metapopulation (USFWS 2008, pp. 6–13). From this analysis we concluded that the southern Selkirk Mountains population of woodland caribou met both the discreteness and significance elements of the DPS policy and was a distinct population segment of the mountain caribou metapopulation (USFWS 2008, p. 13). We acknowledged in our December 19, 2012, 90-day finding (77 FR 75091) that the DPS analysis in our 2008 5-year review was not conducted relative to the appropriate taxon. Specifically, the appropriate DPS analysis should have been conducted relative to the subspecies woodland caribou (*Rangifer tarandus caribou*).

Section 3(16) of the Act defines the term "species" to include "any subspecies of fish or wildlife or plants, and any distinct population segment of any species of vertebrate fish or wildlife which interbreeds when mature." We have always understood the phrase "interbreeds when mature" to mean that a DPS must consist of members of the same

species or subspecies in the wild that would be biologically capable of interbreeding if given the opportunity, but all members need not actually interbreed with each other. A DPS is a subset of a species or subspecies, and cannot consist of members of a different species or subspecies. The "biological species concept" defines species according to a group of organisms, their actual or potential ability to interbreed, and their relative reproductive isolation from other organisms. This concept is a widely accepted approach to defining species. We believe that the Act's use of the phrase "interbreeds when mature" reflects this understanding. Use of this phrase with respect to a DPS is simply intended to mean that a DPS must be comprised of members of the same species or subspecies. As long as this requirement is met, a DPS may include multiple populations of vertebrate organisms that may not interbreed with each other. For example, a DPS may consist of multiple populations of a fish species separated into different drainages. While these populations may not actually interbreed with each other, their members are biologically capable of interbreeding.

The National Marine Fisheries Service (NMFS) and the Service published a joint "Policy Regarding the Recognition of Distinct Vertebrate Population Segments Under the Endangered Species Act" (DPS Policy) on February 7, 1996 (61 FR 4722). According to the DPS policy, two elements must be satisfied in order for a population segment to qualify as a possible DPS: discreteness and significance. If the population segment qualifies as a DPS, the conservation status of that DPS is then evaluated to determine whether it is endangered or threatened.

A population segment of a vertebrate species may be considered discrete if it satisfies either one of the following conditions: (1) It is markedly separated from other populations of the same taxon as a consequence of physical, physiological, ecological, or behavioral factors; or (2) it is delimited by international governmental boundaries within which differences in control of exploitation, management of habitat, conservation status, or regulatory mechanisms exist that are significant in light of section 4(a)(1)(D) of the Act.

If a population is found to be discrete, then it is evaluated for significance under the DPS policy on the basis of its importance to the taxon to which it belongs. This consideration may include, but is not limited to, the following: (1) Persistence of the discrete population segment in an ecological setting unusual or unique to the taxon; (2) evidence that loss of the discrete population segment would result in a significant gap in the range of the taxon; (3) evidence that the population represents the only surviving natural occurrence of the taxon that may be more abundant elsewhere as an introduced population outside of its historical range; or (4) evidence that the population differs markedly from other populations of the species in its genetic characteristics.

If a population segment is both discrete and significant (i.e., it qualifies as a potential DPS) its evaluation for endangered or threatened status is based on the Act's definitions of those terms and a review of the factors listed in section 4(a) of the Act.

According to our DPS policy, it may be appropriate to assign different classifications to different DPSs of the same vertebrate taxon. For this 12-month finding and DPS analysis of the southern Selkirk Mountains population of woodland caribou to the subspecies woodland caribou, we reviewed and evaluated information contained in numerous publications and reports, including but not limited to: Banfield 1961, Stevenson *et al.* 2001, COSEWIC 2002, Cichowski *et al.* 2004, Wittmer *et al.* 2005b, Geist 2007, COSEWIC 2011, van Oort *et al.* 2011, and Serrouya *et al.* 2012.

In 2002 and 2011, COSEWIC completed status assessments of caribou subspecies and species populations in North America. The 2002 COSEWIC Report evaluated woodland caribou "nationally significant populations" (NSPs). The more recent COSEWIC (2011) Report described "Designatable Units" (DUs) as the appropriate "discrete and significant units" useful to conserve and manage caribou populations throughout Canada. Information used in COSEWIC's 2011 report is useful to our DPS analysis. Canada's DUs are identified based on the criteria that there are "discrete and evolutionarily significant units of a taxonomic species, where 'significant' means that the unit is important to the evolutionary legacy of the species as a whole and, if lost, would likely not be replaced through natural dispersion" (COSEWIC 2011, p. 14). They consider a population or group of populations to be "discrete" based on the following criteria: Evidence of genetic distinctiveness, natural disjunction between substantial portions of the species' geographic range, and/or occupancy of differing eco-geographic

regions that are relevant to the species and reflect historical or genetic distinction (COSEWIC 2011, *in litt.*).

It should be noted that COSEWIC's DU designation does not necessarily consider the conservation status or threats to the persistence of caribou DUs. Consistent with their 2009 guidelines, the COSEWIC used five lines of evidence to determine caribou DUs; these include: 1) phylogenetics; 2) genetic diversity and structure; 3) morphology; 4) movements, behavior, and life-history strategies; and 5) distribution (COSEWIC 2011, p. 15). As a general rule, a DU was designated when several lines of evidence provided support for discreteness and significance (COSEWIC 2011, pp. 15–16). Twelve caribou DUs were classified by COSEWIC in 2011, including the Southern Mountain Caribou (DU9), which includes the southern Selkirk Mountains population of woodland caribou (COSEWIC 2011, p. 21). The information used to describe the Southern Mountain DU is reviewed and evaluated in our DPS analysis, as it includes numerous local woodland caribou populations that all possess similar and unique foraging, migration, and habitat use behaviors and are geographically separated from other caribou DUs.

Discreteness

As outlined in our 1996 DPS policy, a population segment of a vertebrate species may be considered discrete if it satisfies either one of the following conditions: (1) It is markedly separated from other populations of the same taxon as a consequence of

physical, physiological, ecological, or behavioral factors; or (2) it is delimited by international governmental boundaries within which differences in control of exploitation, management of habitat, conservation status, or regulatory mechanisms exist that are significant in light of section 4(a)(1)(D) of the Act.

Physical (Geographic) Discreteness

The southern Selkirk Mountains population of woodland caribou is one of 15 (COSEWIC 2011, p. 89) local woodland caribou populations that share distinct foraging, migration, and habitat use behaviors. These populations are all located in steep, mountainous terrain in central and southeastern British Columbia, and extreme northeastern Washington and northern Idaho, United States. Little to no dispersal has been detected between these local populations and other local caribou populations outside this geographic area (Wittmer *et al*. 2005b, pp. 408, 409; COSEWIC 2011, p. 49; van Oort *et al*. 2011, pp. 222–223). For the purposes of this DPS analysis, this collection of local woodland caribou populations, which, as noted above, includes the southern Selkirk Mountains population, will hereafter be referred to as the Southern Mountain Caribou.

Telemetry research by Wittmer *et al.* (2005b) and van Oort *et al.* (2011) supports the physical (geographic) discreteness of Southern Mountain Caribou. One exception is that there is some limited annual range overlap between a few local caribou populations at the far north of the Southern Mountain Caribou population. Although all caribou and

reindeer worldwide are considered to be the same species (*Rangifer tarandus*) and are presumed able to interbreed and produce offspring (COSEWIC 2002, p. 9), the distribution of the Southern Mountain Caribou does not overlap with other populations during the rut or mating season (COSEWIC 2011, p. 50). Previous telemetry studies were completed by Apps and McLellan (2006, pp. 84–85, 92) to determine occupancy across differing landscapes. These studies confirmed that woodland caribou within the geographic area that defines the Southern Mountain Caribou population are strongly associated with the steep, mountainous terrain characterizing the "interior wet-belt" of British Columbia (Stevenson *et al*. 2001, p. 3), located west of the continental divide. This area is influenced by Pacific air masses that produce the wettest climate in the interior of British Columbia (Stevenson *et al*. 2001, p. 3). Forests consist of Engelmann spruce (*Picea engelmannii* or *P. glauca* x *engelmannii*)/subalpine fir (*Abies lasiocarpa*) at high elevation, and western red cedar (*Thuja plicata*)/western hemlock (*Tsuga heterophylla*) at lower elevations. Snowpack typically averages 5 to 16 ft (2 to 5 m) in depth (Stevenson *et al*. 2001, p. 4; COSEWIC 2011, p. 50). Apps and McLellan (2006, p. 92) noted that the steep, complex topography within the interior wet-belt provides seasonally important habitats. Caribou access this habitat by migrating in elevational shifts rather than through the long horizontal migrations of other subspecies in northern Canada. Woodland caribou that live within this interior wet-belt of southern British Columbia, northeastern Washington, and northern Idaho are strongly associated with old-growth forested landscapes (Apps *et al*. 2001, pp. 65, 70). These landscapes are predominantly cedar/hemlock and spruce/subalpine fir composition (Stevenson *et al*.

2001, pp. 3–5; Apps and McLellan 2006, pp. 84, 91; Cichowski *et al*. 2004, pp. 224, 231; COSEWIC 2011, p. 50) that supports woodland caribou's late-winter diet consisting almost entirely of arboreal hair lichens (Cichowski *et al.* 2004, p. 229).

The Southern Mountain Caribou population is markedly separate from other populations of woodland caribou as a result of physical (geographic) factors. The distribution of this population is primarily located within the interior wet-belt of southern British Columbia, occurring west of the continental divide and generally south of Reynolds Creek (which is about 90 miles (mi) (150 kilometers (km)) north of Prince George, British Columbia). Its geographic range is such that it does not reproduce with other local populations of woodland caribou.

Behavioral Discreteness

In addition to being physically (geographically) discrete, individuals within the Southern Mountain Caribou population are behaviorally distinguished from woodland caribou in other populations (including the neighboring Northern Mountain and Central Mountain populations). Southern Mountain Caribou uniquely use steep, high-elevation, mountainous habitats with deep snowfall (about 5 to 16 ft; 2 to 5 m) (COSEWIC 2011, p. 50), and, as described below, are the only woodland caribou that depend on arboreal lichens for forage. This habitat use contrasts with the behavior of other woodland caribou, which occupy relatively drier habitats that receive less snowfall. With less

snowfall in these areas, these woodland caribou primarily forage on terrestrial lichens, accessing them by "cratering" or digging through the snow with their hooves (Thomas *et al.* 1996, p. 339; COSEWIC 2002, pp. 25, 27).

Extreme deep snow conditions have led to a foraging strategy by the Southern Mountain Caribou that is unique among woodland caribou. They rely exclusively on arboreal (tree) lichens for 3 or more months of the year (Servheen and Lyon 1989, p. 235; Edmonds 1991, p. 91; Stevenson *et al*. 2001, p. 1; Cichowski *et al*. 2004, pp. 224, 230–231; MCST 2005, p. 2; COSEWIC 2011, p. 50). Arboreal lichens are a critical winter food for the Southern Mountain Caribou from November to May (Servheen and Lyon 1989, p. 235; Stevenson *et al*. 2001, p. 1; Cichowski *et al*. 2004, p. 233). During this time, a Southern Mountain Caribou's diet can be composed almost entirely of these lichens. Arboreal lichens are pulled from the branches of conifers, picked from the surface of the snow after being blown out of trees by wind, or are grazed from wind-thrown branches and trees. The two kinds of arboreal lichens commonly eaten by the Southern Mountain Caribou are *Bryoria* spp. and *Alectoria sarmentosa*. Both are extremely slow-growing lichens most commonly found in high-elevation, old-growth conifer forests that are greater than 250 years old (Paquet 1997, p. 14; Apps *et al*. 2001, pp. 65–66).

Another unique behavior of caribou within the Southern Mountain Caribou population is their altitudinal migrations. They may undertake as many as four of these

migrations per year (COSEWIC 2011, p. 50). After wintering at high elevations as described above, at the onset of spring these caribou move to lower elevations where snow has melted to forage on new green vegetation (Paquet 1997, p. 16; Mountain Caribou Technical Advisory Committee (MCTAC) 2002, p. 11). Pregnant females will move to these spring habitats for forage. During the calving season, sometime from June into July, the need to avoid predators influences habitat selection. Areas selected for calving are typically high-elevation, alpine and non-forested areas in close proximity to old-growth forest ridge tops, as well as high-elevation basins. These high-elevation sites can be food limited, but are more likely to be free of predators (USFWS 1994, p. 8; MCTAC 2002, p. 11; Cichowski *et al*. 2004, p. 232, Kinley and Apps 2007, p. 16). During calving, arboreal lichens become the primary food source for pregnant females at these elevations. This is because green forage is largely unavailable in these secluded, old-growth conifer habitats.

During summer months, Southern Mountain Caribou move back to upper elevation spruce/alpine fir forests (Paquet 1997, p. 16). Summer diets include selective foraging of grasses, flowering plants, horsetails, willow and dwarf birch leaves and tips, sedges, lichens (Paquet 1997, pp. 13, 16), and huckleberry leaves (U.S. Forest Service (USFS) 2004, p. 18). The fall and early winter diet consists largely of dried grasses, sedges, willow and dwarf birch tips, and arboreal lichens.

The Southern Mountain Caribou are behaviorally adapted to the steep, high-elevation, mountainous habitat with deep snowpack. They feed almost exclusively on arboreal lichens for 3 or more months out of the year. They are also reproductively isolated, due to their behavior and separation from other caribou populations during the fall rut and mating season (COSEWIC 2011, p. 50). Based on these unique adaptations, we consider the Southern Mountain Caribou population to have met the behavioral "discreteness" standard in our DPS policy.

Genetic Discreteness

Data from Serrouya *et al*. (2012, p. 2594) show that genetic population structure (i.e., patterning or clustering of the genetic make-up of individuals within a population) does exist within woodland caribou. Specifically, Serrouya revealed a genetic cluster that is unique to Southern Mountain Caribou and different from genetic clusters found in surrounding local populations of woodland caribou designated as part of other Canada caribou DUs (i.e., Central Mountain DU, Northern Mountain DU, and Boreal DU). However, Serrouya also revealed genetic clusters that occur in both the Southern Mountain Caribou and neighboring DUs that suggest some historical gene flow did occur in the past, meaning that caribou did historically move between populations of these DUs and interbreed when mature.

This cluster overlap of DU boundaries is not surprising, as genetic structure is reflective of long-term historical population dynamics and does not necessarily depict current gene flow. Indeed, it does appear that recent impediments to gene flow may be genetically isolating woodland caribou in the southwest portion of their range (Wittmer *et al.* 2005b, p. 414; van Oort *et al.* 2011, p. 221; Serrouya *et al.* 2012, p. 2598). These impediments include anthropogenic habitat fragmentation and widespread caribou population declines. Therefore, genetic specialization related to unique behaviors and habitat use may represent a relatively recent life-history characteristic (Weckworth *et al.* 2012, p. 3620). Historical gene flow between local populations of Southern Mountain Caribou and neighboring local populations did occur in the past. However, study results from Serrouya *et al.* (2012), combined with telemetry data from Wittmer *et al*. (2005b, p. 414) and van Oort *et al.* (2011, p. 221), suggest that isolation of local populations is now the norm, affecting genetics of these local populations differently through genetic drift (Serrouya *et al.* 2012, p. 2597).

A certain level of genetic differentiation does exist between the Southern Mountain Caribou population and neighboring woodland caribou. However, we do not presently consider there to be sufficient evidence to determine that the Southern Mountain Caribou are genetically isolated from other populations of caribou, particularly the Central Mountain population. Therefore, at this time, we do not find that this population meets the genetic "discreteness" standard in our DPS policy.

Discreteness Conclusion

In summary, we determine the best available information indicates that the Southern Mountain Caribou, comprised of 15 local woodland caribou populations that occur in southern British Columbia, northeastern Washington, and northern Idaho, is markedly separated from all other populations of woodland caribou. The Southern Mountain Caribou population is physically (geographically), behaviorally, and reproductively isolated from other woodland caribou. Therefore, we consider the Southern Mountain Caribou population to be discrete per our DPS policy.

Significance

Under our DPS policy, once we have determined that a population segment is discrete, we consider its biological and ecological significance to the larger taxon to which it belongs. Significance is not determined by a quantitative analysis, but is instead a qualitative finding. It will vary from species to species and cannot be reduced to a simple formula or flat percentage. Our DPS policy provides several potential considerations that may demonstrate the significance of a population segment to the species to which it belongs. These considerations include, but are not limited to: (1) Persistence of the discrete population segment in an ecological setting unusual or unique for the taxon; (2) evidence that the discrete population segment differs markedly from other population segments in its genetic characteristics; (3) evidence that the population

segment represents the only surviving natural occurrence of the taxon that may be more abundant elsewhere as an introduced population outside its historical range; and (4) evidence that loss of the discrete population segment would result in a significant gap in the range of the taxon. The following discussion addresses considerations regarding the significance of the Southern Mountain Caribou population to the subspecies woodland caribou (*Rangifer tarandus caribou*).

(1) Persistence of the discrete population segment in an ecological setting unusual or unique for the taxon

As previously discussed, woodland caribou within the Southern Mountain Caribou population are distinguished from woodland caribou in other areas. Southern Mountain Caribou live in, and are behaviorally adapted to, a unique ecological setting characterized by high-elevation, high-precipitation, and steep old-growth conifer forests that support abundant arboreal lichens (COSEWIC 2011, p. 50). In addition, all woodland caribou in the Southern Mountain Caribou population exhibit a distinct behavior. Specifically, they spend the winter months in high-elevation, steep, mountainous habitats where individuals stand on the deep, hard-crusted snowpack and feed exclusively on arboreal lichens on standing or fallen old-growth conifer trees (Cichowski *et al*. 2004, pp. 224, 230–231; MCST 2005, p. 2; COSEWIC 2011, p. 50). This behavior is unlike that of woodland caribou in neighboring areas that occupy less

steep, drier terrain and do not feed on arboreal lichens during the winter (Thomas *et al.* 1996, p. 339; COSEWIC 2011, p. 50).

In addition to persisting in a specific environment characterized by steep, high-elevation, old-growth forests and being reliant on arboreal lichens as primary winter forage, caribou of the Southern Mountain population make relatively short-distance altitudinal migrations up to four times per year. These caribou occupy valley bottoms and lower slopes in the early winter, and ridge tops and upper slopes in later winter after the snowpack deepens and hardens. In the spring, they move to lower elevations again to access green vegetation. Females make solitary movements back to high elevations to calve. This habitat and behavior are unique to the Southern Mountain Caribou population. All other populations within the woodland caribou subspecies occupy winter habitat characterized by gentler topography, lower elevation, and less winter snowpack (COSEWIC 2011, pp. 43, 46) where their primary winter forage, terrestrial (ground) lichens, is most accessible (Thomas *et al.* 1996, p. 339; COSEWIC 2011, pp. 43, 46). Unlike woodland caribou of the Southern Mountain population, some populations in eastern Canada (Eastern Migratory DU (DU4; COSEWIC 2011, p. 34)) will migrate relatively long distances across the landscape between wintering and calving habitat, where they will calve in large aggregated groups (COSEWIC 2011, pp., 33, 37; Abraham *et al.* 2012, p. 274).

We conclude that the Southern Mountain Caribou meets the definition of significant in accordance with our DPS policy, as this population currently persists in an ecological setting unusual or unique for the subspecies of woodland caribou.

(2) Evidence that the discrete population segment differs markedly from other population segments in its genetic characteristics

Research by Serrouya *et al.* (2012, p. 2594) indicates that there is some genetic population structure between woodland caribou populations in western North America. This research identified two main genetic clusters within the Southern Mountain Caribou, separated from each other by the North Thompson Valley in British Columbia. One of these clusters is unique, with few exceptions, to the Southern Mountain Caribou (structure analysis; Serrouya *et al.* 2012, p. 2594). The other cluster, northwest of the North Thompson Valley, is shared with the adjacent Central Mountain population. As such, there is limited genetic evidence in this study that Southern Mountain Caribou populations north of the North Thompson Valley are genetically unique relative to caribou of the Central Mountain population.

As previously discussed, the best available information indicates that recent impediments to gene flow such as habitat fragmentation and widespread caribou population declines may be genetically isolating woodland caribou in the southwestern portion of their range (Wittmer *et al*. 2005b, p. 414; van Oort *et al.* 2011, p. 221;

Serrouya *et al.* 2012, p. 2598). This genetic isolation has resulted in unique behaviors and habitat use (Weckworth *et al.* 2012, p. 3620). Study results from Serrouya *et al.* (2012), combined with telemetry data from Wittmer *et al.* (2005b, p. 414) and van Oort *et al.* (2011, p. 221), suggest that while historical gene flow between local populations of Southern Mountain Caribou and neighboring local populations did occur in the past, isolation of these local populations is now the norm. Research into the genetics of the woodland caribou will likely continue and will provide further insight into gene flow between these populations.

Despite some level of genetic structure between the Southern Mountain Caribou population and neighboring woodland caribou, and a predicted continuation of genetic structuring between local populations within Southern Mountain Caribou, we do not presently consider Southern Mountain Caribou "genetically unique." Therefore, at this time we do not find this population meets the genetic "significance" standard in our DPS policy.

(3) Evidence that the population segment represents the only surviving natural occurrence of a taxon that may be more abundant elsewhere as an introduced population outside its historic range

All caribou in the world are one species (*Rangifer tarandus*). In a global review of taxonomy of the genus *Rangifer*, Banfield (1961) documented the occurrence of five

subspecies in North America. Woodland caribou (*Rangifer tarandus caribou*), one of the five recognized subspecies of caribou, are the southern-most subspecies in North America. The range of woodland caribou extends in an east/west band from eastern Newfoundland and northern Quebec, all the way into western British Columbia. Southern Mountain Caribou represent a discrete subset of this subspecies. Because Southern Mountain Caribou are not the only surviving natural occurrence of the woodland caribou subspecies, this element is not applicable.

(4) Evidence that loss of the discrete population segment would result in a significant gap in the range of the taxon

Historically, woodland caribou were widely distributed throughout portions of the northern tier of the coterminous United States from Washington to Maine, as well as throughout most of southern Canada (COSEWIC 2002, p. 19). However, as a result of habitat loss and fragmentation, overhunting, and the effects of predation, the population of woodland caribou within the British Columbia portion of their range has declined dramatically with an estimated 40 percent range reduction (COSEWIC 2002, p. 20). Further evidence of this decline was observed within the Southern Mountain Caribou population, where there were an estimated 2,554 individuals as recently as 1995 (Hatter *et al.* 2004, p. 7). The most recent estimate of individuals in this population was conducted in 2012, and estimated only 1,657 individuals (Ritchie 2013, *in litt*.). Loss of the Southern Mountain Caribou population would result in the loss of the southern-most

extent of the range of woodland caribou by about 2.5 degrees of latitude. This includes the only remaining population of the woodland caribou in the coterminous United States. An additional consequence of the loss of the Southern Mountain Caribou population would be the elimination of the only North American caribou population with the distinct behavior of feeding exclusively on arboreal lichens for 3 or more months of the year. This feeding behavior is related to their spending winter months in high-elevation, steep, mountainous habitats with deep snowpack.

The extirpation of peripheral populations, such as the Southern Mountain Caribou population, is concerning because of the potential conservation value that peripheral populations can provide to a species or subspecies. Specifically, peripheral populations can possess slight genetic or phenotypic divergences from core populations (Lesica and Allendorf 1995, p. 756; Fraser 2000, p. 50). The genotypic and phenotypic characteristics peripheral populations may provide to the core population of the species may be central to the species' survival in the face of environmental change (Lesica and Allendorf 1995, p. 756; Bunnell *et al.* 2004, p. 2242).

The extirpation of Southern Mountain Caribou would represent a significant gap in the range of the woodland caribou subspecies. Extirpation of this population segment would result in the loss of a peripheral population segment of woodland caribou that live in, and are behaviorally adapted to, a unique ecological setting characterized by high-

elevation, high-precipitation (including deep snowpack), and steep old-growth conifer forests that support abundant arboreal lichens.

Significance Conclusion

We conclude that the Southern Mountain Caribou persists in an ecological setting unusual or unique for the subspecies of woodland caribou, and that loss of the Southern Mountain Caribou would result in a significant gap in the range of the woodland caribou subspecies. Therefore, the discrete Southern Mountain Caribou population of woodland caribou that occur in southern British Columbia, and in northeastern Washington and northern Idaho meet the significance criteria under our DPS policy.

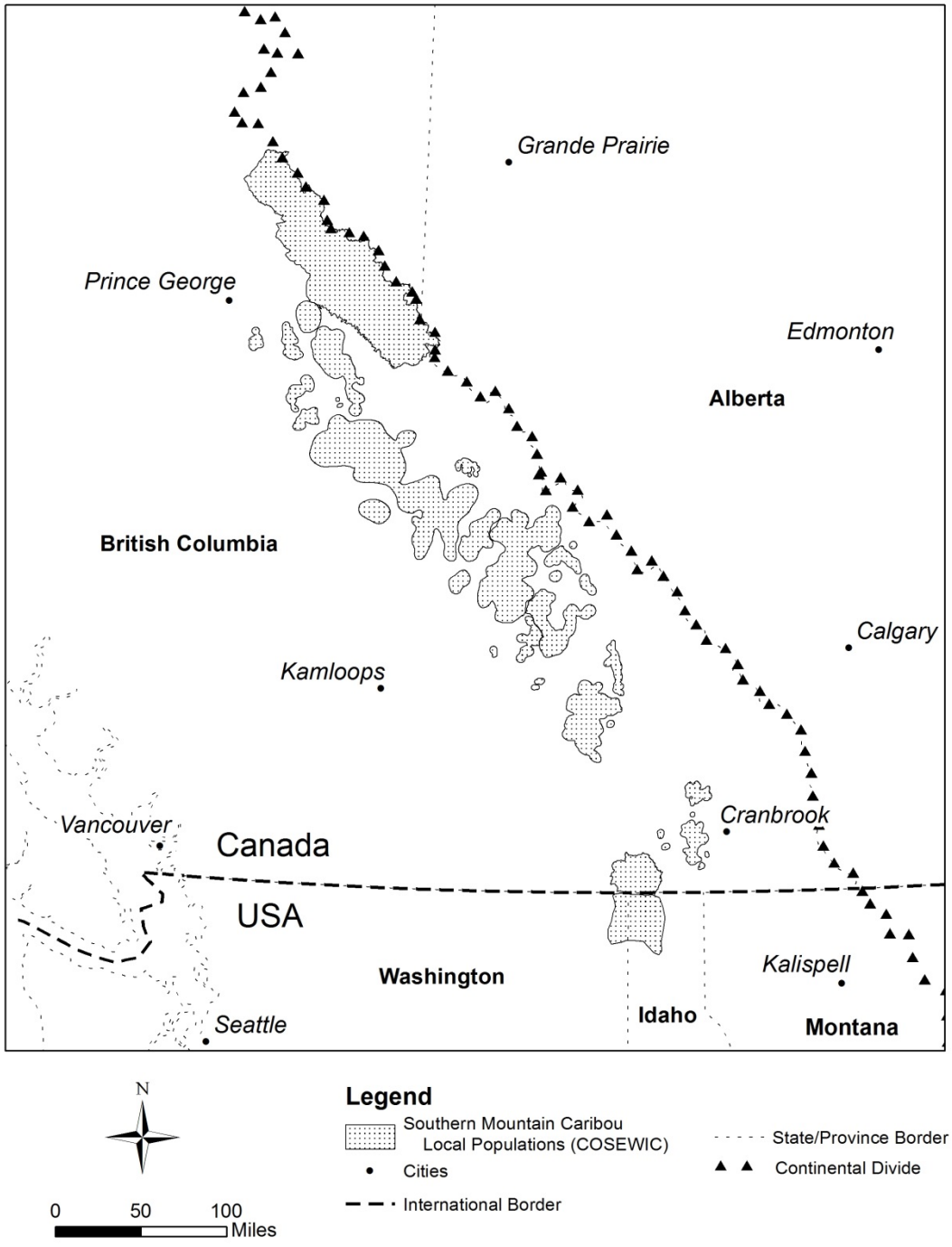
Listable Entity Determination

In conclusion, the Service finds that the Southern Mountain Caribou population meets both the discreteness and significance elements of our DPS policy. It qualifies as discrete because of its marked physical (geographic) and behavioral separation from other populations of the woodland caribou subspecies. It qualifies as significant because of its existence in a unique ecological setting, and because the loss of this population would leave a significant gap in the range of the woodland caribou subspecies. For consistency, we will refer to the Southern Mountain DU, described by COSEWIC, as the

Southern Mountain Caribou DPS. See Figure 1 for a map of the known distribution of local populations within the Southern Mountain Caribou DPS.

The petition asserted that the Act does not permit designation of a DPS of a subspecies, but only of a full species. The Service has long interpreted the Act to authorize designation of a DPS of a subspecies, and the courts have upheld the Service's interpretation. See, for example, *Center for Biological Diversity* v. *U.S. Fish and Wildlife Service*, 274 Fed. Appx. 542 (9th Cir. 2008). Consequently, we deny the petition to the extent that it relies on this argument.

Figure 1. Known distribution of Southern Mountain Caribou local populations. Local population boundaries depicted were provided to the Service by the COSEWIC.



Status of the Southern Mountain Caribou DPS

Declines in caribou populations within British Columbia began in the mid-1960s (Harding 2008, p. 1). Recent survey efforts confirm these declines continue today. Over the past decade, the abundance of individuals in the Southern Mountain Caribou DPS has declined by approximately 8 percent per year across its range. Individual populations have decreased by up to 18 percent per year (Wittmer *et al*. 2005b, p. 413). For example, the South Purcells local population, which is located above the Montana border, had an estimated 100 individuals in 1982, and only 20 in 2002. The larger Wells Gray South local population was estimated at 275 individuals in 1982, but had increased and was considered stable at 325 to 350 caribou from 1995 to 2002. As of 2011, this local population was estimated to be at 204 caribou (Ritchie 2013, *in litt.*).

Surveys of the local populations in the Southern Mountain Caribou DPS estimated that, in 1995, the entire population was approximately 2,554 individuals (Hatter *et al*. 2004, p. 7). By 2002, this number had decreased to approximately 1,900 individuals (Hatter *et al*. 2004, p. 7). Currently, the population is estimated to be 1,657 individuals (Ritchie 2013, *in litt.*). Many local populations within the Southern Mountain Caribou DPS are reported to have experienced declines of 50 percent or greater between 1995 and 2002 (MCST 2005, p. 1). Some of the most extreme decreases were observed in the Central Selkirk and South Purcells local populations. These populations

experienced 61 and 78 percent reductions in their populations, respectively, during this time (Harding 2008, p. 3).

Population models indicate declines will continue into the future for the entire Southern Mountain Caribou DPS and for many local populations. Hatter *et al*. (2004, p. 9) predicted local population levels within this DPS under three different scenarios: "optimistic," "most likely," and "pessimistic." Under these scenarios population levels were modeled to decline from the current level of 1,657 individuals to 1,534 (optimistic), 1,169 (most likely), or 820 (pessimistic), by 2022. In addition, all three scenarios reported the extirpation of two (optimistic), three (most likely), or five (pessimistic) local populations by 2022 (Hatter *et al*. 2004, p. 9). As of 2013, George Mountain, one of the local populations within the Southern Mountain Caribou DPS recently considered to be at risk by Hatter *et al*. (2004), is now considered to be extirpated (Ritchie 2013, *in litt.*).

According to Hatter *et al*. (2004, pp. 9 and 11), no models predicted extinction of the woodland caribou population within the proposed DPS in the next 100 years (Hatter *et al*. 2004, p. 11). However, reductions in the size of the entire population were predicted. Using the same scenarios from Hatter *et al*. (2004) as described above ("optimistic," "most likely," and "pessimistic"), the average time until the population of woodland caribou within the Southern Mountain Caribou DPS is fewer than 1,000 individuals was projected to be 100, 84, and 26 years, respectively (Hatter *et al*. 2004, p. 11). These estimates do not account for the relationship between density and adult

female survival, and may be a conservative estimate of time to extinction (in other words, may underestimate the timeframes). Wittmer (2004, p. 88) attempted to account for density-dependent adult female survival and predicted extinction of all local populations in the proposed DPS within the next 100 years (Wittmer 2004, p. 88).

Along with these documented and predicted population declines, local populations of woodland caribou within the proposed DPS are becoming increasingly fragmented and isolated (Wittmer 2004, p. 28; van Oort *et al*. 2011, p. 25; Serrouya *et al.* 2012, p. 2598). Fragmentation and isolation are particularly pronounced in the southern portion of the Southern Mountain Caribou DPS (Wittmer 2004, p. 28). This fragmentation and isolation are likely accelerating the extinction process and reducing the probability of demographic rescue from natural immigration or emigration. Van Oort *et al*. (2011, p. 215), observed that population fragmentation and isolation in a population with little or no ability to disperse between local populations may represent a geographic pattern of the extinction process.

Despite these predictions, some local populations of woodland caribou within the proposed DPS appear to be stable. For example, the North Mountain region (northern-most populations principally in the Hart Range) was estimated at 500 animals in 2005 and is considered stable (MCST 2005, p. 4; Ritchie 2013, pers. comm.).

Summary of Factors Affecting the Species

Section 4 of the Act (16 U.S.C. 1533), and its implementing regulations at 50 CFR part 424, set forth the procedures for adding species to the Federal Lists of Endangered and Threatened Wildlife and Plants. Under section 4(a)(1) of the Act, we may list a species based on any of the following five factors: (A) The present or threatened destruction, modification, or curtailment of its habitat or range; (B) overutilization for commercial, recreational, scientific, or educational purposes; (C) disease or predation; (D) the inadequacy of existing regulatory mechanisms; and (E) other natural or manmade factors affecting its continued existence. Listing actions may be warranted based on any of the above threat factors, singly or in combination. We discuss each of these factors for the Southern Mountain Caribou DPS below.

A. The Present or Threatened Destruction, Modification, or Curtailment of Its Habitat or Range

Threats to caribou habitat within the Southern Mountain DPS include forest harvest, forest fires, human development, recreation, and climate change. In addition to causing direct impacts, these threats often catalyze indirect impacts to caribou, which are also important in this analysis. Both direct and indirect impacts to caribou from habitat destruction, modification, and curtailment are described below.

Historically, the caribou populations that make up the Southern Mountain Caribou DPS were distributed throughout the western Rocky Mountains of British Columbia, northern Idaho, and northeastern Washington (Apps and McLellan 2006, p. 84). As previously discussed, caribou within the Southern Mountain Caribou DPS are strongly associated with high-elevation, high-precipitation, old-growth forested landscapes (Stevenson *et al*. 2001, pp. 3–5; Apps and McLellan 2006, pp. 84, 91; Cichowski *et al*. 2004, pp. 224, 231; COSEWIC 2011, p. 50) that support their uniquely exclusive winter diet of arboreal lichens (Cichowski *et al.* 2004, p. 229).

It is estimated that about 98 percent of the caribou in the Southern Mountain Caribou DPS rely on arboreal lichens as their primary winter food. They have adapted to the high-elevation, deep-snow habitat that occurs within this area of British Columbia, northern Idaho, and northeastern Washington (Apps and McLellan 2006, p. 84). The present distribution of woodland caribou in Canada is much reduced from historical accounts, with reports indicating that the extent of occurrence in British Columbia and Ontario populations has decreased by up to 40 percent in the last few centuries (COSEWIC 2002, pp. viii, 30). The greatest reduction has occurred in local populations comprising the Southern Mountain Caribou DPS (COSEWIC 2002, p. 30; COSEWIC 2011, p. 49). Hunting was historically considered the main cause of range retraction in the central and southern portions of British Columbia. However, predation, habitat fragmentation from forestry operations, and human development are now considered the main concerns (COSEWIC 2002, p. 30).

Forest Harvest

Forestry has been the dominant land use within the range of the Southern Mountain Caribou DPS in British Columbia throughout the 20th century. The majority of timber harvesting has occurred since the late 1960s (Stevenson *et al.* 2001, pp. 9–10). Prior to 1966 and before pulp mills were built in the interior of British Columbia, a variety of forest harvesting systems were utilized, targeting primarily spruce and Douglas fir (*Pseudotsuga menziesii*) sawlogs, and pole-sized western red cedar. It was not until after 1966, when market conditions changed to meet the demand for pulp and other timber products, that the majority of timber harvesting occurred through clear-cutting large blocks of forest (Stevenson *et al.* 2001, p. 10). However, in the 1970s, some areas in the southern Selkirk Mountains and the North Thompson area (north of Revelstoke, British Columbia) were only partially cut in an effort to maintain habitat for caribou (Stevenson *et al.* 2001, p. 10). In the 1990s, there was an increase in both experimental and operational partial cutting in caribou habitat. Partial cuts continue to remain a small proportion of total area harvested each year within caribou habitat in British Columbia (Stevenson *et al.* 2001, p. 10).

Historically, within the U.S. portion of the Southern Mountain Caribou DPS, habitat impacts have been primarily due to logging and fire (Evans 1960, p. 109). In the early 19th century, intensive logging occurred from approximately 1907 through 1922,

when the foothills and lowlands were logged upwards in elevation to the present U.S. National Forest boundaries (Evans 1960, p. 110). Partly as a result of this logging, farmlands replaced moister valleys that once resembled the rain forests of the Pacific coast (Evans 1960, p. 111). From the 1920s through 1960, logging continued into caribou habitat on the Kanisku National Forest in Idaho (now the Idaho Panhandle National Forest) (Evans 1960, pp. 118–120). In addition, insect and disease outbreaks affected large areas of white pine (*Pinus strobus*) stands in caribou habitat, and Engelmann spruce habitat was heavily affected by windstorms, insect outbreaks, and subsequent salvage logging (Evans 1960, pp. 123–124). As a result, spruce became the center of importance in the lumber industry of this region. This led to further harvest of spruce habitat in adjacent, higher elevation drainages previously unaffected by insect outbreaks (Evans 1960, pp. 124–131). It is not known how much forest within the range of the Southern Mountain Caribou DPS has been historically harvested; however, forest harvest likely had and continues to have direct and indirect impacts on caribou and their habitat, contributing to the curtailment and modification of the habitat of the Southern Mountain Caribou DPS.

The harvesting of forests has both direct and indirect effects on caribou habitat within the Southern Mountain Caribou DPS. A direct effect of forest harvest is the direct loss of large expanses of contiguous old-growth forest habitats. Caribou in the Southern Mountain Caribou DPS rely upon these habitats as an important means of limiting the effect of predation. Their strategy is to spread over large areas at high elevation that

other prey species avoid (Seip and Cichowski 1996, p. 79; MCTAC 2002, pp. 20–21). These old-growth forests have evolved with few and small-scale natural disturbances such as wildfires, insects, or diseases. When these disturbances did occur, they created only small and natural gaps in the forest canopy that allowed trees to regenerate and grow (Seip 1998, pp. 204–205). Forest harvesting through large-scale clear-cutting creates additional and larger openings in old-growth forest habitat. These openings allow for additional growth of early seral habitat.

Research of woodland caribou has shown that caribou alter their movement patterns to avoid areas of disturbance where forest harvest has occurred (Smith *et al.* 2000, p. 1435; Courtois *et al.* 2007, p. 496). With less contiguous old-growth habitat, caribou are also limited to increasingly fewer places on the landscape. Further, woodland caribou that do remain in harvested areas have been documented to have decreased survival due to predation vulnerability (Courtois *et al.* 2007, p. 496). This is because the early seral habitat, which establishes itself in recently harvested or disturbed areas, also attracts other ungulate species such as deer, elk, and moose to areas that were previously unsuitable for these species (MCST 2005, pp. 4-5; Bowman *et al.* 2010, p. 464). With the increase in the distribution and abundance of prey species in or near habitats located where caribou occur, comes an increase in predators and therefore an increase in predation on caribou. Predation has been reported as one of the most important direct causes of population decline for caribou in the Southern Mountain Caribou DPS (see also

C. Disease or Predation, below; MCST 2005, p. 4; Wittmer *et al.* 2005a, p. 257; Wittmer *et al.* 2005b, p. 417; Wittmer *et al.* 2007, p. 576).

Roads created to support forest harvest activities have also fragmented habitat. Roads create linear features that also provide easy travel corridors for predators into and through difficult habitats where caribou seek refuge from predators (MCST 2005, p. 5; Wittmer *et al.* 2007, p. 576). It has been estimated that forest roads throughout British Columbia (which includes the Southern Mountain Caribou DPS) expanded by 4,100 percent (from 528 to 21,748 mi (850 to 35,000 km)) between 1950 and 1990. Most of these roads were associated with forest harvesting (Stevenson *et al.* 2001, p. 10). In the United States, roads associated with logging and forest administration developed continuously from 1900 through 1960. These roads allowed logging in new areas and upper-elevation drainages (Evans 1960, pp. 123–124). In both Canada and the United States, these roads have also generated more human activity and human disturbance in habitat that was previously less accessible to humans (MCST 2005, p. 5). See *E. Other Natural or Manmade Factors Affecting Its Continued Existence* for additional discussion.

The harvest of late-successional (old-growth) forests directly affects availability of arboreal lichens, the primary winter food item for caribou within the Southern Mountain Caribous DPS. Caribou within this area rely on arboreal lichens for winter forage for 3 or more months of the year (Apps *et al.* 2001, p. 65; Stevenson *et al*. 2001, p. 1; MCST 2005, p. 2). In recent decades, however, local caribou populations in the

Southern Mountain Caribou DPS have declined faster than mature forests have been harvested. This suggests that arboreal lichens are not the limiting factor for woodland caribou in this area (MCST 2005, p. 4; Wittmer *et al.* 2005a, p. 265; Wittmer *et al.* 2007, p. 576).

Forest Fires

Forest fires have the same effect on mountain caribou habitat in the Southern Mountain Caribou DPS as forest harvesting. Fires cause direct loss of important old-growth habitat and increase openings that allow for the growth of early seral habitat, which is conducive to use by other ungulates, such as deer and moose, but not by mountain caribou, which require old growth, mature forests. Historically, natural fires occurred at very low frequency and extent throughout the range of the Southern Mountain Caribou DPS. This was due to the very wet conditions of the interior wet-belt (Stevenson *et al.* 2001, p. 3). When fires did occur, most were relatively small in size (Seip 1998, p. 204). Fires can remove suitable habitat for 25 to 100 years or longer depending on fire intensity, geography, and type of forage normally consumed by caribou (COSEWIC 2002, p. 45). As previously discussed, changes in habitat conditions have led to altered predator-prey dynamics, resulting in more predation on caribou in the Southern Mountain Caribou DPS. One of the first notable declines of caribou was reported in Wells Gray Park, British Columbia (within the Southern Mountain Caribou DPS), and was attributed to fires in the 1930s that burned approximately 70 percent of

forests below 4,000 ft (1,219 m) within the park (Edwards 1954, entire). These fires changed forest composition, leading to increased populations of other ungulates, such as mule deer and moose (Edwards 1954, p. 523), which altered the predator-prey dynamics. The 1967 Sundance, Kanisku Mountain, and Trapper Peak fires in the Selkirk Mountains destroyed almost 80,000 ac (32,375 ha) of caribou habitat (Layser 1974, p. 51). In 2006, the Kutetl fire in West Arm Park (British Columbia) destroyed nearly 19,768 ac (8,000 ha) of caribou habitat (Wildeman *et al.* 2010, pp. 1, 14, 33, 36, 61). Forest fires are a natural phenomenon and historically occurred at low frequency and extent throughout the range of the Southern Mountain Caribou DPS prior to human settlement. However, fires are predicted to increase in frequency and magnitude due to ongoing climate change (see "Climate Change" below), thereby continuing to impact caribou habitat in the Southern Mountain Caribou DPS into the future.

Insect Outbreaks

Engelmann spruce beetles (*Dendroctonus engelmannii*) have been known to kill large amounts of old-growth forest and caribou habitat in western Canada and the northwestern United States. Spruce bark beetle (*Dendroctonus rufipennis*) outbreaks and resulting tree mortality within the Southern Mountain Caribou DPS occurred in the late 1940s, 1950s, 1960s, and 1980s. Some of these outbreaks followed wind-throw events of trees or forest fires in the United States (Evans 1960, p. 124; USFWS 1985, p. 21).

More recently, mountain pine beetle outbreaks and mass tree mortality in western Canada have occurred in the 1990s and 2000s. Caribou habitat affected by mountain pine beetle outbreaks may remain viable for caribou, or may even provide better forage for a period of time, perhaps as long as a decade. This is because dead and dying trees may remain standing and continue to provide arboreal lichens to foraging caribou. However, eventually these trees fall and arboreal lichens become scarcer, forcing caribou to seek alternate habitat (Hummel and Ray 2008, p. 252).

These beetle outbreaks have impacted caribou within the Southern Mountain Caribou DPS by directly removing habitat and associated arboreal lichens from the landscape (Evans 1960, p. 132). In addition to eliminating caribou habitat, these beetle outbreaks have brought increased logging operations to high-elevation forests. This logging was done in an attempt to salvage the valuable wood resource in these forest stands. However, this activity also brought human presence and an increase in the potential for poaching and disturbance (Evans 1960, p. 131; USFWS 1985, p. 21). Interestingly, because of the spruce bark beetle outbreaks and a sudden increase in spruce harvest, the logging industry, in an attempt to sell the wood that was being salvaged from the mid-century spruce bark beetle outbreaks, aggressively promoted and developed a market for spruce wood. The associated demand they created for spruce wood continued after the salvaged wood was exhausted, probably leading to continued logging of spruce forests at high elevations. This continued logging of spruce continued the elimination of

habitat and prolonged disturbance to caribou beyond the direct impacts from the beetle infestations (Evans 1960, p. 131).

Management of beetle outbreaks for caribou has involved attempting to preserve alternate habitat until forests that have been affected have time to regenerate and once again become suitable for caribou (Hummel and Ray 2008, p. 252). It is not clear to what extent insect infestations will continue into the future; however, climate change models predict more frequent mountain pine beetle (*Dendroctonus ponderosae*) outbreaks at higher elevations in the future (Littell *et al.* 2009, p. 14).

Human Development

Human development fragments habitat within and between local caribou populations in the Southern Mountain Caribou DPS and creates potential impediments to unrestricted caribou movements (MCST 2005, p. 5). Impediments in valley bottoms, such as human settlements, highways, railways, and reservoirs, have led to an isolation of local populations (MCST 2005, p. 5; Wittmer *et al*. 2005b, p. 414) and reduced chance of rescue (the movement of individuals, often juveniles, to other local populations which can provide genetic flow and recruitment to populations with very low numbers) from natural immigration or emigration (van Oort *et al.* 2011, pp. 220–223; Serrouya *et al.* 2012, p. 2598). Similar to forest harvest and fires, human development and its associated infrastructure also impact caribou in the following ways: It eliminates caribou habitat,

alters the distribution and abundance of other ungulate species, provides travel corridors for predators (MCST 2005, p. 5), and increases human access to habitat that was previously difficult to access.

Caribou have also been killed by vehicles on highways within the range of the Southern Mountain Caribou DPS (Johnson 1985, entire; Wittmer *et al.* 2005b, p. 412; CBC News 2009, *in litt.*). The 1963 opening of the Creston-Salmo section of Highway 3 in British Columbia has led to increased vehicle collisions with mountain caribou. Seven caribou were struck and killed on this section of Highway 3 within the first 9 years (Johnson 1985, entire). More recently, in 2009, a pregnant caribou cow and calf were killed by a vehicle travelling on Highway 3 near Kootenay Pass in British Columbia (CBC News 2009, *in litt.*). Deaths of individual caribou from car collisions can have notable adverse effects on local populations. This is because of the small population sizes of the southern-most populations within the Southern Mountain Caribou DPS and the low productivity and calf survival rates as discussed in the **Background** section.

Highways and their associated vehicle traffic can also fragment caribou habitat and act as impediments to animal movement (Forman and Alexander 1998, p. 215; Dyer *et al.* 2002, p. 839; Fahrig and Rytwinski 2009, entire). Species like the Southern Mountain Caribou DPS, which have relatively large ranges, low reproductive rates, and low natural densities, are more likely to be negatively affected by roads (Fahrig and Rytwinski 2009, entire). It has been postulated that the Trans-Canada Highway may also

be acting as an impediment to caribou movements in certain areas of the Southern Mountain Caribou DPS (Apps and McLellan 2006, p. 93).

Mining activities, although they may not be focused in valleys, can also fragment caribou habitat and limit their dispersal and movement. Additionally, these activities may play a role in the alteration of the distribution and abundance of other ungulate species. These activities may also provide travel corridors for predators (MCST 2005, p. 5), as well as increase human accessibility to habitat that was previously difficult to access. The extent of direct and indirect impacts to caribou from mining activities within the Southern Mountain Caribou DPS is, at this time, not well known.

Human Recreation

Human-related activities are known to impact caribou. Specifically, as described below, wintertime recreational activities such as snowmobiling, heli- or cat-skiing, and back-country skiing are likely to impact short-term behavior, long-term habitat use (MCST 2005, p. 5), and physiology (Freeman 2008, p. 44) of caribou. It is uncertain if these activities are affecting all populations within the Southern Mountain Caribou DPS. There is also some literature that suggests compacted trails resulting from high amounts of wintertime recreational activities such as snowmobiling and snowshoeing may act as travel corridors for predators such as wolves. These trails allow easier access into winter

caribou habitat that was previously more difficult for predators to navigate (Simpson and Terry 2000, p. 2; Cichowski *et al.* 2004, p. 241).

Snowmobile activity represents the greatest threat to caribou within the Southern Mountain Caribou DPS relative to other winter recreation activities. Concern centers on the overlap between preferred snowmobile habitat and preferred caribou habitat (Simpson and Terry 2000, p. 1). Deep snow, open forest, and scenic vistas are characteristics found in caribou winter habitat. These same characteristics are also preferred by snowmobilers (Seip *et al.* 2007, p. 1539), and snowmobilers can easily access these areas (Simpson and Terry 2000, p. 1). New forest roads may even be providing increased access to these areas (Seip *et al.* 2007, p. 1539).

Within the Southern Mountain Caribou DPS, caribou have been shown to alter their behavior by fleeing from (Simpson 1987, pp. 8–10), and dispersing from, high-quality winter habitat because of snowmobile activity (Seip *et al.* 2007, p. 1543). Altered behavior in response to winter recreation in the form of fleeing can have energetic costs to caribou (Reimers *et al.* 2003, pp. 751–753). Perhaps more significantly, however, altered long-term habitat occupancy due to snowmobiling may be forcing caribou within the Southern Mountain Caribou DPS into inferior habitat where there may be energetic costs as well as elevated risks of predation or mortality from avalanches (Seip *et al.* 2007, p. 1543). Anecdotal reports of caribou being notably absent in areas where they had been historically present, but where snowmobile activity had begun or increased (Kinley 2003,

p. 20; USFS 2004, p. 12; Seip *et al.* 2007, p. 1539), support this concept. Further, Freeman (2008, p. 44) showed that caribou exhibit signs of physiological stress within and as far away as 6 mi (10 km) from snowmobile activity. Physiological stress in this study was estimated using fecal glucocorticoids (GC). Glucocorticoids, when chronically elevated, can reduce fitness of an individual by impacting feeding behavior, growth, body condition, resistance to disease, reproduction, and survival (Freeman 2008, p. 33). Caribou within 6 mi (10 km) of open snowmobile areas within the Southern Mountain Caribou DPS showed chronically elevated GC levels. This suggests that snowmobile activity in certain areas of the Southern Mountain Caribou DPS is causing some level of physiological stress to caribou and may be impacting caribou in some way. However, elevated GC levels may be caused by many different environmental factors and may not always translate to impacts (Romero 2004, p. 250; Freeman 2008, p. 48). The extent of impacts from chronically elevated GC levels in caribou appears to need further study (Freeman 2008, p. 46). Research suggests that impacts from snowmobiling are observed in other populations of caribou outside of the Southern Mountain Caribou DPS as well (Mahoney *et al.* 2001, pp. 39-42; Reimers *et al.* 2003, p. 751).

Given what we do understand about the impacts to caribou from human disturbance (Simpson 1987, pp. 8-10), and what has been studied in other ungulate species relative to helicopter disturbance (Cote 1996, p. 683; Webster 1997, p. 7; Frid 2003, p. 393), it is also probable that the presence of humans and machines (helicopters or snow-cats) in caribou habitat from heli- or cat-skiing is a potential source of

disturbance to caribou in certain portions of the Southern Mountain Caribou DPS. This disturbance is likely negatively impacting caribou by altering their behavior and habitat use patterns. Indeed, it has also been documented that caribou within heli-ski areas exhibit elevated GC levels. This suggests that heli-skiing activity in certain areas of the Southern Mountain Caribou DPS is causing some level of physiological stress to caribou (Freeman 2008, p. 44). Additionally, since heli- and cat-skiing often require tree cutting for run and/or road maintenance, habitat alteration may be another threat posed from this activity (Hamilton and Pasztor 2009, entire). Further study may be necessary to completely understand the impacts to caribou from heli- and cat-skiing.

Disturbance impacts to caribou from backcountry skiing also are relatively unstudied. Our current knowledge of caribou responses to human disturbance suggests that backcountry skiing may be a potential source of disturbance to caribou, negatively impacting them by altering their behavior. These impacts are likely similar to behavioral alterations from heli- or cat-skiing (Simpson and Terry 2000, p. 3; USFS 2004, p. 24). Duchesne *et al.* (2000, p. 313–314) found that the presence of humans on snowshoes and skis did impact caribou behavior by altering foraging and vigilance, albeit this study was conducted outside the Southern Mountain Caribou DPS where caribou foraging behavior is different. This study also suggested that caribou may habituate to this level of human disturbance (Duchesne *et al.* 2000, p. 314). Given the possibility of habituation, the relatively slow pace of activity participants, and the non-motorized nature of backcountry skiing or snowshoeing, it is suspected that this recreation activity at its current level poses

a relatively small threat to caribou within certain areas of the Southern Mountain Caribou DPS (Simpson and Terry 2000, p. 3; USFS 2004, p. 24). However, since the magnitude of impacts may be correlated with the number of activity participants in an area (Simpson and Terry 2000, p. 3), this activity may be a larger threat to caribou within the Southern Mountain Caribou DPS in the future as some areas become more accessible from an expanded network of roads and increasing populations.

Each of these activities—snowmobiling, heli- or cat-skiing, and backcountry skiing—has the potential to disturb caribou. The extent to which caribou are impacted is likely correlated with the intensity of activity (Simpson 1987, p. 9; Duchesne *et al.* 2000, p. 315; Reimers *et al.* 2003, p. 753). Nature-based recreation and tourism are on the rise in rural British Columbia, with projected growth of approximately 15 percent per year (Mitchell and Hamilton 2007, p. 3). New forest roads may be providing increased access to caribou habitat as well (Seip *et al.* 2007, p. 1539). As such, the threat of human disturbance may be a contributing factor in caribou population declines within the Southern Mountain Caribou DPS in the future.

Climate Change

Our analyses under the Act include consideration of the effects of ongoing and projected changes in climate. The terms "climate" and "climate change" are defined by the Intergovernmental Panel on Climate Change (IPCC). "Climate" refers to the mean

and variability of different types of weather conditions over time. Thirty years is a typical period for such measurements, although shorter or longer periods also may be used (IPCC 2007, p. 78). The term "climate change" thus refers to a change in the mean or variability of one or more measures of climate (e.g., temperature or precipitation) that persists for an extended period, typically decades or longer, whether the change is due to natural variability, human activity, or both (IPCC 2007, p. 78). Various types of changes in climate can have direct or indirect effects on species. These effects may be positive, neutral, or negative and they may change over time. This change depends on the species and other relevant considerations, such as the effects of interactions of climate with other variables (e.g., habitat fragmentation) (IPCC 2007, pp. 8–14, 18–19). In our analyses, we used our expert judgment to weigh relevant information, including uncertainty, in our consideration of various aspects of climate change.

Between the 1600s and the mid-1800s, Europe and North America were in a period called the "Little Ice Age." During this period, Europe and North America experienced relatively colder temperatures (IPCC 2001, p. 135). The cooling during this time is considered to be modest, with average temperature decreases of less than 1.8 degrees Fahrenheit (F) (1 degree Celsius (C)) relative to 20th century levels. Cooling may have been more pronounced in certain regions and during certain periods, such as in North America during the 1800s (IPCC 2001, p. 135).

In the Pacific Northwest, regionally averaged temperatures have risen 1.5 degrees

Fahrenheit (F) (0.8 degrees Celsius (C)) over the last century (as much as 4 degrees F (2 degrees C) in some areas). Temperatures are projected to increase by another 3 to 10 degrees F (1.5 to 5.5 degrees C) by 2080 (Mote and Salathé 2009, pp. 21, 33). Warmer winter temperatures are reducing snow pack in western North American mountains. This is occurring because a higher proportion of precipitation is falling as rain and because there are higher rates of snowmelt during winter (Hamlet and Lettenmaier 1999, p. 1609; Brown 2000, p. 2347; Mote 2003, pp. 3–1; Christensen *et al*. 2004, p. 347; Knowles *et al*. 2006, pp. 4548–4549). This trend is expected to continue with future warming (Hamlet and Lettenmaier 1999, p. 1611; Christensen *et al*. 2004, p. 347; Mote *et al*. 2005, p. 48). In British Columbia, the last 50 years have seen changes in precipitation distribution. Specifically, there has been a decreasing trend in winter precipitation and an increasing trend in spring and summer precipitation (Columbia Mountains Institute of Applied Ecology 2006, p. 45). Virtually all future climate scenarios for the Pacific Northwest predict increases in wildfire in western North America, especially east of the Cascades. This predicted increase is due to higher summer temperatures, earlier spring snowmelt, and lower summer flows which can lead to drought stress in trees (Littell *et al*. 2009, p. 14). Lastly, climate change may lead to increased frequency and duration of severe storms and droughts (Golladay *et al*. 2004, p. 504; McLaughlin *et al*. 2002, p. 6074; Cook *et al*. 2004, p. 1015).

Review of climate change modeling presented in Utzig (2005, p. 5) demonstrated projected shifts in habitats within the present range of the Southern Mountain Caribou

DPS in Canada. Projections for 2055 indicate a significant decrease in alpine habitats, which is loosely correlated with the distribution of the arboreal lichens on which these caribou depend. The projected biogeoclimatic zone distributions indicate a significant increase in the distribution of western red cedar in the mid-term with a shift upward in elevation and northward over the longer term. Projected subalpine fir distribution is similar, with a predicted shift upward in elevation and long-term decreasing presence in the south and on the drier plateau portions of the present range of the Southern Mountain Caribou DPS. Recent analysis by Rogers *et al*. (2011, pp. 5–6) of three climate projection models indicate that subalpine forests (which contain subalpine fir) may be almost completely lost in the Pacific Northwest (Washington and Oregon) by the end of the 21st century. This loss would be detrimental to the Southern Mountain Caribou DPS given their reliance on this habitat type for forage of arboreal lichens during the late winter and for summer habitat (Utzig 2005, p. 2). However, both western red cedar and subalpine fir are projected to maintain a significant presence in the Southern Mountain Caribou DPS, with increased densities projected northward. This indicates the potential for range expansion of caribou in those northern areas (Utzig 2005, p. 5). Unfortunately, habitat in the southern extent of the Southern Mountain Caribou DPS may become unsuitable, thereby restricting the southern range of this Southern Mountain Caribou DPS (Rogers *et al*. 2011, pp. 5–6).

The movements of local populations within the Southern Mountain Caribou DPS are closely tied to changes in snow depth and consolidation of the snow pack, allowing

access to arboreal lichens in winter (Kinley *et al.* 2007, entire). In general, climate change projections suggest reduced snowpacks and shorter winters, particularly at lower elevations (Utzig 2005, p. 7; Littell *et al.* 2009, p. 1). Snowpack depth is significant in determining the height at which arboreal lichens occur on trees, and the height at which caribou are able to access lichens in the winter. These arboreal lichens are also dependent upon factors influenced by climate, including humidity and stand density (Utzig 2005, p. 7). Kinley *et al.* (2007, entire) found that during low snow years, mountain caribou in deep-snowfall regions made more extensive use of low-elevation sites (sometimes associated with the use of stands of lodgepole pine (*Pinus contorta*) and western hemlock) during late winter. When snowpack differences were slight between years in these regions, mountain caribou did not shift downslope as they did during low snow years (Kinley *et al.* 2007, p. 93). This may indicate that mountain caribou escape reduced snowpacks (similar to what is projected with climate change) by moving to lower elevations during low snow years. However, other factors associated with climate change may negatively impact those lower elevation forests, such as increased episodes of wildfire and insect outbreaks, or large-scale changes in forest composition (Littell *et al.* 2010, entire). In addition, moving to lower elevations during late winter may also make mountain caribou more susceptible to predation due to increased presence of other ungulate species such as moose and deer at these elevations, which in turn attracts greater numbers of predators (see *C. Disease or Predation*).

Predictions for 2085 indicate an increase in drier vegetation types at lower

elevations. This could potentially cause an increase in other ungulate species such as deer, moose, and elk within the range of the Southern Mountain Caribou DPS (Utzig 2005, p. 4). This may result in increased predator numbers in response to increased prey availability, and increased predation on caribou (Utzig 2005, p. 4). For example, in northern Alberta, changes in summer and winter climate are driving range expansion of white-tailed deer, with further changes expected with continuing climate change (Dawe 2011, p. 153). This increase in white-tailed deer is expected to alter predator-prey dynamics, leading to greater predation on woodland caribou by wolves (Latham *et al.* 2011, p. 204). This potential increase in predation pressure on the Southern Mountain Caribou DPS is in addition to the risk of increased predation due to forest harvesting and fires that reduces and fragments suitable habitat (Stevenson *et al.* 2001, p. 1), as described above.

Virtually all future climate scenarios for the Pacific Northwest predict increases in wildfire in western North America, especially east of the Cascades. This is due to higher summer temperatures, earlier spring snowmelt, and lower summer flows, which can lead to drought stress in trees (Littell *et al*. 2009, p. 14). In addition, due to climatic stress to trees and an increase in temperatures more favorable to mountain pine beetles, outbreaks are projected to increase in frequency and cause increased tree mortality (Littell *et al*. 2009, p. 14). These outbreaks will reach higher elevations due to a shift to favorable temperature conditions as these regions warm (Littell *et al.* 2009, p. 14). Other species of insects, such as spruce beetle and western spruce budworm (*Choristoneura occidentalis*),

may also emerge in forests where temperatures are favorable (Littell *et al.* 2009, p. 15). These projected impacts to forested ecosystems have the potential to further impact habitat for the Southern Mountain Caribou DPS (Utzig 2005, p. 8).

The information currently available on the effects of global climate change and increasing temperatures does not make precise estimates of the location and magnitude of the effects. However, we do expect climate change to cause the following: A shorter snow season with shallower snowpacks, increased forest disturbance, and vegetation growing in far from optimal climactic conditions (Columbia Mountains Institute of Applied Ecology 2006, p. 49). Utzig (2005, entire) provided the most applicable summary of the potential effects of climate change to the Southern Mountain Caribou DPS. In his paper, he noted that there are general indications that the present range of mountain caribou may be reduced in some areas and increased in others (p. 10), as the ecosystem upon which they rely undergoes drastic future changes due to changes in the form and timing of precipitation events (snow versus rain), and vegetative responses to climatic conditions (e.g., drier conditions will mean increased occurrence of fire and disease in mature trees that support arboreal lichens (p. 8)). These climatic conditions may also increase other ungulate species (deer, moose) and lead to higher levels of predator prey interactions (p. 4). He also identified several uncertainties (Utzig 2005, pp. 10–11), such as the impossibility of reliably predicting specific ecosystem changes and potential impacts. Utzig acknowledged that caribou did survive the last glacial period, as

well as intervening climate change over the last 10,000 years, although those changes likely occurred over a longer period of time than are those changes occurring today.

We anticipate that climate change could directly impact the Southern Mountain Caribou DPS in the following ways: By negatively affecting the abundance, distribution, and quality of caribou habitat; the ability of caribou to move between seasonal habitats; and their ability to avoid predation. Impacts from climate change may also affect caribou and their habitat by affecting external factors such as increased disease and insect outbreaks, increased fire occurrence, and changes in snow depth. The impacts from these effects could lead to increased habitat fragmentation and changes in forest composition, changes in forage ability and abundance, and changes in predation, which are each important to caribou survival. Because of the close ties between caribou movement and seasonal snow conditions, seasonal shifts in snow conditions will likely be significant to the caribou in the Southern Mountain Caribou DPS (Utzig 2005, pp. 4, 8). A trend towards hotter and drier summers, increasing fire events, and unpredictable snow conditions has the potential to reduce both recruitment and survival of the Southern Mountain Caribou DPS of mountain caribou (Festa-Bianchet *et al.* 2011, p. 427). A warming climate will affect all aspects of caribou ecology and exacerbate the impact of other threats (Festa-Bianchet *et al.* 2011, p. 424).

Conservation Efforts to Reduce Habitat Destruction, Modification, or Curtailment of Its Range

Efforts in the United States

Efforts to protect the Southern Mountain Caribou DPS and its habitat in the United States include: (1) Retaining mature to old-growth cedar/hemlock and subalpine spruce/fir stands; (2) analyzing forest management actions on a site-specific basis to consider potential impacts to caribou habitat; (3) avoiding road construction through mature old-growth forest stands unless no other reasonable access is available; (4) placing emphasis on road closures and habitat mitigation based on caribou seasonal habitat needs and requirements; (5) controlling wildfires within southern Selkirk Mountains woodland caribou management areas to prevent loss of coniferous tree species in all size classes; and (6) managing winter recreation in the Colville National Forest (CNF) in Washington, with specific attention to snowmobile use within the Newport/Sullivan Lake Ranger District.

Relative to human access within caribou habitat, motorized winter recreation, specifically snowmobiling, represents one threat to caribou within the southern Selkirk Mountains woodland caribou recovery area. USFS 1987 land resource management plans (LRMPs) included some standards calling for motorized use restrictions when needed to protect caribou. The CNF's LRMP in Washington has been revised to incorporate special management objectives and standards to address potential threats to woodland caribou on the Forest. The CNF also manages winter recreation in areas of

potential conflict between snowmobile use and caribou, specifically in its Newport/Sullivan Lake Ranger District (77 FR 71042, p. 71071). The Idaho Panhandle National Forest (IPNF), beginning in 1993, implemented site-specific closures to protect caribou on IPNF. However, more comprehensive standards addressing how, when, and where, to impose such restrictions across IPNF were limited (USFS 1987, entire). In December 2005, a United States district court granted a preliminary injunction prohibiting snowmobile trail grooming within the caribou recovery area on the IPNF during the winter of 2005 to 2006. The injunction was granted because the IPNF had not developed a winter recreation strategy addressing the effects of snowmobiling on caribou. In November 2006, the Court granted a modified injunction restricting snowmobiling and snowmobile trail grooming on portions of the IPNF within the recovery area of the southern Selkirk Mountains caribou. On February 14, 2007, the Court ordered a modification of the current injunction to add a protected caribou travel corridor connecting habitat in the U.S. portion of the southern Selkirk Mountains with habitat in British Columbia. This injunction is currently in effect and restricts snowmobiling on 239,588 ac (96,957 ha), involving 71 percent of the existing woodland caribou recovery area. In its revised LRMP (USFS 2013, entire), the IPNF considered the court-ordered snowmobile closure to be the standard until a winter travel plan is approved. The Service will work closely with the IPNF on the future development of their winter recreation strategy, which will be subject to section 7 consultation with the Service.

Within the range of the southern Selkirk Mountains population of woodland caribou is the 43,348-ac (17,542-ha) Salmo-Priest Wilderness area (U.S. Department of Agriculture (USDA) 2013, *in litt.*). The USFS manages these lands under the Wilderness Act of 1964 (16 U.S.C. 1131–1136), which restricts activities in the following manner: (1) New or temporary roads cannot be built; (2) there can be no use of motor vehicles, motorized equipment, or motorboats; (3) there can be no landing of aircraft; (4) there can be no other form of mechanical transport; and (5) no structure or installation may be built.

A recovery plan for the endangered southern Selkirk Mountains population of woodland caribou was finalized in 1994 (USFWS 1994, entire), outlining interim objectives necessary to support a self-sustaining caribou population in the Selkirk Mountains. Among these objectives was a goal to secure and enhance at least 443,000 ac (179,000 ha) of caribou habitat in the Selkirk Mountains. However, the recovery criteria in this recovery plan were determined to be inadequate in the Service's 5-year review (USFWS 2008, p. 15). Additional recovery actions are needed as the 2012 population estimate for this local population has dropped to 27 individuals (Ritchie 2013, *in litt.*). In addition, the 1994 recovery plan only applies to 1 local population (southern Selkirk Mountain population of woodland caribou) of the 15 that comprise the Southern Mountain Caribou DPS.

Efforts in Canada

In 2007, the British Columbia government endorsed the Mountain Caribou Recovery Implementation Plan (MCRIP), which encompasses the Southern Mountain Caribou DPS in Canada (British Columbia Ministry of Agriculture and Lands (BCMAL) 2007, *in litt.*). The plan's goal is to restore the Southern Mountain Caribou DPS in British Columbia to the pre-1995 level of 2,500 individuals (BCMAL 2007, *in litt.*). Actions identified in the MCRIP include, but are not limited, to: Protecting approximately 5,436,320 ac (2,200,000 ha) of range from logging and road building, which would capture 95 percent of high-suitability winter habitat; managing human recreation activities; managing predator populations of wolf and cougar where they are preventing recovery of populations; managing the primary prey base of caribou predators; and augmenting threatened herds with animals transplanted from elsewhere (BCMAL 2007, *in litt.*). The Province of British Columbia pledged to provide $1,000,000 per year, over 3 years, to support adaptive management plans associated with the MCRIP (BCMAL 2007, *in litt.*).

All National Parks in Canada are managed by Parks Canada, and are strictly protected areas where commercial resource extraction and sport hunting are not permitted (Parks Canada National Park System Plan (NPSP) 2009, p. 3). Parks Canada's objective for their National Parks is, "To protect for all time representative natural areas of Canadian significance in a system of national parks, to encourage public understanding, appreciation and enjoyment of this natural heritage so as to leave it unimpaired for future

generations" (Parks Canada NPSP 2009, p. 2). The Southern Mountain Caribou DPS in British Columbia encompasses all or portions of four Canadian National Parks: Glacier, Mount Revelstoke, Jasper, and Banff (Parks Canada 2008, *in litt*.). Two of these National Parks, Glacier and Mount Revelstoke, comprise 333,345 ac (134,900 ha) and are within the range of several local populations of caribou in the Southern Mountain Caribou DPS (Parks Canada NPSP 2009, pp. 18–19). Ninety-four percent of the land in British Columbia is considered Provincial Crown lands, of which 33,881,167 ac (13,711,222 ha) are designated as various park and protected areas managed by British Columbia (B.C.) Parks (B.C. Parks 2013a, *in litt.*). The mission of B.C. Parks is to "protect representative and special natural places within the province's Protected Areas System for world-class conservation, outdoor recreation, education and scientific study" (B.C. Parks 2013b, *in litt.*). Many Canadian National parks, provincial parks, and ecological reserves are regularly or occasionally occupied by local populations or individuals of mountain caribou and provide some level of protection including: Arctic Pacific Lakes, Evanoff, Sugarbowl-Grizzly Den, Ptarmigan Creek, West Twin, Close to the Edge, Upper Rausch, Mount Tinsdale, Bowron Lake, Cariboo Mountains, Wells Gray, Upper Adams, Foster Arm, Cummins Lakes, Goosegrass, Glacier, Mount Revelstoke, Monashee, Goat Range, Purcell Wilderness, Kianuko, Lockhart Creek, West Arm, and Stagleap.

In February 2009, British Columbia's Ministry of Environment (BCMOE) protected 5,568,200 ac (2,253,355 ha) of currently available and eventually available

high-suitability winter caribou habitat. This was accomplished through the issuance of 10 Government Actions Regulation orders on Provincial Crown lands within the Southern Mountain Caribou DPS (BCMOE 2009a, *in litt.*; BCMOE 2009b, *in litt.*; Mountain Caribou Recovery Implementation Plan Progress Board (MCRIPPB) 2010, pp. 7, 9). This protection was accomplished, in part, through the official designation of high-suitability habitats as either wildlife habitat areas or ungulate winter ranges, and associated general wildlife measures (BCMOE 2009b, *in litt.*). These measures are designed to reduce the impact from timber harvest and road construction on caribou habitat. They identify areas where no or modified timber harvesting can take place, along with certain motor vehicle prohibition regulations (BCMOE 2009b, *in litt.*; BCMOE 2009c, *in litt.*). This effort included the creation of two important guidance documents that provide recommendations for the establishment of mineral exploration activity and commercial backcountry recreation (i.e., heli-skiing and cat-skiing). Both of these documents call for their respective activities to maximize use of existing roads and clearings, and specify other activity-specific restrictions on habitat alteration (Hamilton and Pasztor 2009, pp. 7–8; BCMOE 2009c, *in litt.*).

In February 2009, the BCMOE closed approximately 2,471,050 ac (1,000,000 ha) of caribou habitat within the Canadian portion of the Southern Mountain Caribou DPS to snowmobile use (MCRIPPB 2010, p. 10). However, compliance with closures in these areas is not well known, and is likely not 100 percent (MCRIPPB 2012, p. 9). Efforts and progress are being made to replace stolen or vandalized signs, to improve monitoring

and enforcement of compliance, and to inform and educate the users of the closed areas. Specifically, several tickets have been issued in British Columbia for noncompliance, and informational pamphlets have been made and distributed (MCRIPPB 2010, p. 10; MCRIPPB 2012, p. 9).

In addition, conservation has been accomplished through the voluntary signing of stewardship management agreements in British Columbia. These agreements are between the BCMOE and snowmobiling groups, and promote the minimization of disturbance and displacement of caribou from snowmobile activities in their habitat. Through these agreements, snowmobile groups agree to: A code of conduct while riding in designated areas, volunteer to educate riders about impacts to caribou and preventative measures to avoid impacts, volunteer to monitor designated areas for compliance, and submit reports to the BCMOE detailing caribou sightings and snowmobile use of an area. To date, 13 of these agreements have been signed between the BCMOE and snowmobile organizations (MCRIPPB 2010, p. 10).

Private Efforts

Approximately 135,908 ac (55,000 ha) of private land within the British Columbia portion of the southern Selkirk Mountains caribou recovery area were purchased by the Nature Conservancy Canada (NCC). This purchase was made with the support of the Government of Canada, in what has been described as the largest single

private conservation land acquisition in Canadian history (USFWS 2008, p. 17). This private land was previously owned by a timber company known as the Pluto Darkwoods Forestry Corporation, which managed a sustainable harvesting program prior to selling the land. The NCC's goal for the Darkwoods property is sustainable ecosystem management, including the conservation of woodland caribou (USFWS 2008, p. 17).

Summary for Factor A

Destruction, modification, or curtailment of caribou habitat has been and is today a significant threat to caribou throughout the Southern Mountain Caribou DPS. Specific threats directly impacting caribou habitat within the Southern Mountain Caribou DPS include forest harvest, forest fires, insect outbreaks, human development, recreation, and climate change. Each of these threats, through varying mechanisms, directly removes and fragments existing habitat and/or impacts caribou behavior such that it alters the distribution of caribou within their natural habitat.

Forest harvest, forest fires, insect outbreaks, human development, and climate change catalyze other, indirect threats to caribou within the Southern Mountain Caribou DPS. These impacts may be particularly prevalent in the southern extent of this DPS. Specifically, direct habitat loss and fragmentation limits caribou dispersal and movements among local populations within the Southern Mountain Caribou DPS by making it more difficult and more dangerous for caribou to disperse. Further, habitat loss

and fragmentation have and will continue to alter the predator-prey ecology of the Southern Mountain Caribou DPS by creating more suitable habitat and travel corridors for other ungulates and their predators. Finally, habitat loss and fragmentation increases the likelihood of disturbance of caribou in the Southern Mountain Caribou DPS from human recreation or other activities by increasing the accessibility of these areas to humans. Climate change is forecasted to exacerbate these impacts by catalyzing forest composition changes, increasing forest insect outbreaks, and increasing the likelihood of wildfires.

Another threat, human disturbance from wintertime recreation, particularly from snowmobile activity, increases physiological stress, energy expenditure, and alters habitat occupancy of caribou. This disturbance forces caribou to use inferior habitat with greater risk of depredation or avalanche. Human disturbance is likely to continue to increasingly impact caribou within the Southern Mountain Caribou DPS, because nature-based recreation and tourism are on the rise in rural British Columbia. Projected growth of these activities is estimated at approximately 15 percent per year (Mitchell and Hamilton 2007, p. 3). In addition, the establishment of new forest roads may be providing increased human access to caribou habitat, further amplifying the threat of human disturbance and caribou population declines within the Southern Mountain Caribou DPS in the future. Impacts to caribou from human disturbance are occurring today, despite conservation measures, and are likely to occur in the future. These impacts will likely

contribute to the decline of local populations within the Southern Mountain Caribou DPS and further impact the continued existence of the Southern Mountain Caribou DPS.

We have evaluated the best available scientific and commercial data on the present or threatened destruction, modification, or curtailment of the habitat or range of the Southern Mountain Caribou DPS. Through this evaluation, we have determined that this factor poses a significant threat to the continued existence of the Southern Mountain Caribou DPS, especially when considered in concert with the other factors impacting the Southern Mountain Caribou DPS.

B. Overutilization for Commercial, Recreational, Scientific, or Educational Purposes

Caribou have been an important game species since they have shared the landscape with humans. Native Americans have hunted caribou for thousands of years in British Columbia, although the numbers of animals taken were probably modest given the relatively limited hunting pressure and hunting implements at the time (Spalding 2000, p. 38). The introduction of firearms combined with a later increase in human populations in British Columbia led to an increase in caribou harvested by the late 1800s and into the 1900s (Spalding 2000, p. 38).

It is thought that an increase in hunting pressure, although it did not cause extinction, upset the already delicate balance between predators and caribou and

catalyzed a general decline in caribou populations (Seip and Cichowski 1996, p. 73; Spalding 2000, p. 39). As justification for this hypothesis, Spalding (2000, p. 39) cited old field reports that hunters, both Native American and non-Native American, were killing too many caribou. He also cited several regions of British Columbia where, after hunting closures were implemented, caribou numbers began to rebound, although this was not the case in all populations (Spalding 2000, p. 37). These hunting pressures and associated population declines subsided with the hunting season closures, and some regions of British Columbia even saw population increases and stabilization after the 1940s (Spalding 2000, pp. 37, 39).

Hunting of caribou is currently not allowed in any of the lower 48 United States. Further, hunting is prohibited in all National Parks and Ecological Reserves in British Columbia; but may be allowed in some specific British Columbia parks. Hunting regulations put out by the British Columbia's Ministry of Forests, Lands and Natural Resource Operations for 2012–2014, currently allows hunting of large, 5-point adult bull caribou within a few areas within the range of the Southern Mountain Caribou local populations (British Columbia Hunting & Trapping Regulations/Synopsis (BCHT) 2012–2014). Hunting of adult bull caribous are allowed in British Columbia to hunters who have a license and have drawn the appropriate Limited Entry Hunting season authorization (BCHT 2012–2014, p. 19). The range of Mountain Caribou is reported in the BCHT regulations (p. 19) to occur within specific sections of four Management Units (MU's; MUs 3, 4, 5, 7). Caribou that have been harvested are required to be submitted

for a Compulsory Inspection with the animal's front incisor tooth, antlers, and piece of hide with proof of sex within 30 days of harvest (BCHT 2012–2014, p. 21). Hunters are limited to 1, 5-point bull during the specified season. We do not know the number of licenses that are available to hunters in a given year, or the number of adult bull mountain caribou that are harvested. Also within the BCHT, there is a section titled, Mountain Caribou Update (p. 23), describing the current status of the mountain type of woodland caribou and ongoing recovery strategies. One of the strategies discussed in the BCHT regulations describes obtaining information on the predator management/predator-prey dynamics and mountain caribou. As part of this study, the Ministry of Forests, Lands and Natural Resource Operations office are requesting hunters to submit information on the harvest of wolves within the range of the caribou.

Given our current knowledge of caribou dispersal, it is unlikely that many caribou from the Southern Mountain Caribou DPS will be harvested in these areas. Consequently, legal harvest has not been a major limiting factor to caribou within the Southern Mountain Caribou DPS since the mid-1970s (Seip and Cichowski 1996, p. 73). Therefore, although it may have had a historical impact on caribou populations, hunting/harvesting of caribou is not presently impacting caribou within the Southern Mountain Caribou DPS.

Although there are historic reports of the illegal harvest of caribou within the Southern Mountain Caribou DPS (Scott and Servheen 1985, p. 15; Seip and Cichowski

1996, p. 76), we do not have data that suggest illegal killing is affecting caribou numbers in any of the local populations within the Southern Mountain Caribou DPS.

Conservation Efforts to Reduce Overutilization for Commercial, Recreational, Scientific, or Educational Purposes

Aside from State and Provincial regulations that limit hunting of caribou, we are unaware of other conservation efforts to reduce overutilization for commercial, recreational, scientific, or educational purposes; however, we do not have information suggesting that overutilization is an ongoing threat to caribou within the Southern Mountain Caribou DPS.

Summary for Factor B

Threats from overutilization such as hunting appear to be ameliorated, now and in the future, by responsible management. Historically, caribou within the Southern Mountain Caribou DPS were hunted throughout their range. They were likely overharvested when human populations increased in British Columbia and with the advent of modern weapons. The hunting of caribou has been made illegal within the Southern Mountain Caribou DPS, in both the United States and Canada. After hunting was stopped, certain populations began to recover and grow, but others did not. Even though there have been known occurrences of humans illegally killing caribou within the

Southern Mountain Caribou DPS in the past, we do not have information indicating this is an ongoing threat. We have evaluated the best available scientific and commercial data on the overutilization for commercial, recreational, scientific, or educational purposes of the Southern Mountain Caribou DPS and determined that this factor does not pose a threat to the continued existence of the Southern Mountain Caribou DPS.

C. Disease or Predation

Disease

Caribou have been occasionally documented to succumb to disease and parasitism throughout their range and within the Southern Mountain Caribou DPS (Spalding 2000, p. 40; Compton *et al.* 1995, p. 493; Dauphine 1975 *in* COSEWIC 2002, pp. 20, 54–55). The effects of many types of biting and stinging insects on caribou include parasite and disease transmission, harassment, and immune system reactions (COSEWIC 2002, p. 54). Several are considered important including: Warble flies (*Oedemagena* spp.), nose bot flies (*Cephenemyia trompe*), mosquitoes (*Aedes* spp.), black flies (*Simulium* spp.), horseflies (*Tabanus* spp.), and deer flies (*Chrysops* spp.) (COSEWIC 2002, p. 54). Mature and old woodland caribou are likely to have a relatively high incidence and prevalence of hydatid cysts (*Echinococcus granulosus*) in their lungs, which can make them more susceptible to predation (COSEWIC 2002, p. 54). Eggs and larvae of the protostrongylid nematode (*Parelaphostrongylus andersoni*) can develop in woodland

caribou lungs and can contribute to pneumonia (COSEWIC 2002, pp. 54–55). Finally, a related meningeal nematode (*P. tenuis*) causes neurologic disease in caribou. Although this nematode is benign in white-tailed deer, it may be a limiting factor to caribou in southern Ontario and west to Saskatchewan. Samuel *et al*. (1992, p. 629) suggested that this meningeal nematode may anthropogenically spread in western Canada due to game ranching; however, we have no new information to determine if this spread has or has not occurred.

Within the Southern Mountain Caribou DPS, evidence of disease or parasitism is limited. We know that several caribou that were shot or found dead in a forest near Rooney, British Columbia, in 1918 were thought to have a type of pneumonia (Spalding 2000, p. 40). We also know that, of 34 caribou that died within 2 years of translocation to the southern Selkirk Mountains, only 1 was confirmed to have died of severe parasitism (*Sarcocystis* sp.) and emaciation (Compton *et al.* 1995, p. 493). Although evidence within the Southern Mountain DPS is limited, we are aware that a reintroduction effort of 51 caribou outside of the Southern Mountain Caribou DPS in the late 1960s failed, presumably because of meningeal worms (*Parelaphostrongylus tenuis*) (Dauphine 1975 *in* COSEWIC 2002, p. 20).

As is the case with most wildlife, caribou are susceptible to disease and parasitism. These sources of mortality are likely causing some level of impact to individual caribou within the Southern Mountain Caribou DPS. However, because no

severe outbreaks have been documented and because relatively few caribou within the Southern Mountain Caribou DPS have been known to succumb to disease or parasitism, these sources of mortality are unlikely to have significantly impacted caribou within the Southern Mountain Caribou DPS, currently or historically.

Predation

Natural predators of caribou in the Southern Mountain Caribou DPS include cougars (*Felis concolor*), wolves (*Canis lupus*), grizzly bears (*Ursus arctos*), and black bears (*Ursus americanus*) (Seip 2008, p. 1). Increased predation from these natural predators, particularly wolves and cougars, is thought to be the most, or one of the most significant contributors to Southern Mountain Caribou DPS declines in recent decades (Seip 1992, p. 1500; Kinley and Apps 2001, p. 161; MCST 2005, p. 4, Wittmer *et al.* 2005b, pp. 414–415). Elevated levels of predation on caribou in the Southern Mountain Caribou DPS have likely been caused, in part, by an alteration of the natural predator-prey ecology within their range (Wittmer *et al.* 2005b, p. 417; Seip 2008, p. 3).

This change in the predator-prey ecology within the Southern Mountain Caribou DPS is thought to be catalyzed, at least in part, by human-caused habitat alteration and fragmentation (Seip 2008, p. 3). Habitat alteration and fragmentation within the Southern Mountain Caribou DPS is caused by many things including, but not limited to, forest harvest, fire, human development, and climate change (see Factor A discussion, above).

Alteration and fragmentation from these and other activities disturb land and create edge habitats. These new edges and disturbances allow for the introduction of early seral habitat that is preferred by deer, elk, and moose, thereby increasing habitat suitability for these alternate ungulate prey species within the Southern Mountain Caribou DPS (Kinley and Apps 2001, p. 162; Seip 2008, p. 3). The increase in habitat suitability for deer, elk, and moose have allowed these alternate prey species to subsist in areas that, under natural disturbance regimes, would have been dominated by contiguous old-growth forest and of limited value to them (Kinley and Apps 2001, p. 162). The result is an altered distribution and increased numbers of these alternative ungulate prey species, particularly within summer habitat of caribou within the Southern Mountain Caribou DPS (Kinley and Apps 2001, p. 162; Wittmer *et al.* 2005a, pp. 263–264). Many studies suggest that increases in alternative ungulate prey within caribou summer habitat have stimulated an associated increase of natural predators, particularly cougars and wolves, in these same areas, consequently disrupting the predator-prey ecology within the Southern Mountain Caribou DPS and resulting in increased predation on caribou (Kinley and Apps 2001, p. 162; Wittmer *et al.* 2005b, pp. 414–415).

The specific changes to predator/prey ecology are different across the Southern Mountain Caribou DPS. In the northern portion of the DPS, wolf and moose populations have increased. In the southern portion of the DPS, cougar, elk, and deer populations have increased. Because alternate ungulate prey are driving predator abundance in caribou habitat (Wittmer *et al.* 2005b, p. 414), predators may remain abundant in caribou

habitat while caribou numbers remain few. This renders one of the caribou's main predator defenses—predator avoidance—relatively ineffective during certain parts of the year.

Alterations in the predator-prey ecology of the Southern Mountain Caribou DPS may also have been catalyzed, in part, by successful game animal management in the Southern Mountain Caribou DPS (Wittmer *et al.* 2005b, p. 415). This too could have helped to increase deer, elk, and moose populations within the Southern Mountain Caribou DPS and led to an increase in ungulate predators, thus impacting caribou.

Conservation Efforts to Reduce Disease or Predation

Disease

We are not aware of any conservation measures currently being implemented to reduce impacts to caribou from disease.

Predation

Increased predation is thought to be the current primary threat affecting caribou within the Southern Mountain Caribou DPS (Seip 1992, p. 1500; Kinley and Apps 2001, p. 161; MCST 2005, p. 4, Wittmer *et al.* 2005b, pp. 414–415). Leading thoughts on

managing predation include the management of predator populations directly, or the management of alternate ungulate prey populations. The 2007 Mountain Caribou Recovery Implementation Plan (MCRIP), produced by the BCMOE, proposed both approaches be taken within the Canadian portion of the Southern Mountain Caribou DPS (MCRIPPB 2010, pp. 1, 12, and 13).

Direct management of predator populations within the Southern Mountain Caribou DPS to date has included investigations to determine the degree of overlap between wolves and caribou home ranges. This research will assist BCMOE with decisions about location and intensity of wolf management or removal (MCRIPPB 2010, p. 12). Currently, removal of wolves from within the Southern Mountain Caribou DPS has been authorized by BCMOE through hunting and trapping. To date, this program has been implemented only on a limited basis. Initial results suggest this management effort has been successful at reducing wolf densities, but the response by mountain caribou will take several more years to determine (MCRIPPB 2010, p. 12). Finally, a wolf sterilization project is underway in a portion of the Southern Mountain Caribou DPS. This project is a pilot project designed to determine the feasibility and effectiveness of wolf sterilization (MCRIPPB 2010, p. 12). Initial results of this work suggest that some local populations are showing a positive response to these sterilization efforts. However, this conclusion is based on a correlation between the two variables and cause-effect has not been demonstrated (Ritchie *et al.* 2012, p. 4). One ongoing study, in the South

Purcells local population, is investigating wolf and cougar overlap with caribou home ranges (MCRIPPB 2012, p. 12).

Direct management of alternate ungulate prey populations within the Southern Mountain Caribou DPS, to date, has been limited. The BCMOE has reported two pilot moose-reduction programs within the Southern Mountain Caribou DPS to determine effectiveness of reducing wolf densities through the management of moose densities in caribou habitat (MCRIPPB 2010, p. 13). These pilot efforts have indicated that reducing moose densities may reduce wolf numbers (MCRIPPB 2011, p. 4).

The BCMOE established a Mountain Caribou Recovery Implementation Progress Board (Board) with the publication of the 2007 MCRIP. The Board was charged with oversight of the implementation of the MCRIP and monitoring its effectiveness. In the Board's 2010 annual report, they declared that the conservation measures listed above have all been relatively limited in scope and have failed to meet the expectations of the Board (MCRIPPB 2010, p. 4). The Board's annual reports since 2010 have been slightly more favorable in their assessment of the BCMOE's efforts for predator and alternate ungulate prey management. However, it is still apparent that much research and progress still needs to be completed. For example, it is noteworthy that most of the conservation measures listed above target the wolf-moose predator-prey relationship that is the primary driver of predator-prey dynamics in the northern portion of the Southern Mountain Caribou DPS. We were able to find only one record or report of conservation

measures that had been implemented to address predation of caribou by cougars, which may be the most salient issue for the small and struggling local populations in the southern portion of the Southern Mountain Caribou DPS (Wittmer *et al.* 2005b, pp. 414–415). Given the controversial nature of predator and alternate ungulate prey control for caribou conservation (MCRIPPB 2010, p. 4; MCRIPPB 2012, p. 11), these conservation measures have been and may continue to be slow to develop and difficult to implement.

Efforts at reducing predation in the United States are more limited and are not specifically targeted at reducing effects to caribou. In Idaho, caribou are found within game management unit (GMU) 1, which provides recreational hunting opportunities for black bear, mountain lion, and wolves, and also provides a limited trapping season for wolves (IDFG 2012, entire). Within this GMU, between July 1, 2010 and June 30, 2011, 109 mountain lions (IDFG 2011a, p. 6) and 179 black bears (IDFG 2011b, p. 4) were harvested. More recently, from September 1, 2011, through March 31, 2012, 28 wolves were harvested (IDFG 2013, *in litt.*). Washington State provides a limited hunting season for both black bear and mountain lion within GMU 113 (the GMU found in Washington State, Washington Department of Fish and Wildlife (WDFW) 2012, pp. 60–63), and within the critical habitat designated for the southern Selkirk Mountains population of woodland caribou (November 28, 2012, 77 FR 71042), and 44 black bears and 1 mountain lion were harvested in GMU 113 in 2011 (WDFW 2013a, *in litt.*; WDFW 2013b, *in litt.*). However, wolf hunting or trapping is not allowed in Washington State. As mentioned above, the objectives for these predator hunting and trapping seasons are

not to benefit the Southern Mountain Caribou DPS in the United States, and any response in the caribou population is not monitored. As such, any potential effects on caribou survival and population stability from hunting seasons on predators in Idaho and Washington remains unknown.

Summary for Factor C

Predation, particularly from wolves and cougars, is thought to be the most, or one of the most, significant contributors to caribou population declines within the Southern Mountain Caribou DPS in recent decades. Increased predation of caribou within this DPS has likely been caused, in part, by an alteration of the natural predator-prey ecology of the area. This new predator-prey dynamic has been catalyzed by increases in populations of alternative ungulate prey species such as elk, deer, and moose within caribou habitat. Ecosystems that favor these alternate ungulate prey species also favor predators such as wolves and cougars. These changes have likely been catalyzed, in part, by human-caused habitat loss and fragmentation, which increases habitat favorable to alternative ungulate prey species, and consequently attracts increased numbers of predators. Although some conservation measures have been implemented to reduce impacts to local populations of caribou from predation, more efficient, intensive, and frequent action is still needed within the Southern Mountain Caribou DPS. We have evaluated the best available scientific and commercial data on disease or predation of the

Southern Mountain Caribou DPS and have determined that this factor poses a widespread and serious threat to the continued existence of the Southern Mountain Caribou DPS.

D. The Inadequacy of Existing Regulatory Mechanisms

Under this factor, we examine whether existing regulatory mechanisms are inadequate to address the threats to the species discussed under the other factors. Section 4(b)(1)(A) of the Act requires that the Service take into account "those efforts, if any, being made by any State or foreign nation, or any political subdivision of a State or foreign nation, to protect such species…" In relation to Factor D under the Act, we interpret this language to require the Service to consider relevant Federal, State, and Tribal laws, regulations, and other such mechanisms that may minimize any of the threats we describe in threat analyses under the other four factors or otherwise enhance conservation of the species. We give strongest weight to statutes and their implementing regulations and to management direction that stems from those laws and regulations. An example would be State governmental actions enforced under a State statute or constitution, or Federal action under statute.

Many different regulatory mechanisms and government conservation actions have been implemented in both the United States and British Columbia in an attempt to alleviate threats to caribou within the Southern Mountain Caribou DPS. Below, we list

these existing regulatory mechanisms and consider whether they are inadequate to address the identified threats to the Southern Mountain Caribou DPS.

Federal

U.S. Fish and Wildlife Service

The southern Selkirk Mountains population of woodland caribou (which we now consider a local population within the Southern Mountain Caribou DPS) was listed as endangered under the Act on February 29, 1984 (49 FR 7390). Listing the southern Selkirk Mountains local population of woodland caribou provided a variety of protections, including the prohibition against take and the conservation mandates of section 7 for all Federal agencies. Since this listing action, Federal agencies have been required to ensure that any action they authorize, fund, or carry out will not jeopardize the continued existence of the southern Selkirk Mountains population of woodland caribou. On November 28, 2012, the Service designated critical habitat for this population of caribou in northeastern Washington and Idaho (77 FR 71042). This designation encompasses a total of 30,010 ac (12,145 ha), protecting this area by requiring Federal agencies to ensure that any action they authorize, fund, or carry out in this area is not likely to result in destruction or adverse modification of the designated habitat (77 FR 71042). By law, the Service has the authority to designate critical habitat only within the jurisdiction of the United States.

U.S. Forest Service

Much of the caribou habitat within the United States is managed by the USFS (289,000 ac (116,954 ha)), although a significant amount of State and private lands (approximately 79,000 ac (31,970 ha)) occur within caribou range as well (USFWS 1994, p. 21). Because of the endangered status of these caribou and the critical habitat designation, the USFS, the primary caribou habitat land manager in the United States, is required to consult on actions they carry out, authorize, or fund that may affect caribou or their habitat on their lands. Thus, woodland caribou are afforded protections under the Act from the potential effects of Federal agency activities. Land and resource management plans (LRMPs) for the IPNF and the CNF have been revised to incorporate management objectives and standards to address the threats identified in the 1984 final listing rule (49 FR 7390). These LRMP revisions are a result of section 7 consultation between the Service and USFS (USFWS 2001a, b, entire). Standards for caribou habitat management have been incorporated into the IPNF's 1987 and CNF's 1988 LRMP, respectively. These standards are meant to avoid the likelihood of jeopardizing the continued existence of the species, contribute to caribou conservation, and ensure consideration of the biological needs of the species during forest management planning and implementation actions (USFS 1987, pp. II–6, II–27, Appendix N; USFS 1988, pp. 4–10–17, 4–38, 4–42, 4–73–76, Appendix I).

The CNF's LRMP in Washington has been revised to incorporate special management objectives and standards to address potential threats to woodland caribou on the CNF. The CNF also manages winter recreation in areas of potential conflict between snowmobile use and caribou, specifically in its Newport/Sullivan Lake Ranger District (77 FR 71042, p. 71071). The IPNF, beginning in 1993, implemented site-specific closures to protect caribou on the IPNF. However, more comprehensive standards addressing how, when, and where, to impose such restrictions across the IPNF were limited (USFS 1987, entire). In December 2005, a U.S. district court granted a preliminary injunction prohibiting snowmobile trail grooming within the caribou recovery area on the IPNF during the winter of 2005 to 2006. The injunction was granted because the IPNF had not developed a winter recreation strategy addressing the effects of snowmobiling on caribou. In November 2006, the Court granted a modified injunction restricting snowmobiling and snowmobile trail grooming on portions of the IPNF within the southern Selkirk Mountains caribou recovery area. On February 14, 2007, the Court ordered a modification of the current injunction to add a protected caribou travel corridor connecting habitat in the U.S. portion of the southern Selkirk Mountains with habitat in British Columbia. This injunction is currently in effect and restricts snowmobiling on 239,588 ac (96,957 ha), involving 71 percent of the existing woodland caribou recovery area. In its revised LRMP (USFS 2013, entire), the IPNF considered the court-ordered snowmobile closure to be the standard until a winter travel plan is approved. The Service will work closely with the IPNF on the future development of their winter recreation strategy, which will be subject to section 7 consultation with the Service. For additional

information see “Conservation Efforts to Reduce Habitat Destruction, Modification, or Curtailment of Its Range” under “Efforts in the United States.” We will further evaluate existing USFS regulatory mechanisms in our final determination for this action.

States

Idaho Department of Fish and Game (IDFG)

The woodland caribou within Idaho are considered a Species of Greatest Conservation Need by IDFG (IDFG 2005, pp. 373–375). There are historical reports of the illegal harvest of caribou within the Southern Mountain Caribou DPS (Scott and Servheen 1985, p. 15; Seip and Cichowski 1996, p. 76). However, we do not have data that suggest illegal killing is affecting caribou numbers in any of the local populations within the Southern Mountain Caribou DPS, and we do not consider this to be a threat to the species that needs to be addressed by a regulatory mechanism.

Idaho Department of Lands

The Idaho Department of Lands (IDL) manages approximately 51,000 ac (20,639 ha) of Southern Mountain Caribou DPS habitat in the United States. These lands are managed primarily for timber harvest, an activity which has, currently and historically, the potential to significantly impact caribou and their habitat. The IDL contracted for a

habitat assessment of their lands within the South Selkirk ecosystem (Kinley and Apps 2007, entire). The results of this assessment indicated that one of the largest blocks of high-priority caribou habitat in the United States is centered on IDL property and adjacent USFS lands. The report stated that IDL property contributes significantly to caribou habitat within the South Selkirk ecosystem. The IDL, with financial assistance from the Service, began working on a habitat conservation plan (HCP) several years ago to protect caribou and other listed species on their lands. However, development of this HCP has not moved forward beyond the initial stages. Recently, winter motorized use restrictions were loosened on some IDL endowment land in the Abandon Creek area north of Priest Lake. Under a revised winter access plan, these previously closed lands will remain open to winter motorized use unless there is a confirmed caribou sighting along the Selkirk Crest within 2.7 mi (4.3 km) of the previous closing (Seymour 2012, *in litt*.). Because their timber harvest plans currently do not incorporate considerations for caribou and because of the recent removal of snowmobile restrictions, management of IDL's lands is likely not alleviating or addressing the threat of habitat loss, habitat fragmentation, or disturbance from winter recreation to caribou.

Washington Department of Fish and Wildlife

The southern Selkirk Mountains population of woodland caribou was listed as endangered in the State of Washington in 1982 (WDFW 2011, p. 38). In addition, this population within Washington is considered a Species of Greatest Conservation Need by

WDFW (WDFW 2005, p. 620). In addition to Federal penalties associated with convictions of illegally taking a caribou, a $12,000 criminal wildlife penalty is assessed by WDFW for illegally killing or possessing a caribou in Washington State (WDFW 2012, p. 73). We do not have data that suggest illegal killing is affecting caribou numbers in any of the local populations within the Southern Mountain Caribou DPS, and we do not consider this to be a threat to the species that needs to be addressed by a regulatory mechanism.

Canada

The Woodland Caribou Southern Mountain population, which includes the Southern Mountain Caribou DPS, is protected as threatened under Canada's Species at Risk Act (SARA) (Statues of Canada (S.C.) ch 29). SARA defines a "threatened" species as "a wildlife species that is likely to become an endangered species if nothing is done to reverse the factors leading to its extirpation or extinction" (S.C. chapter 29, section 2). It is illegal to kill, harm, harass, capture, or take an individual of a wildlife species that is listed as a threatened species (S.C. chapter 29, section 32). SARA also prohibits any person from damaging or destroying the residence of a listed species, or from destroying any part of its critical habitat (S.C. chapter 29, sections 33, 58). For species that are not aquatic species or migratory birds, however, SARA's prohibition on destruction of the residence applies only on Federal lands. Most lands occupied by the

Woodland Caribou Southern Mountain population are not Federal; hence SARA does little to protect the population's habitat.

The Woodland Caribou Southern Mountain population was assigned the status S1 in 2003, by the Province of British Columbia, meaning it is considered critically imperiled there (BCMOE 2013, *in litt.*). The Province of British Columbia does not have endangered species legislation. This lack of legislation can limit the ability to enact meaningful measures for the protection of status species such as caribou, especially as it relates to their habitat (Festa-Bianchet *et al.* 2011, p. 423). The British Columbia's Ministry of Forests, Lands and Natural Resource Operations currently does not allow hunting of caribou within the area where the Southern Mountain population of caribou occurs. The Woodland Caribou Southern Mountain population and its habitat are also protected by the National Parks Act in numerous National Parks in Canada (Canada 2013, *in litt.*). Because of its threatened status, the British Columbian government has endorsed the MCRIP, which encompasses the Southern Mountain Caribou DPS in Canada (British Columbia Ministry of Agriculture and Lands (BCMAL) 2007, *in litt.*). For further information on caribou conservation efforts in Canada, see the sections "Conservation Efforts to Reduce Habitat Destruction, Modification, or Curtailment of Its Range" under "Efforts in Canada" and "Conservation Efforts to Reduce Disease or Predation" under "Predation."

Substantial progress has been made for certain MCRIP goals, such as protecting habitat through government actions regulation (GAR) orders in British Columbia. However, other goals such as reducing the effects from predation have seen less progress made. Additional work and time is still needed to implement all goals identified in the MCRIP to adequately reduce threats to the Southern Mountain population of caribou in Canada. We will evaluate this further in our final determination for this action.

Local Ordinances

Currently, we are unaware of any local regulatory mechanisms addressing caribou habitat management or protection within the United States or Canada.

Private

Currently, we are unaware of any regulatory mechanisms addressing caribou habitat management or protection on private lands within the United States.

Summary for Factor D

In the United States, the southern Selkirk Mountains local population of woodland caribou of the Southern Mountain Caribou DPS has been listed as endangered since 1984, and critical habitat was designated in 2012. Listing the southern Selkirk Mountains local

population of woodland caribou provided a variety of protections, including the prohibition against take and the conservation mandates of section 7 for all Federal agencies. Because of the endangered status of these caribou and the critical habitat designation, the USFS, the primary caribou habitat land manager in the United States, is required to consult on actions they carry out, authorize, or fund that may affect caribou or their habitat on their lands. Thus, woodland caribou are afforded protections under the Act from the potential effects of Federal agency activities. Because the Service has regulations that prohibit take of all threatened wildlife species (50 CFR 17.31(a)), unless modified by a special rule issued under section 4(d) of the Act (50 CFR 17.31(c)), the regulatory protections of the Act are largely the same for wildlife species listed as endangered and as threatened; thus, the protections provided by the Act would remain in place if the Southern Mountain Caribou DPS is reclassified as a threatened species.

While the IDL also manages a substantial portion of caribou habitat, they are not required to manage their land for caribou. Many of IDL's land management plans, particularly timber harvest plans, do not currently consider caribou and do not address the identified threats to woodland caribou. IDL does consider caribou in their winter access plan and has, in the past, closed snowmobile trails to prevent winter disturbance; however, some of these trail closures have been recently relaxed and will remain open to winter motorized use unless there is a confirmed caribou sighting. Because IDL's land management plans, including timber harvest and winter access, do not consider woodland caribou, we conclude that management of IDL's lands is likely not alleviating or

addressing the threat of habitat loss, habitat fragmentation, or disturbance from winter recreation to caribou.

Hunting regulations at the National and State levels provide adequate protections regarding the legal take of caribou in the United States, and we do not have data that suggest illegal killing is affecting caribou numbers in any of the local populations within the Southern Mountain Caribou DPS, and we do not consider this as a threat to the species.

In Canada, the Southern Mountain Caribou DPS is protected at the national level under SARA, while British Columbia considers them to be critically imperiled. A recovery plan, the MCRIP, has been endorsed by British Columbia. While efforts have been made towards meeting the goals identified in that recovery plan, additional work and time are needed to meet all the goals. Presently, there is not a hunting season in Canada for caribou within the Southern Mountain Caribou DPS.

Caribou local populations continue to decline within the Southern Mountain DPS despite regulatory mechanisms being in place in the United States and Canada. Although U.S. Federal and State, and Canadian national and provincial, regulations are providing some protection for the caribou within the Southern Mountain Caribou DPS, the suite of regulations is unable to address and ameliorate threats to caribou such as predation and loss of habitat. Remedies to address threats such as control of predators are not

logistically easy to implement and may be expensive to address. Currently, the regulatory mechanisms in the United States and Canada are not addressing the identified threats to the Southern Mountain Caribou DPS. We will further evaluate the existing regulatory mechanisms and their impact on ameliorating threats to caribou in our final determination for this action.

E. Other Natural or Manmade Factors Affecting Its Continued Existence

Avalanches and Stochastic Events

One natural source of mortality for caribou is avalanches (Seip and Cichowski 1996, p. 76). This has been a notable threat to caribou within the Revelstoke area of Canada, within the Southern Mountain Caribou DPS, where the terrain is particularly steep and rugged with very high snowfall (Seip and Cichowski 1996, p. 76). Although avalanches are generally a natural phenomenon, the threat of avalanches to caribou may be increasing because caribou may be displaced into steeper, more avalanche-prone terrain during the winter from snowmobile and other winter recreational activities (Simpson 1987, p. 1; Seip and Cichowski 1996, p. 79).

Threats of all stochastic events such as avalanches become more serious as local populations become isolated and population numbers decrease. This is the case in the southern extent of the Southern Mountain Caribou DPS. For example, a small population

of fewer than 10 individuals in Banff National Park (just outside the Southern Mountain Caribou DPS) was extirpated in the spring of 2009 from a single avalanche event (Parks Canada 2013, *in litt.*).

Conservation Efforts to Reduce Other Natural or Manmade Factors Affecting Its Continued Existence

We are not aware of any conservation measures currently being implemented to reduce impacts to caribou from avalanches or other stochastic events.

Summary for Factor E

Caribou are susceptible to stochastic events such as avalanches due to small local population sizes and isolation of these local populations. Local populations are increasingly at risk from impacts of stochastic events as they become more isolated and their population numbers decline. The threat from avalanches is amplified further when caribou are displaced from their preferred habitat into steeper, more dangerous habitat as a consequence of human recreation. Therefore we have determined other natural or manmade factors affecting its continued existence pose a threat to the continued existence of the Southern Mountain Caribou DPS.

Cumulative Effects from Factors A through E

As alluded to in the discussions above, many of the causes of caribou population declines are linked, often by the threat of habitat alteration. For example, predation is one of the most significant threats to caribou within the Southern Mountain Caribou DPS. Predation is directly linked, in part, to habitat alteration and the associated introduction of early seral habitat and the creation of roads within caribou habitat in the Southern Mountain Caribou DPS. Specifically, the introduction of early seral habitat and new forest roads has altered the predator/prey ecology of the Southern Mountain Caribou DPS by creating suitable habitat for alternate ungulate prey and accessibility for their predators, respectively, into caribou habitat. Human disturbance, another of the threats to caribou within the Southern Mountain Caribou DPS, is also linked to habitat alteration because of the increased accessibility of caribou habitat that new forest roads have provided. Habitat alteration, in turn, is directly tied to and caused by another, and possibly two other, threats listed above—human development and climate change. Specifically, human development and the resources it requires, probably in concert with climate change, have altered caribou habitat within the Southern Mountain Caribou DPS. This alteration has occurred through forest harvest and the creation of new infrastructure. It is reasonable to expect that human development and the resources it demands will continue to alter and fragment caribou habitat in the future. This, in turn, will continue to promote altered predator/prey ecology and associated increases in caribou predation, and human disturbance in caribou habitat within the Southern Mountain Caribou DPS. The

suite of all these related threats, combined with each other, have posed and continue to pose a significant threat to caribou within the Southern Mountain Caribou DPS.

Proposed Determination

The range of the Southern Mountain Caribou DPS has been reduced by approximately 40 percent over the last century. The current status and distribution of caribou within the DPS is limited to an estimated 1,657 individuals in 15 local populations. This represents a reduction in total population size of 33 percent since 1995, with some individual local populations experiencing reductions of more than 50 percent. As previously discussed in the **Summary of Factors Affecting the Species**, significant threats to the Southern Mountain Caribou DPS include: increased levels of predation due to changes in the predator/prey dynamics, increased accessibility of caribou habitat by humans, disturbance of caribou from use of roads and from recreational vehicles, and climate change. All these threats are linked with past and ongoing habitat alteration and are occurring throughout the entire range of the DPS. These threats are expected to continue in the foreseeable future.

Under the Act and our implementing regulations, a species may warrant listing if it is endangered or threatened throughout all or a significant portion of its range. The Act defines "endangered species" as any species that is "in danger of extinction throughout all or a significant portion of its range," and "threatened species" as any species which is

"likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range." The definition of "species" is also relevant to this discussion. The Act defines "species" as follows: "The term 'species' includes any subspecies of fish or wildlife or plants, and any distinct population segment [DPS] of any species of vertebrate fish or wildlife which interbreeds when mature." Although the Service employs the concept of being on the brink of extinction in the wild as its general understanding of "in danger of extinction" (USFWS 2010, *in litt.*), it does not do so in a narrow or inflexible way. As implemented by the Service, to be currently on the brink of extinction in the wild does not necessarily mean that extinction is certain or inevitable. Ultimately, whether a species is currently on the brink of extinction in the wild (including the timing of the extinction event itself) depends on the life history and ecology of the species, the nature of the threats, and the species' response to those threats (USFWS 2010, *in litt.*).

We have carefully evaluated the best scientific and commercial data available regarding the past, present, and future threats to the Southern Mountain Caribou DPS. As described above, the Southern Mountain Caribou DPS still has a relatively widespread distribution that has suffered ongoing major reductions of its numbers, range, or both, as a result of factors that have not been abated. This decline has resulted in the shrinking in size and isolation of local populations that make up this DPS.

A species with a relatively widespread distribution that has experienced, and continues to undergo, major reductions in its numbers, range, or both as a result of factors that have not been abated can be listed as either endangered or threatened. For the reasons outlined below, we have determined that the Southern Mountain Caribou DPS meets the definition of threatened throughout its entire range, and acknowledge that many of the smaller local populations may individually fit the definition of endangered. Specifically, we conclude that the Southern Mountain Caribou DPS meets the definition of threatened because, although all local populations within this DPS have suffered declines in numbers, range, or both, and have become increasingly isolated, populations in the northern portion of the DPS have suffered these declines to a lesser extent than those in the southern part of the range. Because of their relatively higher population numbers, these northern local populations have more resiliency to threats than local populations in the southern extent of the DPS. For this reason, when assessed across its range, we conclude that the Southern Mountain Caribou DPS as a whole is not endangered, because we expect the northern populations to persist, at least for the foreseeable future. As discussed below, we have determined that caribou within the "endangered" southern local populations do not constitute a significant portion of the species' range, according to the Service's current policy. In other words, we have determined that the loss of the "endangered" local populations would not substantially increase the vulnerability of the "threatened" local populations, such that the entire DPS would be in danger of extinction (i.e., would become endangered). Therefore, on the basis of the best scientific and commercial data available and per our policy, we propose

to amend the current listing of the woodland caribou (southern Selkirk Mountains population) as an endangered species, as identified at 50 CFR 17.11(h), to reflect the Southern Mountain Caribou DPS as a threatened species in accordance with sections 3(20) and 4(a)(1) of the Act.

Significant Portion of the Range

Under the Act and our implementing regulations, a species may warrant listing if it is an endangered or threatened species throughout all or a significant portion of its range. The Act defines "endangered species" as any species which is "in danger of extinction throughout all or a significant portion of its range," and "threatened species" as any species which is "likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range." The definition of "species" is also relevant to this discussion. The Act defines "species" as follows: "The term 'species' includes any subspecies of fish or wildlife or plants, and any distinct population segment [DPS] of any species of vertebrate fish or wildlife which interbreeds when mature." The phrase "significant portion of its range" (SPR) is not defined by the statute. Additionally, we have never addressed in our regulations: (1) The consequences of a determination that a species is either endangered or likely to become so throughout a significant portion of its range, but not throughout all of its range; or (2) what qualifies a portion of a range as "significant."

Two recent district court decisions have addressed whether the SPR language allows the Service to list or protect less than all members of a defined "species": *Defenders of Wildlife* v. *Salazar*, 729 F. Supp. 2d 1207 (D. Mont. 2010), concerning the Service's delisting of the Northern Rocky Mountain gray wolf (74 FR 15123, April 2, 2009); and *WildEarth Guardians* v. *Salazar*, 2010 U.S. Dist. LEXIS 105253 (D. Ariz. September 30, 2010), concerning the Service's 2008 finding on a petition to list the Gunnison's prairie dog (73 FR 6660, February 5, 2008). The Service had asserted in both of these determinations that it had authority, in effect, to protect only some members of a "species," as defined by the Act (i.e., species, subspecies, or DPS), under the Act. Both courts ruled that the determinations were arbitrary and capricious on the grounds that this approach violated the plain and unambiguous language of the Act. The courts concluded that reading the SPR language to allow protecting only a portion of a species' range is inconsistent with the Act's definition of "species." The courts concluded that once a determination is made that a species (i.e., species, subspecies, or DPS) meets the definition of "endangered species" or "threatened species," it must be placed on the list in its entirety and the Act's protections applied consistently to all members of that species (subject to modification of protections through special rules under sections 4(d) and 10(j) of the Act).

Consistent with that interpretation, and for the purposes of this finding, we interpret the phrase "significant portion of its range" in the Act's definitions of "endangered species" and "threatened species" to provide an independent basis for

listing; thus there are two situations (or factual bases) under which a species would qualify for listing: a species may be endangered or threatened throughout all of its range; or a species may be endangered or threatened in only a significant portion of its range. If a species is in danger of extinction throughout a significant portion of its range, the species is an "endangered species." The same analysis applies to "threatened species." Based on this interpretation and supported by existing case law, the consequence of finding that a species is endangered or threatened in only a significant portion of its range is that the entire species shall be listed as endangered or threatened, respectively, and the Act's protections shall be applied across the species' entire range.

We conclude, for the purposes of this finding, that interpreting the significant portion of its range phrase as providing an independent basis for listing is the best interpretation of the Act. It is consistent with the purposes and the plain meaning of the key definitions of the Act; it does not conflict with established past agency practice (i.e., prior to the 2007 Solicitor's Opinion), as no consistent, long-term agency practice has been established; and it is consistent with the judicial opinions that have most closely examined this issue. Having concluded that the phrase "significant portion of its range" provides an independent basis for listing and protecting the entire species, we next turn to the meaning of "significant" to determine the threshold for when such an independent basis for listing exists.

Although there are potentially many ways to determine whether a portion of a species' range is "significant," we conclude, for the purposes of this finding, that the significance of the portion of the range should be determined based on its biological contribution to the conservation of the species. For this reason, we describe the threshold for "significant" in terms of an increase in the risk of extinction for the species. We conclude that a biologically based definition of "significant" best conforms to the purposes of the Act, is consistent with judicial interpretations, and best ensures species' conservation. Thus, for the purposes of this finding, and as explained further below, a portion of the range of a species is "significant" if its contribution to the viability of the species is so important that without that portion, the species would be in danger of extinction.

We evaluate biological significance based on the principles of conservation biology using the concepts of redundancy, resiliency, and representation. *Resiliency* describes the characteristics of a species and its habitat that allow it to recover from periodic disturbance. *Redundancy* (having multiple populations distributed across the landscape) may be needed to provide a margin of safety for the species to withstand catastrophic events. *Representation* (the range of variation found in a species) ensures that the species' adaptive capabilities are conserved. Redundancy, resiliency, and representation are not independent of each other, and some characteristic of a species or area may contribute to all three. For example, distribution across a wide variety of habitat types is an indicator of representation, but it may also indicate a broad geographic

distribution contributing to redundancy (decreasing the chance that any one event affects the entire species), and the likelihood that some habitat types are less susceptible to certain threats, contributing to resiliency (the ability of the species to recover from disturbance). None of these concepts is intended to be mutually exclusive, and a portion of a species' range may be determined to be "significant" due to its contributions under any one or more of these concepts.

For the purposes of this finding, we determine if the biological contribution of a portion of a species' range qualifies that portion as "significant" by asking whether *without that portion*, the representation, redundancy, or resiliency of the species would be so impaired that the species would have an increased vulnerability to threats to the point that the overall species would be in danger of extinction (i.e., would be "endangered"). Conversely, we would not consider the portion of the range at issue to be "significant" if there is sufficient resiliency, redundancy, and representation elsewhere in the species' range that the species would not be in danger of extinction throughout its range if the population in that portion of the range in question became extirpated (extinct locally).

We recognize that this definition of "significant" (a portion of the range of a species is "significant" if its contribution to the viability of the species is so important that without that portion, the species would be in danger of extinction) establishes a threshold that is relatively high. On the one hand, given that the consequences of finding a species to be endangered or threatened in a significant portion of its range would be

listing the species throughout its entire range, it is important to use a threshold for "significant" that is robust. It would not be meaningful or appropriate to establish a very low threshold whereby a portion of the range can be considered "significant" even if only a negligible increase in extinction risk would result from its loss. Because nearly any portion of a species' range can be said to contribute some increment to a species' viability, use of such a low threshold would require us to impose restrictions and expend conservation resources disproportionately to conservation benefit: listing would be rangewide, even if only a portion of the range of minor conservation importance to the species is imperiled. On the other hand, it would be inappropriate to establish a threshold for "significant" that is too high. This would be the case if the standard were, for example, that a portion of the range can be considered "significant" only if threats in that portion result in the entire species' being currently endangered or threatened. Such a high bar would not give the significant portion of its range phrase independent meaning, as the Ninth Circuit held in *Defenders of Wildlife* v. *Norton*, 258 F.3d 1136 (9th Cir. 2001).

The definition of "significant" used in this finding carefully balances these concerns. By setting a relatively high threshold, we minimize the degree to which restrictions will be imposed or resources expended that do not contribute substantially to species conservation. But we have not set the threshold so high that the phrase "in a significant portion of its range" loses independent meaning. Specifically, we have not set the threshold as high as it was under the interpretation presented by the Service in the

Defenders litigation. Under that interpretation, the portion of a species' range would have to be so important to the species that the current threats to that portion of the range are such that the entire species would be *currently* threatened or endangered everywhere. (We recognize that if the species is threatened or endangered in a portion that rises to that level of biological significance, then we should conclude that the species is in fact endangered or threatened throughout all of its range, and that we would not need to rely on the significant portion of its range language for such a listing.) Under the definition of "significant" used in this finding, however, to be considered significant, a portion of the range need not rise to such an exceptionally high level of biological significance. Rather, under this interpretation we ask whether the species would be endangered everywhere without that portion (*i.e.*, if that portion were to be completely extirpated). In other words, for any portion of the range to be considered significant by our proposed policy, the complete extirpation (in a hypothetical future) of the species in that portion of the range would need to cause the species in the remainder of the range to be endangered. If the hypothetical extirpation of the species in that portion of the range would not cause the species in the remainder of the range to meet the definition of endangered, that portion is not considered significant.

The range of a species can theoretically be divided into portions in an infinite number of ways. However, there is no purpose to analyzing portions of the range that have no reasonable potential to be significant or to analyzing portions of the range in which there is no reasonable potential for the species to be endangered or threatened. To

identify only those portions that warrant further consideration, we determine whether there is substantial information indicating that: (1) The portions may be "significant," *and* (2) the species may be in danger of extinction there or likely to become so within the foreseeable future. Depending on the biology of the species, its range, and the threats it faces, it might be more efficient for us to address the significance question first or the status question first. Thus, if we determine that a portion of the range is not "significant," we do not need to determine whether the species is endangered or threatened there; if we determine that the species is not endangered or threatened in a portion of its range, we do not need to determine if that portion is "significant." In practice, a key part of the determination that a species is in danger of extinction in a significant portion of its range is whether the threats are geographically concentrated in some way. If the threats to the species are essentially uniform throughout its range, no portion is likely to warrant further consideration. Moreover, if any concentration of threats to the species occurs only in portions of the species' range that clearly would not meet the biologically based definition of "significant," such portions will not warrant further consideration.

Having determined that the Southern Mountain Caribou DPS is threatened throughout its range, we must next consider whether there are any significant portions of the range where the species is in danger of extinction (i.e., are endangered). We therefore evaluated the current range of the Southern Mountain Caribou DPS to determine if there is any apparent geographic concentration of potential threats for this species. We considered the potential direct and indirect threats due to habitat alteration, including

forest harvest, forest fires, insect outbreaks, human development, human recreation, and climate change, as well as predation. We found the severity of threats to the DPS to be relatively consistent across its entire range, although habitat alteration has been more pronounced to date in the southern extent of the DPS. Further, although there are several small, local populations that occur on the periphery in the northern extent of the DPS (e.g., Narrow Lake and Barkerville), local populations are generally smaller in numbers and further separated by distance in the southern portion of the DPS. In his paper assessing the status of the Mountain Caribou Ecotype, Hatter *et al.* (2004, p. 10) predicted a loss of some of these smaller populations (ranging from four to seven populations depending on the modeling scenario used) in 20 years. Therefore, these smaller local populations may lack resiliency and redundancy to threats.

We have determined that many local populations within the Southern Mountain Caribou DPS are at risk of extirpation and that these individual local populations meet the definition of endangered under the Act. Given this, we must determine if those "endangered" local populations collectively make up a significant portion of the range of the species. To determine this we asked the question: In the absence of the "endangered" populations, is the representation, redundancy, or resilience of the remaining local populations impaired to the extent that the remainder of the DPS would be endangered? Because the local populations of the Southern Mountain Caribou DPS are largely geographically and behaviorally isolated from each other, it follows that the impacts to one local population should not greatly influence the impacts to another.

Therefore, the future extirpation of the "endangered" local populations would not be anticipated to change the status of the remaining local populations within the DPS. Six of the local populations have current population estimates of 100 individuals or more, and 3 of those have greater than 200 individuals (Ritchie 2013, *in litt*.). Even if several of the small local populations within the Southern Mountain Caribou DPS were to be extirpated within the foreseeable future, we have no information to suggest that this loss, while by no means a desirable conservation outcome, would result in the endangerment of the remaining local populations comprising the DPS. In other words, the loss of some of the smaller, relatively isolated local populations within the DPS would not be anticipated to lead to the impending extinction of the larger local populations in the northern portion of the DPS. Considering the above, we determine that some local populations of the Southern Mountain Caribou DPS are in danger of extirpation over a portion of its range; however, this portion does not meet the standards to be considered a significant portion of the range. Therefore, our determination is that the Southern Mountain Caribou DPS is not endangered in a significant portion of its range, and should be listed as threatened throughout its range.

Available Conservation Measures

Conservation measures provided to species listed as endangered or threatened under the Act include recognition, recovery actions, requirements for Federal protection, and prohibitions against certain practices. Recognition through the listing results in

public awareness and conservation by Federal, State, Tribal, and local agencies; private organizations; and individuals. The Act encourages cooperation with the States and requires that recovery actions be carried out for all listed species. The protection required by Federal agencies and the prohibitions against certain activities are discussed, in part, below.

The primary purpose of the Act is the conservation of endangered and threatened species and the ecosystems upon which they depend. The ultimate goal of such conservation efforts is the recovery of these listed species, so that they no longer need the protective measures of the Act. Subsection 4(f) of the Act requires the Service to develop and implement recovery plans for the conservation of endangered and threatened species. The recovery planning process involves the identification of actions that are necessary to halt or reverse the species' decline by addressing the threats to its survival and recovery. The goal of this process is to restore listed species to a point where they are secure, self-sustaining, and functioning components of their ecosystems.

A Selkirk Mountain Caribou Management Plan/Recovery Plan was approved by the Service in 1985 (USFWS 1985), and a revised Recovery Plan for Woodland Caribou in the Selkirk Mountains was approved by the Service in 1994 (USFWS 1994). An update regarding the status of this recovery plan can be found in the latest 5-year status review for the species (*see* USFWS 2008, entire; see *http://www.fws.gov/idaho/Caribou/Tab5References/USFWS_2008a.pdf*). While actions

have been carried out in an attempt to recover this local population, the recovery criteria in the 1994 recovery plan were determined to be inadequate (USFWS 2008, p. 15). In addition, this recovery plan only applies to this one local population, and does not extend to the entire proposed Southern Mountain Caribou DPS. If we finalize this proposal as currently written, revisions to the plan, in coordination with British Columbia, Canada, will be required to address the entire DPS and the continuing or new threats to the subspecies. A new recovery plan for this DPS would identify site-specific management actions that set a trigger for review of the five factors that determine whether the listed entity remains endangered or threatened or may be downlisted or delisted, and methods for monitoring recovery progress. Recovery plans also establish a framework for agencies to coordinate their recovery efforts and provide estimates of the cost of implementing recovery tasks. A recovery team comprised of species experts from Canada, Tribes, and the United States would be assembled to revise or develop a recovery plan for the Southern Mountain Caribou DPS. When completed, the draft recovery plan and the final recovery plan will be available on our website (*http://www.fws.gov/endangered*), or from our Idaho Fish and Wildlife Office (see **FOR FURTHER INFORMATION CONTACT**).

Implementation of recovery actions generally requires the participation of a broad range of partners, including other Federal agencies, States, Tribes, nongovernmental organizations, businesses, and private landowners. Examples of recovery actions may include habitat restoration (e.g., restoration of native vegetation), research, captive

propagation and reintroduction, and outreach and education. The recovery of many listed species cannot be accomplished solely on Federal lands because their range may occur primarily or solely on non-Federal lands. To achieve recovery of these species requires cooperative conservation efforts on private, State, and Tribal lands.

If this proposed rule becomes final, funding for recovery actions will be available from a variety of sources, including Federal budgets, State programs, and cost share grants for non-Federal landowners, the academic community, and nongovernmental organizations. In addition, pursuant to section 6 of the Act, the States of Idaho and Washington would be eligible for Federal funds to implement management actions that promote the protection or recovery of the Southern Mountain Caribou DPS. Information on our grant programs that are available to aid species recovery can be found at: *http://www.fws.gov/grants*.

Section 7(a) of the Act requires Federal agencies to evaluate their actions with respect to any species that is proposed or listed as an endangered or threatened species and with respect to its critical habitat, if any is designated. Regulations implementing this interagency cooperation provision of the Act are codified at 50 CFR Part 402. Section 7(a)(4) of the Act requires Federal agencies to confer with the Service on any action that is likely to jeopardize the continued existence of a species proposed for listing or result in destruction or adverse modification of proposed critical habitat. If a species is listed subsequently, section 7(a)(2) of the Act requires Federal agencies to ensure that

activities they authorize, fund, or carry out are not likely to jeopardize the continued existence of the species or destroy or adversely modify its critical habitat. If a Federal action may affect a listed species or its critical habitat, the responsible Federal agency must enter into formal consultation with the Service.

Federal agency actions within the species habitat that may require conference or consultation or both as described in the preceding paragraph include but may not be limited to: Management and any other landscape-altering activities on Federal lands administered by the USFS and Bureau of Land Management, issuance of section 404 Clean Water Act permits by the U.S. Army Corps of Engineers, construction and management of gas pipeline and power line rights-of-way by the Federal Energy Regulatory Commission, and construction and maintenance of roads or highways by the Federal Highway Administration.

The Act and its implementing regulations set forth a series of general prohibitions and exceptions that apply to all endangered wildlife. The prohibitions of section 9(a)(2) of the Act, codified at 50 CFR 17.21 for endangered wildlife, in part, make it illegal for any person subject to the jurisdiction of the United States to take (including harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect; or to attempt any of these), import, export, ship in interstate commerce in the course of commercial activity, or sell or offer for sale in interstate or foreign commerce any listed species. Under the Lacey Act (18 U.S.C 42-43; 16 U.S.C. 3371-3378), it is also illegal to possess, sell, deliver, carry,

transport, or ship any such wildlife that has been taken illegally. Certain exceptions apply to agents of the Service and State conservation agencies.

We may issue permits to carry out otherwise prohibited activities involving endangered and threatened wildlife species under certain circumstances. Regulations governing permits are codified at 50 CFR 17.22 for endangered species, and at 17.32 for threatened species. With regard to endangered wildlife, a permit must be issued for the following purposes: for scientific purposes, to enhance the propagation or survival of the species, and for incidental take in connection with otherwise lawful activities.

It is our policy, as published in the **Federal Register** on July 1, 1994 (59 FR 34272), to identify to the maximum extent practicable at the time a species is listed, those activities that would or would not constitute a violation of section 9 of the Act. The intent of this policy is to increase public awareness of the effect of a proposed listing on proposed and ongoing activities within the range of species proposed for listing. The following activities could potentially result in a violation of section 9 of the Act; this list is not comprehensive:

(1) Introduction of nonnative species that compete with or prey upon individuals of the Southern Mountain Caribou DPS; and

(2) Unauthorized modification of the old-growth, coniferous forest landscape within the Southern Mountain Caribou DPS.

Questions regarding whether specific activities would constitute a violation of section 9 of the Act should be directed to the Idaho Fish and Wildlife Office (see **FOR FURTHER INFORMATION CONTACT**). Requests for copies of the regulations concerning listed animals and general inquiries regarding prohibitions and permits may be addressed to the U.S. Fish and Wildlife Service, Endangered Species Permits, 911 NE 11th Avenue, Portland, OR 97232-4181 (telephone 503-231-6131; facsimile 503-231-6243).

Critical Habitat

Under the Act, any species that is determined to be an endangered or threatened species requires critical habitat to be designated, to the maximum extent prudent and determinable. Designations and revisions of critical habitat can only be completed through rulemaking. Because we have determined that the designation of critical habitat will not likely increase the degree of threat to the subspecies and may provide some measure of benefit, we find that designation of critical habitat is prudent for the Southern Mountain Caribou DPS. We reviewed the available information pertaining to the biological and habitat needs of the Southern Mountain Caribou DPS. This and other information represent the best scientific data available and led us to conclude that the

designation of critical habitat is determinable for the Southern Mountain Caribou DPS. Based on our evaluation of the best available data, and analysis of the conservation needs of the species, we have determined that critical habitat is prudent and determinable for the proposed Southern Mountain Caribou DPS.

However, our regulations at 50 CFR 424.12(h) state that critical habitat shall not be designated within foreign countries or in other areas outside of United States jurisdiction; therefore, any designation of critical habitat for the Southern Mountain Caribou DPS must be limited to that portion of the DPS that occurs within the boundaries of the United States. Of the 15 local populations comprising the Southern Mountain Caribou DPS, the southern Selkirk Mountains woodland caribou population is the only population that moves freely between the coterminous United States and Canada.

The Act defines critical habitat as the specific areas occupied by the species at the time it is listed, on which are found those physical or biological features essential to the conservation of the species, which may require special management considerations or protection. On November 28, 2012 (77 FR 71042), we published a final rule designating critical habitat for the southern Selkirk Mountains population of woodland caribou, the only local population of the Southern Mountain Caribou DPS that moves southward across the border into the United States. In that final rule, we determined that the majority of habitat essential to the conservation of this population occurred in British Columbia, Canada, although the U.S. portion of the habitat used by the caribou makes an

essential contribution to the conservation of the species. We designated as critical habitat approximately 30,010 ac (12,145 ha) within Boundary County, Idaho, and Pend Oreille County, Washington, that we considered to be occupied at the time of listing and that provided the physical or biological features essential to the conservation of the species, which may require special management considerations or protection.

The proposed amendment of the currently listed population of the woodland caribou expands the geographical area occupied by the caribou northward across the international border; therefore, all of the new area lies in Canada. Since we can only designate critical habitat within the United States, we must identify those specific areas within the United States that we consider to have been occupied at the time of listing, and that provide the physical or biological features essential to the conservation of the Southern Mountain Caribou DPS. However, as the physical or biological features essential to the conservation of the Southern Mountain Caribou DPS are no different than those essential to the conservation of the currently listed southern Selkirk Mountains population of woodland caribou, and the geographical area in the United States occupied by this transboundary population of woodland caribou at the time of listing remains unchanged, the resulting area corresponds exactly to the critical habitat identified for the southern Selkirk Mountains population of woodland caribou in our final rule published on November 28, 2012 (77 FR 71042). As a result, we have determined that the specific area identified in the previous final critical habitat (77 FR 71042) meets the definition of critical habitat for this DPS, and we have determined that there are no additional areas

that meet the definition of critical habitat and should be included. Therefore, we propose to reaffirm the designation of approximately 30,010 ac (12,145 ha) in one unit within Boundary County, Idaho, and Pend Oreille County, Washington, as critical habitat for the Southern Mountain Caribou DPS, should the proposed amendment to the listed entity become final.

In addition, we propose to change the heading and text of the critical habitat entry, as well as the title of the critical habitat map, published in the Code of Federal Regulations (CFR) at 50 CFR 17.95(a) to reflect the correct entity, the Southern Mountain Caribou DPS (see the **Proposed Regulation Promulgation** section of this document). For further information on the essential physical or biological features for the caribou and our criteria used to develop critical habitat, refer to our November 28, 2012 (77 FR 71042) final rule designating critical habitat for the southern Selkirk Mountains population of woodland caribou.

We recognize that critical habitat designated at a particular point in time may not include all of the habitat areas that we may later determine are necessary for the recovery of the species. For these reasons, a critical habitat designation does not signal that habitat outside the designated area is unimportant or may not be needed for recovery of the species. Areas that are important to the conservation of the species, both inside and outside the critical habitat designation, will continue to be subject to: (1) Conservation actions implemented under section 7(a)(1) of the Act, (2) regulatory protections afforded

by the requirement in section 7(a)(2) of the Act for Federal agencies to insure their actions are not likely to jeopardize the continued existence of any endangered or threatened species, and (3) the prohibitions of section 9 of the Act if actions occurring in these areas may affect the species. Federally funded or permitted projects affecting listed species outside their designated critical habitat areas may still result in jeopardy findings in some cases. These protections and conservation tools will continue to contribute to recovery of this species. Similarly, critical habitat designations made on the basis of the best available information at the time of designation will not control the direction and substance of future recovery plans, habitat conservation plans (HCPs), or other species conservation planning efforts if new information available at the time of these planning efforts calls for a different outcome.

Peer Review

In accordance with our joint policy published in the **Federal Register** on July 1, 1994 (59 FR 34270), we will seek the expert opinions of at least three appropriate and independent specialists regarding this proposed rule. The purpose of peer review is to ensure that our listing determination for this species is based on scientifically sound data, assumptions, and analyses. We will invite these peer reviewers to comment during the public comment period.

We will consider all comments and information received during the comment period on this proposed rule during preparation of a final rule. Accordingly, the final decision may differ from this proposal.

Public Hearings

The Act provides for one or more public hearing on this proposal, if requested. Requests must be received within 45 days after the date of publication of this proposal in the **Federal Register**. Such requests must be sent to the address shown in the **FOR FURTHER INFORMATION CONTACT** section. We will schedule public hearings on this proposal, if any are requested, and announce the dates, times, and places of those hearings, as well as how to obtain reasonable accommodations, in the **Federal Register** and local newspapers at least 15 days before the hearing.

Persons needing reasonable accommodations to attend and participate in a public hearing should contact the Idaho Fish and Wildlife Office at 208–378–5243, as soon as possible. To allow sufficient time to process requests, please call no later than 1 week before the hearing date. Information regarding this proposed rule is available in alternative formats upon request.

Effects of this Rule

This proposal, if made final, would revise 50 CFR 17.11(h) to amend the current listing of the transboundary southern Selkirk Mountains population of woodland caribou by defining the Southern Mountain Caribou DPS, which includes the currently listed endangered southern Selkirk Mountains population of woodland caribou, and designate the status of the Southern Mountain Caribou DPS as threatened under the Act. This rule formally recognizes that the proposed Southern Mountain Caribou DPS is not in imminent danger of extinction throughout all or a significant portion of its range. However, this proposed designation of threatened status for the newly defined DPS would not significantly change the protection afforded the currently listed local population of the southern Selkirk Mountains population of woodland caribou under the Act. The regulatory protections of section 9 and section 7 of the Act are largely the same for species listed as endangered or threatened. Anyone taking, attempting to take, or otherwise possessing a Southern Mountain Caribou or parts thereof, in violation of section 9 of the Act, is still subject to a penalty under section 11 of the Act, unless their action is covered under a special rule under section 4(d) of the Act. At this time, we are not proposing a special rule under section 4(d) of the Act for the Southern Mountain Caribou DPS. Under section 7 of the Act, Federal agencies must ensure that any actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of the Southern Mountain Caribou DPS.

This proposal, if made final, would also revise 50 CFR 17.95(a) by reaffirming the designation of approximately 30,010 ac (12,145 ha) as critical habitat for the southern

Selkirk Mountains population of woodland caribou as applicable to the U.S. portion of the proposed Southern Mountain Caribou DPS.

Required Determinations

Clarity of This Rule

We are required by Executive Orders 12866 and 12988 and by the Presidential Memorandum of June 1, 1998, to write all rules in plain language. This means that each rule we publish must:

(a) Be logically organized;

(b) Use the active voice to address readers directly;

(c) Use common, everyday words and clear language rather than jargon;

(d) Be divided into short sections and sentences; and

(e) Use lists and tables wherever possible.

If you feel that we have not met these requirements, send us comments by one of the methods listed in the **ADDRESSES** section, above. To better help us revise the rule, your comments should be as specific as possible. For example, you should tell us the numbers of the sections or paragraphs that you find unclear, which sections or sentences are too long, the sections where you feel lists or tables would be useful, etc.

Paperwork Reduction Act of 1995 (44 U.S.C. 3501, et seq.)

This rule does not contain any new collections of information that require approval by the Office of Management and Budget (OMB) under the Paperwork Reduction Act. This rule will not impose recordkeeping or reporting requirements on State or local governments, individuals, businesses, or organizations. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number.

National Environmental Policy Act (42 U.S.C. 4321 et seq.)

We have determined that environmental assessments and environmental impact statements, as defined under the authority of the National Environmental Policy Act of 1969, need not be prepared in connection with listing a species as an endangered or threatened species under the Endangered Species Act. We published a notice outlining our reasons for this determination in the **Federal Register** on October 25, 1983 (48 FR 49244).

References Cited

A complete list of all references cited in this rule is available on the Internet at *http://www.regulations.gov* or upon request from the State Supervisor, Idaho Fish and Wildlife Office (see **FOR FURTHER INFORMATION CONTACT**).

Authors

The primary authors of this proposed rule are the staff members of the Idaho Fish and Wildlife Office (see **FOR FURTHER INFORMATION CONTACT**).

List of Subjects in 50 CFR Part 17

Endangered and threatened species, Exports, Imports, Reporting and recordkeeping requirements, Transportation.

Proposed Regulation Promulgation

Accordingly, we propose to amend part 17, subchapter B of chapter I, title 50 of the Code of Federal Regulations, as set forth below:

PART 17—[AMENDED]

1. The authority citation for part 17 continues to read as follows:

Authority: 16 U.S.C. 1361–1407; 1531–1544; 4201–4245, unless otherwise noted.

2. In § 17.11(h), remove the entry for “Caribou, woodland” and add an entry for “Caribou, Southern Mountain” in alphabetical order under MAMMALS in the List of Endangered and Threatened Wildlife to read as follows:

§ 17.11 Endangered and threatened wildlife.

* * * * *

(h) * * *

Species		Historic range	Vertebrate population where endangered or threatened	Status	When listed	Critical habitat	Special rules
Common name	Scientific name						
MAMMALS							
* * * * * * *							
Caribou, Southern Mountain	*Rangifer tarandus caribou*	U.S.A. (AK, ID, ME, MI, MN, MT, NH, VT, WA, WI), Canada.	U.S.A. (wherever occurring), Canada (southeastern British Columbia)	T	128E, 136, 143	17.95(a)	NA
* * * * * * *							

3. In § 17.95(a), amend the entry for "Woodland caribou (*Rangifer tarandus caribou*) Southern Selkirk Mountain Population" as follows:

a. By revising the heading;

b. By revising the introductory text of paragraph (a)(2);

c. By revising paragraph (a)(2)(iv); and

d. By revising paragraph (a)(5).

These revisions read as follows:

§ 17.95 Critical habitat—fish and wildlife.

(a) *Mammals*.

* * * * *

Woodland Caribou (*Rangifer tarandus caribou*) Southern Mountain Caribou Distinct Population Segment (DPS)

* * * * *

(2) Within this area, the primary constituent elements of the physical and biological features essential to the conservation of the Southern Mountain Caribou DPS consist of five components: * * *

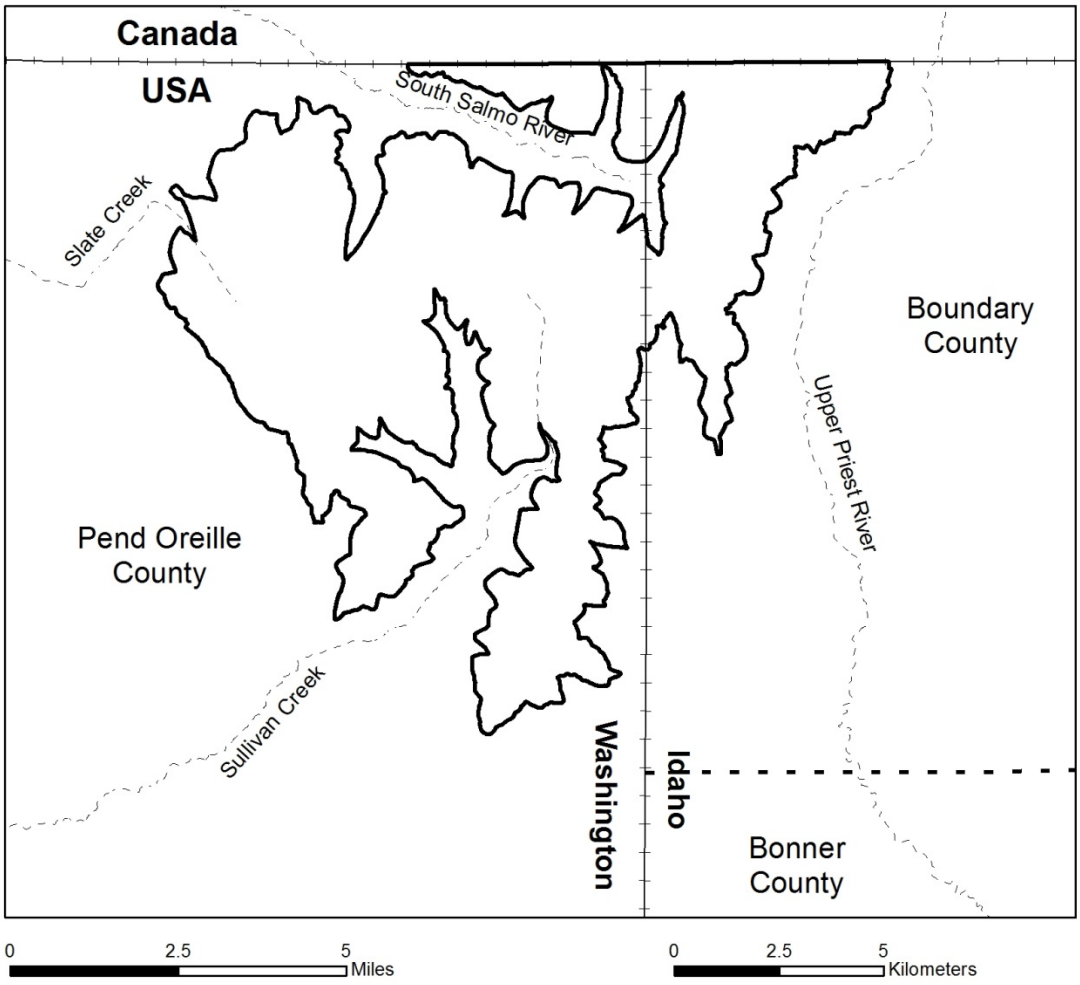
* * * * *

(iv) High-elevation benches and shallow slopes, secondary stream bottoms, riparian areas, seeps, and subalpine meadows with succulent forbs and grasses, flowering plants, horsetails, willow, huckleberry, dwarf birch, sedges, and lichens. The Southern Mountain Caribou DPS, including pregnant females, uses these areas for feeding during the spring and summer seasons.

* * * * *

(5) Unit 1: Boundary County, Idaho, and Pend Oreille County, Washington. The map of the critical habitat unit follows:

Critical Habitat for *Rangifer tarandus caribou*
Southern Mountain Caribou Distinct Population Segment



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Dated: April 7, 2014.

Daniel M. Ashe,

Director, U.S. Fish and Wildlife Service.

Billing Code 4310–55–P

[FR Doc. 2014-09601 Filed 05/07/2014 at 8:45 am; Publication Date: 05/08/2014]