

DEPARTMENT OF THE INTERIOR**Fish and Wildlife Service****50 CFR Part 17**

[Docket No. FWS-R1-ES-2012-0097;
FXES11130900000C2-189-FF09E42000]

RIN 1018-BC84

Endangered and Threatened Wildlife; Endangered Species Status for Southern Mountain Caribou Distinct Population Segment

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Final rule.

SUMMARY: We, the U.S. Fish and Wildlife Service (Service), determine endangered species status under the Endangered Species Act of 1973, as amended (Act), for the southern mountain caribou distinct population segment (DPS) of woodland caribou (*Rangifer tarandus caribou*). This determination amends the current listing of the southern Selkirk Mountains population of woodland caribou by defining the southern mountain caribou DPS. The southern mountain caribou DPS of woodland caribou consists of 17 subpopulations (15 extant and 2 extirpated). 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, for the southern Selkirk Mountains population of woodland caribou is applicable to the U.S. portion of the endangered southern mountain caribou DPS and, as such, reaffirm the existing critical habitat for the DPS. This rule amends the listing of this DPS on the Federal List of Endangered and Threatened Wildlife.

DATES: This rule is effective November 1, 2019.

ADDRESSES: This final rule is available at <http://www.regulations.gov> under Docket No. FWS-R1-ES-2012-0097, and at the Service's Idaho Fish and Wildlife Office at <http://www.fws.gov/idaho/>. Comments and materials we received, as well as supporting documentation we used in preparing this rule, are available for public inspection at <http://www.regulations.gov>. All of the comments, materials, and documentation that we considered in this rulemaking are available by

appointment, during normal business hours at: U.S. Fish and Wildlife Service, Northern Idaho Field Office, 11103 E. Montgomery Drive, Spokane Valley, WA 99206; telephone 509-891-6839; facsimile 509-891-6748.

FOR FURTHER INFORMATION CONTACT: Greg Hughes, 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 are hearing impaired or speech impaired may call the Federal Relay Service at 800-877-8339 for TTY (telephone typewriter or teletypewriter) assistance 24 hours a day, 7 days a week.

SUPPLEMENTARY INFORMATION:

Executive Summary

Why we need to publish a rule. Under the Act, a species may warrant protection through listing if it is endangered or threatened throughout all or a significant portion of its range. Listing a species as an endangered or threatened species can only be completed by rulemaking. Any proposed or final rule designating a 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 (DPS policy; 61 FR 4722, February 7, 1996). 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 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.

This rule amends the current listing of the southern Selkirk Mountains population of woodland caribou as follows:

- By defining the southern mountain caribou DPS, which includes the currently listed southern Selkirk Mountains population of woodland caribou;
- By designating the status of the southern mountain caribou DPS as endangered 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. Section 4 of the Act (16 U.S.C. 1533) and its implementing regulations (50 CFR part 424) set forth the procedures for determining whether a species meets the definition of "endangered species" or "threatened species." The Act defines an "endangered species" as a species that is "in danger of extinction throughout all or a significant portion of its range," and a "threatened species" as a species that is "likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range." Under the Act, a species may be determined to be an endangered species or threatened species because of any one or a combination of the five factors described in section 4(a)(1): (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. We have determined that threats described under factors A, C, and E pose significant threats to the continued existence of the southern mountain caribou DPS.

We listed the southern Selkirk Mountains population of woodland caribou as endangered 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 of the status of the species. 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 neither a species nor a 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.

Peer review and public comment. We sought comments from independent specialists to ensure that our designation is based on scientifically sound data, assumptions, and analyses. We invited these peer reviewers to comment on our amended listing proposal. We also considered all comments and information we received during the comment period.

Summary of Changes From the Proposed Rule

Based on information we received in comments regarding how we described the coat color of caribou during breeding and winter, we modified our description to reflect that caribou coat color and pattern is variable (Geist 2007) and winter pelage varies from almost white to dark brown (see *Species Information* under Background, below).

In our May 8, 2014, proposed rule (79 FR 26504), we noted that woodland caribou populations can be further broken down into subunits called “local populations.” The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) (2014, entire) uses the term “subpopulation” to refer to the same population subunits in Canada. In order to minimize confusion, we have conformed our terminology to that used by COSEWIC. Therefore, our proposed rule uses “subpopulations,” instead of “local populations,” to describe caribou subunits.

Caribou subpopulations represent groupings of individual woodland caribou that have overlapping ranges/movement patterns and breed with one another more frequently than they breed with caribou from other subpopulations. Subpopulations in southern British Columbia are thought to be a relatively recent phenomena resulting from habitat fragmentation and loss within the population of woodland caribou; historically, movement of caribou between subpopulations was likely.

Within the Status of the Southern Mountain Caribou DPS discussion in this final rule, we provide clarification

on the number and names of subpopulations (both extant and recently extirpated) within the DPS, and describe how subpopulation names and groupings of subpopulations by Canada have changed through time. We also clarify that the range of the DPS in British Columbia, Canada, and the United States has declined by 60 percent since historical arrival of Europeans in British Columbia, according to Spalding (2000, p. 40). In our May 8, 2014 proposed rule (79 FR 26504), we stated the range of the DPS had declined by 40 percent, but this was specific to the British Columbia, Canada, portion of the DPS’s range (*i.e.*, it did not include the portion of the range in the United States).

We updated the status of the southern mountain caribou DPS to reflect the most recent information contained in the COSEWIC report (2014, entire) pertaining to the number of individual caribou in each of the 15 extant subpopulations and the total estimated number of individuals in the DPS. We corrected the trend status of the Hart Ranges subpopulation to reflect that it is now declining, and to reflect that the overall trend of the DPS is declining and the rate of decline is accelerating. We also included additional information pertaining to population viability analyses conducted by Hatter (2006, entire, *in litt.*) and Wittmer (2010, entire) assessing the extinction risk of subpopulations within the DPS.

We provided additional analysis pertaining to the isolation of subpopulations within the DPS as well as separation from other populations (*i.e.*, Designatable Units) of woodland caribou in Canada. We explained how this isolation may affect the ability of the subpopulations within the DPS to function as a metapopulation, which could adversely affect the demographic and/or genetic stability or rescue of subpopulations within the DPS. We also provided additional analyses on potential threats to the DPS related to renewable energy and industrial development, and effect of predation upon the current and future status of the DPS.

We included additional information pertaining to Canadian conservation efforts for woodland caribou, which include augmenting animals into the Purcells South subpopulation and wolf control efforts within several subpopulations within the DPS (under the Factor A analysis, below, see *Efforts in Canada* under “Conservation Efforts to Reduce Habitat Destruction, Modification, or Curtailment of Its Range”). We also included additional information pertaining to existing

regulations enacted by the British Columbia provincial government that can be utilized to protect southern mountain caribou and their habitat, as well as implementing programs and projects for their conservation (see “Canada” under Factor D analysis, below).

In our May 8, 2014, proposed rule (79 FR 26504), we stated that further evaluation of existing regulatory mechanisms (Factor D) was needed before a final determination could be made as to the adequacy of existing regulatory mechanisms to address the threats affecting the status of the DPS. Notwithstanding the additional information learned regarding existing provincial laws and regulations of British Columbia, Canada, we conclude that, while the existing regulatory mechanisms in the United States and Canada enable the United States and Canada to ameliorate to some extent the identified threats to the southern mountain caribou DPS, the existing mechanisms do not completely alleviate the potential for the identified threats to affect the status of southern mountain caribou and their habitat.

In our May 8, 2014, proposed rule (79 FR 26504), we proposed to list the southern mountain caribou DPS as threatened. However, we have now determined that the status of, and threats to, the southern mountain caribou DPS warrant its listing as endangered. This determination is based on (1) the additional analysis referenced above and contained in the Status of the Southern Mountain Caribou DPS discussion below; and (2) the discussions of factors A (the present or threatened destruction, modification, or curtailment of its habitat or range), C (disease or predation), D (inadequacy of regulatory mechanisms) and E (other natural or manmade factors affecting its continued existence) in this final rule. The rationale for endangered status is summarized within the Determination section of this final rule. The May 8, 2014, proposed rule also contained a “Significant Portion of the Range” (SPR) analysis. That analysis was included in the proposed rule to conform to Service policy for listing rules at that time. However, subsequent to publishing the proposed rule, the Service revised its policy on when it is necessary to perform a SPR analysis (79 FR 37578, July 1, 2014).

In this case, because we found that the southern mountain DPS of woodland caribou is in danger of extinction throughout all of its range, per the Service’s SPR Policy (79 FR 37578, July 1, 2014), the protections of the Act apply to each individual

member of the DPS wherever found. Consequently, an analysis of whether there is any significant portion of its range where the species is in danger of extinction or likely to become so in the foreseeable future was unnecessary and was not conducted.

Background

Previous Federal Actions

Please refer to the proposed amended listing rule for the southern mountain caribou DPS (79 FR 26504; May 8, 2014) for a detailed description of previous Federal actions concerning this species. The May 8, 2014, proposed rule opened a 60-day public comment period, ending July 7, 2014. On June 10, 2014, we extended the public comment period on the proposed amended listing rule until August 6, 2014, and announced two public informational sessions and hearings (79 FR 33169). Public informational sessions and hearings were held in Sandpoint, Idaho, on June 25, 2014, and in Bonners Ferry, Idaho, on June 26, 2014 (79 FR 33169). On March 24, 2015, we reopened the public comment period on the proposed amended listing rule for an additional 30 days, ending on April 23, 2015, to allow the public time to review new information: A report from COSEWIC¹ and associated literature, which we received after the previous public comment period (80 FR 15545).

In our May 8, 2014, proposed rule (79 FR 26504), we proposed to reaffirm the November 28, 2012, final critical habitat designation (77 FR 71042) for the southern Selkirk Mountains population of woodland caribou as it applies to the U.S. portion of the endangered southern mountain DPS of woodland caribou. However, on March 23, 2015, the Idaho District Court (*Center for Biological Diversity v. Kelly*, 93 F.Supp.3d 1193 (D. Idaho, 2015)) ruled that we made a procedural error in not providing public review and comment regarding considerations we made related to our final critical habitat designation (77 FR 71042). On April 19, 2016, in response to the court's order, we published a document in the **Federal Register** (81 FR 22961) that reopened the public comment period on the November 28, 2012, final designation of critical habitat (77 FR 71042), which we proposed to reaffirm in the May 8, 2014, proposed rule (79 FR 26504) as the critical habitat for the southern mountain caribou DPS. We received numerous comments regarding critical habitat during the initial public comment periods for the

proposed amended listing rule; we are addressing those comments in this final rule as well as new comments we received during the reopened public comment period on the November 28, 2012, final critical habitat designation.

Species Information

Please refer to the proposed listing rule for the southern mountain caribou DPS (79 FR 26504; May 8, 2014) for a summary of species information. Except for the following correction, there are no changes to the species information provided in that proposed rule. The sentence reading, "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)" at 79 FR 26507 should instead read, "Breeding pelage is variable in color and patterning (Geist 2007), and winter pelage varies from almost white to dark brown."

Evaluation of the Southern Mountain Caribou as a Distinct Population Segment

Introduction and Background

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, any proposed or final rule designating a 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. 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.

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. A DPS may include multiple populations of vertebrate organisms that may not necessarily 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.

Distinctive, discrete, and significant populations of the woodland caribou have been identified, described, and assessed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). COSEWIC is composed of qualified wildlife experts drawn from Federal, provincial, and territorial governments; wildlife management boards; Aboriginal groups; universities;

¹ A list of acronyms used in this document is available at <http://www.regulations.gov> under Docket No. FWS-R1-ES-2012-0097.

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). The southern mountain caribou population, which includes the transboundary southern Selkirk Mountains population of woodland caribou (and is the subject of this final amended listing), is currently designated as "threatened" under SARA (COSEWIC 2011, 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, p. 74).

In August 2014, COSEWIC, in accordance with SARA, submitted its assessment to the Canadian Federal Environment Minister for consideration of changing the legal status of the southern mountain caribou in Canada under SARA to endangered (COSEWIC 2014, p. iv). The recommended change in the legal status under SARA is pending review and decision by the Federal Environment Minister.

Because we now consider the southern Selkirk Mountains population of woodland caribou part of the larger southern mountain caribou population, as recognized by COSEWIC (2011, entire), we recognize that our evaluation of the southern Selkirk Mountains population is more appropriately conducted at the scale of the larger southern mountain caribou population. Therefore, below we evaluate whether, under our DPS policy, the southern mountain caribou population segment (*i.e.*, 15 extant and 2 extirpated subpopulations) 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 (USFWS 2008). Because this population was listed prior to the Service's 1996 DPS policy (61 FR 4722; February 7,

1996), the 5-year review included an analysis of this population in relation to the DPS policy. In conducting the DPS analysis, we considered the discreteness and significance of this population in relation to the mountain caribou metapopulation (USFWS 2008, pp. 6–13) (*i.e.*, mountain caribou ecotype). 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). However, we acknowledged in our December 19, 2012, 90-day finding (77 FR 75091) on a petition to delist the southern Selkirk Mountains population of woodland caribou that the DPS analysis in our 2008 5-year review was not conducted relative to the appropriate taxon. Specifically, we should have conducted the DPS analysis of the southern Selkirk Mountains population of woodland caribou relative to the woodland caribou subspecies (*Rangifer tarandus caribou*) instead of the mountain caribou metapopulation.

For this final amended listing and DPS analysis of the southern mountain 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, 2011, 2014; Cichowski *et al.* 2004; Wittmer *et al.* 2005b, 2010; Hatter 2006, *in litt.*; Geist 2007; 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: distinctiveness in genetic characteristics or inherited traits, habitat

discontinuity, or ecological isolation (COSEWIC 2011, p. 15).

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 its 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 population (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 that 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.

I. Physical (Geographic) Discreteness

The southern Selkirk Mountains population of woodland caribou is 1 of 17 woodland caribou subpopulations (15 extant, 2 extirpated) (COSEWIC 2014, p. xix) that share distinct foraging, migration, and habitat use behaviors. These subpopulations are all located in steep, mountainous terrain in central and southeastern British Columbia, Canada, and in extreme northeastern Washington and northern Idaho, United States. Little to no dispersal has been detected between these subpopulations and other caribou populations/subpopulations outside this geographic area (Wittmer *et al.* 2005b, pp. 408, 409; COSEWIC 2011, p. 49; van Oort *et al.*

2011, pp. 222–223), indicating that mountain caribou appear to lack the inherent behavior to disperse long distances (van Oort, *et al.* 2011, pp. 215, 221–222). For the purposes of this DPS analysis, this collection of woodland caribou subpopulations, which, as noted above, includes the southern Selkirk Mountains population, constitutes the southern mountain population of caribou; we also refer to it herein as “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 caribou 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* × *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 feet (ft) (2 to 5 meters (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 subpopulations of woodland caribou.

II. 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 1994a, 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 meet the behavioral “discreteness” standard in our DPS policy.

III. Genetic Discreteness

Data from Serrouya *et al.* (2012, p. 2,594) 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 subpopulations 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 historically, caribou moved between populations of these DUs and interbred 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. 2,598). 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. 3,620). Historical gene flow between subpopulations of southern mountain caribou and neighboring subpopulations 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 subpopulations is now the norm, effecting some genetic differentiation of these subpopulations through genetic drift (Serrouya *et al.* 2012, p. 2,597).

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.

IV. Discreteness Conclusion

In summary, we determine that the best available information indicates that the southern mountain caribou, comprised of 17 woodland caribou subpopulations (15 extant and 2 extirpated) 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*).

I. 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.

II. 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. 2,598). This genetic isolation has resulted in unique behaviors and habitat use (Weckworth *et al.* 2012, p. 3,620). 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 subpopulations of southern mountain caribou and neighboring subpopulations did occur in the past, isolation of these subpopulations 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 differentiation between the southern mountain caribou population and neighboring woodland caribou, and a predicted continuation of genetic differentiation between subpopulations 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.

III. 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.

IV. 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). Additionally, Hatter (pers. comm. as cited in Spalding 2000, p. 40) estimated that the range of southern mountain caribou has declined by approximately 60 percent, when considering both the Canadian and U.S. range of the population. However, because there are no reliable historical estimates of the number of southern mountain caribou and their distribution (Spalding 2000, p. 34), it is difficult to precisely estimate their historical range for a comparison to their current range. Nevertheless, according to COSEWIC (2014, p. 14), mountain caribou were much more widely distributed than they are today, and thus the range of this population is decreasing. Further evidence of this decline is supported by

population surveys. For example, Hatter *et al.* (2004, p. 7) reported there were an estimated 2,554 individuals in the population in 1995, but in 2014, COSEWIC (2014, p. xvii) estimated the number of caribou in this population has declined to only 1,356 individuals.

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. The Service has not established a threshold of degrees latitude loss or percent range reduction for determining significance to a particular taxon. The importance of specific degrees latitude loss and/or percent range reduction, and the analysis of what such loss or reduction ultimately means to conservation of individual species/subspecies necessarily will be specific to the biology of the species/subspecies in question. However, 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. 2,242). Additionally, data tend to show that peripheral populations are persistent when species' range collapse occurs (Lomolino and Channell 1995, p. 342; Channell and Lomolino 2000, pp. 84–86; Channell 2004, p. 1). Of 96 species whose last remnant populations were found either in core or periphery of the historical range (rather than some in both core and periphery), 91 (95 percent) of the species were found to exist only in the periphery, and 5 (5 percent) existed solely in the center (Channell and Lomolino 2000, p. 85). Also, as described previously, caribou within the southern mountain population occur at the southern edge of woodland caribou range (*i.e.*, they are a peripheral population), and have adapted to an environment unique to woodland caribou. Peripheral populations adapted to different environments may facilitate speciation (Mayr 1970 in Channell 2004, p. 9). Thus, the available scientific literature data support the importance of peripheral populations for conservation

(Fraser 2000, entire; Lesica and Allendorf, 1995, entire).

Additionally, loss of the southern mountain caribou population would result in the loss of 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.

Finally, 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.

V. Significance Conclusion

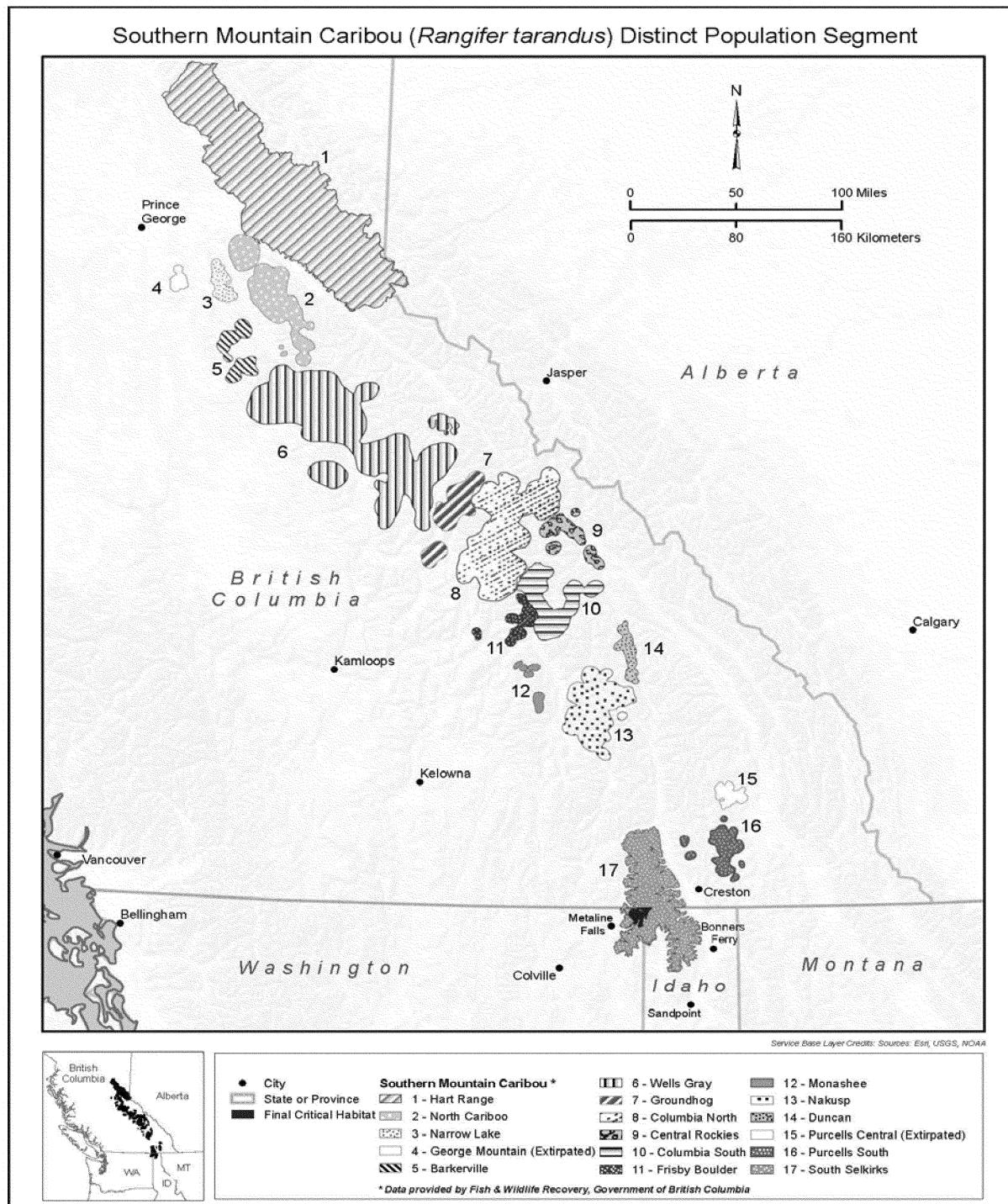
We conclude that the southern mountain caribou persists in an ecological setting unusual or unique for the subspecies of woodland caribou, and that loss of the southern mountain caribou would result in a significant gap in the range of the woodland caribou subspecies. Therefore, the discrete southern mountain caribou population of woodland caribou that occur in southern British Columbia and in northeastern Washington and northern Idaho meets 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 subpopulations within the southern mountain caribou DPS.

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Figure 1. Known distribution of the 17 subpopulations of the southern mountain caribou DPS. Local population boundaries depicted were provided to the Service by COSEWIC.



Status of the Southern Mountain Caribou DPS

As described previously, because there are no reliable historical estimates of the number of southern mountain caribou and their distribution (Spalding 2000, p. 34), it is difficult to precisely estimate their historical range for a comparison to their current range.

Nevertheless, according to COSEWIC (2014, p. 14), mountain caribou were much more widely distributed than they are today, and thus the range of this population is decreasing. Further evidence of this decline is supported by population surveys. For example, surveys of the southern mountain caribou population in 1995 estimated

there were 2,554 individuals in the population (Hatter *et al.* 2004, p. 7), but in 2014, COSEWIC estimated the number of caribou in this population has declined to only 1,356 individuals (COSWEIC 2014, p. xvii). The status (increasing, declining) of each subpopulation and current population estimate is identified in Table 1.

Table 1. Status and trend of the southern mountain caribou DPS subpopulations (after COSEWIC 2014, p. 41).

Subpopulation	3 generations (27 years) ¹			2 generations (18 years) ¹			% change (number of generations)			Current		Population management
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	Estimate	Trend ²	
South Selkirks							-62	-60	20	↓	1988-1998 ²	
Purcells South							-65	-61	22	=	2012 ³	
Purcells Central ⁹							-100	-100	0	×	2012 ⁴	
Nakusp ¹⁰							-72	-72	54	↓		
Duncan ¹⁰							-91	-91	2	↓		
Central Rockies							-86	-83	4	↓		
Monashee							-50	-43	4	↓	1985 ⁵	
Frisby Boulder ¹¹							-69	-68	12	↓	moose reduction 2003-pres ⁶	
Columbia South ¹¹							-94	-93	6	↓	moose reduction 2003-pres ⁶	
Columbia North ¹¹							-36	-36	157	=	moose reduction 2003-pres ⁶	
Groundhog ¹¹							-87	-56	11	↓	wolf sterilization 2001-2012 ⁷	
Wells Gray							-43	-26	341	↓	wolf sterilization 2001-2012 ⁷	
Barkerville							+94	+90	78	↑	wolf sterilization 2001-2012 ⁷	
North Cariboo Mtns							-28	-28	202	↓		
Narrow Lake							-38	-38	45	=		
George Mountain							-100	-100	0	×		
Hart Ranges							-35	-35	398	↓	moose reduction 2006-pres ⁸	
TOTAL							-45	-40	1,356	↓		

¹ Slanted bars indicate the period over which the 3-generation population change was calculated, and the cross-hatching indicates the period over which the 2-generation population change was calculated. [In the trend column, down arrow indicates declining trend, up arrow indicates increasing trend, equal sign indicates a stable trend, and X indicates an extirpated population based on available survey estimates. Current trend is from interviews with regional biologists.

² Augmented with 60 caribou from 1988 to 1990, and 43 caribou from 1996 to 1998 (Compton *et al.* 1995; Wakkinnen 2003)

³ Augmented with 10 caribou in March 2012; all transplanted caribou confirmed dead except 2 with failed collars (L. de Groot 2013, pers. comm.)

⁴ Augmented with 9 caribou in March 2012; all transplanted caribou died or left the area and died (L. de Groot 2013, pers. comm.)

⁵ Augmented with 9 caribou in winter 1984/85 (Wahl 1988).

⁶ Liberalized moose hunting from 2003 to present resulting in a 71 percent reduction of moose and approximately 50 percent reduction in wolves (Serruya 2013)

⁷ Wolf sterilization/removal conducted 2001-2004 and 2007-2012; moose reduction through liberalized harvest conducted 2001-2011 (Roorda and Wright 2012; Hayes 2013); population management actions limited to the Barkerville subpopulation and Wells Gray North portion only of the Wells Gray subpopulation

⁸ Moose reduction through liberalized harvest conducted 2006 to present in the Parsnip portion of the Hart Ranges only (D. Heard 2013, pers. comm.)

⁹ Purcells Central considered part of Purcells South range in COSEWIC (2002)

¹⁰ Naskup and Duncan equivalent to Central Selkirks in COSEWIC (2002)

¹¹ Columbia South, Groundhog, Frisby-Boulder, and Columbia North all part of Revelstoke range in COSEWIC (2002)

Currently the southern mountain caribou DPS is composed of 17 subpopulations (15 extant, 2 extirpated) (Figure 1, above). However, Canada has, over time, grouped its caribou populations in accordance with various assessments (COSEWIC 2002, entire; COSEWIC 2011, entire), which has resulted in shifting boundaries, and moving one or more subpopulations between differing geographic groupings of populations. In addition to altering boundaries between populations, some subpopulation boundaries within the populations have changed as well (e.g., some subpopulations have been combined). Thus, the number of subpopulations within the populations has changed. For example, the Allan Creek subpopulation listed in Hatter (2006, *in litt.*) was grouped with the Wells Gray subpopulation in COSEWIC (2014), and the Kinbasket-South subpopulation listed in Hatter (2006, *in litt.*) was renamed to Central Rockies subpopulation in COSEWIC (2014) (Ray 2014, pers. comm.). Additionally, the north and south Wells Gray subpopulations referred to in COSEWIC (2002, p. 92) were combined into a single Wells Gray subpopulation in COSEWIC's 2011 Designatable Unit Report (COSEWIC 2011, p. 89). However, the number (17) of subpopulations (which includes 15 extant and 2 recently extirpated subpopulations) and their names encompassed within the southern mountain caribou DPS conforms to Canada's southern mountain (DU9) as identified pursuant to COSEWIC (2011, entire).

All 15 extant subpopulations consist of fewer than 400 individuals each, 13 of which have fewer than 250 individuals, and 9 of which have fewer than 50 individuals (COSEWIC 2014, p. xviii). Fourteen of the 15 extant subpopulations within this DPS have declined since the last assessment by COSEWIC in 2002 (COSEWIC 2014, p. vii). Based on COSEWIC (2014, p. vii), which is new information received after we published our proposed amended listing rule (79 FR 26504; May 8, 2014), the population has declined by at least 45 percent over the last 27 years (3 generations), 40 percent over the last 18 years (2 generations), and 27 percent since the last assessment by COSEWIC in 2002 (roughly 1.4 generations) (COSEWIC 2014, p. vii). These subpopulations are continuing to suffer declines in numbers and range and have become increasingly isolated. Only one subpopulation has increased in numbers (likely due to aggressive wolf control and management) but still consists of

fewer than 100 individuals; the most recent estimate was 78 individuals (COSEWIC 2014, p. 43). Given the data cited above, the rate of population decline is accelerating. The accelerated rate of population decline is supported by Wittmer *et al.* (2005b, p. 265), who studied rates and causes of southern mountain caribou population declines from 1984 to 2002 and found an increasing rate of decline.

Because subpopulation names and boundaries have changed over time, it is difficult to precisely compare subpopulation estimates for some subpopulations within the southern mountain caribou DPS over time. However, according to Wittmer *et al.* (2005b, p. 413), individual subpopulations have decreased by up to 18 percent per year (Wittmer *et al.* 2005b, p. 413). For example, the Purcells South subpopulation, which is located above the Montana border, had an estimated 100 individuals in 1982, and only 20 in 2002. According to COSEWIC, this subpopulation had increased to 22 individuals in 2014 (COSEWIC 2104, p. xviii). Even though this subpopulation has slightly increased, it remains depressed.

Additionally, our May 8, 2014, proposed rule (79 FR 26504) stated that the Wells Gray South subpopulation was considered stable at 325 to 350 caribou from 1995 to 2002 (see 79 FR 26514). These numbers were obtained from Hatter *et al.* (2004, p. 7). However, according to COSEWIC's 2002 status report the subpopulation was estimated at 315 individuals and considered to be in decline (COSEWIC 2002, p. 92). Furthermore, as noted previously, COSEWIC has combined the north and south Wells Gray subpopulations (COSEWIC 2011, p. 89). According to COSEWIC, in 2002, the Wells Gray North subpopulation was estimated at 200 individuals and considered stable. Thus, the COSEWIC (2002) estimate for the combined Wells Gray subpopulation (*i.e.*, north and south subpopulations) was 515 individuals (COSEWIC 2002, p. 92). According to COSEWIC's latest assessment, the Wells Gray subpopulation is estimated at 341 individuals and considered to be declining (COSEWIC 2014, p. 41). Also, in our May 8, 2014, proposed rule (79 FR 26504), we stated that subpopulations in the northern-most portion of the DPS's range were stable (principally the Hart Ranges subpopulation with an estimated 500 individuals in 2005) (see 79 FR 26515). However, according to COSEWIC's latest status assessment, both the Hart Ranges and North Caribou Mountains subpopulations, which are both located

at the northern end of this DPS's range, are declining, with population estimates of 398 and 202 caribou, respectively (COSEWIC 2014, p. 41).

Surveys of the subpopulations 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 1,356 individuals (COSEWIC 2014, p. xvii). Many subpopulations 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 Purcells South subpopulations. These subpopulations 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 subpopulations. Hatter *et al.* (2004, p. 9) predicted subpopulation levels within this DPS under three different scenarios: "optimistic," "most likely," and "pessimistic." Under these scenarios population levels were modeled to decline from the estimated population of 1,905 caribou in 2002 to 1,534 (optimistic), 1,169 (most likely), or 820 (pessimistic), by 2022. The most recent population estimate of 1,356 caribou (COSEWIC 2014, p. 41) is already well below Hatter *et al.*'s (2004, p. 9) predicted population estimate of 1,534 caribou in 2022 projected under the optimistic scenario. In addition, all three scenarios reported the extirpation of two (optimistic), three (most likely), or five (pessimistic) subpopulations by 2022 (Hatter *et al.* 2004, p. 9). As of 2014, George Mountain and Purcells Central, two of the subpopulations within the southern mountain caribou DPS, are now considered to be extirpated (COSEWIC 2014, p. 16).

According to Hatter *et al.* (2004, pp. 9, 11), no models predicted extinction of the woodland caribou population within the 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 subpopulations in the DPS within the next 100 years. More recent population viability analyses (PVAs) have predicted quasi-extinction or extinction of several of the subpopulations within the DPS. A PVA conducted by Hatter (2006, p. 7, *in litt.*) predicted that the probability of quasi-extinction (a number below which extinction is very likely due to genetic or demographic risks, considered to be fewer than 20 animals in this case) in 20 years was 100 percent for 6 of the 15 subpopulations, greater than 50 percent for 11 of the 15 subpopulations, and greater than 20 percent for 12 of the 15 subpopulations within the DPS. Hatter (2006, p. 7, *in litt.*) also predicted quasi-extinction of another subpopulation (Wells Gray) in 87 years. Thus, a total of 13 of the 15 subpopulations could be quasi-extinct within 90 years, leaving only 2 subpopulations (Hart Ranges and North Caribou Mountains) remaining at the extreme northern portion of the DPS's range. Both the Hart Ranges and North Caribou Mountains subpopulations are declining (COSEWIC 2014, p. 41). These two subpopulations are subjected to the same threats acting on the other subpopulations in this DPS (COSEWIC 2014, p. 56), and are thus at a greater risk of extirpation than what we understood at the time of our May 8, 2014, proposed rule (79 FR 26504).

Wittmer *et al.* (2010, entire) conducted a PVA on 10 of the subpopulations assessed by Hatter (2006, entire, *in litt.*). All 10 subpopulations were predicted to decline to extinction within 200 years when models incorporated the declines in adult female survival known to occur with increasing proportions of young forest and declining population densities (Wittmer *et al.* 2010, p. 86). The results of PVA modeling by Wittmer *et al.* (2010, p. 90) also suggested that 7 of the 10 populations have a greater than 90 percent cumulative probability of extirpation within 100 years. Further, Wittmer *et al.* (2010, p. 91) suggested that as subpopulation densities decline, predation (see "Predation" under the Factor C analysis, below) may have a disproportionately greater effect, which is defined as compensatory mortality. Thus, the length of time to extirpation may be less than the timeframes

suggested by PVA modeling that does not account for compensatory mortality. Therefore, the 200 and 100 year time spans that Wittmer *et al.* (2010, pp. 86, 90) predict for extirpation of all 10 and 7 of the 10 subpopulations, respectively, may be an overestimate (*i.e.*, extirpation of these subpopulations may occur in less time).

Along with these documented and predicted population declines, subpopulations of woodland caribou within the DPS are becoming increasingly fragmented and isolated (Wittmer 2004, p. 28; van Oort *et al.* 2011, p. 25; Serrouya *et al.* 2012, p. 2,598). Fragmentation and isolation are particularly pronounced in the southern portion of the southern mountain caribou DPS (Wittmer 2004, p. 28). In fact, neither Wittmer *et al.* (2005b, p. 409) nor van Oort *et al.* (2011, p. 221) detected movement of individuals between subpopulations in the DPS.

Fragmentation and isolation are likely accelerating the extinction process and reducing the probability of demographic rescue from natural immigration or emigration because mountain caribou appear to lack the inherent behavior to disperse long distances (Van Oort *et al.* 2011, pp. 215, 221–222). As stated previously, mountain caribou were more widely distributed in mountainous areas of southeastern British Columbia (Canada), northern Idaho, and northeastern Washington. Currently, mountain caribou exist in several discrete subpopulations, which could be considered a metapopulation structure. However, a functioning metapopulation structure requires immigration and emigration between the subpopulations within the metapopulation via dispersal of juveniles (natal dispersal), adults (breeding dispersal), or both. Dispersal of individuals (natal or breeding) can facilitate demographic rescue of neighboring populations that are in decline or recolonization of ranges from which populations have been extirpated (*i.e.*, classic metapopulation theory). Species whose historical distribution was more widely and evenly distributed (such as mountain caribou) (van Oort *et al.* 2011, p. 221) that have been fragmented into subpopulations via habitat fragmentation and loss may appear to exist in a metapopulation structure when in fact, because they may not have evolved the innate behavior to disperse among subpopulations, their fragmented distribution may actually represent a geographic pattern of extinction (van Oort *et al.* 2011, p. 215). Also, as excerpted from COSEWIC (2014, p. 43):

Rescue effect from natural dispersal is unlikely for the southern mountain DU. The nearest subpopulation in the United States is the South Selkirk subpopulation, which is shared between [British Columbia], Idaho, and Washington, and currently consists of only 28 mature individuals. Even within the southern mountain DU, subpopulations are effectively isolated from one another with almost no evidence of movement between them except at the northern extent of the DU (van Oort *et al.* 2011). The closest DU is the Central Mountain and Northern Mountain DU, but these animals are not only declining in most neighboring subpopulations but are adapted to living in shallow snow environments and will likely encounter difficulty adjusting to deep snow conditions. The same characteristics that render all three mountain caribou DUs as discrete and significant relative to neighboring caribou subpopulations (see Designatable Units; COSEWIC 2011) make the prospects for rescue highly unlikely.

Finally, COSEWIC recommended that the southern mountain DU be listed as endangered under SARA (COSEWIC 2014, pp. iv, xix). Endangered is defined by SARA as a wildlife species that is facing imminent extirpation or extinction. COSEWIC cited similar reasons as the threats we identified in this final rule including, but not limited to: Small, declining, and isolated subpopulations; recent extirpation of two subpopulations; recent PVA modeling predicting further declines and extirpation of subpopulations; and continuing and escalating threats (COSEWIC 2014, pp. iv, vii). The International Union for the Conservation of Nature-Conservation Measures Partnership (IUCN–CMP) threat assessment for the southern mountain DU concluded that the threat impact is the maximum (Very High) based on the unified threats classification system (Master *et al.* 2009, entire), which indicates continued serious declines are anticipated (COSEWIC 2014, pp. 109–113).

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 determine whether a species is an endangered species or threatened species because of any one or a combination of the following: (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 because of 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, human development, recreation, and effects due to climate change (such as an increase in fires and a significant decrease in alpine habitats, which is loosely correlated with the distribution of the arboreal lichens on which these caribou depend). In addition to causing direct impacts, these threats often catalyze indirect impacts to caribou, including, but not limited to, predation, increased physiological stress, and displacement from important habitats. Both direct and indirect impacts to caribou from habitat destruction, modification, and curtailment are described below.

Historically, the caribou subpopulations 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; Cichowski *et al.* 2004, pp. 224, 231; Apps and McLellan 2006, pp. 84, 91; 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). According to Spalding (2000, p. 40) the entire range of southern mountain caribou has decreased by 60 percent when including both the United States and Canadian portion of the

population's historical range. The greatest reduction has occurred in subpopulations comprising the southern mountain caribou DPS (COSEWIC 2002, p. 30; COSEWIC 2011, p. 49). Hunting was historically considered the main cause of range contraction 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 because 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.

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 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 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, and 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 caribou 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 can 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 Kutel 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 the effects of climate change (Littell *et al.* 2009, p. 14) (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 tree wind-throw or forest fires

in the United States (Evans 1960, p. 124; USFWS 1985, p. 21).

More recently, mountain pine beetle (*Dendroctonus ponderosae*) 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).

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 affected forests 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 project more frequent mountain pine beetle 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 subpopulations (MCST 2005, p. 5; Wittmer *et al.* 2005b, p. 414) and reduced chance of rescue (the movement of individuals, often juveniles, to other subpopulations, 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. 2,598). 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.

Despite signs posted with caribou depictions warning motorists, 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 of its construction (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 subpopulations. 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 under “Biology” in the *Species Information* section of the May 8, 2014, proposed rule (79 FR 26507).

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). Additionally, other type of transportation corridors associated with industrial developments, including roads, snowmobile trails, hydropower transmission lines, and pipeline rights-of-way, can allow more efficient travel by wolves, leading to greater predation rate on caribou (Festa-Bianchet *et al.* 2011, p. 426) (see also *C. Disease or Predation*, below).

As discussed above, industrial development can directly affect caribou through habitat alteration that fragments caribou habitat and displaces caribou to areas of lower quality or degraded habitat, and indirectly through increased predation rates resulting from changes in predator-prey dynamics due to habitat alterations. In accordance with SARA, Canada has developed a recovery strategy for southern mountain caribou that assessed threats related to industrial developments (Environment Canada 2014, entire). In the recovery strategy, Canada identified the following threats: Oil and gas drilling related to shale gas development in the Kootenays present a moderate threat (defined as possible in the short term [less than 10 years or 3 generations]); mining and quarrying development primarily in the Barkerville, Kootenay, and Kamloops areas present a high threat (defined as continuing); renewable energy related to hydropower projects in the Columbia South and North ranges, and wind farms, present moderate threats; roads and railroad (e.g., Highway 3, Mica Dam Road, and potential twinning of the Trans-Canada Highway) present a high threat; and utility and service lines related to hydro-power project, potential twinning of the Kinder-Morgan oil pipeline, proposed oil and gas pipelines in the Hart Ranges, etc., present a high threat (Environment Canada 2014, pp. 21–22). All of the above-identified threats are or would be located in Canada. Currently, there are no similar existing or proposed industrial developments that would potentially impact caribou habitat within the DPS’s range in the United States.

Mining activities, although they may not be focused in valleys, may 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

current extent of direct and indirect impacts to caribou from existing mining activities within the southern mountain caribou DPS is 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. Literature suggests that trail compaction resulting from high levels 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 due to 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, and are also preferred by snowmobilers (Seip *et al.* 2007, p. 1,539), 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. 1,543). 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 force 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. 1,543). 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. 1,539),

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).

Given our understanding of the impacts to caribou from human disturbance (Simpson 1987, pp. 8–10), and information on other ungulate species relative to helicopter disturbance (Cote 1996, p. 683; Webster 1997, p. 7; Frid 2003, p. 393), the presence of humans and machines (helicopters or snow-cats) in caribou habitat from heli- or cat-skiing may be 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. Elevated GC levels in caribou has been documented within heli-ski areas. 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 understand the degree of impact 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, pp. 313–314) found that the presence of humans on snowshoes and skis impacted 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), an international body established in 1988 to assess the science related to climate change and provide policymakers with regular assessments of the scientific basis of climate change, its impacts and future risks, and options for adaptation and mitigation. “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; IPCC 2014, pp. 119–120). 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; IPCC 2014, p. 120). Various types of changes in climate can have direct or indirect effects on species. These effects may be positive, neutral, or negative (Thomas *et al.* 2011, pp. 126, 131, 136–137) 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).

On a global scale, climate change models under a range of emission scenarios consistently project future increases in temperature and increased precipitation at higher latitudes (Melillo *et al.* 2014, p. 33). At regional scales there is more variability, particularly when projecting future changes in precipitation. Average temperature has increased in the Northwest 1.3 °F between 1895 and 2011 (Dalton *et al.* 2013, p. xxi; Melillo *et al.* 2014, p. 489), while precipitation has fluctuated, but without a significant trend, during the same time period (Dalton *et al.* 2013, p. xxi; Melillo *et al.* 2014, p. 489). Temperature and precipitation extremes are projected to increase in the Northwest (Dalton *et al.* 2013, p. xxiii). For every season, some models project decreases and some project increases in future precipitation, but in a scenario of continued growth in heat-trapping gas emissions, summer precipitation is

projected to decrease by as much as 30 percent by the end of the century (2099) across many climate models. However, the projected changes in precipitation are relatively small compared to projected changes in temperature, and are likely to be masked by natural variability for much of the century (Melillo *et al.* 2014, p. 489). Increasing temperatures are likely to result in reduced snowpack accumulation in the winter and accelerated loss of snowpack in the spring (Mote *et al.* 2005, p. 48; Knowles *et al.* 2006, p. 4558). The earlier snowmelt that would result from projected temperature increases in the Northwest would reduce the amount of available water in the summer (Melillo *et al.* 2014, p. 11), expand the frost-free season (Melillo *et al.* 2014, p. 31), and increase the annual maximum number of consecutive dry days (Melillo *et al.* 2014, p. 33). Virtually all future climate scenarios for the Pacific Northwest project increases in wildfire in western North America, especially east of the Cascades. This projected 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). Westerling *et al.* (2006, pp. 942–943) compiled information on large wildfires in the western United States from 1970 to 2004, and found that large wildfire activity has increased significantly from the mid-1980s with large-wildfire frequency, longer wildfire duration, and longer wildfire seasons. The greatest increases occurred in high-elevation forest types including lodgepole pine and spruce fir in the northern Rockies. They also found that fire exclusion had little impact on natural fire regimes. Rather, climate appeared to be the primary driver of increasing wildfire risk. 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. 6,074; Cook *et al.* 2004, p. 1,015).

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. More recent analysis by Utzig (2012, pp. 11–15) suggests that while western red cedar will maintain a significant presence throughout the southern portion of the DPS, spruce fir forests and alpine parkland will approach near elimination by the 2080s. Similarly, Rogers *et al.* (2011, pp. 5–6) analysis 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. The loss of subalpine and alpine parkland would be detrimental to the southern mountain caribou DPS given the population's reliance on these habitat types for forage of arboreal lichens during the late winter and for summer habitat (Utzig 2005, p. 2). Thus, 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 subpopulations 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). 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). 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). Consistently lower snowpacks (similar to what is projected with climate change) at higher elevations may alter the height of lichen growth on trees which may affect seasonal caribou movement patterns. Thus, caribou may

remain at higher elevations throughout winter under various climate change scenarios. Additionally, climate change may increase predation pressure on caribou through altered distribution and abundance of other ungulate species populations.

Projections 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 project 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 (*Dendroctonus ponderosae*), outbreaks of mountain pine beetles 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 (*Dendroctonus rufipennis*) 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 through alteration of forest patch size and fragmentation that may facilitate increased predation pressure on caribou, and stand structure that may

reduce forage availability (e.g., arboreal lichens) for caribou (Utzig 2005, p. 8).

The information currently available regarding the effects of global climate change and increasing temperatures does not allow precise estimates of the location and magnitude of the effects. However, we do expect changes in climate such as increasing temperatures will result in the following: A shorter snow season with shallower snowpacks, increased forest disturbance, and vegetation growing in far from optimal climatic 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 (pp. 10–11), such as the impossibility of reliably projecting specific ecosystem changes and potential impacts. Utzig (p. 11) acknowledged that caribou survived 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 the changes occurring today.

Given the above information, we anticipate that changes in climate could directly impact the southern mountain caribou DPS by: (1) Reducing the abundance, distribution, and quality of caribou habitat; (2) limiting the ability of caribou to move between seasonal habitats; and (3) limiting 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 availability 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 significantly impact 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 negatively 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. U.S. Forest Service 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, November 28, 2012, see p. 71071). The Idaho Panhandle National Forests (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 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 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 2015, 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 under the Act.

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 (1994 recovery plan), outlining interim objectives necessary to support a self-sustaining caribou population in the Selkirk Mountains (USFWS 1994a, entire). 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 2015 population estimate for this subpopulation has dropped to 14 individuals, which continues a steady decline from 46 caribou in 2009 (Degroot 2015, *in litt.*). In addition, the 1994 recovery plan only applies to 1 subpopulation (southern Selkirk Mountain population of woodland caribou) of the 15 extant subpopulations 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.*).

As stated above, one of the tools of the 2007 MCRIP for achieving recovery of mountain caribou is augmentation of small subpopulations with caribou translocated from other areas. Pursuant to the 2007 MCRIP, an augmentation plan for the Purcells South Mountain Caribou Population was finalized in 2010, and included a goal of achieving a population target of 100 caribou through augmenting 40 caribou into the Purcell South subpopulation over 2 years (Cichowski *et al.* 2014 *in litt.*, p. ii). Twenty caribou were captured in March 2012 (first phase) from the Level-Kawdy subpopulation in northwestern British Columbia (located outside of the southern mountain caribou DU/DPS), fitted with radio collars, and 19 of the caribou (1 caribou died prior to release) were augmented into the Purcell South subpopulation located in south-eastern British Columbia, within the southern mountain caribou DU/DPS. As of the 2013 annual report, 17 of the 19 caribou

have died (6 due to cougar predation; 2 due to wolf predation; 3 due to accidents; 3 from unknown but confirmed non-predation causes; 2 from unknown causes, predation not ruled out; and 1 from malnutrition due to ticks) (Gordon 2013 *in litt.*, p. 1). The satellite collars on the two remaining caribou failed. However, the remaining cow was sighted approximately 112 mi (180 km) north of the Purcells South range, and when the collar on the remaining bull failed, he was utilizing high-elevation habitat with resident caribou and is presumed to still be with the resident group (Cichowski *et al.* 2014 *in litt.*, p. 2). Implementation of the second phase has not been initiated.

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 two Canadian national parks, Glacier and Mount Revelstoke. Both of these national parks comprise 333,345 ac (134,900 ha) and are within the range of several subpopulations 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, 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 Stagleapare, are

regularly or occasionally occupied by subpopulations or individuals of mountain caribou and these areas provide some level of protection.

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 (GAR) 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 were designed to reduce the impact from timber harvest and road construction on caribou habitat. They identified 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 about 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).

Under SARA, Federal, provincial, and territorial government signatories agreed to establish complementary legislation and programs that provide effective protection of species at risk throughout Canada (Environment Canada 2014, p.

i). SARA requires Federal competent ministers to prepare recovery strategies for species listed under SARA (Environment Canada 2014, p. i). The Minister of the Environment and the Minister responsible for the Parks Canada Agency are the competent ministers under SARA for southern mountain caribou (Environment Canada 2014, p. i). In 2014, in accordance with SARA, the BCMOE published the Recovery Strategy for the Woodland Caribou, Southern Mountain population (*Rangifer tarandus caribou*) in Canada (2014 Canadian Recovery Strategy) that set forth a recovery goal of achieving a self-sustaining population of 2,500 caribou in the southern mountain caribou DU (Environment Canada 2014, p. 29). The 2014 Canadian Recovery Strategy will be followed by development of action plans identifying recovery measures to be taken by the Environment Canada, the Parks Canada Agency, and the Province of British Columbia (Environment Canada 2014, p. i). The 2014 Canadian Recovery Strategy identified several actions that are already completed or are underway including, but not limited to:

- Consideration of southern mountain caribou habitat requirements when planning and implementing forest harvesting and other industrial activities, including prohibition of forest harvesting and road building activities in 2.2 million ha (5.4 million ac) (e.g., Ungulate Winter Ranges, protected areas) to protect high suitability habitat for southern mountain caribou in the Southern Group (also defined as the southern mountain caribou (DU 9)) in British Columbia;
- Consideration of southern mountain caribou habitat when planning and implementing prescribed fires in national parks and on other lands, including conducting prescribed fires in areas away from caribou habitat to maintain a safe distance between caribou and predators;
- Closure to snowmobiling of 1 million ha (2.5 million ac) of high-elevation habitat within ranges of southern mountain caribou in the Southern Group in British Columbia;
- Development and implementation of operating procedures for helicopter and snowcat skiing in southern mountain caribou in the Southern Group in British Columbia;
- Development and implementation of operating guidelines for industrial development within southern mountain caribou ranges;
- Land-use planning to identify areas within southern mountain caribou ranges where southern mountain caribou conservation is prioritized;

- Reduced speed zones on highways in important caribou habitat;
- Predator and alternate prey management projects in some ranges where subpopulations of southern mountain caribou are declining; and
- Population augmentation through translocations and reduction of early calf mortality through maternal penning.

In addition, implementation of voluntary stewardship management agreements in British Columbia may contribute to conservation of the southern mountain caribou DPS. 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 abide by 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). Finally, a maternal penning trial is being implemented near Revelstoke, British Columbia, Canada, and a memorandum of understanding has been signed between Parks Canada and the Calgary Zoo to develop captive breeding capacity for mountain caribou (MCRIPPB 2014, p. 5).

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 effects of 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 effects due to climate change may 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 further limits caribou dispersal and movements among subpopulations within the southern mountain caribou DPS by making it more difficult and more dangerous for caribou to disperse. Additionally, 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. Projections of changes in climate indicate that the changes will exacerbate impacts by catalyzing forest composition changes; increasing forest insect outbreaks; and increasing the likelihood of wildfires through changes in phenology, precipitation (both timing and quantity), and temperature.

Another threat, human disturbance from wintertime recreation, particularly from snowmobile activity, increases physiological stress and energy expenditure, and alters habitat occupancy of caribou. This disturbance forces caribou to use inferior habitat with greater risk of predation 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 subpopulations 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 the activities identified under this factor pose significant threats 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). In support of 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. While hunting of mountain caribou is allowed within certain areas

of British Columbia (British Columbia Hunting and Trapping Regulations/Synopsis 2014–2016), according to Chris Ritchie (2015, pers. comm.), there is no legal harvest of mountain caribou allowed within the range of the southern mountain caribou DU/DPS in Canada. Further, hunting is prohibited in all national parks and ecological reserves in British Columbia, but may be allowed in some specific British Columbia parks. 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 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), we do not have data that suggest illegal killing is affecting caribou numbers in any of the subpopulations 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 ceased, certain populations began to recover 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 activities identified under this factor do not pose threats to the continued existence of the southern mountain caribou DPS.

C. Disease or Predation

Disease

Caribou mortality due to disease and parasitism has been documented 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 insects with the potential to affect caribou populations include 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 one was confirmed to have died of

severe parasitism (*Sarcocystis* sp.) and emaciation (Compton *et al.* 1995, p. 493). Additionally, in 2012, 19 caribou were translocated from the Level-Kawdry subpopulation in northwestern British Columbia into the Purcell Mountains subpopulation in southeastern British Columbia, Canada. Of the 19 translocated caribou, one died from malnutrition due to ticks (Gordon 2013, *in litt.*). 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. 1,500; Kinley and Apps 2001, p. 161; MCST 2005, p. 4; Wittmer *et al.* 2005b, pp. 414–415). McLellan *et al.* (2012, entire) investigated whether interactions with forage (bottom-up) or predators (top-down) were the principal mechanisms regulating southern mountain caribou populations. They concluded that apparent competition (*i.e.*, predation) is the proximate mechanism driving the population decline of mountain caribou (McLellan *et al.* 2012, p. 859). Apparent competition occurs indirectly between prey populations that share a common food-limited predator, whereby the predator asymmetrically impacts the prey populations (Holt 1977, pp. 201–202), even without resource competition between the prey species. For example, in this case, the numerical response of

predators (*e.g.*, wolves and cougars) to the primary prey (*i.e.*, deer, elk, moose) can depress the population of the secondary prey (*i.e.*, caribou), resembling competition between the prey species. Predation on the secondary prey can be incidental, can increase proportionately as the numbers of secondary prey decline (Sinclair *et al.* 1998 in Wittmer *et al.* 2005a, p. 259), and can lead to extinction of the secondary prey (DeCesare *et al.* 2010, pp. 353, 355). McLellan *et al.* (2012, p. 859) also concluded that food limitation (neither quality nor quantity) is likely not driving the continued population decline of mountain caribou.

As cited previously the decline of this population is accelerating (COSEWIC 2014, p. vii). Wittmer *et al.* (2005b, p. 264) found that predation was the primary cause of mortality driving the accelerated rate of population decline of mountain caribou. The accelerated rate of decline of the overall population composed of small, fragmented, and isolated subpopulations is consistent with the Allee effect² (Stephens *et al.* 1999, p. 186), which predicts population growth rates to decline as populations become smaller. Increased predation pressure on small populations is one example of an Allee effect, but genetic drift can also result in an Allee effect (Stephens *et al.* 1999, p. 185).

Genetic drift can result from rapid changes in gene frequencies caused by environmental and demographic stochasticity independent of mutation and natural selection, and smaller populations are more susceptible to genetic drift. For example, when alleles³ occur at a low frequency in a small population, these alleles have a significant probability of being lost in each generation. The gradual loss of rare alleles from a population changes the overall genotype of the population, and ultimately results in a loss of genetic variability. Serrouya *et al.* (2012, p. 2,597) demonstrated that below a population size of approximately 150 caribou, the magnitude and variation of genetic differentiation greatly increased between pairs of adjacent subpopulations (*i.e.*, genetic drift). In summary, genetic drift reduces genetic variation in populations, potentially reducing a population's ability to evolve in response to new selective pressure, and genetic drift acts faster and has

more drastic results in small populations.

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 effects due to 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). Additionally, many studies conducted across the range of mountain caribou (Northern, Central, and Southern DUs) as well as the Boreal DU in Canada suggest these populations of caribou are at risk of extirpation where habitat altering industrial activities affect predator-prey dynamics (Festa-Bianchet *et al.* 2011, p. 427).

Habitat alteration and fragmentation has resulted in increased numbers and distribution of other ungulate prey species (*i.e.*, deer, moose, and elk) that

²The Allee effect is a phenomenon in biology characterized by a correlation between population size or density and the mean individual fitness (often measured as per capita population growth rate) of a population or species.

³One member of a pair of genes occupying a specific spot on a chromosome that controls the same trait.

has supported, and continues to support, higher densities of predators which then prey opportunistically on caribou (*i.e.*, apparent competition). It will likely require greater than 150 years (greater than 16 generations of caribou) of habitat protections for early successional and fragmented forests to develop the old-growth habitat characteristics (vegetative structure and composition) (Stevenson *et al.* 2001, p. 1) necessary to restore the natural predator-prey balance of these high-elevation, old-growth forests, and thus reduce predation pressure on caribou. As discussed above under Status of the Southern Mountain Caribou DPS, Hatter (2006, p. 7, *in litt.*) predicted quasi-extinction of 13 of the 15 subpopulations within the DPS within 20 to 90 years, and Wittmer *et al.* (2010, p. 86) predicted extinction of 10 of the 15 subpopulations within 200 years (notably, they did not assess 5 of the subpopulations). Thus, the subpopulations within the DPS are not likely sustainable given ongoing declines and the length of time needed to improve habitat conditions that may ameliorate the threat of predation.

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. 1,500; Kinley and Apps 2001, p. 161; MCST 2005, p. 4, Wittmer *et al.* 2005b, pp. 414–415). Strategies on managing predation may 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 that both approaches be taken within the Canadian portion of the southern mountain caribou DPS (MCRIPPB 2010, pp. 1, 12, 13).

Direct management of predator populations within the southern mountain caribou DPS to date has included investigations of 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, BCMOE has authorized removal of wolves from within the southern mountain caribou DPS 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 subpopulations 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 Purcells South subpopulation 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. The Board's 2010 annual report 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 subpopulations 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 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 (Idaho Department of Fish and Game (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 (77 FR 71042, November 28, 2012). Forty-four 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 remain 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 subpopulations 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 predation 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 ameliorate 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. 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 1994a, p. 21). Land and resource management plans (LRMPs) for the IPNF and the CNF have been revised to incorporate management objectives and standards for caribou. Standards for caribou habitat management have been incorporated into the IPNF’s 2015 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 2015, pp. 29–33; USFS 1988, pp. 4–10–17, 4–38, 4–42, 4–73–76, Appendix I).

We acknowledge that LRMPs can be amended or revised. However, LRMPs are typically in place for 15 years or longer, and the Service, other Federal and State agencies, and the public would have opportunities to comment on any proposed amendments or revisions to the IPNF and/or CNF LRMPs through the National Environmental Policy Act (NEPA; 42 U.S.C. 4321 *et seq.*) process. Therefore, we expect that both the IPNF and CNF will continue managing for caribou and their habitat into the future.

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, November 28, 2012, see 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. To date, the IPNF has not completed a winter recreation strategy. For additional information, under the Factor A analysis, above, see *Efforts in the United States* under “Conservation Efforts to Reduce Habitat Destruction, Modification, or Curtailment of Its Range.”

State

Idaho Department of Fish and Game (IDFG): The woodland caribou within Idaho are considered a Species of Greatest Conservation Need by IDFG under Idaho State’s Comprehensive Wildlife Conservation Strategy that provides a framework enabling development of partnerships to jointly develop and implement long-term conservation plans for species of greatest conservation need (<https://idfg.idaho.gov/wildlife/comprehensive-wildlife-strategy>; accessed on November 3, 2016). 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 subpopulations within the southern mountain caribou DPS, and we do not consider this to be a threat to the species.

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 that 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, lands will remain open to winter motorized use unless there is a confirmed caribou sighting (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). 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

subpopulations 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 (which is equivalent to Canada's southern mountain DU), is protected as threatened under Canada's Species at Risk Act (SARA) (Statutes of Canada (S.C.) chapter 29).⁴ However, as noted previously, COSEWIC has recommended that the southern mountain DU be listed as endangered under SARA (COSEWIC 2014, pp. iv, xix) pending review and decision by the Federal Environment Minister. "Endangered" is defined by SARA as a wildlife species that is facing imminent extirpation or extinction. 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 an endangered or 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 directly 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). However, British Columbia has

enacted two separate pieces of legislation that can provide protections for imperiled species, the Forest and Range Practices Act (FRPA) and the Wildlife Act (WA).

The FRPA enables the BCMOE to regulate road building, logging, reforestation, and grazing through passage of Government Act Regulations (GARs) to protect ungulate winter range and wildlife habitat areas. As described previously through passage of GARs, BCMOE has protected over 5 million ac (over 2 million ha) of high-quality ungulate winter range from road building and logging, which equates to protecting greater than 95 percent of high-quality caribou habitat in British Columbia (Ritchie 2015, pers. comm.). The WA enables BCMOE to establish wildlife management areas and issue regulations pertaining to the management of such areas. In accordance with the WA, BCMOE has prohibited recreational snow machine use on almost 2.5 million ac (over 1 million ha) of mountain caribou habitat. Additionally, the WA contains provisions allowing BCMOE to develop and implement predator management plans. The British Columbia's Ministry of Forests, Lands and Natural Resource Operations prepared the Management Plan for the Gray Wolf in British Columbia as advice to the responsible jurisdiction and organizations that may be involved in managing gray wolves in British Columbia. Recommendations in the plan are used by provincial agencies to guide the development of new, or modification of existing, provincial policies and procedures. Consistent with that plan and in accordance with the WA, BCMOE has implemented projects to reduce wolf predation on mountain caribou.

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, under the Factor A analysis, above, see *Efforts in Canada* under "Conservation Efforts to Reduce Habitat Destruction, Modification, or Curtailment of Its

⁴The southern mountain population of woodland caribou is a broader outdated grouping of caribou that was based on Canada's "National Ecological Areas" (NEAs) established by COSEWIC in 1994 (COSEWIC 2002, pp. 7, 18–19). Please see our response to Comment (2), below, for a more completed description of historical woodland caribou groupings in Canada.

Range" and under the Factor C analysis, above, see "Conservation Efforts to Reduce Disease or 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 and habitat restoration, have seen less progress made. Additional work and time are still needed to implement all goals identified in the MCRIP to adequately reduce threats to the southern mountain population of caribou in Canada.

Local Ordinances

The Service sought but was unable to find 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

The vast majority of caribou habitat in the Selkirk Mountains of the United States is located on USFS land, specifically the CNF and IPNF. Both the CNF and IPNF have incorporated caribou habitat management standards into their LRMPs. Therefore, we expect both the CNF and IPNF to continue managing for caribou and their habitat into the future.

While the IDL also manages a substantial portion of caribou habitat within the southern Selkirk Mountains subpopulation, they are not required to manage their land for caribou. The 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 within the Selkirk Mountains subpopulation.

Hunting regulations at the national and State levels provide adequate protections regarding the legal take of caribou in the United States. We do not have data that suggest illegal killing is affecting caribou numbers in any of the subpopulations within the southern mountain caribou DPS, and we do not consider this a threat to the species.

In Canada, the southern mountain caribou DPS is protected as threatened at the national level under SARA, while British Columbia considers them to be critically imperiled. British Columbia, Canada, has also enacted legislation (*i.e.*, Forest and Range Practices Act, Wildlife Act) that enables the BCMOE to implement regulations for the protection of wildlife, which it has done for caribou. 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 subpopulations continue to decline within the southern mountain DPS despite regulatory mechanisms being in place in the United States and Canada. However, 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 current status of caribou habitat is largely an artifact of historical (and in some cases current) silvicultural practices and wildfires that reset the successional forest stage and structure favoring early successional ungulate species (*e.g.*, deer, elk, moose) that in turn support higher densities and distribution of predators that prey opportunistically on caribou. The reality is that it will require several decades of appropriate forest management to reduce habitat fragmentation and achieve the old-growth forest structure that will begin to restore the natural predator-prey ecology of this ecosystem and, thus, reduce the predation pressure on caribou. Remedies to address threats such as control of predators are not logically easy to implement, may be expensive to address, and may meet social resistance.

We have determined that, while existing regulatory mechanisms in the United States and Canada enable both the United States and Canada to ameliorate to some extent the identified threats to the southern mountain caribou DPS, the existing mechanisms do not completely alleviate the potential for the identified threats to adversely

affect the status of southern mountain caribou and their habitat.

E. Other Natural or Manmade Factors Affecting Its Continued Existence

Avalanches and Stochastic Events

As explained previously, predation and genetic drift are two examples of demographic stochasticity that can negatively impact the status of these small, fragmented mountain caribou subpopulations. Mountain caribou, because they live in high-elevation, steep habitats that receive deep winter snowfall, are also susceptible to environmental stochastic factors such as avalanches. According to Seip and Cichowski (1996, p. 76), avalanches are a natural source of mortality to caribou. 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 subpopulations 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 April of 2009, from a single avalanche event (Hebblewhite *et al.* 2010, p. 342).

As discussed in "Biology" under *Species Information* in our proposed rule (79 FR 26504, May 8, 2014, see p. 26507), caribou also have low reproductive rates compared to other cervids, with females typically reproducing for the first time at 3 years of age and producing only a single calf per year (Cicchowski *et al.* 2004, p. 230; Shackleton 2010, p. 1). This low reproductive rate can affect the resiliency⁵ of the subpopulation to withstand demographic and environmental stochastic impacts. Calf

⁵ Resiliency describes the ability of a species to withstand stochastic disturbance. Resiliency is positively related to population size and growth rate, and may be influenced by connectivity among populations. Generally speaking, populations need abundant individuals within habitat patches of adequate area and quality to maintain survival and reproduction in spite of disturbance.

mortality averages 50 to 70 percent within their first year (COSEWIC 2002, p. 35). Low reproductive rates and high calf mortality reduce the resiliency of the subpopulation.

Additionally, the two subpopulations predicted not to be extirpated within 90 years are located at the far north of the DPS's range; in fact, they are the two most northern subpopulations within the DPS. Thus, after 90 years, it is predicted that the DPS will have been extirpated from over 65 percent of its current range, including most of the southern portion, which would severely reduce representation⁶ of the southern mountain caribou DPS within its range. Based on observed declines in abundance, the subpopulations that may remain are already exhibiting reduced resiliency. Therefore, the decreased redundancy⁷ and reduced resiliency of the southern mountain caribou DPS places it at greater risk of extinction sooner than 100 years as predicted by Wittmer (2004, p. 88), due to existing demographic and environmental stochastic factors.

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 subpopulation sizes and isolation of these subpopulations. Subpopulations 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 these other natural or manmade factors affecting its continued existence pose threats to the continued existence of the southern mountain caribou DPS.

⁶ Representation describes the ability of a species to adapt to changing environmental conditions over time. It is characterized by the breadth of genetic and environmental diversity within and among populations.

⁷ Redundancy describes the ability of a species to withstand catastrophic events. It is about spreading risk among multiple populations to minimize the potential loss of the species from catastrophic events. Redundancy is characterized by having multiple, resilient populations distributed within the species' ecological settings and across the species' range.

Cumulative Effects

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 vegetation 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.

Summary of Comments and Recommendations

In the proposed rule published on May 8, 2014 (79 FR 26504), we requested that all interested parties submit written comments on the proposal by July 7, 2014. We also contacted appropriate Federal and State agencies, scientific experts and organizations, and other interested parties and invited them to comment on the proposal. Newspaper notices inviting general public comment were

published in the Lewiston Morning Tribune, Idaho Statesman, Coeur d'Alene Press, Spokesman Review, Bonners Ferry Herald, Bonner County Daily Bee, Priest River Times, and The Miner. Subsequently, on June 10, 2014, we extended the public comment period until August 6, 2014 (79 FR 33169). We received requests for public hearings. Public informational sessions and hearings were held on June 25, 2014, in Sandpoint, Idaho, and on June 26, 2014, in Bonners Ferry, Idaho (79 FR 33169). On March 24, 2015, we reopened the public comment period for an additional 30 days, ending on April 23, 2014, to allow the public time to review new scientific information received after the previous public comment period (80 FR 15545). We also reopened the public comment period on April 19, 2016, for an additional 30 days, ending on May 19, 2016, addressing a U.S. District Court for the District of Idaho remand of the final critical habitat rule to correct a procedural error (81 FR 22961).

Including all public comment periods for the proposed rule, we received over 400 individual comments. Additionally, we received a form letter representing comments from almost 2,000 different individuals. During the June 25, 2014, public hearing in Sandpoint, Idaho, six individuals or organizations made comments, and during the June 26, 2014, public hearing in Bonners Ferry, Idaho, five individuals or organizations provided comments on the proposed rule. All substantive information provided during comment periods has either been incorporated directly into this final determination or is addressed below.

Peer Reviewer Comments

In accordance with our peer review policy published on July 1, 1994 (59 FR 34270), we solicited expert opinion from four knowledgeable individuals with scientific expertise that included familiarity with the southern mountain caribou DPS and its habitat, biological needs, and threats. We received responses from all four of the peer reviewers.

We reviewed all comments received from the peer reviewers for substantive issues and new information regarding the listing of the southern mountain caribou DPS. The reviewers provided comments and clarifications pertaining to the taxonomy of mountain caribou, status of the DPS, type and degree of threats affecting the status of the DPS, and our proposal to list the DPS as threatened. Peer reviewer comments are addressed in the following summary and incorporated into the final rule as appropriate.

(1) *Comment:* All peer reviewers disagreed with our proposal to list southern mountain caribou DPS as threatened; they all suggested it should be listed as endangered due to: (1) Declining population size; (2) small and isolated subpopulations resulting from habitat loss and fragmentation; and (3) other threats, including predation and recreation. All noted that COSEWIC has recommended that the southern mountain DU (which is analogous to the southern mountain caribou DPS) be listed as endangered under Canada's Species at Risk Act (SARA) (COSEWIC 2014).

Our Response: Subsequent to our proposed rule, in May 2014, COSEWIC published its "Assessment and Status Report on the Caribou (*Rangifer tarandus*) Northern Mountain population, Central Mountain population, and southern mountain population in Canada" (COSEWIC 2014). As noted previously, COSEWIC, which 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, recommended that the southern mountain DU be listed as endangered under SARA (COSEWIC 2014, pp. iv, xix) pending review by the Federal Environment Minister. Upon further analysis of this new information, in conjunction with considering the comments received from the peer reviewers, as well as comments from the general public, Canadian government, states of Washington and Idaho, and the Kootenai Tribe of Idaho and Kalispel Tribe of Indians (hereafter collectively referred to as Tribes), we agree that the southern mountain caribou DPS should be listed as endangered under the Act. We have provided additional analysis supporting our endangered determination within Status of the Southern Mountain Caribou DPS, and the Factor C analysis in this final rule. See also the Determination, below.

(2) *Comment:* One peer reviewer suggested that the significance discussion in our DPS analysis could be bolstered by adding that the loss of the southern mountain caribou DPS (*i.e.*, continued northerly contraction of the range of woodland caribou) would represent a loss of approximately 13 percent of the range of southern mountain caribou as defined by SARA.

Our Response: The southern mountain caribou, as defined by SARA, is an outdated grouping of "Nationally Significant Populations" (NSPs) of

caribou that was based on Canada's "National Ecological Areas" (NEAs) established by COSEWIC in 1994 (COSEWIC 2002, pp. 7, 18–19) and should not be confused with the southern mountain caribou DPS addressed in this document. Canada's NSPs were delineated based on separate geographic populations of caribou occurring within different ecological areas, and did not necessarily consider differences in genetics or morphology between or behavioral adaptations exhibited by different caribou populations within the NEAs. Thus, to account for morphological, genetic, and/or behavioral differences between geographically discrete and evolutionarily significant populations of caribou, COSEWIC reorganized the population structure of caribou into "Designatable Units" (DU) (COSEWIC 2011, entire). The NSP of southern mountain caribou, as defined by SARA, was thus replaced by COSEWIC's DU 7 (Northern Mountain), DU 8 (Central Mountain), and DU 9 (southern mountain). Our DPS analysis of the southern mountain caribou DPS closely conforms to COSEWIC's DU 9 analysis contained in their 2011 DU report. Additionally, for the same reason as explained in our proposed rule (79 FR 26504, May 8, 2014, see p. 79 FR 26509), using the former NSP southern mountain caribou grouping, as defined by SARA, for comparing the significance in the loss of range should the southern mountain caribou DPS be extirpated is inappropriate because the southern mountain caribou, as defined by SARA, is not a species or subspecies. Rather, in accordance with our 1996 DPS policy, the appropriate comparison for significance is to assess the southern mountain caribou DPS (DU 9) relative to the woodland caribou subspecies.

(3) *Comment:* Three of the four peer reviews noted that Banfield's (1961) taxonomical classification for *Rangifer tarandus* is outdated and is the subject of much debate; thus, the classification of caribou as it pertains to the grouping of "woodland" caribou within *Rangifer tarandus* needs revision. Two of the reviewers suggested using the grouping of caribou, at least for North America, as outlined in COSEWIC (2014). One peer reviewer, noting the debate surrounding caribou taxonomy in North America, suggested that the proposed rule does not need to rest on the veracity of the subspecies classification scheme to work, and that our DPS analysis should be relative to the species *Rangifer tarandus* as opposed to *Rangifer tarandus caribou*.

Our Response: As noted in our May 8, 2014, proposed rule (79 FR 26504),

while caribou taxonomy continues to be subject to debate, Banfield's (1961) taxonomic grouping of woodland caribou is still currently widely accepted. Thus, until a scientifically accepted and peer reviewed revision to the taxonomic classification of the subspecies of caribou (*Rangifer tarandus*) is completed, Banfield (1961) represents the best available science on the taxonomic classification for the subspecies of caribou in North America. However, regardless of whether Banfield's (1961) taxonomic classification for the subspecies of caribou in North America is used or COSEWIC's grouping of caribou in North America is used as the barometer for assessing the discreteness and significance of the southern mountain caribou DPS relative to caribou in North America, the southern mountain caribou meets the discreteness and significance criteria for identifying it as a DPS under our DPS policy.

(4) *Comment:* Two peer reviewers suggested that the boundary of subpopulations (herds) within the southern mountain caribou DPS should be clarified. One peer reviewer identified that the proposed rule appears to refer to subpopulations (herds) outside of the southern mountain caribou DPS (*e.g.*, Banff and Jasper National Parks, and Ontario populations). Two peer reviewers commented that the proposed rule omitted referencing two recently extirpated subpopulations (George Mountain and Purcells Central), and recommended they be included in the list of identified subpopulations within the DPS boundary. One peer reviewer noted that there are discrepancies in the literature regarding the number of extant subpopulations in this DPS. Two peer reviewers commented that the proposed rule identified the status of the Hart Range herd as stable; however, according to COSEWIC (2014), the herd has declined to less than 500 individuals and is no longer considered stable.

Our Response: The proposed rule should have clearly identified the subpopulations, and we have included in this rule: (1) Figure 1, which contains the subpopulation names and current distribution of each subpopulation including the two extirpated subpopulations (George Mountain and Purcells Central); and (2) Table 1, which includes the status (increasing, declining) of each subpopulation and current population estimates. We refer to the subpopulations and the regions where they currently occur instead of delineating a boundary for the entire DPS.

We have removed the reference to the Banff and Jasper subpopulations (79 FR 26504, May 8, 2014, see p. 79 FR 26521). However, the Ontario reference was used in discussions pertaining to the historical distribution of woodland caribou, and as an example of a potential disease vector that could migrate west and affect woodland caribou in the southern mountain caribou DPS (see *C. Disease or Predation*). We have also corrected the reference to the status of the Hart Ranges subpopulation to reflect that the subpopulation is now declining with an estimated size of 398 individuals (COSEWIC 2014, p. xviii) (see Status of the Southern Mountain Caribou DPS).

Regarding the apparent discrepancies in the literature surrounding the number and names of extant subpopulations that are encompassed within the boundary of this DPS, further explanation would be helpful. Over time, Canada has grouped its caribou populations in accordance with various assessments (COSEWIC 2002, entire; COSEWIC 2011, entire), which has resulted in shifting boundaries, and moving one or more subpopulations between differing geographic groupings of populations. Additionally, not only have the boundaries of the subpopulations, and, thus, the number of subpopulations within them changed, but some subpopulations within the boundaries have been combined. For example, the Allan Creek subpopulation listed in Hatter (2006, *in litt.*) was grouped with the Wells Gray subpopulation in COSEWIC (2014), and the Kinbasket-South subpopulation listed in Hatter (2006, *in litt.*) was renamed to Central Rockies subpopulation in COSEWIC (2014) (Ray 2014, pers. comm.). However, the number (17) of subpopulations (which includes 15 extant, and 2 recently extirpated subpopulations) and their names encompassed within the southern mountain caribou DPS boundary conforms to Canada's southern mountain (DU9) as identified pursuant to COSEWIC (2011, entire); this is currently the best available information regarding population groupings.

(5) *Comment:* Three peer reviewers suggested that we incorporate population viability analyses from Hatter (2006, *in litt.*) and Wittmer *et al.* (2010) into the final decision. One peer reviewer indicated that the declining population trend and rate of extinction predicted by Hatter (2006, *in litt.*) and Wittmer *et al.* (2010) may be accelerated due to small population sizes.

Our Response: We have incorporated the findings of Hatter (2006, *in litt.*) and Wittmer *et al.* (2010) into our status

assessment. Wittmer *et al.* (2010, entire) used stochastic projection models on 10 subpopulations of the southern mountain DPS based on vital rates. All 10 subpopulations were predicted to decline to extinction within less than 200 years when models incorporated the declines in adult female survival known to occur with increasing proportions of young forest and declining population densities (Wittmer *et al.* 2010, p. 86).

Hatter (2006, entire, *in litt.*) conducted population viability analyses (PVAs) for all extant 15 subpopulations in this DPS based on population estimates from surveys. Time to quasi-extinction (a number below which extinction is very likely due to genetic or demographic risks, considered fewer than 20 animals in this case) was less than 50 years for 10 of 15 subpopulations (Hatter 2006, p. 7, *in litt.*). The probability of quasi-extinction in 20 years was 100 percent for 6 subpopulations, greater than 75 percent for 9 of the 15 subpopulations, greater than 50 percent for 11 of 15 subpopulations, and greater than 20 percent for 12 of 15 subpopulations. Hatter (2006, p. 7, *in litt.*) also predicted quasi-extinction of another subpopulation (Wells Gray) in 87 years.

Regarding the comment that the extinction rate of the southern mountain caribou DPS may be accelerating due to small subpopulation sizes, there appears to be some merit to this argument. The number of animals in the DPS has declined by at least 45 percent over the last 27 years (3 generations), 40 percent over the last 18 years (2 generations), and 27 percent since the last assessment by COSEWIC in 2002 (roughly 1.4 generations). Given this data, the rate of population decline appears to be accelerating, which is supported by Wittmer *et al.* (2005, p. 265) who studied rates and causes of southern mountain caribou population declines from 1984 to 2002, and found an accelerating population decline. Wittmer *et al.* (2005, p. 264) also found that predation was the primary cause of mortality driving the decline of mountain caribou. The decline of the overall population composed of small, fragmented, and isolated subpopulations is consistent with the Allee effect (Stephens *et al.* 1999, p. 186; McLellan *et al.* 2010, p. 286) which predicts population growth rates to decline as populations become smaller.

(6) *Comment:* One peer reviewer stated that human activity (including snowmobile use) in caribou habitat and predation are the most critical factors directly affecting caribou. The commenter suggested that human activity within areas occupied by caribou should be minimized, especially

during winter, and that snowmobiles should be restricted from these areas.

Our Response: Human activity in caribou habitat can affect caribou through a variety of mechanisms, including habitat loss and fragmentation, disturbance, and increased predation of caribou facilitated by habitat-mediated apparent competition (habitat changes that support increased numbers and distribution of other ungulate prey species (*i.e.*, deer, moose, and elk) that support higher densities of predators which then prey opportunistically on caribou) supported by altered forest composition and structure, etc. We will continue working with our partners (both within the United States and Canada) who manage landscapes within caribou habitat to identify and implement appropriate management strategies to reduce, if not eliminate, impacts that are detrimental to caribou conservation and recovery.

(7) *Comment:* One peer reviewer commented that there is currently no evidence that climate change is negatively affecting caribou genetic diversity and cited Yannic *et al.* (2013).

Our Response: Yannic *et al.* (2013, p. 3) noted higher genetic differentiation of caribou herds located at the extreme northern and southern latitudes of the species' range, and suggested that for southern herds (which would include the southern mountain caribou DPS) this may be due to the population's/ subpopulation's occupancy of isolated mountain ranges and having smaller population sizes with high site fidelity. We also note that Serrouya *et al.* (2012, p. 2,597) demonstrated that below a population size of approximately 150 caribou, the magnitude and variation of genetic differentiation greatly increased between pairs of adjacent subpopulations (*i.e.*, genetic drift). Genetic drift can result from rapid changes in gene frequencies caused by environmental and demographic stochasticity independent of mutation and natural selection, and smaller populations are more susceptible to genetic drift. The gradual loss of rare alleles from a population changes the overall genotype of the population, ultimately resulting in a loss of genetic variability, which can negatively affect a population's ability to evolve in response to new selective pressure.

Finally, regarding climate change, 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 possible at this time. However, climate change modeling has projected changes (*e.g.*,

decreases in spruce fir forests and alpine parkland) in mountain caribou habitats (Utzig 2005, p. 5; Utzig 2012, pp. 11–15), declines in snow occurrence (Columbia Basin Trust 2017, pp. 24–25), and increased prevalence of wildfires in western North America (Westerling et al. 2006, pp. 942–943). All these potential outcomes of climate change can serve to further isolate the southern mountain caribou DPS from other woodland caribou populations and further isolate caribou subpopulations within the southern mountain caribou DPS from one another. Further isolation of this DPS and subpopulations within it may exacerbate and accelerate the genetic differentiation noted by Yannic *et al.* (2013, p. 3) affecting caribou populations at the periphery of the species' current range.

(8) *Comment:* One peer reviewer commented that habitat alteration is a long-term and highly important issue, and suggested that wildfire suppression and silvicultural treatments (e.g., timber harvest and thinning) can either be beneficial or detrimental to maintenance of caribou habitat. For example, the commenter suggested that thinning may be used to facilitate and enhance the development of arboreal lichens.

Our Response: Habitat alteration within caribou habitat is a long-term issue as it can take greater than 150 years for forests to develop the microsite characteristics (e.g., structure and moisture) that support abundant arboreal lichen growth. We acknowledge that natural wildfire plays an important role in maintaining a mosaic of forest successional stages that provides habitat for a variety of species native to this ecosystem, and that fire suppression can alter vegetative mosaics and species composition. We also acknowledge that there are various silvicultural tools that can be employed to manage forest vegetation development and succession, which may include differing forms of thinning (either commercial or non-commercial). We will continue working with our partners who manage landscapes within caribou habitat to identify and implement a variety of tools and silvicultural treatment methodologies that facilitate the retention, development, and/or enhancement of vegetative characteristics that provide caribou habitat.

(9) *Comment:* One peer reviewer commented that the COSEWIC assessment process, which followed the methodology based on the International Union for the Conservation of Nature-Conservation Measures Partnership (IUCN–CMP) unified threats classification system, determined that

the overall calculated threat impact for this population was the maximum (Very High) indicating that continued serious declines are anticipated. The commenter suggested it would be desirable to include some details of that threat assessment in the final rule.

Our Response: We have included a summary of the COSEWIC threat assessment under Status of the Southern Mountain Caribou DPS.

(10) *Comment:* Two peer reviewers questioned the assessment of our “Significant Portion of the Range” (SPR) analysis pertaining to the isolation and fragmentation of the subpopulations, which led us to conclude that loss of some smaller isolated subpopulations would have no bearing on the status of remaining larger subpopulations. The reviewers noted that the isolation of the caribou subpopulations is a result of habitat loss and fragmentation, and has largely contributed and continues to contribute to the declining status of this population.

Our Response: We acknowledge the peer reviewers' concerns with the SPR analysis conducted in the May 8, 2014, proposed rule. Since then, we reevaluated the risk to the status of the DPS resulting from ongoing population fragmentation and potential loss of subpopulations within the DPS in this final rule under Status of the Southern Mountain Caribou DPS and the Factor C analysis. On July 1, 2014, we published a final policy interpreting the phrase “significant portion of its range” (SPR) (79 FR 37578). In our policy, 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 a species in its entirety; thus there are two situations (or factual bases) under which a species would qualify for listing: A species may be in danger of extinction or likely to become so in the foreseeable future throughout all of its range; or a species may be in danger of extinction or likely to become so throughout a significant portion of its range. If a species is in danger of extinction throughout an SPR, the species, is an “endangered species.”

The same analysis applies to “threatened species.” The SPR policy is applied to all status determinations, including analyses for the purposes of making listing, delisting, and reclassification determinations. As described in our SPR Policy, once the Service determines that a “species”—which can include a species, subspecies, or DPS—meets the definition of “endangered species” or “threatened species,” the species must be listed in its entirety and the Act's

protections are applied consistently to all individuals of the species wherever found (subject to modification of protections through special rules under sections 4(d) and 10(j) of the Act).

Because in this final rule we found that this DPS is endangered throughout all of its range, an SPR analysis is not required and is not included in this final rule.

(11) *Comment:* One peer reviewer suggested that we should include a cross-walk to the Canadian Species at Risk Act designation of the Southern Group of the Southern Mountain Population of the Woodland Caribou (Environment Canada 2014, p. 4).

Our Response: Prior to the revision of the caribou population structure in Canada, pursuant to COSEWIC (2011, entire), which established the “Designatable Unit” structure, the population of caribou in Canada has been grouped into various population structures through time, some of which were based on Canada's “NEAs” (also, see response to *Comment (2)*).

Currently, the population of caribou referred to in Environment Canada (2014, p. 4) as the Southern Group of the Southern Mountain Population is now recognized as the southern mountain caribou (DU 9), in accordance with COSEWIC (2011, entire), and the southern mountain caribou (DU 9) is the same as our southern mountain caribou DPS. Thus, while the different “groupings” are informative from a historical perspective, including a “cross-walk” of Canada's various caribou population structures/groupings to the southern mountain caribou DPS is not useful, and may confound the understanding of our DPS analysis and final decision.

(12) *Comment:* One peer reviewer commented that the analysis of threats section is lacking and should include discussion on disease, energy development (particularly pipeline infrastructure), and mining. The commenter also noted a lack of discussion on threats within the U.S. portion of the DPS.

Our Response: We have added additional discussion pertaining to disease, human developments including energy development (e.g., pipeline construction), and mining to the Summary of Factors Affecting the Species section of this rule. For additional energy and mining discussion, see “Human Development” under the Factor A discussion, above. For additional disease discussion, see Factor C, above. Relative to the U.S. portion of the DPS, the threats stemming from disease, predation, recreation, and forest management are similar to the

Canadian portion of the DPS. However, relative to human development and mining in the U.S. portion of the DPS, we are not aware of any such existing or proposed activities. We clarified this under the Factor A discussion, above.

(13) *Comment:* One peer reviewer suggested that augmenting the southern mountain caribou DPS with individual caribou obtained from other populations (*i.e.*, DU 8 and/or DU 9) may be necessary for recovery of the southern mountain caribou DPS. One peer reviewer suggested that conservation of this subpopulation will require coordinated predator management between Canada and the United States.

Our Response: Although recovery planning is beyond the scope of this listing decision, we are committed to achieving the conservation and recovery of the DPS, as is required by the Act. Population augmentation, as well as other management techniques, including, but not limited to, maternal penning, predator management, and habitat protection may be utilized to achieve recovery of this DPS. The efficient and effective implementation of management strategies (including predator management) designed to facilitate recovery of this subpopulation will require coordination between the United States and Canada. In 2013, we began coordinating with British Columbia's Ministry of Forests, Lands, and Natural Resource Operations on wolf and caribou radio-collaring activities in an effort to better understand the habitat overlap and use between these species and the potential predation risk of wolves to caribou, and to implement effective and timely predator management strategies to reduce the predation risk to caribou.

(14) *Comment:* One peer reviewer noted an inaccuracy regarding our morphological description of the woodland caribou subspecies contained in our proposed rule (79 FR 26504, May 8, 2014, see p. 79 FR 26507) which stated, "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)." The peer reviewer noted the actual text from COSEWIC (2011, pp. 10–11) is, "Breeding pelage is variable in colour and patterning (Geist 2007) and winter pelage varies from almost white to dark brown." The reviewer commented that the insertion of subspecies is misleading relative to the definitiveness of Banfield's (1961) woodland caribou description.

Our Response: We have corrected the inaccuracy under *Species Information* in this final rule.

(15) *Comment:* One peer reviewer stated that the designation of 30,010 acres (ac) (12,145 hectares (ha)) of critical habitat is insufficient relative to the size of the recovery area for the southern Selkirk Mountains population that was listed under the Act in 1983.

Our Response: As stated previously under *Previous Federal Actions* in the Background section of this final rule, on March 23, 2015, the Idaho District Court ruled that we made a procedural error in not providing public review and comment regarding considerations we made related to our November 28, 2012, final critical habitat designation (77 FR 71042). In response to the court order we reopened the public comment period on the November 28, 2012, final designation of critical habitat (77 FR 71042), which we proposed to reaffirm in the May 8, 2014, proposed rule (79 FR 26504) as the critical habitat for the southern mountain caribou DPS. On November 28, 2012 (77 FR 71042), we published a final rule designating approximately 30,010 ac (12,145 ha) of critical habitat for the southern Selkirk Mountains population of woodland caribou. In the final rule, the Service based our final designation of critical habitat for the southern Selkirk Mountains subpopulation of woodland caribou on the best available scientific information. In that final rule, we determined that the majority of habitat essential to the conservation of this subpopulation 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 the specific areas within the geographical area occupied by the species at the time it was listed in accordance with the provisions of section 4 of the Act, on which are found the physical or biological features essential to the conservation of the species, and which may require special management considerations or protection. The Act also allows us to designate as critical habitat specific areas outside the geographical area occupied by the species at the time it is listed in accordance with the provisions of section 4 of the Act, upon a determination by the Secretary that such areas are essential for the conservation of the species. In this case, no unoccupied habitat was determined to be essential. Please see that final rule for a full discussion and analysis of the rationale and reasons for the area and

acreage of the final critical habitat designation. However, critical habitat designation does not signal that habitat outside the designated area is unimportant or may not contribute to the recovery of the species. The entire recovery area (*i.e.*, recovery zone) identified in the 1994 recovery plan comprises approximately 2,200 square miles (5,698 kilometers) in northern Idaho, northeastern Washington, and southern British Columbia (USFWS 1994a, p. 4). Approximately 53 percent of the recovery zone lies in the United States (USFWS 1994a, p. 4), and much of this area is administered by either the IPNF or CNF. Both the IPNF and CNF have LRMPs that incorporate management objectives and standards for caribou. Thus, pursuant to their respective LRMPs, both the IPNF and CNF have implemented extensive measures to protect caribou and caribou habitat on their ownership, both within the area designated as critical habitat as well as within the existing recovery zone. Further, section 7(a)(2) of the Act requires that Federal agencies insure that any action authorized, funded, or carried out is not likely to jeopardize the continued existence of any endangered or threatened species, or destroy or adversely modify critical habitat. Therefore, pursuant to section 7(a)(2), Federal agencies (primarily IPNF and CNF) have been consulting with the Service on the potential effects of proposed actions on the southern Selkirk Mountains subpopulation of woodland caribou since this subpopulation was emergency listed in 1983. Additionally, within all areas occupied by caribou, section 7 consultation on effects to caribou will continue to be required on all USFS lands, other Federally owned lands, and other non-Federally owned lands where actions create a project-related Federal nexus (*e.g.*, a Federal permit is required, Federal funds are used, etc.) regardless of whether or not the lands are designated as critical habitat. Within areas occupied by caribou that are not designated as critical habitat, Federal agencies and actions with a Federal nexus are not allowed to jeopardize caribou, and within areas designated as critical habitat Federal agencies and actions with a Federal nexus are not allowed to jeopardize the species nor adversely modify their designated critical habitat. Finally, section 7(a)(1) of the Act is an affirmative action mandate requiring Federal agencies to utilize their authorities to carry out programs for the conservation of endangered and threatened species. Thus, areas (*i.e.*, within the recovery

zone) 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. These protections and conservation tools will continue to contribute to recovery of this species.

Comments From States

(16) *Comment:* The State of Idaho questioned the Service's justification that the southern mountain population is discrete and significant, and asserted that our DPS determination is conclusory and unsupported by current available information.

Our Response: We appreciate the State of Idaho's comments. Since issuing the May 8, 2014, proposed rule (79 FR 26504), as described earlier in this rule, we have determined that, in accordance with our DPS policy, the best available scientific information supports our conclusion that the southern mountain caribou population is geographically, reproductively, and behaviorally discrete from other caribou populations.

Under our DPS policy, assessing the significance of a discrete population to the taxon may consider several lines of evidence or analysis. Under the DPS policy only one line of evidence is needed to demonstrate that the southern mountain caribou population is significant relative to the woodland caribou subspecies. We have identified two: (1) Persistence in a unique ecological setting, and (2) evidence that loss of the discrete population segment would result in a significant gap in the range of the taxon. In summary, the best available science supports our determination that this population exists in an ecological setting unique to the taxon, and its loss would represent a significant gap in the range of the taxon, and, therefore, it is a DPS pursuant to our DPS policy.

(17) *Comment:* The State of Idaho's Office of Species Conservation (OSC) commented that we have relied primarily on the fact that caribou in the southern mountain caribou DPS occupy "high elevation, mountainous habitats with deep snowfall" that forces them to rely on arboreal lichens as the single measure supporting our determination

that individual caribou in this population are physically and behaviorally separated from individual caribou in other populations. According to the State's comments, this population's unique adaptation to subsisting on arboreal lichens, whereas other caribou do not, is not a behavior that is "markedly separate" from other woodland caribou populations. The State used the polar bear as an example where we determined that polar bear populations are not markedly separate because their differences "do not outweigh the similarities that are most relevant to the polar bear's conservation status—in particular, the species' universal reliance on sea ice for critical life functions."

Our Response: As we described in our response to *Comment (16)*, several lines of evidence support our conclusion that caribou in the southern mountain caribou DPS are geographically (Wittmer *et al.* 2005b, pp. 408–409; COSEWIC 2011, p. 49; van Oort *et al.* 2011, pp. 222–223), behaviorally (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), and reproductively (van Oort *et al.* 2011, pp. 221–222) isolated and discrete from other woodland caribou populations. Thus, we did not rely on a single measure to assess discreteness.

Additionally, unlike the polar bear example, where the species exhibits universal reliance on sea ice for its survival, caribou in the southern mountain caribou DPS occupy different habitats in a very different ecological setting from other woodland caribou populations, and have evolved a very unique foraging strategy to secure their life-history needs. Other neighboring caribou populations occupy less steep, drier terrain with less winter snow pack, and do not feed on arboreal lichens during the winter (Thomas *et al.* 1996, p. 339; COSEWIC 2011, pp. 50). Caribou in the southern mountain caribou DPS occur in high-elevation, mountainous habitats in the wet and very wet subzones of the Englemann Spruce–Subalpine Fir biogeoclimatic zone, the wet and very wet subzones of the Interior Cedar Hemlock zone, and the very wet subzones of the Sub-Boreal Spruce zone that typically receive between 2 to 5 meters of snow during the winter (van Oort 2010, p. 216). The occupancy of this type of ecological setting is unique among woodland caribou; other woodland caribou populations occupy less steep, drier terrain with less winter snow pack, and do not feed almost exclusively on arboreal lichens during the winter (Thomas *et al.* 1996, p. 339; COSEWIC 2011, pp. 50). Adaptation to this unique ecological setting has resulted in the southern mountain caribou's almost complete reliance on arboreal lichens during winter to support their nutritional requirements (as previously discussed), as well as their very unique migration behavior. Caribou within this population undertake as many as four altitudinal migrations per year (COSEWIC 2011, p. 50) between seasonal habitats, which is unique among caribou. While the boreal population of woodland caribou may consume arboreal lichens, they do not

southern mountain population have evolved unique life-history strategies, enabling their persistence in an ecological setting unique among woodland caribou. This "unique behavior and ecological setting" is markedly different from other woodland caribou populations.

(18) *Comment:* The State of Idaho's OSC commented that the southern mountain caribou does not occupy an ecological setting unique to woodland caribou, and cite gray squirrels and the boreal population of woodland caribou in Canada to refute the Service's assessment. Relative to gray squirrels, the State commented that the Service determined that certain populations of gray squirrels' reliance on pine tree seeds was not unique because, across their range, gray squirrels consume a variety of tree seeds. The State commented that, because the boreal population of woodland caribou also utilizes arboreal lichens, the Service cannot use the southern mountain caribou's reliance on arboreal lichens as a rationale for supporting their occupancy of a unique ecological setting.

Our Response: As discussed in our response to *Comment (17)*, the uniqueness of the ecological setting occupied by southern mountain caribou hinges on the fact that they are the only woodland caribou population that occurs in high-elevation, mountainous habitats in the wet and very wet subzones of the Engelmann Spruce–Subalpine Fir biogeoclimatic zone, the wet and very wet subzones of the Interior Cedar Hemlock zone, and the very wet subzones of the Sub-Boreal Spruce zone that typically receive between 2 to 5 meters of snow during the winter (van Oort 2010, p. 216). The occupancy of this type of ecological setting is unique among woodland caribou; other woodland caribou populations occupy less steep, drier terrain with less winter snow pack, and do not feed almost exclusively on arboreal lichens during the winter (Thomas *et al.* 1996, p. 339; COSEWIC 2011, pp. 50). Adaptation to this unique ecological setting has resulted in the southern mountain caribou's almost complete reliance on arboreal lichens during winter to support their nutritional requirements (as previously discussed), as well as their very unique migration behavior. Caribou within this population undertake as many as four altitudinal migrations per year (COSEWIC 2011, p. 50) between seasonal habitats, which is unique among caribou. While the boreal population of woodland caribou may consume arboreal lichens, they do not

rely on arboreal lichens (almost exclusively) as the only source of forage for 3 to 4 months of the year as southern mountain caribou do. In addition, boreal caribou occur in lower elevation habitats characterized by mature to old-growth coniferous forest composed of jack pine (*Pinus banksiana*) and black spruce (*Picea mariana*) with abundant lichens, or muskegs and peat lands intermixed with upland or hilly areas (Environment Canada 2012, p. 9).

(19) *Comment:* The State of Idaho's OSC commented that we analyzed inappropriately the significance of the loss of the southern mountain caribou relative to the British Columbia population of woodland caribou instead of the entire woodland caribou subspecies. The State also questioned the significance of a loss of 2.5 degrees in the range of the woodland caribou subspecies.

Our Response: Our "gap in the range" analysis discussed the decline of woodland caribou within British Columbia that has resulted from habitat loss and fragmentation, overhunting, and the effects of predation. We also discussed the fact that the woodland caribou population in British Columbia has declined by about 40 percent. However, our significance finding rested on analyzing what the loss of the southern mountain caribou population would represent to the entire woodland caribou subspecies. In this case, we determined that the southern mountain caribou population represents approximately 2.5 degrees in the range of the entire woodland caribou subspecies, and its loss would represent a significant gap in the range of the woodland caribou subspecies. Regarding the significance of 2.5 degrees latitude loss of woodland caribou range, the Service has not established a threshold of degrees latitude loss or percent range reduction for determining significance to a particular taxon. The importance of specific degrees latitude loss and/or percent range reduction, and the analysis of what such loss or reduction ultimately means to conservation of individual species/subspecies necessarily will be specific to the biology of the species/subspecies in question. However, as we explained in our proposed rule (79 FR 26504, May 8, 2014, see p. 79 FR 26512), 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. 2,242). Additionally, data tend to show that peripheral populations are persistent when species' range collapse occurs (Lomolino and Channell 1995, p. 342; Channell and Lomolino 2000, pp. 84–86; Channell 2004, p. 1). Of 96 species whose last remnant populations were found either in core or periphery of the historical range (rather than some in both core and periphery), 91 (95 percent) of the species were found to exist only in the periphery, and 5 (5 percent) existed solely in the center (Channell and Lomolino 2000, p. 85). Also, as described previously, caribou within the southern mountain caribou DPS occur at the southern edge of woodland caribou range (*i.e.*, they are a peripheral population), and have adapted to an environment unique to woodland caribou. Peripheral populations adapted to different environments may facilitate speciation (Mayr 1970 in Channell 2004, p. 9). Thus, the available scientific literature data support the importance of peripheral populations for conservation (Fraser 1999, entire; Lesica and Allendorf, 1995, entire).

(20) *Comment:* The State of Idaho's OSC commented that we did not support our finding in the proposed rule that the southern mountain caribou DPS is threatened.

Our Response: Upon receiving numerous comments along this line (*i.e.*, the DPS should or should not be listed, should or should not be listed as either threatened or endangered), we re-assessed our analysis pertaining to the status of the DPS. Consequently, based on our re-assessment, we determined that the DPS is endangered, and have provided additional analysis in this final rule supporting our determination under Status of the Southern Mountain Caribou DPS and *C: Disease or Predation*, above. Also see *Determination*, below.

(21) *Comment:* The Idaho Department of Lands (IDL) questioned the use of Evans (1960) as best available science in describing the historical composition of forests and the effects of fires, insect and disease outbreaks, and logging on caribou habitat in the United States, as much of Evans' information was obtained from a personal interview with the Forest Supervisor of the Kanisku National Forest. The IDL questioned Evans' (1960) assertion, based on the interview, that harvest (both salvage and non-salvage) of spruce trees was a significant component of timber volume obtained from forests during the early 1950s as a result of insects, disease, and blow-down. IDL calls into questions this

assertion by noting that the spruce component of the total net volume of merchantable trees obtained from IDL ownership comprised only 5.4 percent in 1968, and 7.3 percent in 1980. As such, IDL recommended removing Evans (1960) as a scientific source of information used in the analysis.

Our Response: We assume the Forest Supervisor of the Kanisku National Forest at that time was knowledgeable about the conditions on the forest under his supervision. Therefore, we have no reason to question the accuracy of his statements as reflected in Evans (1960). Additionally, the time frame IDL uses (*i.e.*, 1968 to 1980) to refute the spruce timber harvest volume is much later than the 1950s time span upon which Evans (1960, pp. 123–124) bases his assessment. Thus, we take Evans (1960) at face value and consider it to represent the best available science, providing an accurate record of historical timber harvest composition on the forest in the 1950s.

(22) *Comment:* The IDL stated that the Service portrayed timber harvest management of caribou habitat on IDL lands incorrectly. The IDL maintains that caribou are considered in timber management planning on IDL-owned lands in the Priest Lake area through adjustments borne out of discussions with the IDFG.

Our Response: Currently, the Service is not aware of any specific management standards the IDL has developed and implemented to maintain or enhance caribou habitat. However, the Service recognizes that IDL considers the potential effect to caribou during discussions with IDFG when planning timber harvest within caribou habitat. The Service also recognizes that the Act affords caribou protection through section 9 prohibitions. Section 9 of the Act prohibits taking a listed species. The definition of take includes harm, and harm is defined at 50 CFR 17.3 as "an act which actually kills or injures wildlife. Such act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering." Incidental take of a listed species cannot be exempted where such incidental take would lead to the jeopardy of the species or prevent its recovery and/or conservation. However, Section 10 of the Act allows for certain exceptions such as permits; one avenue is through development of habitat conservation plans (section 10(a)(1)(B)).

(23) *Comment:* The Washington Department of Fish and Wildlife (WDFW) stated its support of the

amendment to the listed entity and considers it an appropriate interpretation of the DPS policy that should be applied consistently. The WDFW would like the Service's continued support and partnership working with other State and Tribal partners to conserve and recover the species.

Our Response: We look forward to working with WDFW, IDFG, and Tribes in a coordinated effort to achieve recovery of this species.

(24) *Comment:* The State of Idaho's OSC supported the Service's commitment to transparency during the listing process. The OSC also commented that the Service should not rely on COSEWIC's assessment and recommendation to list the southern mountain caribou DU as endangered under SARA as supporting a listing determination of either endangered or threatened under the Act, primarily because the protections afforded species listed under SARA differ from those listed under the Act, but also because COSEWIC's recommended listing determination to SARA is advisory.

Our Response: The Act requires that the Service base its listing decisions on the best available scientific and commercial data. Therefore, we utilized the COSEWIC 2014 status assessment, as well as other scientific data and information, in our final listing decision. However, we are not relying on the ultimate decision that Canada may make with regard to COSEWIC's listing recommendation under SARA to support our final listing decision pursuant to the Act. We did, however, consider the significant and comprehensive analysis COSEWIC completed, specific to the southern mountain caribou, in their 2014 status assessment on the Northern Mountain, Central Mountain, and southern mountain caribou populations in Canada (COSEWIC 2014, entire) as substantively informing our analysis on the status of the southern mountain caribou DPS in accordance with the Act and other laws, policies, and regulations governing review of species considered for listing under the Act. Additionally, while it is important for the Service to understand COSEWIC's rationale for its listing recommendations to the Canadian government, the Service must base its listing decisions in accordance with our laws, regulations, and policy, the legal underpinnings of which may not be the same as Canada's Federal laws. Thus, based on differences in statutory language between the Canadian and U.S. laws, listing decisions may differ between Canada and the United States.

(25) *Comment:* The State of Idaho's OSC stated that it has been a committed partner in the conservation of caribou and will continue to support efforts to conserve this population, and is currently working with the Service and the Kootenai Tribe of Idaho to develop an updated recovery plan for caribou.

Our Response: We appreciate the State's significant interest and active involvement in the conservation of the caribou and its habitat, and look forward to continued work with the State of Idaho, as well as the State of Washington, Tribes, USFS, and Canadian partners in a coordinated effort to achieve recovery of this species.

(26) *Comment:* The State of Idaho's OSC stated that it supports the Service's final rule designating 30,010 ac (12,145 ha) of critical habitat in the United States. The State believes the final rule, which is a reduction from the proposed 375,562 ac (151,985 ha) of critical habitat, represents the best available scientific information, appropriately recognizes the area occupied by the species at the time of listing, and adequately analyzes the area providing the physical and biological features essential to "conserve" (emphasis in original) the Selkirk population of woodland caribou.

Our Response: The Service appreciates the State's support.

Comments From Native American Tribes

(27) *Comment:* In a letter to the Service on August 6, 2014, the Kalispel Tribe of Indians recommended that the Service list the southern mountain caribou DPS as endangered. The Tribe was specifically concerned about declines in the Selkirk Mountain herd over the past 4 years, citing a decline from 46 animals to 18 animals. The Tribe also mentioned that the Canadian portion of the DPS is currently in the process of being listed as endangered by the Canadian Ministry of Forests, Lands, and Natural Resource Operations.

Our Response: We appreciate the Kalispel Tribe of Indians concern over the decline of the southern Selkirk Mountains subpopulation. With regard to the Tribe's comment that the southern mountain caribou DPS should be listed as endangered, pursuant to our analysis of new information pertaining to the status of subpopulations within this DPS, we find that the southern mountain caribou DPS should be listed as endangered under the Act. We have provided our analysis for the endangered classification of this DPS in this final listing determination, which is based upon the best available scientific information, as well as comments from

peer reviewers, Tribes, British Columbia, Canada, the states of Washington and Idaho, and the general public. We also acknowledge that we are aware that COSEWIC has recommended to the Canadian Federal Environment Minister that the legal status of southern mountain caribou DU (which is equivalent to our DPS) be changed from threatened to endangered under SARA.

(28) *Comment:* The Kalispel Tribe of Indians recommended that a transboundary recovery strategy be developed to neutralize the threats responsible for the decline.

Our Response: Although recovery planning is beyond the scope of this listing decision, we are committed to achieving the conservation and recovery of the DPS, as is required by the Act. To that end, the Service has recently renewed recovery planning efforts that includes coordination with our partners within the United States (e.g., WDFW, IDFG, Tribes, and others) as well as our Canadian partners (e.g., British Columbia's Ministry of Forests, Lands, and Natural Resource Operations; Ktunaxa Nation; and others), with the ultimate goal of developing an updated recovery plan for this transboundary DPS.

(29) *Comment:* In a letter to the Service on August 6, 2014, the Kootenai Tribe of Idaho commended the Service's analysis and proficiency in collecting the best available scientific and commercial information to support the proposed rule. The Tribe commented that it is proud of the close working relationship the Tribe has with the Service in working cooperatively to address impacts to Kootenai Territory and the Kootenai Tribe. The Tribe also acknowledged that the Service has worked government-to-government with the Tribe on issues affecting caribou. The Tribe requested the continuation of government-to-government relations to further address caribou conservation. The Tribe agreed with the Service's determination that the southern mountain caribou population meets the DPS criteria and that the southern Selkirk Mountain subpopulation alone does not meet the DPS criteria.

Our Response: The Service values its government-to-government relationship with the Kootenai Tribe of Idaho, and greatly appreciated the formal discussion on May 22, 2014, regarding the Service's proposed rule, as well as conservation of caribou in general. In accordance with the President's memorandum of April 29, 1994 (Government-to-Government Relations With Native American Tribal Governments; 59 FR 22951), Executive

Order 13175 (Consultation and Coordination With Indian Tribal Governments), and the Department of the Interior's Manual at 512 DM 2, we readily acknowledge our responsibility to communicate meaningfully with recognized Federal Tribes on a government-to-government basis. This government-to-government relationship, as outlined in Secretarial Order 3206, dated June 5, 1997, establishes several important principles, including: (1) Working directly with Tribes to promote healthy ecosystems; (2) recognizing that Indian lands are not subject to the same control as Federal public lands; (3) assisting Tribes in developing and expanding tribal programs to promote healthy ecosystems; (4) supporting Tribal measures that preclude the need for conservation restrictions; (5) being sensitive to Indian culture, religion, and spirituality; (6) exchanging information regarding Tribal trust resources; and (7) striving to protect sensitive Tribal information from disclosure. Therefore, pursuant to Executive Order 13175, and more importantly, in consideration of continuing our close working relationship with the Tribe, we look forward to continued government-to-government, as well as biological and technical staff, discussions with the Tribe on caribou recovery and other matters important to the Tribe.

(30) *Comment:* The Kootenai Tribe of Idaho stated that it believes the status of the southern mountain caribou DPS should be endangered and not threatened. The Tribe stated that, based on a review of the population trend data (2002 to 2014) and several population modeling publications (Wittmer *et al.* 2005b; Hatter 2006, *in litt.*; Environment Canada 2014), it believes the southern mountain caribou DPS is in danger of becoming extinct over all or a significant portion of its range. The Tribe also referred to Canada's proposal to reclassify the southern mountain population of woodland caribou from threatened to endangered (COSEWIC 2014). Therefore, the Kootenai Tribe disagrees with amending the listing status from endangered to threatened and recommends that the Service maintain the current status as endangered.

Our Response: With regard to the Tribe's comment that the southern mountain caribou DPS should be listed as endangered, please see our response to *Comment (27)*.

(31) *Comment:* The Kootenai Tribe of Idaho stated that it believes the proposed rule inaccurately states that the range of the southern mountain caribou DPS has declined by 40 percent from the historical range. The Tribe

commented that this estimate only applies to the British Columbia portion of the historical range and does not include the U.S. portion. When estimated internationally, the range reduction of the southern mountain caribou DPS is approximately 60 percent (Spalding 2000).

Our Response: We correctly attributed the 40 percent reduction to the range of woodland caribou within British Columbia, Canada, in the proposed rule. However, to better characterize the decline in the range of this transboundary southern mountain caribou DPS, we agree the 60 percent range contraction provided in Spalding (2000, p. 40) provides a better measure of assessing the reduction in range of the southern mountain caribou DPS. We have included this reference and discussion within this final rule.

(32) *Comment:* The Kootenai Tribe of Idaho also commented that the proposed rule did not include two recently extirpated subpopulations (COSEWIC 2011; Environment Canada 2014) and recommended these subpopulations be incorporated into the final DPS description. The Kootenai Tribe of Idaho requested that the Service further define the DPS to include all extant and recently extirpated subpopulations to assure consistency with the listed entity under Canada's Species at Risk Act (southern group, southern mountain caribou) and the Committee on the Status of Endangered Wildlife in Canada designatable units (DU9) (COSEWIC 2011, Environment Canada 2014).

Our Response: The May 8, 2014, proposed rule stated that the George Mountain local population was recently considered to be extirpated (see 79 FR 26515). However, the proposed rule could have been more descriptive regarding the total number of subpopulations (including extant and recently extirpated) identified within the southern mountain caribou DPS. We have incorporated information regarding the two recently extirpated subpopulations (George Mountain and Purcell Central herds) into this final rule. See our response to *Comment (4)* for more information.

(33) *Comment:* The Kootenai Tribe of Idaho also recommended further discussion of Canada's augmentation efforts and the measures Canada has put into place (MCRIPPB 2013). The Tribe believes that this information should be included in the final rule, as it will bolster the Service's analysis related to past and ongoing conservation measures for the DPS.

Our Response: We have added information on Canada's efforts to

manage and conserve caribou; specifically, we have added additional discussion pertaining to Canada's recent publication of their "Recovery Strategy for the Woodland Caribou, southern mountain population (*Rangifer tarandus caribou*) in Canada" (Canadian Mountain Caribou Recovery Plan) (Environment Canada 2014).

(34) *Comment:* The Kootenai Tribe of Idaho stated that, although the proposed rule adequately details many of the threats to the species, the threats should be assessed together in an ecosystem approach.

Our Response: As required by section 4(a)(1) of the Act, we assessed the threats affecting the status of a species under 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. Immediately following our analysis of these factors, we provide a summary of the cumulative effects of the threats from Factors A through E that we believe provides the Tribe's suggested synthesis of the threats affecting this ecosystem. For example, we discuss how habitat alteration (Factor A) has affected the predator/prey balance (Factor C) within the ecosystem and how those threats have collectively affected the status of caribou within the DPS. Additionally, we described how human development (e.g., roads) within caribou habitat has affected the predator/prey balance and forest ecology, and how climate change (Factor A) and human development (Factor A) acting in concert have altered caribou habitat within this DPS. Finally, we state that 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.

(35) *Comment:* The Kootenai Tribe of Idaho stated that certain regulatory mechanisms on national forest system lands could be enhanced and/or modified on these lands. The Tribe recommended that the Service reassess the Factor D (the inadequacy of existing regulatory mechanisms) analysis in the proposed rule, and separate out and provide guidance on what regulatory mechanisms are possible, in comparison to current and past accomplishments.

Our Response: Section 7(a)(2) of the Act requires Federal agencies (including USFS) to ensure that any action authorized, funded, or carried out by such agency is not likely to jeopardize

the continued existence of any endangered or threatened species, or destroy or adversely modify critical habitat. Additionally, pursuant to section 7(a)(1) of the Act, Federal agencies have an affirmative mandate to utilize their authorities in the assistance in the conservation of endangered and threatened species, as appropriate. It is not within the Service's purview to alter (*i.e.*, enhance or modify) existing regulatory mechanisms. Both the Idaho Panhandle National Forests (IPNF) and Colville National Forest (CNF) (the primary U.S. Federal landowners within the Selkirk Ecosystem) have amended their Land and Resource Management Plans (LRMPs) to address management of caribou. The CNF's LRMP was amended in 1988 (the CNF is currently in the process of revising their existing plan), and the IPNF developed and implemented a new LRMP in 2015. However, should future new scientific information indicate the need to change forest management for caribou, both the CNF and IPNF could amend their respective LRMPs to incorporate such new science. Future LRMP amendments affecting caribou would be coordinated with the Service pursuant to the Act's section 7(a)(2) requirements.

(36) *Comment:* The Kootenai Tribe of Idaho stated that the potential for vehicle collisions, especially on Highway 3 in British Columbia, should be added to the Factor E (other natural or manmade factors affecting its continued existence) analysis in the proposed rule. The Tribe stated that, based on the current locations of collared caribou in the South Selkirks, nearly 30 crossings of Highway 3 have been documented from March to August 2014, and the Tribe indicated that this may pose a significant risk to many small herds throughout the DPS.

Our Response: We discuss the potential for and impact of caribou mortality related to vehicle collisions on highways, specifically on Highway 3 in British Columbia, within the "Human Development" discussion under our Factor A threat analysis in the proposed rule and this final rule.

(37) *Comment:* The Kootenai Tribe of Idaho stated that the Service adequately analyzed and correctly concluded in the proposed rule that the threats and regulations discussed in relation to "biological, commercial trade, or other relevant data concerning any threats (or lack thereof) to this DPS" do not pose a threat to the continued existence of the southern mountain caribou DPS. The Tribe did not recommend any associated changes to the proposed rule.

Our Response: We appreciate the Tribe's comments.

(38) *Comment:* Regarding current or planned activities in the areas occupied by the DPS and their potential effects to the DPS, the Kootenai Tribe of Idaho stated it is working with the USFS and the Kootenai Valley Resource Initiative (KVRI) on several projects that are anticipated to aid in protection of caribou habitat. For example, the Trout/Ball Project plans to increase the resiliency of the forest in the lower elevations and provide fuel breaks below caribou habitat. These actions, while aimed at improving forest conditions outside caribou habitat, may benefit caribou by reducing the potential for fire to alter existing habitat.

Our Response: We appreciate the significant interest and active involvement of the Kootenai Tribe of Idaho in the conservation of the southern Selkirk Mountains subpopulation of woodland caribou and its habitat.

(39) *Comment:* The Kootenai Tribe of Idaho stated that the proposed rule adequately discussed and analyzed the potential effects of climate change on caribou habitat. However, the Tribe indicated that the effects of climate change extend beyond caribou habitat, and managing forests toward resiliency to fire and insect outbreaks could further protect caribou habitat in the face of climate change. The Tribe recommended that the Service enhance its analysis to include effects of climate change throughout the ecosystem.

Our Response: The effects of climate change will likely extend beyond caribou habitat, and most likely will affect all ecosystems and forests in North America and their associated flora and fauna to greater or lesser degrees depending on the rapidity and severity of the climate change. Increasing the resiliency of forests to fire and insect outbreaks would benefit caribou. Toward that end, our final rule designating critical habitat for the southern Selkirk Mountains population of woodland caribou, recommended the development and implementation of comprehensive wildland fire use plans (plans that describe the treatment of all fires on USFS lands) (77 FR 71042, November 28, 2012, see p. 77 FR 71059). Regarding ecosystem-specific climate change analysis, current climate change modeling does not allow more precise discussion or projections of the future of climate change at local scales (*i.e.*, specific ecosystems) beyond that provided in the proposed and this final rule. Given the uncertainty in the current state of climate modeling, it is impossible to project specific fine-scale changes to the ecosystems to which caribou have adapted (Utzig 2005, p.

10). However, we expect to continue working with our Federal, State, and Tribal partners to incorporate changes to caribou habitat management as needed to address ecosystem specific responses resulting from climate change as they become more regionally certain and/or as the state of climate modeling facilitates increased precision and reliability of predictions.

(40) *Comment:* The Kootenai Tribe of Idaho recommended that the Service consider additional literature sources in its analysis, including Canada's Recovery Strategy for the Woodland Caribou, southern mountain population in Canada (Environment Canada 2014) and additional references pertaining to unsustainable predation rates (McLellan *et al.* 2012) and augmentation information, where it appears that resident animals are beneficial to successful augmentations by "teaching" new animals (*i.e.*, northern caribou) how to use the available niche and/or provide a stabilizing effect to transplanted animals (Warren *et al.* 1996, p. 552).

Our Response: McLellan *et al.* (2012, entire) investigated whether interactions with forage (bottom-up) or predators (top-down) were the principal mechanisms regulating southern mountain caribou populations. Their conclusion supports the conclusions of other cited scientific publications that determined apparent competition (*i.e.*, predation) is the proximate mechanism driving the population decline of mountain caribou (McLellan *et al.* 2012, p. 859). They also concluded that food limitation (neither quality nor quantity) is likely not driving the continued population decline of mountain caribou (McLellan *et al.* 2012, p. 859). We have incorporated this citation into our literature review. The conclusions of Warren *et al.* (1996, p. 552) will be informative during analysis of various management techniques that will be assessed during recovery planning and implementation for this DPS. As stated previously, recovery planning is beyond the scope of this process.

(41) *Comment:* The Kootenai Tribe of Idaho incorporated by reference its comments submitted on May 5, 2012, pursuant to the public comment periods on the November 30, 2011, proposed rule to designate critical habitat for the southern Selkirk Mountains subpopulation of woodland caribou (76 FR 74018). The Tribe also indicated support for the final caribou critical habitat designation published in the **Federal Register** on November 28, 2012 (77 FR 71042).

Our Response: We acknowledge the Tribe's comments and stated support for

the designation and management of critical habitat for the southern Selkirk Mountains subpopulation of woodland caribou.

(42) *Comment:* The Kootenai Tribe of Idaho commented that caribou recovery is more important than critical habitat designation or a proposed rule to amend the listing, and ideally, habitat conservation, population viability, and recovery efforts would work together to provide a holistic approach to caribou recovery. The Kootenai Tribe indicated that it looks forward to working government-to-government with the Service and with all our co-sovereigns in the United States and Canada toward caribou recovery and protecting and enhancing the Kootenai Tribe's Treaty-reserved rights.

Our Response: Although recovery planning for the southern mountain caribou DPS is beyond the scope of this rule, section 4(f)(4) of the Act states that the Secretary shall, prior to final approval of a new or revised recovery plan, provide public notice and an opportunity for public review and comment on such plan, and shall consider all information presented during the public comment period. Any successful recovery planning effort will require input and participation by appropriate Federal, State, Tribal, local, and private stakeholders to identify measures needed to conserve any species listed under the Act. The Service looks forward to working with the Tribe as well as other partners and stakeholders within the United States and Canada interested in recovery of this population.

Public Comments

Poaching

(43) *Comment:* One commenter questioned the Service's inclusion of poaching as a serious threat to the Selkirk Mountain caribou population, without citing poaching data in both the proposed rule and in the 1994 recovery plan (p. 24). The commenter stated that the use of anecdotal poaching information from 1980 to 1990 should not be included in the proposed rule if it cannot be confirmed by citable facts.

Our Response: In the May 8, 2014, proposed rule (79 FR 26504), we determined that there is no information indicating that, currently, illegal killing of caribou is a threat (see 79 FR 26523). The commenter may be referring to the following two instances we referenced poaching in the proposed rule. The proposed rule's first reference to poaching (see 79 FR 26505) was related to the Service's February 29, 1984, listing determination (49 FR 7390). In

that document, we determined the designation of critical habitat was not prudent at that time. That determination was based on the conclusion that increased poaching could result from the publication of maps showing areas used by the species. The 1984 listing rule identified that poaching regularly occurred and that a radio-collared caribou was shot in 1983 (49 FR 7390), and cited poaching of at least one animal from the southern Selkirk caribou herd in 1980, 1981, 1982, and 1983 (49 FR 7392). The proposed rule's other reference to poaching (see 79 FR 26517) is a reference to Evans (1960, p. 131) who, based on his studies of caribou in the northwestern United States, believed that, at that time, poaching may have been impacting the status of caribou in the area he studied. Additionally, according to the Service's 1994 recovery plan (p. 22), poaching was known to be a significant cause of caribou mortality in the Selkirk Mountains. For example, a mortality of a transplanted caribou in Washington in 1988 was being investigated, one case in Idaho in 1990 was successfully prosecuted, and two more caribou mortalities in Idaho in 1992 were being investigated. Furthermore, in 1984, British Columbia closed all big game hunting within a portion of caribou range in southern British Columbia in an effort to reduce illegal shooting of caribou (Service 1994a, p. 23). Finally, Johnson (1985, entire), who analyzed caribou mortality in the Selkirk and Purcell Mountains in British Columbia, Canada, from 1967 through 1983, determined that illegal hunting accounted for 75 percent of caribou mortality within these populations over this time frame.

In accordance with section 4(b)(1) of the Act, the Service is required to use the "best available scientific and commercial data" in its listing determinations. Our Policy on Information Standards under the Act (published in the **Federal Register** on July 1, 1994 (59 FR 34271)), the Information Quality Act (section 515 of the Treasury and General Government Appropriations Act for Fiscal Year 2001 (Pub. L. 106-554; H.R. 5658)), and our associated Information Quality Guidelines (<http://www.fws.gov/informationquality/>) provide criteria and guidance, and establish procedures to ensure that our decisions are based on the best scientific data available. They require our biologists, to the extent consistent with the Act and with the use of the best scientific and commercial data available, to use primary and original sources of information as the

basis for recommendations to list species.

Primary or original information sources are those that are closest to the subject being studied, as opposed to those that cite, comment on, or build upon primary sources. The Act and our regulations do not require us to use only peer-reviewed literature, but instead they require us to use the "best scientific and commercial data available" in a listing determination. We use information from many different sources, including articles in peer-reviewed journals, scientific status surveys, and studies completed by qualified individuals; Master's thesis research that has been reviewed but not published in a journal; other unpublished governmental and nongovernmental reports; reports prepared by industry; personal communication about management or other relevant topics; conservation plans developed by States and counties; biological assessments; other unpublished materials; experts' opinions or personal knowledge; and other sources.

Threats

(44) *Comment:* One commenter asserted that the Service did not fully assess new threats, such as new human development, particularly increased infrastructure for energy extraction, pipelines, power lines, and mines, to the DPS in its analysis.

Our Response: We have added additional discussion on these threats to the Summary of Factors Affecting the Species section of this final rule (see "Human Development" under the Factor A analysis).

(45) *Comment:* We received a few comments pertaining to silvicultural management within caribou habitat. One commenter suggested that logging operations should be restricted in caribou habitat. One commenter suggested that logging of old growth forest has nothing to do with decreases in the caribou population. Another commenter stated that proper harvesting and management of the forest in the area of the proposed caribou habitat would go far toward creating a habitat that is conducive to the return of caribou to the area, and that the Idaho Department of Lands has amply demonstrated that they have incorporated excellent management procedures that would facilitate such a return.

Our Response: Loss and fragmentation of caribou habitat (including old-growth forests) in an ecosystem that has been significantly altered from historical forest conditions due to a combination of timber harvest, wildfires, and road

construction continues to be a primary long-term threat to caribou. Historical implementation of timber management practices (e.g., large clear cuts) was not compatible with maintaining caribou habitat. To the extent that these same types of timber harvests would be implemented today, such treatments would similarly be incompatible with the habitat requirements of caribou. Certain timber harvest treatments may result in benign or even beneficial effects to caribou habitat, and that, in some situations timber harvest may be used to achieve or promote quicker attainment of tree species composition or certain structural characteristics (e.g., old-growth).

Within the United States, a majority of the habitat occupied by the southern Selkirk Mountain woodland caribou subpopulation of southern mountain caribou DPS is administered by national forests, specifically the IPNF and CNF. Federal agencies, pursuant to section 7 of the Act, are required to coordinate with the Service on any actions the agencies undertake, fund, or permit that have the potential to affect listed species (in this case, the caribou). Therefore, pursuant to section 7 consultation under the Act, the Service will coordinate with the Federal agencies (e.g., CNF and IPNF) during the course of developing timber harvest activities within caribou habitat to appropriately minimize the effects of such activities upon caribou conservation and recovery.

Additionally, we acknowledge that both the IPNF and CNF have implemented extensive measures to protect caribou and caribou habitat on their land ownerships, within the existing Selkirk Mountain Caribou Recovery Zone.

We also understand that all other woodland caribou subpopulations (including the transboundary southern Selkirk Mountain subpopulation) and their habitat occur in British Columbia, Canada. Canada has implemented several measures to manage and protect caribou habitat from further fragmentation and loss, including, but not limited to: (1) In 2007, Canada endorsed the Caribou Recovery Implementation Plan (MCRIP) that protects 5,436,320 ac (2,200,000 ha) from logging and road building; and (2) all national parks (NPs) in Canada are strictly protected from commercial resource extraction, which includes Glacier NP and Mount Revelstoke NP that together comprise approximately 333,345 ac (134,900 ha). For more information, under the Factor A analysis, above, see *Efforts in the United States* under “Conservation Efforts to Reduce Habitat Destruction, Modification, or Curtailment of Its

Range.” Additionally, we are committed to achieving the conservation and recovery of the DPS, as is required by the Act. To that end, the Service will actively coordinate and participate with our partners within the United States (e.g., WDFW, IDFG, Tribes, and others) and Canada (e.g., British Columbia’s Ministry of Forests, Lands, and Natural Resource Operations; Ktunaxa Nation; and others) on the development of management objectives to maintain and enhance woodland caribou habitat.

Based on an analysis conducted by Wittmer *et al.* (2010, p. 91), increasing proportions of early seral forest (e.g., fragmentation) within caribou habitat results in increasing rates of extinction of caribou populations. Increased proportion of young forest supports higher densities and distribution of other ungulate species that in turn supports higher predator numbers that prey opportunistically on caribou. Additionally, higher predator numbers can further accelerate the rate of population decline through compensatory⁸ mortality effects (Wittmer *et al.* 2010, p. 91). It will likely require greater than 150 years (greater than 16 generations of caribou) of habitat protections for early successional and fragmented forests to develop the old-growth habitat characteristics (vegetative structure and composition) (Stevenson *et al.* 2001, p. 1) that would begin to restore the natural predator to prey balance of high-elevation, old-growth forests, and thus reduce predation pressure on caribou.

(46) *Comment:* One commenter stated that the Service must consider documented snowmobiling violations within the area of Selkirk Mountain Caribou Recovery Zone closed to snowmobiling by court order until the IPNF develops and implements a winter travel plan when determining what habitat protections are necessary for recovery of the southern Selkirk Mountains caribou subpopulation. The commenter suggested that these violations may have affected the functionality of the area to benefit caribou, potentially impairing caribou distribution within the ecosystem as well as increasing their susceptibility to predation.

Our Response: We acknowledge that snowmobiling violations of the area closed by court ordered injunction on the IPNF have occurred. Human activity in caribou habitat can affect caribou through a variety of mechanisms,

including habitat loss and fragmentation, disturbance, and increased predation. Additionally, we appreciate that effective enforcement of caribou habitat protection measures can be challenging. We will continue working with our partners (both within the United States and Canada) who manage landscapes within caribou habitat to identify and implement appropriate management strategies to reduce, if not eliminate, impacts detrimental to caribou conservation and recovery.

(47) *Comment:* One commenter referenced language in the final critical habitat rule (77 FR 71042; November 28, 2012) recommending the development of a wildland fire use plan by the IPNF to deal with management of fire (both natural and human-caused) within the ecosystem. The commenter suggested that all fires within caribou habitat should be suppressed because of the fire’s potential to create habitat for other predators or competitors of caribou. For example, the commenter referenced research conducted by Robinson *et al.* (2012) that showed wolves select for burns and areas adjacent to burns whereas caribou avoid burns, and that fires increased the probability of wolf-caribou overlap.

Our Response: The Selkirk Ecosystem, in addition to providing habitat for caribou, also supports habitat for other species native to the ecosystem, including Canada lynx, grizzly bear, other forest carnivores, and avian species including the black-backed woodpecker (*Picoides arcticus*). The Canada lynx and black-backed woodpecker, for example, rely on fires to facilitate the development and/or maintenance of habitat they utilize to provide some of their life-history needs. Thus, natural wildfire plays an important role in maintaining a mosaic of forest successional stages that provides habitat for a variety of species native to this ecosystem. However, we also appreciate the research findings of Robinson *et al.* (2012, entire) relative to the effects of fire upon caribou habitat and wolf/caribou habitat overlap and interactions. Thus, in the November 28, 2012, final rule designating critical habitat (77 FR 71042), we recommended the development of a wildland fire use plan that will facilitate assessment of the appropriate use of fire or fire suppression within the Selkirk Ecosystem to maintain the variety of habitats and structural stages supporting the species native to this ecosystem.

Predator Control

(48) *Comment:* Several commenters suggested southern mountain caribou

⁸In population dynamics, compensation is the effect on a population whereby, due to certain causes, a decrease in the breeding population (mature individuals) leads to reduced production and survival of eggs or offspring.

select their winter habitat as a response to avoid predation rather than for food or winter habitat preference. Because predation by wolves and mountain lions is listed as “one of the most significant contributors to Southern Mountain Caribou DPS declines in recent decades” (79 FR 26504, May 8, 2014, see p. 79 FR 26523), several commenters questioned why the Service, and the States of Idaho and Washington do not try to actively protect caribou from predators. One commenter suggested that reducing the wolf population would result in increased numbers of caribou. Another commenter stated that until the predator-to-prey ratio is brought into proper balance, no activity or effort by humans will change the outcome for the caribou. Additionally, one commenter suggested that the Service does not properly address the effects of the introduction of the “Canadian” gray wolf on all cervid populations, including caribou, and that the Service is misleading the public by stating, “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” (79 FR 26504, May 8, 2014, see p. 79 FR 26523). This commenter suggested that the recolonization of the Selkirks by wolves as a result of the 1995 wolf reintroduction in Idaho may be jeopardizing the remnant caribou populations in Idaho and Washington rather than a change in the predator-prey ecology stemming from habitat alteration and fragmentation.

Our Response: Mountain caribou’s use of high-elevation habitats during the winter is an adaptive strategy to avoid predation by predators that are otherwise typically excluded from accessing these areas during winter due to high snow depths. However, the ability of mountain caribou to exploit these high-elevation habitats during winter is dependent on their ability to utilize, almost exclusively, arboreal lichens to provide their nutritional and energetic needs during this time.

Regarding management of wolves, on May 5, 2011, in accordance with Public Law 112–10, the Service issued a final rule (76 FR 25590) reinstating the April 2, 2009, delisting rule (74 FR 15123) whereby wolves in eastern Washington and Idaho (as well as other States) were removed from the Federal List of Endangered and Threatened Wildlife. Accordingly, management of wolves in eastern Washington and Idaho are the responsibility of the respective States in which they reside. Wolves may be exerting disproportionate predation

pressure on caribou as a result of altered forest structure that may be facilitating higher prey densities and increased distribution and thus higher wolf densities and distribution than would naturally occur in the Selkirk Mountains. To address this issue, we will coordinate with our State wildlife partners (e.g., WDFW and IDFG), Tribes, and Canadian partners on the development of appropriate wolf (as well as other predators) monitoring and management plans. Additionally, British Columbia’s Ministry of Forests, Lands, and Natural Resource Operations, recognizing the impact of predation on the status of the subpopulations within the DPS, is undertaking aggressive measures to control predator populations (e.g., targeted wolf removal operations within the South Peace region in northern British Columbia and the South Selkirk Mountains).

Recovery of this DPS will require implementation of a comprehensive recovery strategy, including predator management. As stated above, we will coordinate with our State wildlife partners (e.g., WDFW and IDFG), Tribes, and Canadian partners on the development of appropriate predator monitoring and management plans.

Relative to predation by wolves on other cervids, the Service is certainly aware that this occurs. However, within the context of this listing decision, we are required to address the threats to this DPS of woodland caribou, and predation is identified as a threat to this DPS. Regarding the statement that the Service is misleading the public over whether habitat alteration/fragmentation or wolf reintroduction is the primary catalyst driving the predator-prey ecology within the Selkirk ecosystem, we acknowledge the commenter’s opinion. Wolves were reintroduced into central Idaho and Yellowstone National Park in 1994, as nonessential experimental populations in accordance with the Service’s final environmental impact statement (FEIS; USFWS 1994b, entire). The Service’s FEIS stated that, over a timeframe of 15 years prior to 1994, wolves had naturally recolonized northwest Montana as a result of natural dispersal from Canada (USFWS 1994b, p. vi). Thus, it is likely that recolonization of the Selkirk Mountains by wolves is a result of dispersal of wolves from farther north in Canada and/or northwest Montana. Gray wolves, upon arriving in the Selkirk Ecosystem, have also very likely benefited from the increased abundance and distribution of prey species (deer, moose, elk) whose population growth and expansion in the Selkirk Mountains

have likely benefited from the alteration and fragmentation of the older successional boreal forest through fires (both natural and manmade) and historical silvicultural practices to younger successional forests that these species require. Increased abundance and distribution of these other cervid species (i.e., deer, moose, elk) likely support higher numbers of wolves (and other predators endemic to this ecosystem) than would otherwise be naturally supported by the older successional boreal forests. Higher numbers of wolves translates to increased predation pressure on caribou due to the overlap of these other cervid species with caribou during summer, primarily, when wolves opportunistically encounter caribou in the course of searching for these other cervid prey species. Thus, we believe that alteration and fragmentation of the boreal forest landscape is the primary driver that is currently supporting higher populations of alternate prey species that support a higher number of wolves that in turn have disproportionate predation impacts on caribou, rather than wolf reintroduction being primarily responsible for the existing predator/prey imbalance of this ecosystem.

Wolf Sterilization

(49) *Comment:* One commenter stated that wolf sterilization and reducing moose populations are ineffective measures that do not solve caribou predation problems. The commenter stated that wolf control through trapping and hunting is the only cost effective solution because it reduces wolf populations and generates revenue for the both the State and Federal Government in the form of license and tag sales and ammunition and gun sale taxes.

Our Response: The management of wolves and moose is the responsibility of the States in which these species reside. We are coordinating with the States of Idaho and Montana, as well as British Columbia, Canada, to better understand: (1) The predation impacts of wolves upon caribou; (2) the role these other cervid populations play in supporting higher numbers and or increased distribution of wolves within the ecosystem; (3) the interactions between other cervid species, wolves, and caribou; and (4) the potential management implications of such interactions. Improved understanding of the relationship between wolves, caribou, other prey species, and their habitats will facilitate the development of comprehensive conservation frameworks addressing management of

all species (inclusive of both predator and prey) native to this ecosystem.

DPS/Genetic Discreteness/Uniqueness

(50) Comment: Several commenters agreed with our DPS analysis, while several others disagreed. Several commenters suggested that the Service's statement that the southern mountain caribou population is markedly separate from other populations of woodland caribou as a result of physical (geographic) factors is not well supported and there is no evidence of a physical barrier preventing movement. One commenter disagreed with our DPS analysis indicating that the southern Selkirk Mountain caribou subpopulation is part of the larger southern mountain caribou DPS. One commenter stated that there is no new information proving that the southern mountain caribou are discrete or significant, and implied we relied on a single characteristic in our significance conclusion. One commenter challenged the perception that significant numbers of caribou occurred in the United States prior to or since listing, even with the augmentation efforts. One commenter stated that evidence of historical gene flow between the local southern mountain subpopulations and other neighboring populations undermines our discreteness analysis, and is contrary to the Service's statement that the southern Selkirk Mountain subpopulation is isolated or incapable of migrating from their current habitats within the southern Selkirk Mountains.

Our Response: Regarding discreteness, under 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. Thus, the policy does not require there to be a physical barrier preventing movement of individual animals between populations to satisfy the discreteness criteria. The best available science indicates the southern mountain caribou DPS is both geographically (Wittmer *et al.* 2005b, pp. 408–409; COSEWIC 2011, p. 49; van Oort *et al.* 2011, pp. 222–223) and behaviorally (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) discrete from other woodland caribou populations. While there is limited overlap between the annual ranges of some subpopulations at the far north of the southern mountain caribou DPS and other subpopulations of the Central Mountain (DU 8) caribou population, this overlap does not occur during the rut or mating season (COSEWIC 2011, p. 50). Furthermore, according to van Oort *et al.* (2011, pp. 221–222), it is highly likely that caribou subpopulations within the southern mountain caribou DPS (also known as southern mountain (DU 9)) are reproductively isolated from one another, let alone between neighboring caribou populations (*i.e.*, Central Mountain (DU 8), Northern Mountain (DU 7)). Thus, during the mating season, when genetic interchange would occur, individual caribou in the southern mountain caribou DPS are reproductively isolated through geographic separation from other woodland caribou occurring in the neighboring Central Mountain (DU 8) population. Additionally, caribou within the southern mountain caribou DPS occur in high-elevation, steep, mountainous terrain supporting deep snowfall (about 5 to 16 ft; 2 to 5 m) (COSEWIC 2011, p. 50) that has resulted in a foraging strategy unique among woodland caribou; caribou within this DPS subsist almost entirely upon arboreal lichens during winter months (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). Finally, caribou within this DPS undertake altitudinal migrations as many as four times per year, which is also unique among woodland caribou (COSEWIC 2011, p. 50). Therefore, in accordance with our DPS policy, the best available scientific information supports our conclusion that the southern mountain caribou population is geographically, reproductively, and behaviorally discrete from other caribou populations.

Regarding the statement that we relied on a single characteristic to establish the significance of this DPS relative to the woodland caribou taxon, please see our responses to *Comments (16)* and *(17)*. Regarding significant numbers of caribou in the United States, we are unclear if the comment pertained to the significance analysis we conducted under our DPS policy. The commenter also did not define what would be considered a significant number of animals. However, a definition of significant number of animals is highly

variable and necessarily specific to the biology of the species in question. For example, a certain number of animals within a population might be considered significant for a given species that naturally has low density, distribution, and reproductive capacity, while for another species that naturally occurs at higher densities, larger distribution, and possesses higher reproductive capacity, that same number of animals might be considered insignificant. Furthermore, under our DPS policy, the number of individual animals in a population is not the basis, *per se*, of the significance analysis. Rather, the significance test under the DPS policy assesses the significance of a population (that theoretically could be comprised of many or few individuals) to the taxon (*i.e.*, species or subspecies) to which it belongs, and may include, but is not limited: (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.

Relative to connectivity of the southern mountain caribou DPS to other neighboring mountain caribou populations (*i.e.*, Northern and Central), evidence of historical gene flow between these populations does not contradict evidence suggesting that these populations are now isolated from one another. While the conclusions of Serrouya *et al.* (2012, p. 2,594) indicate that historical gene flow (*i.e.*, movement of individuals between populations) did occur in the past between these populations, studies investigating recent caribou movement patterns indicate this is no longer the case. A radio-telemetry study conducted by van Oort *et al.* (2011, entire) on all subpopulations of caribou within this DPS from 1984 through 1987 did not detect any dispersal of juvenile caribou between subpopulations, and very little adult dispersal between subpopulations (van Oort *et al.* 2011, p. 221). Similarly, Wittmer *et al.* (2005b, entire) investigated caribou movement patterns within the same population from 1984 through 2004, and found limited interaction between the subpopulations (Wittmer *et al.* 2005b, p. 414). We presume a similar lack of dispersal (*i.e.*,

connectivity) is currently the case between the southern mountain caribou DPS and the other neighboring Northern Mountain and Central Mountain caribou populations. This presumption is supported by COSEWIC (2011, pp. 49–50), which concludes that the southern mountain caribou population is likely isolated from the Northern Mountain and Central Mountain caribou populations. We believe that the apparent lack of dispersal between neighboring caribou populations, as well as the observed lack of dispersal between subpopulations within the southern mountain caribou DPS, is an artifact of recent anthropogenic habitat fragmentation, which is supported by the conclusions of Serrouya *et al.* (2012, p. 2,597) and van Oort *et al.* (2011, p. 222).

Additionally, we are unclear as to the reference to the isolation of the southern Selkirk Mountain caribou subpopulation. The analysis under Discreteness in the May 8, 2014, proposed rule (79 FR 26504, see p. 26509) assessed the discreteness of the southern mountain caribou population relative to the neighboring Northern and Central Mountain Caribou populations. This analysis did not assess the relative connectivity of the southern Selkirk Mountains subpopulation to other subpopulations within the southern mountain caribou DPS. Nonetheless, as just described, the best available science indicates that the subpopulations within the southern mountain caribou DPS (including the southern Selkirk Mountains subpopulation) are now largely isolated from one another. The physical and reproductive isolation of these subpopulations may have significant implications for the conservation of the southern mountain caribou DPS as mountain caribou appear to lack the inherent behavior to disperse long distances (van Oort *et al.* 2011, pp. 215, 221–222). Dispersal of individuals (natal or breeding) can facilitate demographic rescue of neighboring populations that are in decline or recolonization of ranges from which populations have been extirpated (*i.e.*, classic metapopulation theory). However, species whose historical distribution was more widely and evenly distributed (such as mountain caribou) (van Oort *et al.* 2011, p. 221) that have been fragmented into subpopulations via habitat fragmentation and loss may appear to exist in a metapopulation structure when, in fact, because they may not have evolved the innate behavior to disperse among subpopulations, their fragmented distribution may actually

represent a geographic pattern trending toward extinction (van Oort *et al.* 2011, p. 215).

(51) *Comment:* We received three comments pertaining to the provision of our DPS policy allowing use of international borders to identify discrete vertebrate populations. One commenter suggested that differences in management of southern Selkirk Mountain caribou and their habitat between the United States and Canada is sufficient enough to warrant use of the international border provision of the DPS policy to delineate the southern Selkirk Mountains subpopulation as a DPS and retain its endangered status. Another commenter suggested a similar use of the international border provision for similar reasons, but suggested it should apply to the southern mountain caribou population and likewise be used to list it as endangered. Specifically, the commenter alleges that Canadian management of the southern mountain caribou population has failed to prevent or reverse the decline of the population. Another commenter suggested that, because caribou do not adhere to the 49th parallel (*i.e.*, essentially the border between the United States and Canada) the caribou population in the United States should not be considered a separate population.

Our Response: Our DPS policy allows the use of international borders to identify a discrete vertebrate population when 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. However, in this case, use of the international border to identify a DPS of the southern Selkirk Mountain woodland caribou subpopulation is inappropriate for the following reasons. First, there would need to be differences in the management of caribou between the United States and Canada that would differentially affect the conservation status of the population. In this case, there are not. For example, similar to habitat protections that have been implemented within the United States for caribou, British Columbia, Canada, has endorsed the Mountain Caribou Recovery Implementation Plan whose goal is to protect 2,200,000 ha (5,436,320 ac) of caribou habitat from logging and road building. There is no difference in the exploitation of mountain caribou within the southern mountain caribou DU/DPS between the United States and Canada; currently legal hunting of mountain caribou is not allowed within the southern mountain

caribou DU/DPS in British Columbia, Canada, or the United States. Further, hunting is prohibited in all national parks and ecological preserves in British Columbia. Thus, according to Seip and Cichowski (1996, p. 73), hunting has not been a major limiting factor to caribou within the southern mountain caribou DPS since the mid-1970s. Additionally, British Columbia's Ministry of Forests, Lands, and Natural Resource Operations, recognizing the impact of predation on the status of the subpopulations within the DPS, is undertaking aggressive measures to control predator populations (*e.g.*, targeted wolf removal operations within the South Peace region in northern British Columbia and the South Selkirk Mountains).

(52) *Comment:* Two commenters questioned the Service's evaluation of uniqueness based on the use of steep, mountainous habitats and/or feeding on arboreal lichens. One of the commenters stated that other North American species of cervids (*i.e.*, elk, mule deer, American bison) all contain subpopulations that historically and currently occupy a diverse range of habitats and food preferences yet are all genetically the same species. This commenter stated that the Service's uniqueness determination is not sufficiently supported by science. The other commenter suggested that mountain caribou's reliance on arboreal lichens is not unique because mountain caribou located south of the international border with Canada will utilize whatever feed is available to them, and, therefore, use of arboreal lichens in and of itself is not evidence that this DPS occurs in a unique ecological setting.

Our Response: The southern mountain caribou DPS is the only woodland caribou population that occurs in high-elevation, mountainous habitats in the wet and very wet subzones of the Englemann Spruce–Subalpine Fir biogeoclimatic zone, the wet and very wet subzones of the Interior Cedar Hemlock zone, and the very wet subzones of the Sub-Boreal Spruce zone that typically receive between 2 to 5 m (6 to 16 ft) of snow during the winter (van Oort 2011, p. 216). The occupancy of this type of ecological setting is unique among woodland caribou; other woodland caribou populations occupy less steep, drier terrain with less winter snow pack, and do not feed almost exclusively on arboreal lichens during the winter (Thomas *et al.* 1996, p. 339; COSEWIC 2011, p. 50). Adaptation to this unique ecological setting has resulted in the southern mountain caribou's almost

complete reliance on arboreal lichens during winter to support their nutritional requirements, as well as adopting a unique migration behavior. Caribou in this population undertake as many as four altitudinal migrations per year (COSEWIC 2011, p. 50) between seasonal habitats, which is unique among caribou. Additionally, while other populations of woodland caribou may consume arboreal lichens to some extent, they do not rely on arboreal lichens (almost exclusively) as the only source of forage for 3 to 4 months of the year as do southern mountain caribou.

(53) *Comment:* One commenter suggested that the DPS policy should not be used to simultaneously designate and list.

Our Response: The DPS policy is not used to make decisions as to whether or not to list under the Act. The DPS policy is used to identify discrete and significant populations of vertebrate species or subspecies. The decision to list species, subspecies, or DPSs of species or subspecies is made pursuant to section 4(a) of the Act. In order to list a DPS under the Act, it would first have to be defined in accordance with our DPS policy. Once defined (*i.e.*, designated), the DPS could then be considered for listing under the Act, provided it met the criteria for listing (*i.e.*, the status of the DPS is either endangered or threatened). The Act does not prohibit publishing DPS analyses and delineations simultaneously with listing analyses within the same proposed or final rulemaking documents.

(54) *Comment:* One commenter agreed with our determination that the southern Selkirk Mountains subpopulation (to which the commenter referred to as the South Selkirks caribou herd) is a DPS.

Our Response: Contrary to the comment, pursuant to our proposed rule, we determined that the southern Selkirk Mountain subpopulation of woodland caribou did not meet the criteria established under our 1996 DPS Policy for designating as a DPS (79 FR 26504, May 8, 2014, see pp. 79 FR 26504–26505 and 26508–26509). However, in the proposed rule, we also stated that delisting the species was not warranted, and that the southern Selkirk Mountains subpopulation is part of the larger southern mountain caribou population, which does meet our 1996 DPS policy criteria for designation as a DPS. Hence, we proposed to amend the listing from the southern Selkirk Mountains subpopulation to the southern mountain caribou DPS.

(55) *Comment:* One commenter stated a concern that lumping the southern

Selkirk Mountain caribou subpopulation into the larger southern mountain caribou DPS would result in the southern Selkirk Mountain caribou subpopulation potentially being dismissed as a biologically and ecologically minor or inconsequential part of the DPS.

Our Response: The best available scientific information was brought to bear in our status assessment, and in accordance with our DPS policy, that information indicates that the southern Selkirk Mountain caribou subpopulation is biologically and ecologically part of the larger southern mountain caribou DPS. Once a DPS is identified, designated, and listed, the Act requires the Service to strive to recover the DPS to the point at which the protections of the Act are no longer needed to ensure its long-term persistence. Although recovery planning is beyond the scope of this listing decision, we are committed to achieving the conservation and recovery of the DPS, as is required by the Act.

COSEWIC 2014/Proposed Rule Is Contrary to Best Available Science

(56) *Comment:* We received numerous comments regarding our proposal to list the southern mountain caribou DPS as threatened. Many commented that the DPS should be listed as endangered and not threatened. Others agreed with listing the DPS as threatened. A few stated the DPS should not be listed at all. Those who commented that the DPS should be listed as endangered cited reasons including: (1) The DPS includes the last surviving caribou subpopulation in the coterminous United States; (2) small population size; (3) continuing population decline; (4) increasing and escalating threats related to recreation (including snowmobiling and heli-skiing), timber harvest, disease, and climate change; (5) altered predator/prey dynamics related to habitat changes resulting from timber harvest; (6) isolation of this DPS from other woodland caribou populations in Canada; (7) changing the status from endangered to threatened is contrary to the considerable body of science generated over the past 3 decades; (8) the Service should be consistent with COSEWIC's 2014 status assessment; and (9) more scientific study, data collection, and tracking data are necessary before removing endangered status. Those who support listing the DPS as threatened commented that there are other woodland caribou populations in Canada and this DPS is part of the larger, more numerous woodland caribou subspecies. Those who support delisting caribou (*i.e.*, removing caribou

from the Federal List of Endangered and Threatened Wildlife, which would remove the protections of the Act) believe that Canada supports healthy populations of caribou with sufficient numbers of individuals such that the southern mountain caribou DPS should not be listed. One commenter noted that the Service partially supported the proposed listing of the DPS as threatened due to the statement that northern subpopulations in the Hart Range were considered stable, which is contrary to newer science indicating some of those subpopulations are now declining. One commenter stated that we should not rely on the study by Hatter *et al.* (2004) as a basis for listing as threatened because their analysis, which used population modeling to predict the probability of extinction of the southern mountain caribou DPS, is more than 10 years old.

Our Response: Upon further analysis of the best available scientific and commercial data pertaining to the status of this DPS, including review of the recently released 2014 report on the status of mountain caribou by COSEWIC (COSEWIC 2014, entire), and population viability analyses conducted by Hatter (2006, entire, *in litt.*) and Wittmer *et al.* (2010, entire), we have determined that the status of and threats to the southern mountain caribou DPS warrant listing it as endangered (see Determination, below). Additionally, we have updated the status of all subpopulations in accordance with the latest population assessment by COSEWIC (COSEWIC 2014), which includes that fact that some populations, once considered as stable, are now declining. Accordingly, this final rule lists the southern mountain caribou DPS as endangered.

Regarding the use of Hatter *et al.* (2004), there are more recent population viability analyses that should be included in our assessment. Therefore, in addition to Hatter *et al.* (2004), we have incorporated the findings of Hatter (2006, *in litt.*) and Wittmer *et al.* (2010) into our status assessment under Status of the Southern Mountain Caribou DPS in this final rule.

(57) *Comment:* One commenter stated that the original listing of caribou under the Act was flawed because it relied on a single Master's degree thesis that was not scientifically peer-reviewed, and that any listing of a species under the Act must be based on sound scientific data and justification.

Our Response: The Service is not relying on Evans 1960 (the Master's thesis to which the commenter refers) to inform our understanding of the current status of and threats to the southern mountain caribou DPS. Evans (1960) is

informative from a historical standpoint, and was, therefore, used to provide insight into the historical ecology and distribution of woodland caribou in the northwestern United States. The Act requires that we use the best available scientific and commercial data in making listing determinations, see our response to *Comment (43)* for an explanation of what information we may consider. In our May 8, 2014, proposed rule (79 FR 26504), we determined that the original listing of the southern Selkirk Mountain subpopulation of woodland caribou was incorrect, and we proposed to amend the original listing from the southern Selkirk Mountain subpopulation of woodland caribou to the southern mountain caribou DPS. The final listing of the southern mountain caribou DPS is based on an extensive review of all currently available and relevant scientific information, including peer-reviewed science, on the status of the DPS, which includes, but is not limited to: COSEWIC 2011, 2014; Hatter et al. 2004; Hatter 2006; Wittmer et al. 2005a, 2005b, 2007, 2010; McLellan et al. 2012; Seip 1992, 2008; and Kinley and Apps 2001.

(58) Comment: Two commenters stated that the recently released and published information from agency biologists in Canada, and subsequently the Canadian government, is of utmost importance to the caribou listing decision of the Service.

Our Response: The Act requires that the Service base its listing decisions on the best available scientific and commercial data. Therefore, we have utilized COSEWIC's 2014 status assessment, to which the commenter referred, in our final listing decision. However, while it is important for the Service to understand COSEWIC's rationale for its listing recommendations to the Canadian government, the Service must make its listing decisions in accordance with applicable United States laws, regulations, and Service policies. Consequently, listing decisions may differ between Canada and the United States.

Significant Portion of the Range

(59) Comment: One commenter questioned the validity of our "significant portion of the range" (SPR) analysis. Specifically, the commenter questioned our assessment pertaining to the isolation and fragmentation of the subpopulations within the southern mountain caribou DPS, which led us to conclude that loss of the smaller, isolated southern subpopulations (that each individually would meet the definition of endangered under the Act)

would have no bearing on the status of remaining larger northern subpopulations. Therefore, the loss of the smaller, isolated southern subpopulations would not lead to the extirpation of larger northern subpopulations such that the DPS would be in danger of extinction. Thus, the smaller, isolated southern subpopulations did not constitute a significant portion of the range of the southern mountain caribou DPS.

Our Response: We acknowledge the commenter's concerns with the SPR analysis conducted in the proposed rule. Please see our response to comment no. 10.

Threatened Status Would Weaken Protections

(60) Comment: Several commenters expressed concern that there is inadequate enforcement of habitat restrictions for caribou under the current endangered status and concern that a change in status to threatened would weaken protective restrictions under the rules governing threatened status. Several commenters stated that enforcement of the court injunctions against snowmobiling in critical habitat is lacking and is difficult, especially now that new snow machines are faster and can travel farther into remote areas. One commenter expressed concern that threatened status would make enforcement even less effective and would reduce protections for the Selkirk herd by opening up more of their range to snowmobiles and logging of old growth forests.

Our Response: The comments pertaining to a threatened designation are moot, as pursuant to peer review, public comments, and our additional analysis of all the science pertaining to this DPS, we determined that the status of and threats to this DPS warrant listing it as endangered. Additionally, we appreciate that effective enforcement of caribou habitat protection measures can be challenging for Federal and State land management agencies within the United States, and British Columbia provincial authorities in Canada. We have assessed the effects and governance of such activities under our Factor A and D analyses, respectively.

(61) Comment: Several commenters expressed concern over the effects that snowmobiling and other recreational activities can have on caribou and their habitat, including disturbance, and fragmentation of habitat leading to smaller habitat patches caribou have to support breeding activities, etc. One commenter suggested that the access provided to predators through the compaction of snow by snowmobiles

may have increased predation on caribou calves, potentially further decreasing an already low calf survival rate, and potentially contributing to a declining caribou population. On the other hand, one commenter stated that snowmobiles, other over-the-snow vehicles, or other recreational users do not pose a threat to caribou, and that such perceived threats are based on conjecture or speculation, and are contrary to experiences of snowmobilers and other forest users. Others expressed concern that listing the DPS would continue to restrict or result in increased restrictions on recreational access to areas occupied by caribou. One commenter stated that listing of this population under the Act has led to a court-ordered injunction of snowmobiling and snowmobile trail grooming in the IPNF, inhibiting winter recreation in the region and depriving many of the income and public lands access that are dependent on the enjoined activities.

Our Response: Winter is a particularly stressful time for caribou as their mobility is restricted by deep snow, and their nutritional intake is exceptionally limited due to their dependency on arboreal lichen to survive during this period. During winter, mountain caribou are primarily located in high-elevation subalpine forest and subalpine parkland habitat in areas of deep snow and gentle or moderate terrain (Apps et al. 2001, p. 70; Terry et al. 2000, p. 594). These areas are also attractive to snowmobilers. The best available science indicates that increasing levels of winter recreation activities (e.g., snowmobiling, heli-skiing, snow-cat skiing, etc.) within the caribou's winter range represent a significant threat to woodland caribou (USFWS 2008, p. 28). Current best available scientific information indicates that snowmobile activity can displace caribou from suitable habitat (Simpson 1987, pp. 8–10; Tyler 1991, pp. 183–188; Kinley 2003, p. 25; Seip et al. 2007, p. 1,543), cause caribou to experience elevated energetic costs (Reimers et al. 2003, pp. 751–753) and physiological stress (Freeman 2008, p. 44), and possibly force caribou into using lower quality habitat with increased risks of predation or mortality from avalanches (Seip et al. 2007, p. 1,543). Additionally, snowmobile trails may facilitate access of predators to caribou habitat, thereby increasing predation risk to caribou (Whittington et al. 2011, p. 1540). Furthermore, there is emerging concern regarding the potential effects that other types of recreational use within caribou habitat outside of the winter season may

have upon caribou. Dumont (1993, pp. 31–33), in a study of the impact of hikers on caribou in the Gaspesie Conservation Park, Quebec, Canada, concluded that hikers caused woodland caribou to move from preferred alpine areas into adjacent forested habitat. Displacement of caribou into forested areas may increase their susceptibility to predation by moving caribou into areas of reduced visibility (Dumont 1993, p. 11).

Regarding the management of recreational snowmobile access, management of these lands is not under the Service's purview. In the United States, management of lands occupied by the southern Selkirk Mountain woodland caribou subpopulation is within the purview of the Federal (*i.e.*, CNF, IPNF, Bureau of Land Management) and State (*i.e.*, Idaho Department of Lands) land managers and private landowners. The Service will coordinate with the Federal agencies managing the effects of recreational activities (including snowmobiling) upon caribou and their habitat through the development of land and resource management plans. Development of land and resource management plans are Federal actions subject to section 7 consultation under the Act for which Federal agencies must consult with the Service.

The Service acknowledges that some seasonal limitations on motorized (primarily pertaining to snowmobiles) vehicle access to public lands have occurred since listing of the southern Selkirk Mountains subpopulation of woodland caribou under the Act. These seasonal closures were put in place to minimize disturbance to caribou, and include a 1994 closure for a large area of the Selkirk Crest on the IPNF. The 1994 closure was put in place to protect caribou from impacts related to snowmobiling, in coordination with the IDFG. Additionally, we understand that a court-ordered injunction in 2006, which was modified in 2007, has restricted much of the area used by caribou within the Selkirk Crest from snowmobiling, until the IPNF develops a winter recreation strategy addressing the effects of snowmobiling upon the species. The Service will work closely with the IPNF on the development of their winter recreation strategy.

Additionally, except for the transboundary southern Selkirk Mountain subpopulation, all other subpopulations of this DPS occur in Canada. Canada recognizes the potential effect of snowmobile recreation on caribou and their habitat. For example, in 2009, the British Columbia's Ministry of Environment 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). The Service is committed to achieving the conservation and recovery of the DPS, as is required by the Act. To that end, we will actively coordinate with our partners in the United States (*e.g.*, WDFW, IDFG, Tribes, and others) and Canada (*e.g.*, British Columbia's Ministry of Forests, Lands, and Natural Resource Operations; Ktunaxa Nation; and others) on the development of management objectives allowing for snowmobile use and other recreational activities to occur within the range of the DPS without resulting in excessive disturbance to caribou or fragmentation of their habitat to the extent that conservation of the DPS would be undermined.

Recovery

(62) *Comment:* Several commenters stated that the Service should work more closely with Canada on a recovery plan, and that the Service should contribute more resources to the recovery effort.

Our Response: We have recently (within the past year) initiated a process to revise the 1994 recovery plan. To date, this process has included participation and coordination with British Columbia, Canada, including British Columbia's Ministry of Forests, Lands, and Natural Resource Operations, and Ktunaxa Nation (First Nations Canada), as well as U.S. entities including USFS, WDFW, IDFG, Kootenai Tribe of Idaho, Kalispel Tribe of Indians, and local and environmental stakeholders.

Recovery/Role of Service

(63) *Comment:* Several commenters referred to recovery success stories of the Act (*i.e.*, the eastern red wolf, Pacific salmon now jumping fish ladders, the reintroduction of the California condor, revival of the whooping crane, and even the comeback of the bison, which was almost exterminated). One commenter stated that the Service would be derelict in its duty by not providing caribou with the same protection afforded to other animals, such as the wolf and the grizzly bear in Idaho. Several commenters expressed concern that the Service is not enforcing the Act properly and questioned the Service's commitment to protecting threatened and endangered species.

Our Response: We hope to achieve success with the conservation of the southern mountain caribou DPS. Listing this DPS as endangered under the Act requires that we strive to provide for the

southern mountain caribou's conservation to the point at which the protections of the Act are no longer required, and the DPS can then be delisted. As stated previously in the response to *Comment (62)*, the Service has initiated a process to update the 1994 recovery plan. Recovery plans are intended to identify and establish management and conservation needs of the species (in this specific case, the DPS) so that when they are achieved, the species (DPS) can be delisted as the protections of the Act will no longer be required to ensure its conservation.

Cultural Importance

(64) *Comment:* Several commenters stated woodland caribou should be conserved because they are an important part of the ecosystem and environmental heritage of northeastern Washington and northwestern Idaho, and because they are also culturally and spiritually important to Tribes.

Our Response: Although recovery planning is beyond the scope of this listing decision, we are committed to achieving the conservation and recovery of the DPS, as is required by the Act. To that end, the Service will actively coordinate and participate in the development of a recovery plan with our partners within the United States (*e.g.*, WDFW, IDFG, Tribes, and others) as well as our Canadian partners (*e.g.*, British Columbia's Ministry of Forests, Lands, and Natural Resource Operations; Ktunaxa Nation; and others).

Request Access to More Information

(65) *Comment:* One commenter requested that the Service and State agency websites provide information (or provide links to the British Columbia's websites) about the status of mountain caribou and recovery efforts in British Columbia to provide a better overall picture of the caribou situation.

Our Response: The Service will consider adding links to Canada's COSEWIC web page on our web page for woodland caribou. However, until such a link is established, information on Canada's efforts to recover woodland caribou can be found at <http://www.cosewic.gc.ca>. State's web pages are managed by the appropriate State agency.

Taxonomy

(66) *Comment:* We received many comments pertaining to the taxonomy of caribou. Several agreed with the subspecies designation of woodland caribou, while several others stated that there is a need for a contemporary review and revision of caribou

taxonomy (Geist 2007; COSEWIC 2011, p. 10), and that the Banfield definition is outdated and should no longer be used. Other commenters suggested that the COSEWIC (2011, p. 49) definition is the best available definition at the present time, and one commenter implicitly questioned our DPS analysis by asserting there is no such thing as a “mountain caribou” and that there is no differentiation among caribou (*i.e.*, all caribou are alike).

Our Response: As noted in our May 8, 2014, proposed rule (79 FR 26504), while caribou taxonomy continues to be subject to debate, Banfield’s (1961) taxonomic grouping of woodland caribou is still currently widely accepted. Thus, until a scientifically accepted and peer-reviewed revision to the taxonomic classification of the subspecies of caribou (*Rangifer tarandus*) is completed, it is appropriate to rely on Banfield 1961. We believe that until such a review is completed, Banfield (1961) represents the currently best available science on the taxonomic classification for the subspecies of caribou in North America. Additionally, COSEWIC’s 2011 report that established 12 “Designatable Units” of caribou in Canada is not analogous to and should not be construed with a taxonomic analysis at the species or subspecies level. Canada’s criteria for establishing Designatable Units (DU) allows consideration of separate and discrete populations of species where the individually discrete population is evolutionarily significant to the overall taxon (species). Thus, under COSEWIC, a DU is not dissimilar to our DPS policy, except that, whereas our DPS analysis considers threats when establishing a DPS, COSEWIC, when establishing a DU, does not. However, regardless of whether Banfield’s (1961) taxonomic classification for the subspecies of caribou in North America is used or COSEWIC’s grouping of caribou in North America is used as the gauge for assessing the discreteness and significance of the southern mountain caribou DPS relative to caribou in North America, the southern mountain caribou meets the discreteness and significance criteria for identifying it as a DPS under our DPS policy. For a discussion on the relevance of the biological grouping of the southern mountain caribou as a DPS and its conformance to our DPS policy, please refer to the DPS analysis contained in this final rule.

(67) **Comment:** We received a few comments regarding listing DPSs under the Act. One commenter stated that the Service’s decision on the Bonner County and Idaho State Snowmobile Association (ISSA) petition to delist the

Selkirk caribou subpopulation (*Rangifer tarandus caribou*) from the List of Endangered and Threatened Wildlife (discussed below) is insufficient and inconsistent with the Act. Some commenters stated that the Act only allows listing DPSs of species, and not subspecies, while other commenters stated that the Act allows designating DPSs of both species and subspecies.

Our Response: On May 14, 2012, we received a petition from the Pacific Legal Foundation, representing Bonner County, Idaho, and ISSA requesting that the Service delist the Selkirk caribou subpopulation (*Rangifer tarandus caribou*) from the List of Endangered and Threatened Wildlife. 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 southern Selkirk Mountains subpopulation of woodland caribou may not be a listable entity under our 1996 DPS policy (61 FR 4722, February 7, 1996). We acknowledged that our analysis in the 2008 5-year review did not consider the southern Selkirk Mountains subpopulation of woodland caribou relative to the appropriate taxon allowable under our 1996 DPS policy, the subspecies woodland caribou (*Rangifer tarandus caribou*). Thus, the Service initiated a review of the status of the woodland caribou subspecies to determine if delisting the southern Selkirk Mountains subpopulation of woodland caribou is warranted. Pursuant to that review, on May 8, 2014, we published in the **Federal Register** (79 FR 26504) a 12-month finding on the petition to delist the southern Selkirk Mountains population of woodland caribou (*Rangifer tarandus caribou*). In that 12-month finding, we stated that, upon review of the best available scientific and commercial information, we found that delisting the species was not warranted, but rather, a revision to the then current listed entity to define a DPS, consistent with our 1996 DPS policy, was appropriate. The Service acknowledges the commenter’s disagreement with the Service’s determination in that matter. Consistent with our determination, we proposed to amend the current listing of the southern Selkirk Mountains subpopulation of woodland caribou by defining the southern mountain caribou DPS, which includes the southern Selkirk Mountains subpopulation of woodland caribou, and we proposed to designate the status of the southern mountain caribou DPS as threatened under the Act.

The Service disagrees with the comment that only species, as opposed to subspecies, can be listed as DPSs under the Act. The Act defines a “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” (16 U.S.C. 1532(16)). The Service has long interpreted the Act to authorize designation of a DPS of both species and subspecies. The 1996 DPS Policy explains the following: “Restricting listings to full taxonomic species would render the Act’s definition of species, which explicitly includes subspecies and DPS’s of vertebrates, superfluous. Clearly, the Act is intended to authorize listing of some entities that are not accorded the taxonomic rank of species, and the Services are obliged to interpret this authority in a clear and reasonable manner” (61 FR 4722–4723; February 7, 1996). Consequently, the Service believes “that the authority to address DPS’s extends to species in which subspecies are recognized, since anything included in the taxon of lower rank is also included in the higher ranking taxon” (61 FR 4724; February 7, 1996). Courts have specifically found that listing a DPS of a subspecies is a permissible construction of the Act (*e.g.*, *Center for Biological Diversity v. U.S. Fish and Wildlife Service*, 274 Fed. Appx. 542, 545 *2 n. 5 (9th Cir. 2008) (unpublished) (“FWS has interpreted the ambiguous language of 16 U.S.C. 1532(16) to allow . . . listing [of a DPS of a subspecies]. Because that is a permissible construction of the statute, we must accord it deference.”); *Defenders of Wildlife v. Jewell*, 176 F. Supp. 3d 975, 1110–11 (D. Mont. 2016) (The Service may list a subspecies of a species as a DPS because “[e]very species necessarily subsumes its own subspecies, meaning that a DPS of a subspecies is also a DPS of the larger species. Moreover, the Act defines ‘species’ to include subspecies, making mere reference to a subspecies statutorily equivalent to referencing a species.”), appeal dismissed (9th Cir. 16–35466) (Oct. 7, 2016)).

(68) **Comment:** One commenter stated that because various closure orders and restrictions have not increased the presence of caribou in the continental United States, caribou in the continental United States should be declared extirpated and delisted. The commenter also stated that a population of woodland caribou did not exist in the United States at the time of listing in 1983, nor since listing, and that, while several caribou were released in

northeastern Washington and northern Idaho in the 1980s and 1990s, all released caribou either moved north into Canada due to lack of suitable habitat or died from predation.

Our Response: We acknowledge that, to date, recovery of the Selkirk Mountain woodland caribou subpopulation has not been achieved, and that although 103 caribou were augmented into the subpopulation in the 1980s and 1990s, this subpopulation is currently in decline. However, until recently, this population was relatively stable and was experiencing slight population growth. The augmentation efforts resulted in a fairly stable population (Wakkinen *et al.* 2010, p. 2) that was slowly increasing at a rate of approximately 7 percent (USFWS 2008, p. 18) in the early 2000s, reaching an estimated population size of 46 individuals in 2008 and 2009. It began declining in 2010 (DeGroot 2014, p. 5), likely due primarily to predation. We also acknowledge that, based on the winter survey efforts, woodland caribou occurrence, and use and distribution within the United States, appears limited. Based on the winter census surveys, from zero to four caribou have been observed in the United States since the surveys were initiated in 2001. However, while it appears few caribou currently utilize habitat within the United States, and that use appears close to the Canadian border, the surveys are only designed and intended to facilitate population trend monitoring. The winter surveys are not intended to, and do not, indicate how extensively (both numbers of individuals and/or distribution of those individuals) or when (*i.e.*, during other times of the season [*e.g.*, summer]) caribou may use habitat within the United States. Additionally, as individuals of this transboundary subpopulation still exist, we are unable to consider this subpopulation as extirpated. Furthermore, as this final rule concludes, the Selkirk Mountain subpopulation of woodland caribou is part of the larger southern mountain caribou DPS comprised of 15 extant subpopulations. Thus, the entire southern mountain caribou DPS (*i.e.*, all extant 15 subpopulations) would have to cease to exist before the Service could consider the DPS as extinct/extirpated. However, the purposes of the Act are to provide a means whereby the ecosystems upon which endangered and threatened species depend may be conserved. Although recovery planning is beyond the scope of this listing decision, we are committed to achieving

the conservation and recovery of the DPS, as is required by the Act.

At the time of listing, Scott and Servheen (1984, p. 27) documented two woodland caribou bulls utilizing habitat near Little Snowy Top and Upper Hughes Ridge in Idaho and Sullivan Creek in Washington. These two bulls were part of the transboundary subpopulation occupying habitat in the Selkirk Mountains of northeastern Washington, northwestern Idaho, and southern British Columbia, Canada. Furthermore, 60 woodland caribou were translocated into Ball Creek drainage, Boundary County, Idaho, from 1987 to 1990 (Compton *et al.* 1995, p. 492), and 32 were translocated into northeast Washington from 1996 to 1997 (Katnik 2002, p. 5). As explained above, these caribou were part of the transboundary Selkirk Mountain woodland caribou subpopulation that continues to persist today, and currently utilizes habitat within the United States on a seasonal basis. We expect that successful conservation and recovery of this subpopulation will result in substantially increased frequency, distribution, and use of habitat by caribou within the United States.

Regarding habitat suitability in the U.S. portion of the Selkirk Mountains, results of habitat suitability modeling conducted by Kinley and Apps (2007, pp. 24–25) indicate that there is sufficient high-quality caribou habitat within the U.S. portion of the Selkirk Mountains to support caribou foraging and reproduction. Thus, the availability of high-quality caribou habitat is not currently limiting the growth of this subpopulation. Rather, currently, we believe predation is the overriding proximate factor driving the decline of this population. Predator populations (primarily gray wolves and mountain lions) have very likely benefited from the increased abundance and distribution of prey species (deer, moose, elk) whose population growth and expansion in the Selkirk Mountains have likely benefited from the alteration and fragmentation of the older successional boreal forest through fires (both natural and manmade) and historical silvicultural practices to younger successional forests that these species require. Increased abundance and distribution of these other ungulate prey species (*i.e.*, deer, moose, elk) likely support higher numbers of predators endemic to this ecosystem (MCST 2005, pp. 4–5; Bowman *et al.* 2010, p. 464; McLellan *et al.* 2012, p. 859; Wittmer *et al.* 2005b, pp. 414–415) than would otherwise be naturally supported by the older successional boreal forests. Higher numbers of

predators translates to increased predation pressure on caribou due to the overlap of these other prey species habitats with caribou when the predators opportunistically encounter caribou in the course of searching for these other prey species. Thus, we believe that alteration and fragmentation of the boreal forest landscape is the primary driver that is currently supporting higher populations of alternate prey species that support higher number of predators that in turn have disproportionate predation impacts on caribou. It will likely require greater than 150 years (greater than 16 generations of caribou) of habitat protections for these early successional and fragmented forests to develop the old-growth habitat characteristics (vegetative structure and composition) (Stevenson *et al.* 2001, p. 1) that would begin to restore the natural predator-prey balance of these high-elevation, old-growth forests, and thus reduce predation pressure on caribou.

(69) **Comment:** One commenter stated that there is scientific evidence that refutes the connection of the Selkirk herd to the Canadian population of caribou, so delisting the southern Selkirk Mountains woodland caribou is not justified. The commenter stated, “every agency charged with tracking and maintaining caribou in the United States and Canada agrees that there is absolutely no interaction between the Southern Selkirk population and any others.”

Our Response: The best currently available science indicates that the southern Selkirk Mountain transboundary subpopulation of woodland caribou is largely isolated (geographically) from other woodland caribou subpopulations within the southern mountain caribou DPS (van Oort *et al.* 2011, pp. 221–222; Wittmer *et al.* 2005b, p. 414) due to human-caused habitat fragmentation and loss. Additionally, while we determined that the southern Selkirk Mountain subpopulation is not a listable entity under the Act in accordance with the Service’s DPS policy, we determined that the subpopulation is part of the larger southern mountain caribou DPS, which is listable under the Act in accordance with our DPS policy (79 FR 26504, May 8, 2014). Upon review of the status of and threats to the southern mountain caribou DPS, which includes the southern Selkirk Mountain caribou subpopulation, we determined that the DPS warrants listing under the Act as endangered.

(70) **Comment:** One commenter stated that maintaining secure caribou habitat in Canada and connectivity between the

United States and Canada is essential to the survival of the southern Selkirk Mountain subpopulation.

Our Response: Acknowledging the importance of maintaining secure and effective habitat connectivity for caribou in the Selkirk Mountains between the United States and Canada, the Service designated approximately 30,010 ac (12,145 ha) of critical habitat for caribou adjacent to the Canadian border in northeastern Washington and northwestern Idaho on November 28, 2012 (77 FR 71042). Additionally, Canada has protected 282,515 ac (114,330 ha) of Crown Lands from further timber harvest within the Selkirk Mountains to support woodland caribou conservation (77 FR 71042, November 28, 2012, see p. 77 FR 71066), and the Nature Conservancy of Canada has also purchased approximately 135,908 ac (55,000 ha) of the former Darkwoods property located within the Selkirk Mountains in British Columbia and halted all logging activities in woodland caribou habitat (77 FR 71042, November 28, 2012, see p. 77 FR 71066). The Nature Conservancy lands are essentially surrounded by the protected Crown Lands described above. Thus, the critical habitat designated in the United States adjacent to the border with Canada, together with the protected land adjacent to the border in Canada, comprises approximately 448,443 ac (181,478 ha) of secured and connected habitat that will be managed to support current and future caribou habitat use and movement between the United States and Canada, facilitating the conservation and recovery of the species.

Transplant/Recovery

(71) **Comment:** We received many comments pertaining to caribou recovery efforts both within the United States and Canada. Several commenters referred to successes and failures of Canada's past, current, and future recovery methods ranging from transplants, maternal penning, wolf sterilization, etc. A couple of commenters suggested that the recovery plan should be improved. One commenter referred to a recent statement from Environment Canada that "Recovery of all southern mountain caribou local population units is technically and biologically feasible." The commenter stated the Service should not scale back recovery efforts or send the message that mountain caribou have no chance of survival in the United States. One commenter suggested that recovery planning should consider identifying and setting aside "lowland matrix habitat" for caribou. One

commenter suggested that both the United States and Canada's recovery planning efforts are inadequate as evidenced by the continued declines of woodland caribou populations. The commenter suggested that additional habitat protections are needed, including banning all old-growth logging, increased restrictions on snowmobile access, and identification of matrix habitat. One commenter suggested that industrial land uses should be curtailed within the recovery area. One commenter expressed concern that the Service has never implemented a recovery plan. Another commenter stated that if we do not take recovery actions now, the last herd of caribou in the contiguous United States will be extirpated. Another commenter stated it is too late to recover caribou. Finally, one commenter requested that the counties potentially affected by recovery planning for caribou (*i.e.*, Boundary and Bonner Counties) be allowed to participate in the recovery planning.

Our Response: Recovery of the southern mountain caribou DPS is biologically feasible. Population augmentation, maternal penning, predator management, and habitat protection are, without limitation, examples of methods that can be utilized to achieve recovery of this DPS. Recovery is likely to require the implementation of a combination of methods. Although recovery planning is beyond the scope of this listing decision, we are committed to achieving the conservation and recovery of the DPS, as is required by the Act. To that end, the Service will actively coordinate and participate in the development of a recovery plan with our partners within the United States (*e.g.*, WDFW, IDFG, Tribes, and others) as well as our Canadian partners (*e.g.*, British Columbia's Ministry of Forests, Lands, and Natural Resource Operations; Ktunaxa Nation; and others). The recovery plan will identify management needs and population goals for achieving recovery. The Service will apprise the public regarding the development of a recovery plan, as well as specific opportunities to review and provide comment on a draft recovery plan prior to its finalization.

Regarding the comment that we have never implemented a recovery plan, we assume the comment pertains to woodland caribou. We first developed a recovery plan for the previously listed southern Selkirk Mountains subpopulation of woodland caribou in 1985 (USFWS 1985) and updated the recovery plan in 1994 (USFWS 1994a). Several of the 1994 recovery plan's recommended actions were

implemented. For example, one of the plan's objectives was to manage for an increasing population. To accomplish that objective, two separate augmentation efforts transplanted 103 caribou into the southern Selkirk Mountains in the 1980s and 1990s from source populations farther north in British Columbia, Canada. These augmentation efforts resulted in a fairly stable population (Wakkinen *et al.* 2010, p. 2) that was slowly increasing at a rate of approximately 7 percent (USFWS 2008, p. 18) in the early 2000s, reaching an estimated population size of 46 individuals in 2008 and 2009. It began declining in 2010 (DeGroot 2014, p. 5), likely due primarily to predation.

(72) **Comment:** One commenter stated that the Service should employ more stringent conservation measures, including restricting recreation use in the southern Selkirk Mountain recovery area.

Our Response: Management of lands within the recovery area is not under the purview of the Service. However, as is required by the Act, the Service is committed to the conservation and recovery of this DPS. To that end, we will work with our Federal, State, Tribal, and Canadian land management partners to develop and implement appropriate conservation plans, including recreational management plans, to facilitate the conservation and recovery of this DPS.

(73) **Comment:** One commenter, referencing several studies documenting separate caribou populations altering movements within their home range and/or temporarily abandoning portions of their home range during population increases and declines over many decades, suggested that full occupation of the southern Selkirk Mountain caribou subpopulation recovery area may similarly take many years as the subpopulation slowly expands (number of caribou in the subpopulation increases). Thus, the commenter suggested that planning must be initiated now to ensure successful recovery and full occupation of the U.S. Selkirk ecosystem occurs.

Our Response: Some of the available scientific information indicates there is some annual variation in caribou home range use and that portions of caribou home ranges may go unused for many years (Freddy 1974, p. 15; Kelsall (1968) and Skoog (1968) in Freddy 1974, p. 15). Although recovery planning is beyond the scope of this listing decision, we are committed to achieving the conservation and recovery of the DPS, as is required by the Act. To that end, the Service will actively coordinate and participate in the development of a

recovery plan with our partners within the United States (e.g., WDFW, IDFG, Tribes, and others) as well as our Canadian partners (e.g., British Columbia's Ministry of Forests, Lands, and Natural Resource Operations; Ktunaxa Nation; and others). The recovery plan will identify management needs and population goals for achieving recovery of this transboundary DPS.

(74) *Comment:* One commenter stated that even though caribou have been transported and reintroduced into the Selkirk Mountains of Idaho and Washington, nothing has changed; the transplanted caribou died naturally, were eaten by predators, or migrated back to Canada. The commenter stated that the caribou were reintroduced around the same time that grizzly bears were introduced into the area and that wolf packs are increasing in the area after being reintroduced, implying that predation by these species has hampered recovery efforts.

Our Response: We acknowledge that, to date, recovery of the Selkirk Mountain woodland caribou subpopulation has not been achieved, and that although 103 caribou were augmented into the subpopulation in the 1980s and 1990s, this subpopulation is currently in decline. However, until recently, this subpopulation was relatively stable and was experiencing slight population growth. The augmentation efforts resulted in a fairly stable population (Wakkinen et al. 2010, p. 2) that was slowly increasing at a rate of approximately 7 percent (USFWS 2008, p. 18) in the early 2000s, reaching an estimated population size of 46 individuals in 2008 and 2009. It began declining in 2010 (DeGroot 2014, p. 5), likely due primarily to predation.

Grizzly bears have not been reintroduced or augmented into the Selkirk Mountains in Idaho or Washington. The Selkirk Ecosystem currently supports a low density grizzly bear population, but the species has always occurred in this area. Likewise, gray wolves have not been reintroduced into the Selkirk Mountains in Idaho or Washington. Wolves were reintroduced into central Idaho and Yellowstone National Park in 1994, as nonessential experimental populations in accordance with the Service's final environmental impact statement (FEIS; USFWS 1994b, entire). The Service's FEIS identified that, over a timeframe of 15 years prior to 1994, wolves had naturally recolonized northwest Montana as a result of natural dispersal from Canada (USFWS 1994b, p. vi). Thus, it is likely that recolonization of the Selkirk Mountains by wolves is a result of

dispersal of wolves from farther north in Canada and/or northwest Montana. However, we acknowledge that currently predation by primarily wolves, but to a lesser extent grizzly bears and mountain lions, is likely affecting the status of caribou in the Selkirk Mountains. While recovery planning is beyond the scope of this listing decision, the Service will work with our partners within the United States (e.g., WDFW, IDFG, Tribes, and others) as well as our Canadian partners (e.g., British Columbia's Ministry of Forests, Lands, and Natural Resource Operations; Ktunaxa Nation; and others) to develop appropriate conservation measures addressing predation, among other threats, that potentially affect the continued existence of this DPS.

(75) *Comment:* One commenter questioned the use of Kinley and Apps (2007) to establish habitat management standards for caribou recovery because the document has not been subject to independent review. The commenter also suggested that fragmentation of the ecosystem by major transportation corridors and industrial-scale land uses must be considered when undertaking recovery planning.

Our Response: The Act requires the Service to make a decision based solely on the best scientific and commercial data information available. We consider Kinley and Apps (2007) to be the best available data. Please see our response to *Comment (43)* for an explanation of what information we may consider. Additionally, the analysis under Factor A in this rule identifies that major highways (e.g., Trans-Canada Highway 3) and industrial-scale land uses (e.g., mining) are threats to the continued existence of the southern mountain caribou DPS. Although recovery planning is beyond the scope of this listing decision, the Service will work with our partners within the United States (e.g., WDFW, IDFG, Tribes, and others) as well as our Canadian partners (e.g., British Columbia's Ministry of Forests, Lands, and Natural Resource Operations; Ktunaxa Nation; and others) to develop appropriate conservation measures addressing these threats, among other threats, that potentially affect the continued existence of this DPS (see our response to *Comment (74)*).

(76) *Comment:* One commenter questioned the Service's reliance on a private entity's (The Nature Conservancy) ownership of land towards contributing to the recovery of caribou in southern British Columbia, as there are no legal regulations requiring the private entity to manage the land for caribou.

Our Response: The Nature Conservancy of Canada (NCC) is Canada's leading national land conservation organization that acquires natural areas for the protection of their intrinsic value and for the benefit of mankind. The NCC has a long-documented and proven history (dating back to the 1960s) of acquiring, protecting, and managing natural areas, and has helped conserve more than 1.1 million ha (2.8 million ac) of ecologically significant land in Canada (NCC 2011, p. 20). The NCC has developed, has published, and is implementing the Darkwoods Conservation Area, Property Management Plan that contains these goals, among others, for woodland caribou (NCC 2011, p. 5): (1) Restore and maintain mountain caribou habitat and movement; (2) restrict human access to core mountain caribou and grizzly bear habitat; and (3) restore and maintain old-forest attributes in old-growth and young cedar-hemlock forests. The Service believes that it is appropriate to take NCC's conservation efforts towards caribou population restoration into account, along with the efforts of others, as appropriate.

Take

(77) *Comment:* One commenter stated that the legislative history explains that it was Congress's express intent to only regulate purely private behavior for those species facing an immediate risk of extinction and, thus, only apply the take prohibition to endangered species as a whole, and selectively for threatened species on an individual basis, provided that the Service determined it necessary and advisable. The commenter also stated that by proposing to list the southern mountain caribou DPS as threatened under the Act, the Service did not identify that section 9 take prohibitions would be extended to the DPS.

Our Response: In our May 8, 2014, proposed rule (79 FR 26504), we identified that the regulatory protections of section 9 of the Act (including take prohibitions) are largely the same for species listed as endangered or threatened (see p. 79 FR 26533). This is true for the following reason. In accordance with section 4(d) of the Act, by regulation, the Service may extend the protections afforded endangered species to species listed as threatened. Regulations codified at 50 CFR 17.31(a) extended the section 9 take prohibitions for endangered species to species listed as threatened, except where the Service develops and implements a 4(d) rule in accordance with regulations codified at 50 CFR 17.31(c), in which case the 4(d)

rule will contain all the prohibitions and exceptions applicable to the listed threatened species. In this case, for our proposed amended listing of the southern mountain caribou DPS as threatened, we did not propose to implement a 4(d) rule. Thus, all protections applicable to an endangered species (including take) were intended to be extended to the proposed amended listing of the southern mountain caribou DPS as threatened. However, this is a moot point, as pursuant to peer review, public comments, and our additional analysis of all the science pertaining to this DPS, we determined that the status of and threats to this DPS warrant listing it as endangered.

Critical Habitat

(78) Comment: We received numerous comments regarding critical habitat. Some commenters suggested that we were proposing to decrease the critical habitat designation from 375,562 acres (151,985 ha) to 30,010 ac (12,145 ha) in the May 8, 2014, proposed amended listing rule. Some commenters indicated agreement with our proposal to reaffirm the final critical habitat designation, while others disagreed with this proposal. Many commenters believe the critical habitat designation of 30,010 ac (12,145 ha) is inadequate and suggested the original proposal of 375,562 ac (151,985 ha) would be more appropriate. Several commenters believe the data used to delineate the 30,010 ac (12,145 ha) was not reliable due to lack of scientific observation and records, and the historical range of caribou in Idaho and Washington extended much farther than the current designation of critical habitat. One commenter implied that the reduction from the proposed acreage of 375,562 (151,985 ha) to the final acreage of 30,010 (12,145 ha) occurred because the Service determined that the southern Selkirk Mountains subpopulation did not qualify as a DPS unto itself but was part of the larger southern mountain caribou DPS composed of several subpopulations. Another commenter stated that the Service reduced the protection status of the southern Selkirk Mountain subpopulation (*i.e.*, changed from endangered to threatened) to facilitate reducing the recovery area by 90 percent, leaving most of the critical habitat in Washington State. Another commenter stated that in reducing the critical habitat recovery area by 90 percent, the Service essentially abandoned the goal of caribou recovery.

Our Response: On November 30, 2011, we published a proposed rule (76 FR 74018) to designate approximately 375,562 ac (151,985 ha) as critical

habitat for the southern Selkirk Mountains population of the woodland caribou. On November 28, 2012, we published a final rule (77 FR 71042) designating approximately 30,010 acres (12,145 ha) of critical habitat for the southern Selkirk Mountains population of woodland caribou. Here we are simply reaffirming that decision for the southern mountain caribou DPS; we are not altering (*i.e.*, increasing or decreasing) the acreage of critical habitat designated for the southern Selkirk Mountains woodland caribou subpopulation in the November 28, 2012, final rule. Please see that final rule for a full discussion and analysis of the rationale and reasons for the area and acreage of the final critical habitat designation.

In the November 28, 2012, final rule, we based our final designation of critical habitat for the southern Selkirk Mountains subpopulation of woodland caribou on the best available scientific information. In that final rule, we determined that the majority of habitat essential to the conservation of this subpopulation occurs 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. Regulations at 50 CFR 424.12(g) state that critical habitat shall not be designated within foreign countries or in other areas outside of U.S. 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. We designated as critical habitat approximately 30,010 ac (12,145 ha) of land within Boundary County, Idaho, and Pend Oreille County, Washington, that meet the definition of critical habitat (see our response to *Comment (15)* for the definition of critical habitat).

Additionally, the Act does not require designation of critical habitat throughout a listed species' historical range. The Act does require that we propose and finalize critical habitat designations concurrent with issuing proposed and final listing rules, respectively, to the maximum extent prudent and determinable. Designation of critical habitat for listed species may include areas within the geographical area occupied by the species at the time it is listed, as well as areas outside the geographical area occupied by the species at the time of listing. Areas occupied by the species at the time of listing and designated as critical habitat must contain the physical and biological features essential to the conservation of the species and which may require

special management considerations or protections. The Service may designate specific areas not occupied by the species at the time of listing, but only to the extent that such areas are determined essential for the conservation of the species.

Regarding occupancy at the time of emergency listing in 1983 (48 FR 1722, January 14, 1983) and final listing in 1984 (49 FR 7390, February 29, 1984), neither of these rules defined "occupancy." The original area of occupancy (375,562 ac (151,985 ha)) identified in the November 30, 2011, proposed critical habitat rule (76 FR 74018) was based on the 1983 emergency listing and 1984 final listing rule descriptions of "approximate area of utilization" (48 FR 1722) and "area of normal utilization" (49 FR 7390), which we equated to mean "occupancy at the time of listing." However, peer review comments submitted on the proposed critical habitat rule caused us to reexamine the basis of our analysis pertaining to the geographical area occupied by the species at the time of listing in 1983 and 1984. Based on the reexamination, we considered the studies conducted by Scott and Servheen (1984 and 1985) to be the most definitive with regard to establishing the area occupied by the southern Selkirk Mountain subpopulation of woodland caribou at the time of listing in 1983 and 1984. Scott and Servheen, who conducted their studies on this subpopulation of woodland caribou from 1983 to 1984, documented extensive use by caribou of habitat in British Columbia in drainages just north and adjacent to B.C. Highway 3. In contrast, they documented use of habitat in the United States by only two bull caribou located near Little Snowy Top and Upper Hughes Ridge in Idaho, and Sullivan Creek in Washington (Scott and Servheen 1984, p. 19). Caribou were not documented any farther south within Washington or Idaho during the course of helicopter and ground tracking surveys. Consequently, we determined that the area generally depicted in Scott and Servheen (1984, p. 27) as the area that was occupied by this subpopulation of caribou at the time they were listed in 1983 and 1984. The area actually designated as critical habitat for this subpopulation (30,010 ac (12,145 ha)) was adjusted for elevation and habitat use based on seasonal habitat suitability modeling (see 77 FR 71063–71064, November 28, 2012). The Service determined that areas within the United States not occupied by this subpopulation at the time of listing were not essential for the conservation of the

species (see 77 FR 71042, November 28, 2012, for a complete discussion on this topic).

Furthermore, designation of critical habitat for the southern Selkirk Mountains subpopulation of woodland caribou occurred well before we undertook the DPS analysis for this species. Thus, our determination that the southern Selkirk Mountains woodland caribou subpopulation was not a DPS had no bearing on the final critical habitat designation. However, because the southern Selkirk Mountains subpopulation is part of the southern mountain caribou DPS, and is the only subpopulation within this DPS that occurs within the United States and where we have the authority to designate critical habitat, we reaffirm our November 28, 2012, final designation of critical habitat for the southern Selkirk Mountains population of woodland caribou (77 FR 71042, November 28, 2012) as critical habitat for the southern mountain caribou DPS.

Finally, the final critical habitat designation of 30,010 ac (12,145 ha) did not affect or reduce the size of the existing recovery area (also known as the recovery zone) boundary, and did not signal that habitat outside the designated area is unimportant or may not contribute to the recovery of the species. As stated previously, the purposes of the Act are to provide a means whereby the ecosystems upon which endangered and threatened species depend may be conserved, to provide a program for the conservation of such endangered and threatened species, and to take such steps as may be appropriate to achieve the purposes of the treaties and conventions set forth in section 2(a) of the Act. Although recovery planning is beyond the scope of this listing decision, we are committed to achieving the conservation and recovery of the DPS, as is required by the Act. Please see our response to *Comment (15)* for more information on this topic.

(79) *Comment:* One commenter questioned why critical habitat was not designated in other States in the lower 48 States where caribou historically occurred (*i.e.*, Montana, Minnesota, Wisconsin, Michigan, Vermont, New Hampshire, and Maine). The commenter suggested the Service has not studied all historical caribou ranges and critical habitat should have been designated in these other States.

Our Response: See our analysis under Evaluation of the Southern Mountain Caribou as a Distinct Population Segment and our response to *Comment (78)*. Additionally, the range of the southern Selkirk Mountain

subpopulation of woodland caribou only encompasses the States of Washington and Idaho within the United States. While individuals of the woodland caribou subspecies historically occurred in other States within the United States, these individuals were most likely part of other subpopulations of woodland caribou, separate from the southern Selkirk Mountain woodland caribou subpopulation.

(80) *Comment:* One commenter asserted that, if the Service maintains the listing, it must analyze the impacts that the listing has on communities, residents, and businesses before regulating take or critical habitat.

Our Response: Section 4 of the Act (16 U.S.C. 1533), and its implementing regulations at 50 CFR 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, the Secretary may determine whether any species is an endangered or threatened species because of 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; or (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. The Act does not provide any language allowing the consideration of economic impacts when making listing decisions for species; listing decisions must be made solely on the basis of the best scientific and commercial data available (16 U.S.C. 1533(b)(1)(A)) pertaining to the biological status of and threats to the persistence of the species in question. The Act does require, however, the consideration of economic impacts when making decisions to designate critical habitat for listed species.

Relative to this DPS, we completed an economic analysis on the designation of critical habitat for the southern Selkirk Mountains subpopulation of woodland caribou in accordance with section 4(b)(2) of the Act. We announced availability of the draft economic analysis for review, and reopened a 30-day public comment period to take comment on the draft economic analysis for the proposed designation of critical habitat, on May 31, 2012 (77 FR 32075). We published the final economic analysis, which incorporated comments received on the draft economic analysis during the public comment period,

concurrently with the final rule designating critical habitat for southern Selkirk Mountains subpopulation of woodland caribou on November 28, 2012 (77 FR 71042). The May 8, 2014, proposed rule (79 FR 26504) to amend the listing of the southern Selkirk Mountains subpopulation of woodland caribou to the southern mountain caribou DPS stated that we are “reaffirming” our November 28, 2012, final critical habitat designation. As such, the final economic analysis completed for the designation of critical habitat in 2012 (77 FR 71042, November 28, 2012) is incorporated by reference into this final determination for the southern mountain caribou DPS. Please see the November 28, 2012, final critical habitat rule (77 FR 71042) for an analysis of the economic impacts associated with the designation of critical habitat that is applicable to this DPS listing. Subsequent to that final critical habitat rule, and the reopening of the comment period on April 19, 2016 (81 FR 22961), for the final critical habitat rule in response to the March 23, 2015, court order to address a procedural error, the Service has not received any additional or new economic information or data. Additionally, because we are simply “reaffirming” a critical habitat designation for which an economic analysis was completed, it is not necessary to complete a new economic analysis.

(81) *Comment:* One commenter suggested that because the take prohibition does not apply to threatened species, it is inappropriate to conduct an incremental effects analysis for assessing economic impacts stemming from critical habitat designations for species listed as, or proposed to be listed as, threatened. Several commenters stated that an economic impact analysis for the 30,010 ac (12,145 ha) of critical habitat in Boundary and Pend Oreille Counties was not included in the proposed rule. One commenter stated that because critical habitat designations must be made “on the basis of the best scientific data available and after taking into consideration the economic impact, the impact on national security, and any other relevant impact, of specifying any particular area as critical habitat” (16 U.S.C. 1533(b)(2)), the Service should include an economic impact analysis in the final rule. Several commenters referenced the economic analysis commissioned by Bonner County and Idaho State Snowmobile Association (ISSA), stating that the analysis demonstrates the detrimental effect

continued regulation will have on the local economy, in contrast to the Service's economic analysis.

Our Response: Regarding the take prohibition for threatened species, refer to our response to *Comment (77)* that discusses the applicability of take prohibitions to endangered and threatened species. Regarding the economic analysis, see our response to *Comment (80)*. Furthermore, we disagree that it is inappropriate to conduct incremental effects analyses when designating critical habitat for threatened species. The Act does not require or stipulate that critical habitat analyses should be conducted differently for endangered species versus threatened species. The Act simply requires that economic impacts be considered when making critical habitat designations for endangered or threatened species, but does not define or describe how such analyses should be conducted or what should be considered within the context of the analysis.

Regarding the economic analysis commissioned by Bonner County and ISSA, the analysis was based on the impacts to the economies within the area proposed for designation as critical habitat (approximately 375,562 acres (151,985 ha)) and not on the area actually designated as critical habitat (approximately 30,010 acres (12,145 ha)), a reduction of 345,552 ac (139,839 ha). Additionally, the area designated as critical habitat is comprised entirely of National Forest lands (CNF, IPNF, and the Salmo-Priest Wilderness Area); there are no non-Federal (*i.e.*, State or private) lands contained within the area designated as critical habitat. Within the area designated as critical habitat, the CNF and IPNF have routinely conducted section 7 consultations with the Service on the effects of their actions upon woodland caribou (including their habitat) since the species was listed under the Act in 1984 (emergency listing in 1983, final listing in 1984). Consequently, the only economic impacts that would accrue due solely to the critical habitat designation are minor and incremental to Federal agencies (*i.e.*, CNF, IPNF) resulting from additional administrative costs associated with section 7 consultation to consider the effects of Federal actions upon critical habitat.

(82) Comment: One commenter stated that the Service should exclude any areas from critical habitat designation where the burden associated with the designation would exceed the benefits. The commenter suggested the economic analysis commissioned by Bonner County and ISSA demonstrated the

significant costs to local communities that the Service should consider when determining whether certain areas should be excluded from critical habitat designation.

Our Response: Section 4(b)(2) of the Act allows the Secretary to exclude an area from designation as critical habitat if he determines that the benefits of such exclusion outweigh the benefits of specifying such area as part of the critical habitat, unless he determines, based on the best scientific and commercial data available, that the failure to designate such area as critical habitat would result in the extinction of the species concerned. As stated previously, in the May 8, 2014, proposed amended listing rule (79 FR 26504), we are "reaffirming" our November 28, 2012, final critical habitat designation (77 FR 71042) wherein the Secretary did not exclude any areas from designation as critical habitat. Thus, in this final listing determination for the southern mountain caribou DPS, no areas were excluded from

designation as critical habitat. Regarding the economic analysis commissioned by Bonner County and ISSA, see our response to *Comment (81)*, and for a more complete discussion on exclusions, refer to the Exclusions section of our final critical habitat designation (77 FR 71042, November 28, 2012, see p. 77 FR 71076).

(83) Comment: One commenter stated that it is inappropriate to "reaffirm" critical habitat that was designated for the southern Selkirk Mountains population of woodland caribou (*i.e.*, previously listed entity) to the southern mountain caribou DPS, as the newly listed DPS is not the same listed entity upon which the critical habitat designation was based. Another commenter stated the Service cannot accurately determine or establish critical habitat for the southern mountain caribou DPS without listing them as endangered, or before the International Recovery Plan, contracted out to the Tribe by the Service, is completed.

Our Response: The southern mountain caribou DPS is composed of 15 extant subpopulations, including the southern Selkirk Mountains subpopulation. All subpopulations, except the southern Selkirk Mountains subpopulation, occur entirely within British Columbia, Canada; the southern Selkirk Mountains subpopulation is a transboundary population that occurs in both the United States (in northeastern Washington and northwestern Idaho) and in British Columbia, Canada. Regulations at 50 CFR 424.12(g) state that critical habitat shall not be

designated within foreign countries or in other areas outside of U.S. 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. Thus, the only critical habitat designation that can be considered for the southern mountain caribou DPS is the same area that met the definition of critical habitat for the southern Selkirk Mountains subpopulation.

On November 28, 2012, we published a final rule (77 FR 71042) designating critical habitat for the southern Selkirk Mountains subpopulation of woodland caribou that we found to meet the definition of critical habitat as described in our response to *Comment (15)*. 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, and that may require special management considerations or protection. 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 formerly listed southern Selkirk Mountains subpopulation of woodland caribou, and the geographical area in the United States occupied by this transboundary subpopulation of woodland caribou at the time of listing remains unchanged, the resulting area in the United States that meets the definition of critical habitat for the southern mountain caribou DPS 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 November 28, 2012, final critical habitat designation (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 that should be included. Therefore, we 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.

Relative to designating critical habitat for endangered versus threatened species, section 4(a)(3)(A)(i) of the Act requires the designation of critical habitat for both endangered and

threatened species. Also, the Service need not wait for completion of a recovery plan before making a critical habitat determination. To the contrary, section 4(a)(3) of the Act requires designation of critical habitat, to the maximum extent prudent and determinable, concurrently with making a listing determination. Section 4(f) of the Act requires the Service to develop recovery plans for listed species, unless the plans will not promote the conservation of the species; the Act does not specify a time constraint for development of recovery plans.

(84) Comment: One commenter suggested that comments from the State of Idaho objecting to the designation of State endowment lands, managed by the Idaho Department of Lands, as critical habitat, as was originally proposed, must be viewed in light of the State's fiduciary responsibility to maximize the return from the management of said lands to the trust beneficiaries.

Our Response: The area designated as critical habitat was based on the area occupied by caribou at the time of listing as depicted by Scott and Servheen (1984, p. 27), and does not contain any State endowment lands. Furthermore, the decision not to designate any other areas not occupied by caribou at the time of listing (*i.e.*, the State endowment lands contained within the recovery zone boundary) was based on our determination that such lands were not essential to the conservation of the species. Because we determined that the area administered as State endowment lands was not essential to the conservation of the species, the State's comments pertaining to the economic importance of the area to the State or economic impacts stemming from critical habitat designation of said area had no bearing on our final decision. See the final critical habitat determination (77 FR 71042, November 28, 2012) for a full discussion and analysis of the rationale and reasons for the area and acreage of the final critical habitat designation.

(85) Comment: One commenter stated that designating 30,010 ac (12,145 ha) as critical habitat will preclude other uses, including recreation and resource conservation activities, with no real benefit to caribou.

Our Response: The designation of critical habitat does not affect land ownership or establish a wilderness area, preserve or wildlife refuge, nor does it open or restrict an area to human access or use. In this case, the area designated as critical habitat for the southern mountain caribou DPS is entirely composed of Federal land, the majority of which is situated with the

Salmo-Priest Wilderness Area in Washington State, and the remainder is either administered by the CNF or the IPNF. Both the CNF and IPNF have LRMPs that contain standards and guidelines addressing control and management of recreational and resource conservation activities within caribou habitat, both within the area designated as critical habitat as well as the existing Selkirk Mountain Caribou Recovery Zone, in which the designated critical habitat is contained. Thus, through implementation of their LRMPs, both the CNF and IPNF currently implement extensive measures to protect caribou and their habitat. We have no information that would indicate this designation of critical habitat will result in the closure of areas to public access or result in restrictions to currently permissible activities, including recreation and resource conservation activities.

(86) Comment: One commenter stated that closing "these areas" will prevent timber and wildfire management, and adversely affect the ability of the U.S. Border Patrol (USBP) to do its job along the Canadian border.

Our Response: We assume the commenter is referring to the designation of critical habitat in the Selkirk Mountains for the southern mountain caribou DPS when referencing "these areas." See our response to *Comment (85)*.

Regarding USBP activities, the designation of critical habitat in the Selkirk Mountains for the southern mountain caribou DPS would not restrict, regulate, or determine the ability of the USBP to operate in close proximity to the U.S. border. Within caribou habitat, the USBP operates, for the most part, on National Forest System lands and its existing roads and trails. The March 31, 2006, Memorandum of Understanding (MOU) between the Secretary of the Interior, Secretary of Homeland Security, and Secretary of Agriculture Regarding Cooperative National Security and Counterterrorism Efforts on Federal Lands Along the U.S. Borders commits the agencies to preventing illegal entry into the United States, protecting Federal lands and natural and cultural resources, and where possible, preventing adverse impacts associated with illegal entry by cross-border-violators (CBVs). The intent of the MOU is to provide consistent goals, principles, and guidance related to border security such as law enforcement operations; tactical infrastructure installation; utilization of roads; minimization and/or prevention of significant impact on or impairment of

natural and cultural resources; and implementation of the Wilderness Act, Endangered Species Act, and other related environmental laws, regulations, and policies across land management agencies. The MOU is also intended to facilitate coordination and sharing information on threat assessments and other risks, plans for infrastructure and technology improvements on Federal lands, and operational and law enforcement staffing changes. Through this 2006 MOU, and local groups such as the Spokane Sector Borderlands Management Task Force, the three departments are cooperating to understand, respect, and accomplish their respective missions. The MOU includes provisions for Customs and Border Protection (CBP) vehicle motor operations on existing public and administrative roads and/or trails and in areas previously designated by the land management agency for off-road vehicle use at any time, provided that such use is consistent with presently authorized public or administrative use. It also includes provisions for CBP requests for access to additional Federal lands (*e.g.*, areas not previously designated by the land management agency for off-road use) for such purposes as routine patrols, nonemergency operational access, and establishment of temporary camps or other operational activities. The MOU states, "Nothing in this MOU is intended to prevent CBP-BP agents from exercising existing exigent/emergency authorities to access lands, including authority to conduct motorized off-road pursuit of suspected CBVs at any time, including in areas designated or recommended as wilderness, or in wilderness study areas when, in their professional judgment based on articulated facts, there is a specific exigency/emergency involving human life, health, safety of persons within the area, or posing a threat to national security, and they conclude that such motorized off-road pursuit is reasonably expected to result in the apprehension of the suspected CBVs." Accordingly, there is no verifiable information that would suggest the designation of critical habitat in the Selkirk Mountains for the southern mountain caribou DPS would affect CBP operations.

(87) Comment: One commenter stated that because the vast majority of habitat for this DPS is found in Canada, the commenter agreed with our use of existing management and protection of caribou habitat in Canada in our critical habitat determination for this DPS relative to the United States.

Our Response: We acknowledge this comment.

(88) *Comment:* One commenter requested that the Service consider the needs of long-time local residents of Boundary, Bonner, and Pend Oreille Counties to log, hunt, and forage for their subsistence when deciding what land is needed to preserve the woodland caribou as a species.

Our Response: In the November 28, 2012, final critical habitat determination (77 FR 71042), we based our final designation of critical habitat for the southern Selkirk Mountains subpopulation of woodland caribou on the best available scientific information, including comments and information received from peer reviewers, Federal and State agencies, the Kootenai Tribe of Idaho, the Kalispel Tribe of Indians, and the general public, and after taking into consideration, as required by section 4(b)(2) of the Act, the economic impact, the impact on national security, and any other relevant impact of the critical habitat designation. All of the areas designated as critical habitat in the November 28, 2012, final critical habitat determination (77 FR 71042), as reaffirmed in this final rule, contain the physical or biological features (PBFs) and habitat characteristics essential to conserve the species. Again, the designation of critical habitat does not affect land ownership or establish a wilderness area, preserve or wildlife refuge, nor does it open or restrict an area to human access or use. Refer to the *Criteria Used to Identify Critical Habitat* section in the November 28, 2012, final critical habitat determination (77 FR 71042, see pp. 77 FR 71071–71073) for more information.

(89) *Comment:* One commenter asserted that the final critical habitat rule is arbitrary, capricious, and contrary to the Act because the Service failed to demonstrate how protecting the area that supports the existing small population of caribou in the southern Selkirk Mountains will allow the population to expand in size and geographic distribution, which the Service has repeatedly stated, is necessary for recovery. Another commenter stated that there is no support in the record to show that management of Canadian lands plus the small amount of critical habitat in the United States is sufficient to recover the southern Selkirk Mountains caribou subpopulation.

Our Response: Our critical habitat designation is consistent with the purposes of the Act. The Service can only designate critical habitat within the United States (50 CFR 424.12(g)) that we consider to have been occupied at the time of listing, and that provides the PBFs essential to the conservation of the

species and that may require special management considerations or protections; the Service may also designate areas outside the geographical area occupied by the species at the time of listing provided that such areas are determined essential for the conservation of the species (see our response to *Comment (15)*).

In the November 28, 2012, final critical habitat determination (77 FR 71042), which the Service proposed to reaffirm in our May 8, 2014, proposal to amend the listing of the southern mountain caribou DPS (79 FR 26504), the Service based our final designation of critical habitat for the southern Selkirk Mountains subpopulation of woodland caribou on the best available scientific information. As we stated in our final critical habitat rule (77 FR 71042, November 28, 2012, see p. 77 FR 71064), our analysis of that information led us to conclude that, for reasons not fully understood, this subpopulation of caribou appears to be primarily dependent upon the availability of habitat in British Columbia. We concluded that the majority of habitat essential to the conservation of the southern Selkirk Mountains subpopulation of woodland caribou occurs in British Columbia, Canada, and the U.S. portion of the habitat used by the caribou makes an essential contribution to the conservation of the species. We determined that the 30,010 ac (12,145 ha) designated as critical habitat within the Selkirk Mountains in the United States, combined with the amount of habitat protected and managed for woodland caribou within Canada, meets the amount of habitat recommended to be secured and enhanced in the 1994 recovery plan (443,000 ac, (179,000 ha)) to support a recovered population (USFWS 1994, pp. 28, 30–31). As we noted in the final critical habitat rule (77 FR 71042, November 28, 2012, see p. 77 FR 71066), Canada has protected 282,515 ac (114,330 ha) of Crown Lands from further timber harvest within the Selkirk Mountains to support woodland caribou conservation (DeGroot 2012, pers. comm.), and the NCC has purchased and is managing approximately 135,908 ac (55,000 ha) of the former Darkwoods property located within the Selkirk Mountains in British Columbia for caribou (The NCC 2011, p. 4; DeGroot 2012, pers. comm.). These acres in Canada, when added together with the U.S. acres of designated critical habitat, provides approximately 448,443 ac (181,478 ha) of habitat protected within the Selkirk Mountains for woodland caribou conservation. Additionally,

areas in the United States designated as critical habitat for the species are immediately adjacent to, and contiguous with, the Crown Lands protected in Canada for woodland caribou conservation. The protection of these connected habitats in the United States and British Columbia is intended to facilitate the expansion of this subpopulation (both geographic distribution and number of individuals) as well as continued woodland caribou movement and seasonal habitat use and other behaviors that this population currently and historically exhibited.

Finally, while recovery planning is outside the scope of this listing decision, we are committed to achieving the conservation and recovery of the DPS, as is required by the Act. The Service also acknowledges that the existing 1994 recovery plan that is specific to the southern Selkirk Mountains subpopulation of this DPS is outdated. The Service will actively coordinate and participate in the development of a recovery plan with our partners within the United States (e.g., WDFW, IDFG, Tribes, and others) as well as our Canadian partners (e.g., British Columbia's Ministry of Forests, Lands, and Natural Resource Operations; Ktunaxa Nation; and others) to address recovery of this DPS. The Service will apprise the public regarding the development of a recovery plan, as well as specific opportunities to review and provide comment on a draft recovery plan prior to its finalization.

(90) *Comment:* One commenter referred to a 2009 U.S. District of Arizona court case involving critical habitat for the jaguar (*Panthera onca*) where the court remanded a decision by the Service not to designate critical habitat in the United States for the jaguar (*Center for Biological Diversity v. Kempthorne*, 607 F.Supp.2d 1078 (D. Ariz 2009); CV 07–372 TUC JMR; CV 08–335–TUC JMR), and suggested a similar reasoning found by the court to remand the decision to the Service is applicable to our final critical habitat determination for caribou. The commenter also referred to another court case (*Center for Biological Diversity v. Army Corps of Engineers*, CV 03–29–M–DWM (D. Mont. May 25, 2005)) wherein the Plaintiff prevailed in its challenge to the Service's decision not to designate unoccupied habitat as critical habitat for the Kootenai River white sturgeon (*Acipenser transmontanus*; sturgeon)."

Our Response: The underlying facts of the final critical habitat determination for caribou are dissimilar from the referenced court cases. In the jaguar case, the Service did not designate

critical habitat in the United States that was occupied by the species when it was listed under the Act. Essentially, in the jaguar case, the Service determined that even though a few jaguars were likely utilizing habitat in the United States on, at least, an intermittent basis, designation of critical habitat was not prudent because the small amount of habitat (constituting potentially less than 1 percent of the jaguar's current range) potentially used by the species in the United States did not contribute significantly to their survival or recovery; the Service determined there were no areas in the United States, occupied by the species at the time of listing, that were essential to the conservation of the species. The court found these reasons to be not compelling and remanded the decision to the Service. In contrast, in the final caribou critical habitat determination (77 FR 71042, November 28, 2012), the Service designated critical habitat in the United States for the species in the area that was occupied by the species at the time it was listed.

In the sturgeon case, plaintiffs argued that the area designated as critical habitat did not contain the primary constituent elements (now referred to as the physical and biological features (PBFs)) identified in the final critical habitat rule and suggested that the Service should designate as critical habitat areas that were currently not known to be occupied by sturgeon but that contained the PBFs; the lacking PBFs pertained to spawning substrate. The judge agreed and remanded the case to the Service for reconsideration. It should be noted that when the area was originally designated as critical habitat the Service believed the area did, in fact, provide the spawning substrate PBF. However, through new science generated subsequent to the final critical habitat determination, the Service learned that the designated critical habitat did not provide spawning substrate. Consequently, the Service re-evaluated the critical habitat determination, and designated the area unoccupied by sturgeon, but available to them as critical habitat (73 FR 39506, July 9, 2008). In contrast to facts the surgeon case, the area designated as critical habitat for caribou provides the identified PBFs for caribou. Please refer to the final critical habitat determination for a description of the PBFs (77 FR 71042, November 28, 2012, see p. 77 FR 71070).

In our final critical habitat rule (77 FR 71042, November 28, 2012), we determined that the 30,010 ac (12,145 ha) of occupied, designated critical habitat in the United States made an

essential contribution to the species conservation when added to the approximately 418,423 ac (169,329 ha) of caribou habitat protected in Canada. Furthermore, the caribou habitat designated as critical habitat in the United States is adjacent to and contiguous with habitat in Canada, such that movement and habitat use by individuals of this population between the United States and Canada will be facilitated. We also determined that currently unoccupied habitat in the United States, which was historically part of the species' range, was not essential for the species' conservation because, as we stated in that final rule, the best available scientific information indicates that the range of this population appears to have shifted northward. For reasons not fully understood, the southern Selkirk Mountains population of woodland caribou continues to utilize habitat in Canada to a greater extent than would otherwise be expected based on habitat suitability modeling.

(91) *Comment:* One commenter challenged the Service's statement that the 1994 recovery plan is outdated and no longer represents the best available science regarding the essential conservation needs of the southern Selkirk Mountains population of caribou relative to identifying the essential conservation needs of the Southern Selkirk Mountain population, which the Service made during the process of identifying critical habitat for the population. The commenter asserted that the Service's statement is contradicted by the Service's 2008 5-year review that stated, "the contracting range of the South Selkirk population, the small number of animals in the population, and the limited genetic exchange between the South Selkirk population and adjacent populations threaten population viability" and a Service-issued 2008 biological opinion stating that the primary conservation needs for this caribou population still include expanding the size and distribution of the existing population; expanding both size and distribution of southern Selkirk Mountain caribou population is stated as objectives in the 1994 recovery plan.

Our Response: We acknowledge that the existing southern Selkirk Mountain caribou subpopulation is small, occupies a limited geographic area, and is currently declining. We also acknowledge that increasing the size and distribution of this subpopulation are objectives of the 1994 recovery plan. However, the 1994 recovery plan identifies these as "interim" objectives, and states that development of specific

long-term recovery goals at that time were not appropriate due to the inadequacy of existing ecological data (Service 1994a, p. 27). Since development of the 1994 recovery plan, much new scientific information has been learned about this subpopulation, including, but not limited to, caribou habitat use and movement patterns and predation threats. Therefore, the 1994 recovery plan, which is specific to the southern Selkirk Mountains subpopulation of this DPS, is outdated. Additionally, because the southern Selkirk Mountains subpopulation has now been correctly identified as composing part of the larger southern mountain caribou DPS, the Service, as is required by the Act, will actively coordinate and participate in the development of a recovery plan with our partners within the United States (e.g., WDFW, IDFG, Tribes, and others) as well as our Canadian partners (e.g., British Columbia's Ministry of Forests, Lands, and Natural Resource Operations; Ktunaxa Nation; and others) to address recovery of the southern mountain caribou DPS.

(92) *Comment:* One commenter stated that in the final critical habitat determination, the Service arbitrarily disavowed every recovery plan objective except the objective of securing 443,000 ac (179,274 ha), which the commenter alleged amounts to the Service's "cherry-picking" a single objective. Another commenter stated that because the Service does not know where the 443,000-acre figure stems from, the Service's reliance on it as the single objective to achieve recovery of the subpopulation is arbitrary and capricious.

Our Response: We did not disavow any specific individual objective of the 1994 recovery plan in our final critical habitat determination (77 FR 71042, November 28, 2012). We did state, however, that the objectives are outdated and need revising to reflect the current needs of the southern Selkirk Mountain subpopulation, specifically with regard to its biology and habitat. The 1994 recovery plan (which is specific to the southern Selkirk Mountain subpopulation) acknowledges that this subpopulation is limited in size and distribution. Our final critical habitat determination addresses several of the 1994 recovery plan objectives: Securing and managing at least 443,000 ac (179,274 ha) of habitat for caribou to facilitate an increase in the abundance of individuals within the subpopulation, and allowing for the expansion of the subpopulation's distribution. The best available scientific information indicates that this

expansion is most likely to occur in Canada because, as we stated in the final determination, for reasons not fully understood, the range of this subpopulation appears to have shifted northward, and, thus, the majority of habitat essential to the conservation of this subpopulation now occurs in British Columbia, Canada. Again, the 1994 recovery plan is specific to the southern Selkirk Mountain subpopulation of the southern mountain caribou DPS. Although recovery planning is beyond the scope of this listing decision, the Service will actively coordinate and participate in the development of a recovery plan with our partners within the United States (e.g., WDFW, IDFG, Tribes, and others) as well as our Canadian partners (e.g., British Columbia's Ministry of Forests, Lands, and Natural Resource Operations; Ktunaxa Nation; and others) to address recovery of the southern mountain caribou DPS.

(93) *Comment:* One commenter stated that the Service has noted that the Kinley and Apps (2007) habitat model showed that one of the largest blocks of high-priority caribou habitat in the Selkirk Ecosystem is centered on IDL property and is considered to contribute significantly to caribou habitat within the Selkirk Ecosystem. This same commenter stated that simply because a species has declined and is no longer using former habitat does not support the conclusion that the area is not essential for recovery.

Our Response: Although Kinley and Apps (2007, pp. 24–26) identified highly suitable caribou habitat throughout the Selkirk Ecosystem within the existing recovery zone within the United States, for reasons not fully understood, the individuals of the southern Selkirk Mountains subpopulation of woodland caribou continue to utilize habitat in Canada to a greater extent than would otherwise be expected. However, not designating critical habitat in certain areas does not signal that habitat outside the designated area is unimportant or may not contribute to the recovery of the species. Please see our response to *Comment (15)*.

(94) *Comment:* One commenter stated that just weeks prior to reducing the critical habitat designation, a draft of the Service's final rule indicated that even if some areas proposed for designation as critical habitat were not occupied by the species at the time of listing, "the determination that the areas being designated in this final rule are essential to the conservation of the species would still apply." The commenter also stated that peer reviewers likewise agreed that

the proposed critical habitat designation was sufficient for conservation of the species, and just suggested using the Kinley and Apps (2007) and Wakkinen and Slone (2010) habitat and corridor analyses to refine the designation.

Our Response: A draft final rule is not the final agency decision and simply reflects debate and deliberation within the Service in the course of determining what, if any areas, not occupied by the species at the time of listing were essential to the conservation of the species. Ultimately, the Service determined, as explained in the final critical habitat rule (77 FR 71042, November 28, 2012), that these areas not occupied by the species at the time of listing were not essential for the conservation of the species (see pp. 77 FR 71063–71067).

Regarding the peer reviewers' comments that the areas proposed for designation were sufficient, they suggested that we refine our proposal using Kinley and Apps (2007) and Wakkinen and Slone (2010) to better reflect newer science pertaining to caribou habitat use and movement patterns. However, the peer reviewers did not indicate that the area proposed for designation was essential to the conservation of the species; they simply indicated it was sufficient, *i.e.*, it was big enough. Stating that a certain size area is sufficient does not inform whether or not the size of the area itself is essential. In order for an area that was unoccupied by the species at the time of listing to be designated as critical habitat, it must be considered essential for the conservation of the species, not simply sufficient for their conservation. See the final critical habitat rule at pages (77 FR 71063–71067) for an in-depth analysis of why the unoccupied area was determined to be not essential for the conservation of the species.

(95) *Comment:* One commenter stated that the Service used the status of caribou habitat management and protection in Canada to justify its decision to reduce critical habitat in the United States, after-the-fact, demonstrating post hoc rationalization.

Our Response: The final critical habitat determination was based on the area in the United States that was occupied at the time of their listing under the Act in 1983, and on the fact that we determined that no other unoccupied areas in the United States were essential for caribou conservation for the reasons stated in the final rule. Refer to the final rule for a thorough discussion of this topic (see 77 FR 71063–71067, November 28, 2012). Through our longstanding coordination with Canada on efforts to recover the

southern Selkirk Mountain subpopulation, we had a general understanding that Canada was actively engaged in securing and developing management plans for caribou habitat in Canada. However, in order to conduct a thorough review during the critical habitat analysis, the Service necessarily had to clarify the nature and the status of caribou habitat protection and management within Canada, which required the Service to obtain information as detailed as possible on the status of caribou habitat management within Canada within the time constraints of the critical habitat rulemaking process. Through this improved understanding of caribou habitat management and protection in Canada, we realized that the acreage designated as critical habitat in the United States, when added to the acreage protected and managed for caribou in Canada, essentially equaled the amount of habitat recommended to be secured and enhanced in the 1994 recovery plan to support a recovered population.

(96) *Comment:* One commenter stated that the 1994 recovery plan clearly did not intend for 95 percent of the 443,000 ac (179,274 ha) of habitat protected and managed for caribou to be in Canada, noting that approximately 53 percent of the caribou recovery zone lies in the United States, and approximately 75 percent of the caribou habitat identified at that time (331,150 ac (134,011 ha) of the 443,000 ac (179,274 ha)) was within the United States.

Our Response: Although the 1994 recovery plan envisioned that more of the recovery of this subpopulation would occur within the United States, for reasons not fully understood, the range of southern Selkirk Mountain subpopulation appears to have shifted northward and caribou within this subpopulation continue to utilize habitat in Canada to a greater extent than was anticipated. As we noted in our final critical habitat determination (77 FR 71042, November 28, 2012), there was speculation in the 1980s that caribou may be abandoning the U.S. portion of their range because caribou sightings in the United States had declined since the 1970s (Scott and Servheen 1984, p. 16; 1985, p. 27). Although much of the area identified by the 1994 recovery plan as occurring in the United States is federally managed by the USFS for this subpopulation of caribou and contains one or more of the PBFs of critical habitat, individuals of this subpopulation continue to make greater use of habitat in Canada than would be predicted (based on available habitat in the United States as identified

in the Kinley and Apps (2007) modeling study). Thus, as we stated in our final critical habitat determination, we no longer find the extensive areas initially identified for the recovery of this subpopulation within the United States to be essential to the conservation of the species. Rather, the best scientific information available indicates that vast majority of essential habitat for this subpopulation now occurs in Canada. This information will be used to inform the recovery planning process with our partners for the southern mountain caribou DPS, which is outside the scope of this listing process.

(97) *Comment:* One commenter stated that habitat protections for caribou in Canada do not negate the need for critical habitat designation in the United States, because habitat protections in Canada are not the functional equivalent of critical habitat designation in the United States.

Our Response: After review of the best available science, we determined that 30,010 ac (12,145 ha) of habitat in the United States meet the definition of critical habitat for caribou, and that these designated acres of critical habitat in the United States will contribute to the conservation of the species. See our November 28, 2012, final rule designating critical habitat (77 FR 71042) for more information.

(98) *Comment:* One commenter stated that the Service did not indicate in the final critical habitat rule how much, if any, of the Crown Lands (282,515 ac (114,330 ha)) or Nature Conservancy lands (135,908 ac (55,000 ha)) protected in Canada contain the primary constituent elements essential for recovery, and did not assess threats related to roads, human access, or predation within those lands. The commenter stated that, because the Canadian lands are not subject to the Act's section 7 requirements and are not the functional equivalent of critical habitat, the Service cannot rely on the Canadian lands for conservation of caribou. The commenter also stated that Canadian biologists indicate that status quo management will lead to a continuing decline of mountain caribou, and that successful recovery of southern caribou populations may require greater efforts. The commenter also offered the following direct quote from the Service's 5-year review: "as the southernmost mountain caribou population and the last remaining population within the [United States], the South Selkirk population takes on added significance in maintaining the shrinking range of mountain caribou, which has already decreased 60 percent from the historical range. Further range

contraction, combined with decreasing population numbers, could have serious implications to the conservation of mountain caribou." The commenter asserted that the above-referenced Canadian biologists' concerns, when coupled with the quoted statement from the Service's 5-year review, undermine the Service's reliance on the management of lands in Canada as contributing towards the successful recovery of caribou.

Our Response: Because our ability to designate critical habitat is restricted to lands within the jurisdiction of the United States, our final designation constitutes all lands within the United States that meet the statutory definition of critical habitat for the southern mountain caribou DPS (see our response to *Comment (15)*). While we did not complete an in-depth, quantitative analysis (e.g., species composition, age structure, etc.) of the Crown or Nature Conservancy lands protected and managed for caribou in Canada, we generally understood that almost all of the protected lands were identified as priority 1, 2, and 3 caribou habitats through the habitat suitability modeling completed by Kinley and Apps (2007, p. 25) that entailed assessing the area's ecological attributes including lichen availability, forest structure and composition, topography, connectivity between habitat patches, etc. In fact, most of the priority 1 habitats identified by Kinley and Apps (2007, p. 25) are located in Canada on the protected Crown and Nature Conservancy lands. Thus, as these lands were identified as priority 1, 2, and 3 habitats for caribou, we concluded they provided the functional equivalents to the PBFs of caribou critical habitat we identified as essential to the conservation of the species. Additionally, as we have previously stated, the range of the southern Selkirk Mountain subpopulation appears to have shifted northward, and the vast majority of essential habitat for this subpopulation now occurs in Canada. Therefore, it is entirely appropriate for the Service to consider these lands protected and managed in Canada for caribou as contributing significantly to caribou conservation. Further, the management of these lands in Canada, together with management of caribou habitat in the United States (including those acres designated as critical habitat in the United States), will inform the development of a recovery plan for this DPS, which is outside the scope of this listing decision.

(99) *Comment:* One commenter stated that there is no support in the record to show that management of Canadian

lands plus the small amount of designated critical habitat in the United States is sufficient to recover the southern Selkirk Mountains caribou subpopulation, and because the Service does not know where the 443,000-ac figure stems from, the Service's reliance on it as the single objective to achieve recovery of the subpopulation is arbitrary and capricious.

Our Response: While recovery planning is beyond the scope of the critical habitat rulemaking process, the Service is not relying on designation of critical habitat as the single means to achieve recovery of the southern Selkirk Mountains subpopulation. We reiterate that addressing threats of predation, habitat fragmentation and loss, and human recreation are necessary to achieve conservation and recovery of this subpopulation. Objectives addressing these threats, among others, will be developed with our partners during recovery planning for the southern mountain caribou DPS.

(100) *Comment:* One commenter stated that the amount of designated critical habitat should be increased to compensate for the potential effects of climate change that could result in increased intensity of future fires that may result in loss of habitat.

Our Response: We acknowledge that climate change could change the suitability of habitat for the southern Selkirk Mountains subpopulation of woodland caribou in the future. However, we are required to designate critical habitat based upon the best available scientific data at the time that we finalize the designation. The information currently available on the effects of global climate change does not provide precise estimates of the location and magnitude of the potential effects. We are also not currently aware of any climate change information that would help identify specific areas that might become important to the southern Selkirk Mountains subpopulation of woodland caribou in the future. Therefore, as explained in the proposed rule to designate critical habitat for the southern Selkirk Mountains subpopulation of woodland caribou (76 FR 74018, November 30, 2011, see p. 76 FR 74024), we are unable to determine what additional areas, if any, may be appropriate to include in the final critical habitat for this species to address the effects of climate change. We also find that the best scientific information available suggests that the range of the southern Selkirk Mountains subpopulation of woodland caribou has largely shifted northward, and the vast majority of essential habitat for this population of woodland caribou now

occurs within Canada. Critical habitat can be revised under section 4(a)(3)(A)(ii) of the Act as appropriate, as additional scientific data on climate change or other significant information becomes available.

(101) Comment: One commenter stated that the Service must seek additional peer review of the final designation of 30,010 ac (12,145 ha) of critical habitat because the final designation is a drastic departure from the Service's proposal to designate 375,562 ac (151,985 ha), upon which the Service solicited peer review.

Our Response: The Service solicited expert opinions on the proposed critical habitat rule from four individuals with scientific expertise on the woodland caribou; we received responses from all four peer reviewers. One of the peer reviewers commented that the proposed rule was very thorough and accurate, but the reviewer did not submit any additional comments. The other three peer reviewers who provided substantive comments indicated that the area proposed for designation as critical habitat in the proposed rule was far greater than the area actually used by caribou. The peer reviewers stated that "the major flaw" in the proposed rule was designating far too many of these unused acres as meeting the definition of critical habitat. The final designation of critical habitat (77 FR 71042, November 28, 2012) reflects the concerns expressed by the peer reviewers and is a logical outgrowth of their comments. Therefore, the Service is not required to seek additional peer review of the final critical habitat designation.

(102) Comment: One commenter stated the final critical habitat designation is unlawful because it is not a logical outgrowth of the best available science and because the designation failed to include unoccupied habitats that are essential to the recovery of this dwindling population.

Our Response: In the November 28, 2012, final critical habitat determination (77 FR 71042), which the Service proposed to reaffirm in our May 8, 2014, proposal to amend the listing of the southern mountain caribou DPS (79 FR 26504), the Service based our final designation of critical habitat for the southern Selkirk Mountains subpopulation of woodland caribou on the best available scientific information. See our response to *Comment (101)*. Additionally, several other comments received from State agencies, Tribes, and others agreed with peer reviewers that the proposed rule was overly expansive. The final designation of critical habitat, therefore, was informed

by and is a logical outgrowth of the comments provided by the peer reviewers, Federal and State agencies, Tribes, and other organizations and individuals. Finally, see our responses to *Comments (78)* and *(89)* for a discussion of the rationale on which we based the final critical habitat determination.

(103) Comment: One commenter stated that critical habitat designation must be revised to correspond with the entirety of the existing caribou recovery zone within the United States.

Our Response: See our response to *Comment (15)*.

Determination

Introduction

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 determine whether a species is an endangered species or threatened species because of any one or a combination of the following: (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. Listing actions may be warranted based on any of the above threat factors, singly or in combination. These five factors apply whether we are analyzing the species' status throughout all of its range or throughout 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" (16 U.S.C. 1532(6)) 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" (16 U.S.C. 1532(20)). The definition of "species" is also relevant to this discussion. On July 1, 2014, we published a final policy interpreting the phrase "significant portion of its range" (SPR) (79 FR 37578). In our policy, 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 a species in its entirety; thus there are two situations (or factual bases) under which a species would qualify for listing: A species may be in

danger of extinction or likely to become so in the foreseeable future throughout all of its range; or a species may be in danger of extinction or likely to become so throughout a significant portion of its range. If a species is in danger of extinction throughout an SPR, the species, is an "endangered species." The same analysis applies to "threatened species." The SPR policy is applied to all status determinations, including analyses for the purposes of making listing, delisting, and reclassification determinations.

Determination of Status Throughout All of Its Range

We proposed to list the southern mountain caribou DPS as threatened in our May 8, 2014, proposed rule (79 FR 26504). However, based on new information received since the proposed rule and as described previously in this rule, we now conclude that the status of and threats to this DPS warrant listing it as an endangered species.

The current abundance and number of caribou subpopulations within the DPS are limited to an estimated 1,356 individuals in 15 extant subpopulations (COSEWIC 2014, p. xviii). The population is declining, and based on population estimates over generations, it appears that the population rate of decline is accelerating (see below). Additionally, while it is difficult to establish a precise historical distribution of woodland caribou (including the distribution of the southern mountain subpopulation of woodland caribou), according to COSEWIC (2014, p. 14), mountain caribou were much more widely distributed than they are today, and based on this information, the range of this DPS is decreasing.

As previously discussed under 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 (factor C); increased human access into caribou habitat, resulting in disturbance of caribou from use of roads and off-road vehicles (factor B); and climate change (factor A). All of these threats are linked with continuing habitat alteration (factor A) and occur throughout the entire range of the DPS. These threats are not adequately ameliorated by existing regulatory mechanisms (factor D). Through this evaluation, we have determined that these factors pose significant threats to the continued existence of the southern mountain caribou DPS. These threats are expected to continue in the foreseeable future.

As described above, under the Act and our implementing regulations, a species may warrant listing if it is in danger of extinction or likely to become so in the foreseeable future throughout all or throughout a significant portion of its range. 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” (16 U.S.C. 1532(16)). 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 in this rule, the southern mountain caribou DPS has a limited distribution that has suffered ongoing major reductions of its numbers and range as a result of threats that have not been abated. These declines have resulted in further isolation of subpopulations that make up this DPS.

For the reasons outlined above in the final rule and as briefly summarized here, we have determined that the southern mountain caribou DPS meets the definition of an endangered species because it is in danger of extinction throughout all of its range.

1. The species’ response to ongoing threats has resulted in further declines in subpopulation abundance. All 15 extant subpopulations consist of fewer than 400 individuals each, 13 of which have fewer than 250, and 9 of which have fewer than 50 (COSEWIC 2014, p. xviii). Fourteen of the 15 extant subpopulations within this DPS have declined since the last assessment by COSEWIC in 2002 (COSEWIC 2014, p. vii). Based on COSEWIC’s 2014 report (p. vii), which is new information received after we published our proposed amended listing rule (79 FR 26504, May 8, 2014), the rate of the population decline is accelerating. The accelerated rate of population decline is supported by Wittmer *et al.* (2005b, p. 265), who studied rates and causes of southern mountain caribou population declines from 1984 to 2002, and found an increasing rate of decline. Wittmer *et al.* (2005b, p. 264) also found that

predation was the primary cause of mortality driving the accelerated rate of population decline of mountain caribou.

2. A PVA conducted by Hatter (2006, p. 7, *in litt.*) predicted a high likelihood of quasi-extinction for 12 of the 15 subpopulations and a lower likelihood of quasi-extinction for one additional subpopulation within this DPS within 20 to 90 years. Thus, a total of 13 of the 15 subpopulations could be quasi-extinct within 90 years. Wittmer *et al.* (2010, p. 86) also conducted a PVA on 10 of the same subpopulations assessed by Hatter (2006, entire, *in litt.*), and predicted extinction of all 10 subpopulations within 200 years.

3. Given the likelihood of extirpation of 13 of 15 subpopulations within 20 to 90 years, the entire DPS is at risk of extinction due to lack of redundancy (ability of the species to withstand catastrophic events) and resiliency (ability of the populations to withstand stochastic events) of the remaining 2 subpopulations whose status are likely to be negatively affected by existing demographic and/or environmental stochastic threats. Mountain caribou are susceptible to avalanches, have low reproductive rates, and have high calf mortality. Low reproductive rates and high calf mortality reduce the resiliency of the subpopulation. Therefore, the decreased redundancy and reduced resiliency of the southern mountain caribou DPS places it at greater risk of extinction sooner than 200 years (as predicted by Wittmer 2010, entire) due to existing demographic and environmental stochastic threats.

4. Further exacerbating the decline and potential extirpation of mountain caribou subpopulations is that mountain caribou appear to lack the inherent behavior to disperse long distances (van Oort *et al.* 2011, pp. 215, 221–222). Species whose historical distribution was more widely and evenly distributed (such as mountain caribou) (van Oort *et al.* 2011, p. 221) that have been fragmented into subpopulations via habitat fragmentation and loss may appear to exist in a metapopulation structure when in fact, because they may not have evolved the innate behavior to disperse among subpopulations, their fragmented distribution may actually represent a geographic pattern of extinction (van Oort *et al.* 2011, p. 215).

5. The three largest subpopulations are declining, contain fewer than 400 individuals each (COSEWIC 2014, p. 41), are isolated from other subpopulations (van Oort *et al.* 2011, pp. 221–222; Wittmer *et al.* 2005b, p. 414), and are becoming increasingly more so due to habitat fragmentation

and human activities (Serrouya *et al.* 2013, p. 2,597; van Oort *et al.* 2011, p. 222). They are also subject to the same type and level of threats acting on the DPS as a whole that have not been abated, and which have resulted in the recent extirpation of two subpopulations.

6. As explained previously, habitat alterations (increased distribution and quantity of early successional habitats) have increased predation of southern mountain caribou, particularly by wolves and mountain lions. Predation is thought to be the principal and proximate factor driving their recent decline. It will likely require greater than 150 years (greater than 16 generations of caribou) of habitat protections for these early successional and fragmented forests to develop the old-growth habitat characteristics (vegetative structure and composition) (Stevenson *et al.* 2001, p. 1) that would begin to restore the natural predator-prey balance of these high-elevation, old-growth forests, and thus reduce predation pressure on caribou. As discussed above, Hatter (2006, p. 7, *in litt.*) predicted quasi-extinction of 13 of the 15 subpopulations within the DPS within 20 to 90 years, and Wittmer *et al.* (2010, p. 86) predicted extinction of 10 of the 15 populations within 200 years (notably, they did not assess 5 of the populations). Thus, the subpopulations within the DPS are not likely sustainable given ongoing declines and the length of time needed to improve habitat conditions that may ameliorate the threat of predation.

In summary, all 15 extant subpopulations consist of fewer than 400 individuals each: 2 subpopulations have greater than 300 individuals; 4 subpopulations have between 50 and 210 individuals each; and 9 subpopulations each have fewer than 50 individuals. Based on updated trend data (COSEWIC 2014, p. xviii), the rate of population decline of each subpopulation appears to be accelerating. A recent PVA indicates that there is a likelihood of 13 of 15 subpopulations becoming quasi-extinct in 20 to 90 years, which is likely to lead rapidly to their extirpation. The extirpation of these subpopulations would leave only two subpopulations (Hart Ranges and North Caribou Mountains) located adjacent to one another at the extreme northern edge of the DPS’s range, an over 65 percent reduction of current range. Both of these subpopulations are declining, and the rate of decline appears to be accelerating. The high likelihood of only two adjacent subpopulations remaining at the extreme northern edge of the

DPS's range leaves the DPS without sufficient redundancy to withstand existing demographic and/or environmental stochastic threats and severely reduces representation of the population within its range. Additionally, declining and small subpopulation sizes, low reproductive rates, and high calf mortality reduces the resiliency of this DPS to withstand these same threats. Severely reduced redundancy, resiliency, and representation greatly increase the risk of extinction of the entire DPS. In conclusion, we have determined that the southern mountain caribou DPS meets the definition of an endangered species because it is in danger of extinction throughout all of its range.

Determination of Status Throughout a Significant Portion of Its Range

Because we found that the species is an endangered species because of its status throughout all of its range, we do not need to conduct an analysis of its status in any portions of its range. This is consistent with the Act because the species is currently in danger of extinction throughout all of its range due to high-magnitude threats across its range, or threats that are so high in particular areas that they severely affect the species across its range. Therefore, the species is in danger of extinction throughout every portion of its range, and an analysis of whether the species is in danger of extinction or likely to become so throughout any significant portion of its range would be redundant and unnecessary. See the Final Policy on Interpretation of the Phrase "Significant Portion of Its Range" in the Act's Definitions of "Endangered Species" and "Threatened Species" (79 FR 37578, July 1, 2014).

Determination of Status

We have carefully assessed the best scientific and commercial information available regarding the past, present, and future threats to the southern mountain caribou DPS. Because the species is in danger of extinction throughout all of its range, the species meets the definition of an endangered species. Therefore, on the basis of the best scientific and commercial data available and per our DPS policy, we amend the current listing of the endangered southern Selkirk Mountains population of woodland caribou, as identified at 50 CFR 17.11(h), to reflect the southern mountain caribou DPS as an endangered species in accordance with sections 3(6) and 4(a)(1) of the Act.

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 1994a). An update regarding the status of this recovery plan can be found in the latest 5-year status review for the species (USFWS 2008, entire). While actions have been carried out in an attempt to recover this subpopulation, 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 subpopulation, and does not extend to the entire southern mountain caribou DPS. Consistent with this final rule, revisions to the existing plan, in coordination with British Columbia, Canada, will be required to address the entire DPS and the continuing or new threats to the DPS. 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.

Development of a recovery plan for the southern mountain caribou DPS will be coordinated with species experts from Canada, Tribes, and the United States. 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.

Following publication of this final listing rule, 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 will 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 consultation 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 (33 U.S.C. 1251 *et seq.*) 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)(1) 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 50 CFR 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 listing on proposed and ongoing activities within the range of listed species. 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.

At this time, we are unable to identify specific activities that would not be considered to result in a violation of section 9 of the Act due to the variety and nature of activities that may occur within caribou habitat across the range of the DPS. Depending on the implementation timing, intensity, and duration of such activities, it is likely that site-specific conservation measures may be needed for specific activities that may directly or indirectly affect the species.

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**).

Required Determinations

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 (NEPA; 42 U.S.C. 4321 *et seq.*), need not be prepared in connection with listing a species as an endangered or threatened species under the section 4(a) of the Act. We published a notice outlining our reasons for this determination in the **Federal Register** on October 25, 1983 (48 FR 49244).

Government-to-Government Relationship With Tribes

In accordance with the President's memorandum of April 29, 1994 (Government-to-Government Relations with Native American Tribal Governments; 59 FR 22951), Executive Order 13175 (Consultation and Coordination with Indian Tribal Governments), and the Department of the Interior's manual at 512 DM 2, we readily acknowledge our responsibility to communicate meaningfully with recognized Federal Tribes on a

government-to-government basis. In accordance with Secretarial Order 3206 of June 5, 1997 (American Indian Tribal Rights, Federal-Tribal Trust Responsibilities, and the Endangered Species Act), we readily acknowledge our responsibilities to work directly with Tribes in developing programs for healthy ecosystems, to acknowledge that Tribal lands are not subject to the same controls as Federal public lands, to remain sensitive to Indian culture, and to make information available to Tribes.

We address the comments we received from Tribes on our May 8, 2014, proposed amended listing rule (79 FR 26504) under *Comments from Native American Tribes*, above. We had several informal technical discussions and meetings with both the Kalispel Tribe of Indians and the Kootenai Tribe of Idaho during 2014–2017. We had one formal government-to-government meeting with the Kootenai Tribe on May 22, 2014, as well as two recent meetings with the Tribe on January 12 and March 22, 2017, to discuss recovery planning, which included some discussion of the listing.

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 final 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.

Regulation Promulgation

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

PART 17—ENDANGERED AND THREATENED WILDLIFE AND PLANTS

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

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

■ 2. Amend § 17.11(h) by revising the entry for “Caribou, woodland [Southern Selkirk Mountains DPS]” under MAMMALS in the List of Endangered

and Threatened Wildlife to read as follows:

§ 17.11 Endangered and threatened wildlife.

(h) * * *

Common name	Scientific name	Where listed	Status	Listing citations and applicable rules
MAMMALS				
Caribou, woodland [Southern Mountain DPS].	<i>Rangifer tarandus caribou.</i>	U.S.A. (wherever found), E Canada (southeastern British Columbia).	E	48 FR 1722, 1/14/1983; 48 FR 49245, 10/25/1983; 49 FR 7390, 2/29/1984; 83 FR [Insert Federal Register page where the document begins], [Insert date of publication in the Federal Register]; 50 CFR 17.95(a). ^{CH}

- 3. In § 17.95(a), amend the entry for “Woodland Caribou (*Rangifer tarandus caribou*) Southern Selkirk Mountains Population” by:
 - a. Revising the heading;
 - b. Revising the introductory text of paragraph (a)(2);
 - c. Revising paragraph (a)(2)(iv); and
 - d. Revising paragraph (a)(5).

The revisions read as follows:

§ 17.95 Critical habitat—fish and wildlife.

(a) *Mammals.*

* * * * *

Woodland Caribou (*Rangifer tarandus caribou*), Southern Mountain 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

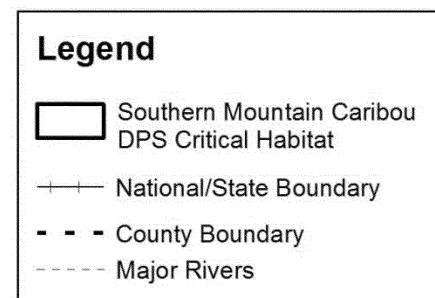
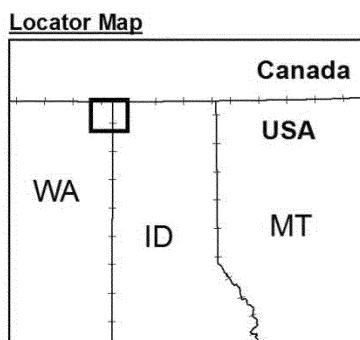
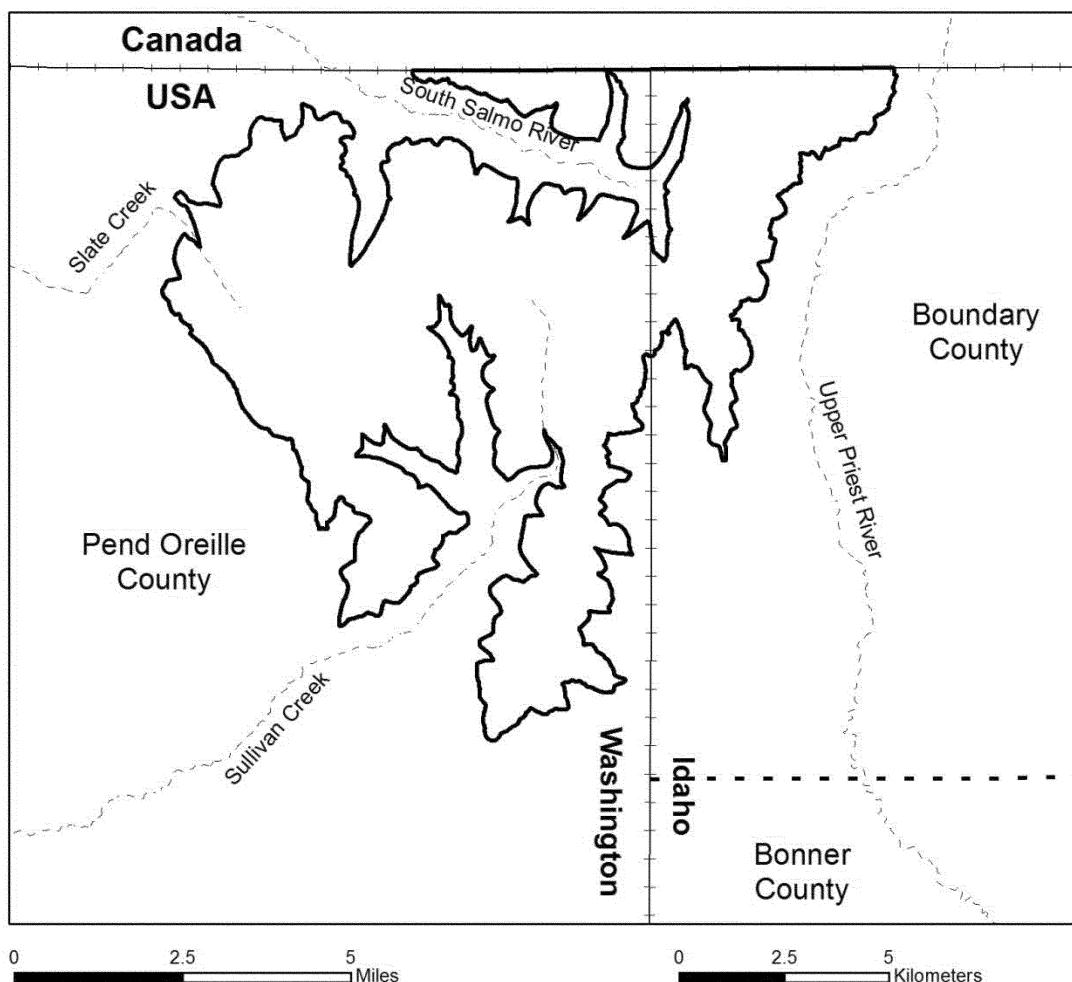
subalpine meadows with succulent forbs and grasses, flowering plants, horsetails, willow, huckleberry, dwarf birch, sedges, and lichens. The southern mountain caribou DPS, including pregnant females, uses these areas for feeding during the spring and summer seasons.

* * * * *

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

BILLING CODE 4333-15-P

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



* * * * *

Dated: September 17, 2019.

Margaret E. Everson,
Principal Deputy Director, U.S. Fish and
Wildlife Service, Exercising the Authority of
the Director, U.S. Fish and Wildlife Service.

[FR Doc. 2019-20459 Filed 10-1-19; 8:45 am]

BILLING CODE 4333-15-C