(3) *Reporting.* Unless the permittee is relying on another entity to satisfy its NPDES permit obligations under § 122.35(a), the permit must require the permittee to submit annual reports to the NPDES permitting authority for the first permit term. For subsequent permit terms, the permit must require that permittee to submit reports in year two and four unless the NPDES permitting authority requires more frequent reports. The report must include:

(i) The status of compliance with permit conditions, an assessment of the appropriateness of the permittee's identified best management practices and progress towards achieving its identified measurable goals for each of the minimum control measures;

(ii) Results of information collected and analyzed, including monitoring data, if any, during the reporting period;

(iii) A summary of the storm water activities the permittee plans to undertake during the next reporting cycle;

(iv) A change in any identified best management practices or measurable goals for any of the minimum control measures; and

(v) Notice that the permittee is relying on another governmental entity to satisfy some of the permit obligations (if applicable), consistent with § 122.35(a).

(e) *Qualifying local program.* If an existing qualifying local program requires the permittee to implement one or more of the minimum control measures of paragraph (b) of this section, the NPDES permitting authority may include conditions in the NPDES permit that direct the permittee to follow that qualifying program's requirements rather than the requirements of paragraph (b) of this section. A qualifying local program is a local, State or Tribal municipal stormwater management program that imposes the relevant requirements of paragraph (b) of this section.

■ 4. Amend § 122.35 by revising the second and third sentences of paragraph (a)(3) to read as follows:

§ 122.35 As an operator of a regulated small MS4, may I share the responsibility to implement the minimum control measures with other entities.

(a) * * *

(3) * * * In the reports you must submit under § 122.34(d)(3), you must also specify that you rely on another entity to satisfy some of your permit obligations. If you are relying on another governmental entity regulated under section 122 to satisfy all of your permit obligations, including your obligation to file periodic reports required by § 122.34(d)(3), you must note that fact in your NOI, but you are not required to file the periodic reports.* * *

* * * * *

[FR Doc. 2015–33174 Filed 1–5–16; 8:45 am]

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DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

[Docket No. FWS–R7–ES–2015–0167; FF07C00000 FXES11190700000 167F1611MD]

Endangered and Threatened Wildlife and Plants; 12-Month Finding on a Petition To List the Alexander Archipelago Wolf as an Endangered or Threatened Species

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Notice of 12-month petition finding.

SUMMARY: We, the U.S. Fish and Wildlife Service (Service), announce a 12-month finding on a petition to list the Alexander Archipelago wolf (*Canis lupus ligoni*) as an endangered or threatened species and to designate critical habitat under the Endangered Species Act of 1973, as amended (Act). The petitioners provided three listing options for consideration by the Service: Listing the Alexander Archipelago wolf throughout its range; listing Prince of Wales Island (POW) as a significant portion of its range; or listing the population on Prince of Wales Island as a distinct population segment (DPS). After review of the best available scientific and commercial information, we find that listing the Alexander Archipelago wolf is not warranted at this time throughout all or a significant portion of its range, including POW. We also find that the Alexander Archipelago wolf population on POW does not not meet the criteria of the Service's DPS policy, and, therefore, it does not constitute a listable entity under the Act. We ask the public to submit to us any new information that becomes available concerning the threats to the Alexander Archipelago wolf or its habitat at any time.

DATES: The finding announced in this document was made on January 6, 2016.

ADDRESSES: This finding is available on the Internet at *http://www.regulations.gov* at Docket No. FWS–R7–ES–2015–0167. Supporting documentation we used in preparing this finding will be available for public inspection, by appointment, during normal business hours at the U.S. Fish and Wildlife Service, Anchorage Fish and Wildlife Field Office, 4700 BLM Rd., Anchorage, AK 99507–2546. Please submit any new information, materials, comments, or questions concerning this finding to the above street address.

FOR FURTHER INFORMATION CONTACT: Soch Lor, Field Supervisor, Anchorage Fish and Wildlife Field Office (see **ADDRESSES**); by telephone at 907–271–2787; or by facsimile at 907–271–2786. If you use a telecommunications device for the deaf (TDD), please call the Federal Information Relay Service (FIRS) at 800–877–8339.

SUPPLEMENTARY INFORMATION:

Background

Section 4(b)(3)(B) of the Act (16 U.S.C. 1531 *et seq.*), requires that, for any petition to revise the Federal Lists of Endangered and Threatened Wildlife and Plants that contains substantial scientific or commercial information that listing the species may be warranted, we make a finding within 12 months of the date of receipt of the petition. In this finding, we will determine that the petitioned action is: (1) Not warranted, (2) warranted, or (3) warranted, but the immediate proposal of a regulation implementing the petitioned action is precluded by other pending proposals to determine whether species are endangered or threatened, and expeditious progress is being made to add or remove qualified species from the Federal Lists of Endangered and Threatened Wildlife and Plants. Section 4(b)(3)(C) of the Act requires that we treat a petition for which the requested action is found to be warranted but precluded as though resubmitted on the date of such finding, that is, requiring a subsequent finding to be made within 12 months. We must publish these 12-month findings in the **Federal Register**.

This finding is based upon the ''Status Assessment for the Alexander Archipelago Wolf (*Canis lupus ligoni*)'' (Service 2015, entire) (hereafter, Status Assessment) and the scientific analyses of available information prepared by Service biologists from the Anchorage Fish and Wildlife Field Office, the Alaska Regional Office, and the Headquarters Office. The Status Assessment contains the best scientific and commercial data available concerning the status of the Alexander Archipelago wolf, including the past, present, and future stressors. As such, the Status Assessment provides the scientific basis that informs our regulatory decision in this document, which involves the further application of standards within the Act and its implementing regulations and policies.

Previous Federal Actions

On December 17, 1993, the Service received a petition, from the Biodiversity Legal Foundation, Eric Holle, and Martin Berghoffen, to list the Alexander Archipelago wolf as an endangered or threatened species under the Act. On May 20, 1994, we announced a 90-day finding that the petition presented substantial information indicating that the requested action may be warranted, and we initiated a status review of the Alexander Archipelago wolf and opened a public comment period until July 19, 1994 (59 FR 26476). On August 26, 1994, we reopened the comment period on the status review to accept comments until October 1, 1994 (59 FR 44122). The Service issued its 12-month finding that listing the Alexander Archipelago wolf was not warranted on February 23, 1995 (60 FR 10056).

On February 7, 1996, the Southwest Center for Biological Diversity, Biodiversity Legal Foundation, Save the West, Save America's Forests, Native Forest Network, Native Forest Council, Eric Holle, Martin Berghoffen, and Don Muller filed suit in the U.S. Court for the District of Columbia challenging the Service's not-warranted finding. On October 9, 1996, the U.S. District Court remanded the 12-month finding to the Secretary of the Interior, instructing him to reconsider the determination ''on the basis of the current forest plan, and status of the wolf and its habitat, as they stand today'' (96 CV 00227 DDC). The Court later agreed to the Service's proposal to issue a new finding on June 1, 1997. On December 5, 1996, we published a document announcing the continuation of the status review for the Alexander Archipelago wolf and opening a public comment period until January 21, 1997 (61 FR 64496). The comment period was then extended or reopened through three subsequent publications (61 FR 69065, December 31, 1996; 62 FR 6930, February 14, 1997; 62 FR 14662, March 27, 1997), until it closed on April 4, 1997.

Prior to the publication of a 12-month finding, however, the U.S. Forest Service (USFS) issued the 1997 Tongass Land and Resource Management Plan Revision, which superseded the 1979 version of the plan. In keeping with the U.S. District Court's order that a finding be based upon the ''current forest plan,'' the District Court granted us an extension until August 31, 1997, to issue our 12-month finding so that the petitioners, the public, and the Service could reconsider the status of the Alexander Archipelago wolf under the revised Tongass Land and Resource Management Plan. Therefore, the Service reopened the public comment period on the status review of the Alexander Archipelago wolf from June 12, 1997, to July 28, 1997 (62 FR 32070, June 12, 1997), and we then reevaluated all of the best available information on the Alexander Archipelago wolf, as well as long-term habitat projections for the Tongass National Forest included in the 1997 Tongass Land and Resource Management Plan Revision. On September 4, 1997, we published a 12-month finding that listing the Alexander Archipelago wolf was not warranted (62 FR 46709).

On August 10, 2011, we received a petition dated August 10, 2011, from the Center for Biological Diversity and Greenpeace, requesting that the Alexander Archipelago wolf be listed as an endangered or threatened species under the Act and critical habitat be designated. Included in the petition was supporting information regarding the subspecies' taxonomy and ecology, distribution, abundance and population trends, causes of mortality, and conservation status. The petitioners also requested that we consider: (1) Prince of Wales Island (POW) as a significant portion of the range of the Alexander Archipelago wolf; and (2) wolves on POW and nearby islands as a distinct population segment. We note here that a significant portion of the range is not a listable entity in and of itself, but instead provides an independent basis for listing and is part of our analysis to determine whether or not listing as an endangered or threatened species is warranted. We published the 90-day finding for the Alexander Archipelago wolf on March 31, 2014, stating that the petition presented substantial information indicating that listing may be warranted (79 FR 17993).

On June 20, 2014, the Center for Biological Diversity, Greenpeace, Inc., and The Boat Company (collectively, plaintiffs) filed a complaint against the Service for failure to complete a 12-month finding for the Alexander Archipelago wolf within the statutory timeframe. On September 22, 2014, the Service and the aforementioned plaintiffs entered into a stipulated settlement agreement stating that the Service shall review the status of the Alexander Archipelago wolf and submit to the **Federal Register** a 12-month finding as to whether listing as endangered or threatened is warranted, not warranted, or warranted but precluded by other pending proposals, on or before December 31, 2015. In Fiscal Year 2015, the Service initiated work on a 12-month finding for the Alexander Archipelago wolf.

On September 14, 2015, the Service received a petition to list on an emergency basis the Alexander Archipelago wolf as an endangered or threatened species under the Act. The petition for emergency listing was submitted by Alaska Wildlife Alliance, Cascadia Wildlands, Center for Biological Diversity, Greater Southeast Alaska Conservation Community, Greenpeace, and The Boat Company. The petitioners stated that harvest of the Alexander Archipelago wolf in Game Management Unit (GMU) 2, in light of an observed recent population decline, would put the population in danger of extinction. On September 28, 2015, the Service acknowledged receipt of the petition for emergency listing to each of the petitioners. In those letters, we indicated that we would continue to evaluate the status of the Alexander Archipelago wolf as part of the settlement agreement and that if at any point we determined that emergency listing was warranted, an emergency rule may be promptly developed.

This document constitutes the 12-month finding on the August 10, 2011, petition to list the Alexander Archipelago wolf as an endangered or threatened species. For additional information and a detailed discussion of the taxonomy, physical description, distribution, demography, and habitat of the Alexander Archipelago wolf, please see the Status Assessment for Alexander Archipelago Wolf (*Canis lupus ligoni*) (Service 2015, entire) available under Docket No. FWS–R7–ES–2015–0167 at *http://www.regulations.gov,* or from the Anchorage Fish and Wildlife Field Office (see **ADDRESSES**).

Current Taxonomy Description

Goldman (1937, pp. 39–40) was the first to propose the Alexander Archipelago wolf as a subspecies of the gray wolf. He described *C. l. ligoni* as a dark colored subspecies of medium size and short pelage (fur) that occupied the Alexander Archipelago and adjacent mainland of southeastern Alaska. Additional morphometric analyses supported the hypothesis that wolves in southeastern Alaska were phenotypically distinct from other gray wolves in Alaska (Pedersen 1982, pp. 345, 360), although results also indicated similarities with wolves that historically occupied coastal British Columbia, Vancouver Island, and perhaps the contiguous western United States (Nowak 1983, pp. 14–15; Friis 1985, p. 82). Collectively, these findings demonstrated that wolves in southeastern Alaska had a closer affinity to wolves to the south compared to wolves to the north, suggesting that either *C. l. ligoni* was not confined to southeastern Alaska and its southern boundary should be extended southward (Friis 1985, p. 78) or that *C. l. ligoni* should be combined with *C. l. nubilus,* the subspecies that historically occupied the central and western United States (Nowak 1995, p. 396). We discuss these morphological studies and others in detail in the Status Assessment (Service 2015, ''Morphological analyses'').

More recently, several molecular ecology studies have been conducted on wolves in southeastern Alaska and coastal British Columbia, advancing our knowledge of wolf taxonomy beyond morphometric analyses. Generally, results of these genetic studies were similar, suggesting that coastal wolves in southeastern Alaska and coastal British Columbia are part of the same genetic lineage (Breed 2007, pp. 5, 27, 30; Weckworth *et al.* 2011, pp. 2, 5) and that they appear to be genetically differentiated from interior continental wolves (Weckworth *et al.* 2005, p. 924; Munoz-Fuentes *et al.* 2009, p. 9; Weckworth *et al.* 2010, p. 368; Cronin *et al.* 2015, pp. 1, 4–6). However, interpretation of the results differed with regard to subspecific designations; some authors concluded that the level of genetic differentiation between coastal and interior continental wolves constitutes a distinct coastal subspecies, *C. l. ligoni* (Weckworth *et al.* 2005, pp. 924, 927; Munoz-Fuentes *et al.* 2009, p. 12; Weckworth *et al.* 2010, p. 372; Weckworth *et al.* 2011, p. 6), while other authors asserted that it does not necessitate subspecies status (Cronin *et al.* 2015, p. 9). Therefore, the subspecific identity, if any, of wolves in southeastern Alaska and coastal British Columbia remained unresolved. As a cautionary note, the inference of these genetic studies depends on the type of genetic marker used and the spatial and temporal extent of the samples analyzed; we review these studies and their key findings as they relate to wolf taxonomy in detail in the Status Assessment (Service 2015, ''Genetic analyses'').

In the most recent meta-analysis of wolf taxonomy in North America, Chambers *et al.* (2012, pp. 40–42) found evidence for differentiating between coastal and inland wolves, although ultimately the authors grouped wolves in southeastern Alaska and coastal British Columbia with wolf populations that historically occupied the central and western United States (*C. l. nubilus*). One of their primary reasons for doing so was because coastal wolves harbored genetic material that also was found only in historical samples of *C. l. nubilus* (Chambers *et al.* 2012, p. 41), suggesting that prior to extirpation of wolves by humans in the western United States, *C. l. nubilus* extended northward into coastal British Columbia and southeastern Alaska. However, this study was conducted at a broad spatial scale with a focus on evaluating taxonomy of wolves in the eastern and northeastern United States and therefore was not aimed specifically at addressing the taxonomic status of coastal wolves in western North America. Further, Chambers *et al.* (2012, p. 41) recognized that understanding the phylogenetic relationship of coastal wolves to other wolf populations assigned as *C. l. nubilus* is greatly impeded by the extirpation of wolves (and the lack of historical specimens) in the western United States. Lastly, Chambers *et al.* (2012, p. 2) explicitly noted that their views on subspecific designations were not intended as recommendations for management units or objects of management actions, nor should they be preferred to alternative legal classifications for protection, such as those made under the Act. Instead, the authors stated that the suitability of a subspecies as a unit for legal purposes requires further, separate analysis weighing legal and policy considerations.

We acknowledge that the taxonomic status of wolves in southeastern Alaska and coastal British Columbia is unresolved and that our knowledge of wolf taxonomy in general is evolving as more sophisticated and powerful tools become available (Service 2015, ''Uncertainty in taxonomic status''). Nonetheless, based on our review of the best available information, we found persuasive evidence suggesting that wolves in southeastern Alaska and coastal British Columbia currently form an ecological and genetic unit worthy of analysis under the Act. Although zones of intergradation exist, contemporary gene flow between coastal and interior continental wolves appears to be low (*e.g.,* Weckworth *et al.* 2005, p. 923; Cronin *et al.* 2015, p. 8), likely due to physical barriers, but perhaps also related to ecological differences (Munoz-Fuentes *et al.* 2009, p. 6); moreover, coastal wolves currently represent a distinct portion of genetic diversity for all wolves in North America (Weckworth *et al.* 2010, p. 363; Weckworth *et al.* 2011, pp. 5–6). Thus, we conclude that at most, wolves in southeastern Alaska and coastal British Columbia are a distinct subspecies, *C. l. ligoni,* of gray wolf, and at least, are a remnant population of *C. l. nubilus.* For the purpose of this 12-month finding, we assume that the Alexander Archipelago wolf (*C. l. ligoni*) is a valid subspecies of gray wolf that occupies southeastern Alaska and coastal British Columbia and, therefore, is a listable entity under the Act.

Species Information

Physical Description

The Alexander Archipelago wolf has been described as being darker and smaller, with coarser and shorter hair, compared to interior continental gray wolves (Goldman 1937, pp. 39–40; Wood 1990, p. 1), although a comprehensive study or examination has not been completed. Like most gray wolves, fur coloration of Alexander Archipelago wolves varies considerably from pure white to uniform black, with most wolves having a brindled mix of gray or tan with brown, black, or white. Based on harvest records and wolf sightings, the black color phase appears to be more common on the mainland of southeastern Alaska and coastal British Columbia (20–30 percent) (Alaska Department of Fish and Game [ADFG] 2012, pp. 5, 18, 24; Darimont and Paquet 2000, p. 17) compared to the southern islands of the Alexander Archipelago (2 percent) (ADFG 2012, p. 34), and some of the gray-colored wolves have a brownish-red tinge (Darimont and Paquet 2000, p. 17). The variation in color phase of Alexander Archipelago wolves is consistent with the level of variation observed in other gray wolf populations (*e.g.,* Central Brooks Range, Alaska) (Adams *et al.* 2008, p. 170).

Alexander Archipelago wolves older than 6 months weigh between 49 and 115 pounds (22 and 52 kilograms), with males averaging 83 pounds (38 kilograms) and females averaging 69 pounds (31 kilograms) (British Columbia Ministry of Forests, Lands and Natural Resource Operations [BCMO] 2014, p. 3; Valkenburg 2015, p. 1). On some islands in the archipelago (*e.g.,* POW) wolves are smaller on average compared to those on the mainland, although these differences are not statistically significant (Valkenburg 2015, p. 1) (also see Service 2015, ''Physical description''). The range and mean weights of Alexander Archipelago wolves are comparable to those of other populations of gray wolves that feed primarily on deer (*Odocoileus* spp.; *e.g.,* northwestern Minnesota) (Mech and Paul 2008, p. 935), but are lower than those of adjacent gray wolf populations that regularly feed on larger ungulates such as moose (*Alces americanus*) (*e.g.,* Adams *et al.* 2008, p. 8).

Distribution and Range

The Alexander Archipelago wolf currently occurs along the mainland of southeastern Alaska and coastal British Columbia and on several island complexes, which comprise more than 22,000 islands of varying size, west of the Coast Mountain Range. Wolves are found on all of the larger islands except Admiralty, Baranof, and Chichagof islands and all of the Haida Gwaii, or Queen Charlotte Islands (see Figure 1, below) (Person *et al.* 1996, p. 1; BCMO 2014, p. 14). The range of the Alexander Archipelago wolf is approximately 84,595 square miles (mi^2) (219,100 square kilometers [km^2]), stretching roughly 932 mi (1,500 km) in length and 155 mi (250 km) in width, although the northern, eastern, and southern boundaries are porous and are not defined sharply.

The majority (67 percent) of the range of the Alexander Archipelago wolf falls within coastal British Columbia, where wolves occupy all or portions of four management ''regions.'' These include Region 1 (entire), Region 2 (83 percent of entire region), Region 5 (22 percent of entire region), and Region 6 (17 percent of entire region) (see Figure 1, below). Thirty-three percent of the range of the Alexander Archipelago wolf lies within southeastern Alaska where it occurs in all of GMUs 1, 2, 3, and 5, but not GMU 4. See the Status Assessment (Service 2015, ''Geographic scope'') for a more detailed explanation on delineation of the range.

The historical range of the Alexander Archipelago wolf, since the late Pleistocene period when the last glacial ice sheets retreated, was similar to the current range with one minor exception. Between 1950 and 1970, wolves on Vancouver Island likely were extirpated by humans (Munoz-Fuentes *et al.* 2010, pp. 547–548; Chambers *et al.* 2012, p. 41); recolonization of the island by wolves from mainland British Columbia occurred naturally and wolves currently occupy Vancouver Island.

In southeastern Alaska and coastal British Columbia, the landscape is dominated by coniferous temperate rainforests, interspersed with other habitat types such as sphagnum bogs, sedge-dominated fens, alpine areas, and numerous lakes, rivers, and estuaries. The topography is rugged with numerous deep, glacially-carved fjords and several major river systems, some of which penetrate the Coast Mountain Range, connecting southeastern Alaska and coastal British Columbia with interior British Columbia and Yukon Territory. These corridors serve as intergradation zones of variable width with interior continental wolves; outside of them, glaciers and ice fields dominate the higher elevations, separating the coastal forests from the adjacent inland forest in continental Canada.

Within the range of the Alexander Archipelago wolf, land stewardship largely lies with State, provincial, and Federal governments. In southeastern Alaska, the majority (76 percent) of the land is located within the Tongass National Forest and is managed by the USFS. The National Park Service manages 12 percent of the land, most of which is within Glacier Bay National Park. The remainder of the land in southeastern Alaska is managed or owned by the State of Alaska (4 percent), Native Corporations (3 percent), and other types of ownership (*e.g.,* private, municipal, tribal reservation; 5 percent). In British Columbia (entire), most (94 percent) of the land and forest are owned by the Province of British Columbia (*i.e.,* Crown lands), 4 percent is privately owned, 1 percent is owned by the federal government, and the remaining 1 percent is owned by First Nations and others (British Columbia Ministry of Forests, Mines, and Lands 2010, p. 121).

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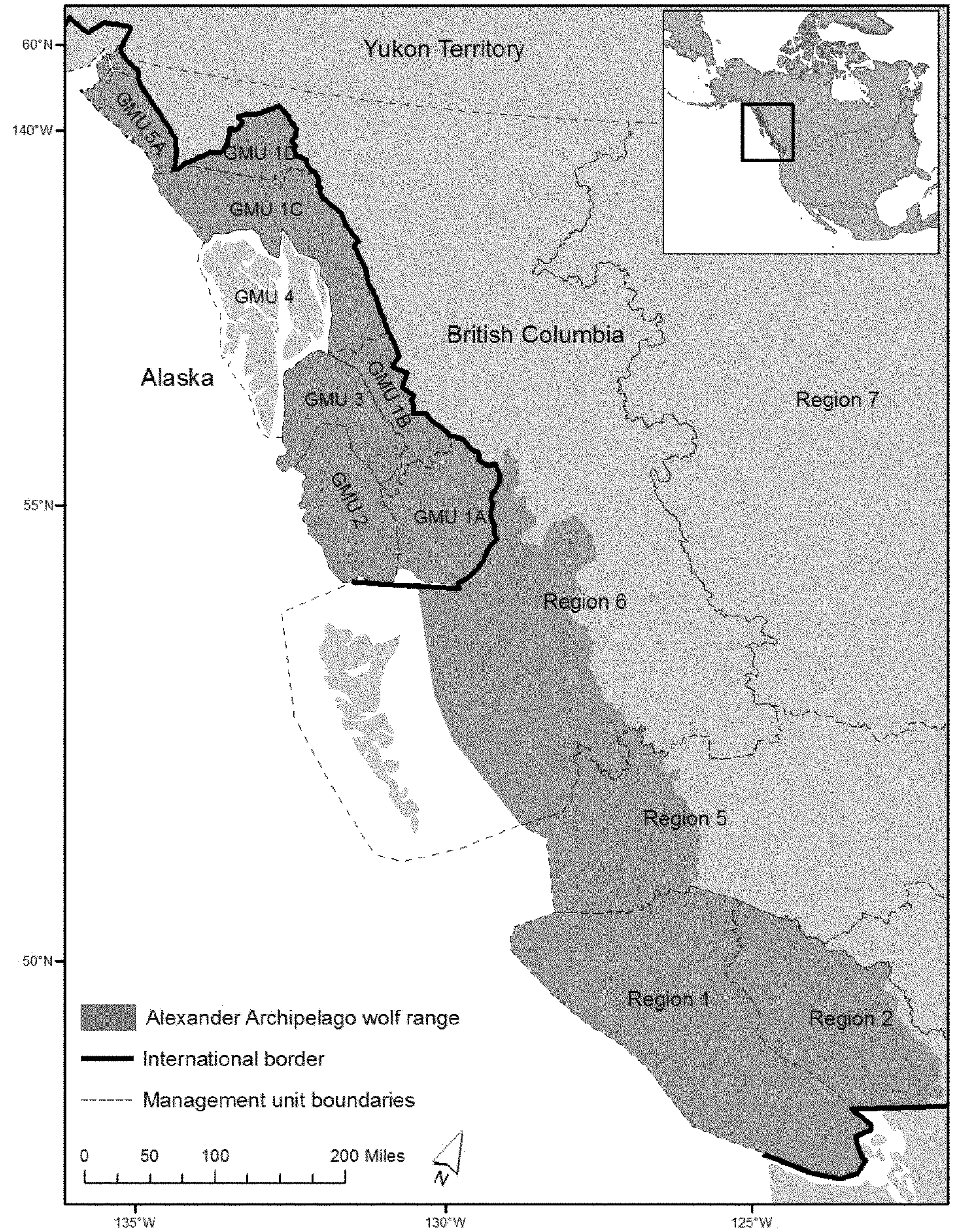

Figure 1. Assumed range of the Alexander Archipelago wolf with Game Management Unit (GMU) boundaries in southeastern Alaska, as used by the Alaska Department of Fish and Game, and Region boundaries in coastal British Columbia, as used by the Ministry of Forests, Lands, and Natural Resource Operations.

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Life History

In this section, we briefly describe vital rates and population dynamics, including population connectivity, of the Alexander Archipelago wolf. For this 12-month finding, we considered a population to be a collection of individuals of a species in a defined area; the individuals in a population may or may not breed with other groups of that species in other places (Mills 2013, p. 3). We delineated wolves into populations based on GMUs in southeastern Alaska and Regions in British Columbia (coastal portions only) because these are defined areas and wolf populations are managed at these spatial scales (see Figure 1). For example, GMU 2 comprises one population of wolves on POW and adjacent islands.

Abundance and Trend

Using the most recent and best available information, we estimate a current, rangewide population of 850–2,700 Alexander Archipelago wolves. The majority (roughly 62 percent) occurs in coastal British Columbia with approximately 200–650 wolves in the southern portion (Regions 1 and 2; about 24 percent of rangewide population) and 300–1,050 wolves in the northern portion (Regions 5 and 6; about 38 percent of rangewide population) (see Figure 1). In southeastern Alaska, we estimate that currently the mainland (GMUs 1 and 5A) contains 150–450 wolves (about 18 percent of rangewide population), the islands in the middle portion of the area (GMU 3) contain 150–350 wolves (about 14 percent of rangewide population), and the southwestern set of islands (GMU 2) has 50–159 wolves (95 percent confidence intervals [CI], mean = 89 wolves; about 6 percent of rangewide population) (Person *et al.* 1996, p. 13; ADFG 2015a, p. 2). Our estimates are based on a variety of direct and indirect methods with the only empirical estimate available for GMU 2, which comprises POW and surrounding islands. See the Status Assessment (Service 2015, ''Abundance and density'') for details on derivation, assumptions, and caveats.

Similar to abundance, direct estimates of population trend of the Alexander Archipelago wolf are available only for GMU 2 in southeastern Alaska. In this GMU, fall population size has been estimated on four occasions (1994, 2003, 2013, and 2014). Between 1994 and 2014, the population was reduced from 356 wolves (95 percent CI = 148–564) (Person *et al.* 1996, pp. 11–12; ADFG 2014, pp. 2–4) to 89 wolves (95 percent CI = 50–159) (ADFG 2015a, pp. 1–2), equating to an apparent decline of 75 percent (standard error [SE] = 15), or 6.7 percent (SE = 2.8) annually. Although the numerical change in population size over the 20-year period is notable, the confidence intervals of the individual point estimates overlap. The most severe reduction occurred over a single year (2013–2014), when the population dropped by 60 percent and the proportion of females in the sample was reduced from 0.57 (SE = 0.13) to 0.25 (SE = 0.11) (ADFG 2015a, p. 2). In the remainder of southeastern Alaska, the trend of wolf populations is not known.

In British Columbia, regional estimates of wolf population abundance are generated regularly using indices of ungulate biomass, and, based on these data, the provincial wolf population as a whole has been stable or slightly increasing since 2000 (Kuzyk and Hatter 2014, p. 881). In Regions 1, 2, 5, and 6, where the Alexander Archipelago wolf occurs in all or a portion of each of these regions (see *Distribution and Range,* above), the same trend has been observed (BCMO 2015a, p. 1). Because estimates of population trend are not specific to the coastal portions of these regions only, we make the necessary scientific assumption that the trend reported for the entire region is reflective of the trend in the coastal portion of the region. This assumption applies only to Regions 5 and 6, where small portions (22 and 17 percent, respectively) of the region fall within the range of the Alexander Archipelago wolf; all of Region 1 and nearly all (83 percent) of Region 2 are within the range of the coastal wolf (see Figure 1). Thus, based on the best available information, we found that the wolf populations in coastal British Columbia have been stable or slightly increasing over the last 15 years. See the Status Assessment (Service 2015, ''Abundance and density'') for a more thorough description of data assumptions and caveats.

Reproduction and Survival

Similar to the gray wolf, sizes of litters of the Alexander Archipelago wolf can vary substantially (1–8 pups, mean = 4.1) with inexperienced breeding females producing fewer pups than older, more experienced mothers (Person and Russell 2009, p. 216). Although uncommon, some packs fail to exhibit denning behavior or produce litters in a given year, and no pack has been observed with multiple litters (Person and Russell 2009, p. 216). Age of first breeding of the Alexander Archipelago wolf is about 22 to 34 months (Person *et al.* 1996, p. 8).

We found only one study that estimated survival rates of Alexander Archipelago wolves. Based on radio-collared wolves in GMU 2 between 1994 and 2004, Person and Russell (2008, p. 1545) reported mean annual survival rate of wolves greater than 4 months old as 0.54 (SE = 0.17); survival did not differ between age classes or sexes, but was higher for resident wolves (0.65, SE = 0.17) compared to nonresidents (*i.e.,* wolves not associated with a pack; 0.34, SE = 0.17). Average annual rates of mortality attributed to legal harvest, unreported harvest, and natural mortality were 0.23 (SE = 0.12), 0.19 (SE = 0.11), and 0.04 (SE = 0.05), respectively, and these rates were correlated positively with roads and other landscape features that created openings in the forest (Person and Russell 2008, pp. 1545–1546).

In 2012, another study was initiated (and is ongoing) in GMU 2 that involves collaring wolves, but too few animals have been collared so far to estimate annual survival reliably (n = 12 wolves between 2012 and May 2015). Nonetheless, of those 12 animals, 5 died from legal harvest, 3 from unreported harvest, and 1 from natural causes; additionally, the fate of 2 wolves is unknown and 1 wolf is alive still (ADFG 2015b, p. 4). Thus, overall, harvest of Alexander Archipelago wolves by humans has accounted for most of the mortality of collared wolves in GMU 2. Our review of the best available information did not reveal any estimates of annual survival or mortality of wolves on other islands or the mainland of southeastern Alaska and coastal British Columbia.

Dispersal and Connectivity

Similar to gray wolves, Alexander Archipelago wolves either remain in their natal pack or disperse (Person *et al.* 1996, p. 10), here defined as permanent movement of an individual away from its pack of origin. Dispersers typically search for a new pack to join or associate with other wolves and ultimately form a new pack in vacant territories or in vacant areas adjacent to established territories. Dispersal can occur within or across populations; when it occurs across populations, then population connectivity is achieved. Both dispersal and connectivity contribute significantly to the health of individual populations as well as the taxon as a whole.

Dispersal rates of the Alexander Archipelago wolf are available only for GMU 2, where the annual rate of dispersal of radio-collared wolves was 39 percent (95 percent CI = 23 percent, n = 18) with adults greater than 2 years of age composing 79 percent of all dispersers (Person and Ingle 1995, p. 20). Minimum dispersal distances from the point of capture and radio-collaring ranged between 8 and 113 mi (13 and 182 km); all dispersing wolves remained in GMU 2 (Person and Ingle 1995, p. 23). Successful dispersal of individuals tends to be short in duration and distance in part because survival of dispersing wolves is low (annual survival rate = 0.16) (*e.g.,* Peterson *et al.* 1984, p. 29; Person and Russell 2008, p. 1547).

Owing to the rugged terrain and island geography across most of southeastern Alaska and coastal British Columbia, population connectivity probably is more limited for the

Alexander Archipelago wolf compared to the gray wolf that inhabits interior continental North America. Of the 67 Alexander Archipelago wolves radio-collared in GMU 2, none emigrated to a different GMU (Person and Ingle 1995, p. 23; ADFG 2015c, p. 2); similarly, none of the four wolves collared in northern southeastern Alaska (GMU 1C and 1D) attempted long-distance dispersal, although the home ranges of these wolves were comparatively large (ADFG 2015c, p. 2). Yet, of the three wolves opportunistically radio-collared on Kupreanof Island (GMU 3), one dispersed to Revillagigedo Island (GMU 1A) (USFS 2015, p. 1), an event that required at least four water crossings with the shortest being about 1.2 mi (2.0 km) in length (see Figure 1). Thus, based on movements of radio-collared wolves, demographic connectivity appears to be more restricted for some populations than others; however, few data exist outside of GMU 2, where the lack of emigration is well documented but little is known about the rate of immigration.

Likewise, we found evidence suggesting that varying degrees of genetic connectivity exist across populations of the Alexander Archipelago wolf, indicating that some populations are more insular than others. Generally, of the populations sampled, gene flow was most restricted to and from the GMU 2 wolf population (Weckworth *et al.* 2005, p. 923; Breed 2007, p. 19; Cronin *et al.* 2015, Supplemental Table 3), although this population does not appear to be completely isolated. Breed (2007, pp. 22–23) classified most wolves in northern coastal British Columbia (Regions 5 and 6) as residents and more than half of the wolves in the southern portion of southeastern Alaska (GMUs 1A and 2) as migrants of mixed ancestry. Further, the frequency of private alleles (based on nuclear DNA) in the GMU 2 wolf population is low relative to other Alexander Archipelago wolves (Weckworth *et al.* 2005, p. 921; Breed 2007, p. 18), and the population does not harbor unique haplotypes (based on mitochondrial DNA), both of which suggest that complete isolation has not occurred. Thus, although some genetic discontinuities of Alexander Archipelago wolves is evident, likely due to geographical disruptions to dispersal and gene flow, genetic connectivity among populations seems to be intact, albeit at low levels for some populations (*e.g.,* GMU 2). The scope of inference of these genetic studies depends on the type of genetic marker used and the spatial and temporal extent of the samples analyzed; we review key aspects of these studies in more detail in the Status Assessment (Service 2015, ''Genetic analyses,'' ''Genetic connectivity'').

Collectively, the best available information suggests that demographic and genetic connectivity among Alexander Archipelago wolf populations exists, but at low levels for some populations such as that of GMU 2, likely due to geographical disruptions to dispersal and gene flow. Based on the range of samples used by Breed (2007, pp. 21–23), gene flow to GMU 2 appears to be uni-directional, which is consistent with the movement data from wolves radio-collared in GMU 2 that demonstrated no emigration from that population (ADFG 2015c, p. 2). These findings, coupled with the trend of the GMU 2 wolf population (see ''Abundance and Trend,'' above), suggest that this population may serve as a sink population of the Alexander Archipelago wolf; conversely, the northern coastal British Columbian population may be a source population to southern southeastern Alaska, as suggested by Breed (2007, p. 34). This hypothesis is supported further with genetic information indicating a low frequency of private alleles and no unique haplotypes in the wolves occupying GMU 2. Nonetheless, we recognize that persistence of this population may be dependent on the health of adjacent populations (*e.g.,* GMU 3), but conclude that its demographic and genetic contribution to the rangewide population likely is lower than other populations such as those in coastal British Columbia.

Ecology

In this section, we briefly describe the ecology, including food habits, social organization, and space and habitat use, of the Alexander Archipelago wolf. Again, we review each of these topics in more detail in the Status Assessment (Service 2015, entire).

Food Habits

Similar to gray wolves, Alexander Archipelago wolves are opportunistic predators that eat a variety of prey species, although ungulates compose most of their overall diet. Based on scat and stable isotope analyses, black-tailed deer (*Odocoileus hemionus*), moose, mountain goat (*Oreamnos americanus*), and elk (*Cervus* spp.), either individually or in combination, constitute at least half of the wolf diet across southeastern Alaska and coastal British Columbia (Fox and Streveler 1986, pp. 192–193; Smith *et al.* 1987, pp. 9–11, 16; Milne *et al.* 1989, pp. 83–85; Kohira and Rexstad 1997, pp. 429–430; Szepanski *et al.* 1999, p. 331; Darimont *et al.* 2004, p. 1871; Darimont *et al.* 2009, p. 130; Lafferty *et al.* 2014, p. 145). Other prey species regularly consumed, depending on availability, include American beaver (*Castor canadensis*), hoary marmot (*Marmota caligata*), mustelid species (*Mustelidae* spp.), salmon (*Oncorhynchus* spp.), and marine mammals (summarized more fully in the Status Assessment, Service 2015, ''Food habits'').

Prey composition in the diet of the Alexander Archipelago wolf varies across space and time, usually reflecting availability on the landscape, especially for ungulate species that are not uniformly distributed across the islands and mainland. For instance, mountain goats are restricted to the mainland and Revillagigedo Island (introduced). Similarly, moose occur along the mainland and nearby islands as well as most of the islands in GMU 3 (*e.g.,* Kuiu, Kupreanof, Mitkof, and Zarembo islands); moose distribution is expanding in southeastern Alaska and coastal British Columbia (Darimont *et al.* 2005, p. 235; Hundertmark *et al.* 2006, p. 331). Elk also occur only on some islands in southeastern Alaska (*e.g.,* Etolin Island) and on Vancouver Island. Deer are the only ungulate distributed throughout the range of the Alexander Archipelago wolf, although abundance varies greatly with snow conditions. Generally, deer are abundant in southern coastal British Columbia, where the climate is mild, with their numbers decreasing northward along the mainland due to increasing snow depths, although they typically occur in high densities on islands such as POW, where persistent and deep snow accumulation is less common.

Owing to the disparate patterns of ungulate distribution and abundance, some Alexander Archipelago wolf populations have a more restricted diet than others. For example, in GMU 2, deer is the only ungulate species available to wolves, but elsewhere moose, mountain goat, elk, or a combination of these ungulates are available. Szepanski *et al.* (1999, pp. 330–331) demonstrated that deer and salmon contributed equally to the diet of wolves on POW (GMU 2), Kupreanof Island (GMU 3), and the mainland (GMUs 1A and 1B) (deer = 45–49 percent and salmon = 15–20 percent), and that ''other herbivores'' composed the remainder of the diet (34–36 percent). On POW, ''other herbivores'' included only beaver and voles (*Microtus* spp.), but on Kupreanof Island, moose also was included, and on the mainland, mountain goat was added to the other two herbivore prey species. Therefore, we hypothesize that wolves in GMU 2, and to a lesser extent in parts of GMU 3, are more vulnerable to changes in deer abundance compared to other wolf populations that have a more diverse ungulate prey base available to them.

Given the differences in prey availability throughout the range of the Alexander Archipelago wolf, some general patterns in their food habits exist. On the northern mainland of southeastern Alaska, where deer occur in low densities, wolves primarily eat moose and mountain goat (Fox and Streveler 1986, pp. 192–193; Lafferty *et al.* 2014, p. 145). As one moves farther south and deer become more abundant, they are increasingly represented in the diet, along with correspondingly smaller proportions of moose and mountain goat where available (Szepanski *et al.* 1999, p. 331; Darimont *et al.* 2004, p. 1869). On the outer islands of coastal British Columbia, marine mammals compose a larger portion of the diet compared to other parts of the range of the Alexander Archipelago wolf (Darimont *et al.* 2009, p. 130); salmon appear to be eaten regularly by coastal wolves in low proportions (less than 20 percent), although some variation among populations exists. Generally, the diet of wolves in coastal British Columbia appears to be more diverse than in southeastern Alaska (*e.g.,* Kohira and Rexstad 1997, pp. 429–430; Darimont *et al.* 2004, pp. 1869, 1871), consistent with a more diverse prey base in the southern portion of the range of the Alexander Archipelago wolf. We review these diet studies and others in the Status Assessment (Service 2015, ''Food habits'').

One of the apparently unusual aspects of the Alexander Archipelago wolf diet is consumption of marine-derived foods. However, we found evidence suggesting that this behavior is not uncommon for gray wolves in coastal areas or those that have inland access to marine prey (*e.g.,* spawning salmon). For example, wolves on the Alaska Peninsula in western Alaska have been observed catching and eating sea otters (*Enhydra lutris*), using offshore winter sea ice as a hunting platform and feeding on marine mammal carcasses such as Pacific walrus (*Odobenus rosmarus divergens*) and beluga whale (*Delphinapterus leucas*) (Watts *et al.* 2010, pp. 146–147). In addition, Adams *et al.* (2010, p. 251) found that inland wolves in Denali National Park, Alaska, ate salmon in slightly lower but similar quantities (3–17 percent of lifetime diet) compared to Alexander Archipelago wolves (15–20 percent of lifetime diet; Szepanski *et al.* 1999, p. 327). These findings and others suggest that marine-derived resources are not a distinct component of the diet of the Alexander Archipelago wolf. Nonetheless, marine prey provide alternate food resources to coastal wolves during periods of the year with high food and energy demands (*e.g.,* provisioning of pups when salmon are spawning; Darimont *et al.* 2008, pp. 5, 7–8) and when and where abundance of terrestrial prey is low.

Social Organization

Wolves are social animals that live in packs usually composed of one breeding pair (*i.e.,* alpha male and female) plus offspring of 1 to 2 years old. The pack is a year-round unit, although all members of a wolf pack rarely are observed together except during winter (Person *et al.* 1996, p. 7). Loss of alpha members of a pack can result in social disruption and unstable pack dynamics, which are complex and shift frequently as individuals age and gain dominance, disperse from, establish or join existing packs, breed, and die (Mech 1999, pp. 1197–1202). Although loss of breeding individuals impacts social stability within the pack, at the population level wolves appear to be resilient enough to compensate for any negative impacts to population growth (Borg *et al.* 2015, p. 183).

Pack sizes of the Alexander Archipelago wolf are difficult to estimate owing to the heavy vegetative cover throughout most of its range. In southeastern Alaska, packs range from one to 16 wolves, but usually average 7 to 9 wolves with larger packs observed in fall than in spring (Smith *et al.* 1987, pp. 4–7; Person *et al.* 1996, p. 7; ADFG 2015c, p. 2). Our review of the best available information did not reveal information on pack sizes from coastal British Columbia.

Space and Habitat Use

Similar to gray wolves in North America, the Alexander Archipelago wolf uses a variety of habitat types and is considered a habitat generalist (Person and Ingle 1995, p. 30; Mech and Boitani 2003, p. xv). Person (2001, pp. 62–63) reported that radiocollared Alexander Archipelago wolves spent most of their time at low elevation during all seasons (95 percent of locations were below 1,312 feet [ft] [400 m] in elevation), but did not select for or against any habitat types except during the pup-rearing season. During the pup-rearing season, radiocollared wolves selected for open- and closed-canopy old-growth forests close to lakes and streams and avoided clearcuts and roads (Person 2001, p. 62), a selection pattern that is consistent with den site characteristics.

Alexander Archipelago wolves den in root wads of large living or dead trees in low-elevation, old-growth forests near freshwater and away from logged stands and roads, when possible (Darimont and Paquet 2000, pp. 17–18; Person and Russell 2009, pp. 211, 217, 220). Of 25 wolf dens monitored in GMU 2, the majority (67 percent) were located adjacent to ponds or streams with active beaver colonies (Person and Russell 2009, p. 216). Although active dens have been located near clearcuts and roads, researchers postulate that those dens probably were used because suitable alternatives were not available (Person and Russell 2009, p. 220).

Home range sizes of Alexander Archipelago wolves are variable depending on season and geographic location. Generally, home ranges are about 50 percent smaller during denning and pup-rearing periods compared to other times of year (Person 2001, p. 55), and are roughly four times larger on the mainland compared to the islands in southeastern Alaska (ADFG 2015c, p. 2). Person (2001, pp. 66, 84) found correlations between home range size, pack size, and the proportion of ''critical winter deer habitat''; he thought that the relation between these three factors was indicative of a longer-term influence of habitat on deer density. We review space and habitat use of Alexander Archipelago wolf and Sitka black-tailed deer, the primary prey item consumed by wolves throughout most of their range, in detail in the Status Assessment (Service 2015, ''Space and habitat use'').

Summary of Species Information

In summary, we find that the Alexander Archipelago wolf currently is distributed throughout most of southeastern Alaska and coastal British Columbia with a rangewide population estimate of 850–2,700 wolves. The majority of the range (67 percent) and the rangewide population (approximately 62 percent) occur in coastal British Columbia, where the population is stable or increasing. In southeastern Alaska, we found trend information only for the GMU 2 population (approximately 6 percent of the rangewide population) that indicates a decline of about 75 (SE = 15) percent since 1994, although variation around the point estimates (n = 4) was substantial. This apparent decline is consistent with low estimates of annual survival of wolves in GMU 2, with the primary source of mortality being harvest by humans. For the remainder of southeastern Alaska (about 32 percent of the rangewide population), trends of wolf populations are not known.

Similar to the continental gray wolf, the Alexander Archipelago wolf has several life-history and ecological traits that contribute to its resiliency, or its ability to withstand stochastic disturbance events. These traits include high reproductive potential, ability to disperse long distances (over 100 km), use of a variety of habitats, and a diverse diet including terrestrial and marine prey. However, some of these traits are affected by the island geography and rugged terrain of most of southeastern Alaska and coastal British Columbia. Most notably, we found that demographic and genetic connectivity of some populations, specifically the GMU 2 population, is low, probably due to geographical disruptions to dispersal and gene flow. In addition, not all prey species occur throughout the range of the Alexander Archipelago wolf, and, therefore, some populations have a more limited diet than others despite the opportunistic food habits of wolves. Specifically, the GMU 2 wolf population is vulnerable to fluctuations in abundance of deer, the only ungulate species that occupies the area. We postulate that the insularity of this population, coupled with its reliance on one ungulate prey species, likely has contributed to its apparent recent decline, suggesting that, under current conditions, the traits associated with resiliency may not be sufficient for population stability in GMU 2.

Summary of Information Pertaining to the Five Factors

Section 4 of the Act (16 U.S.C. 1533) and implementing regulations (50 CFR 424) set forth procedures for adding species to, removing species from, or reclassifying species on the Federal Lists of Endangered and Threatened Wildlife and Plants. Under section 4(a)(1) of the Act, a species may be determined to be endangered or threatened based on any of the following five factors:

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

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

(C) Disease or predation;

(D) The inadequacy of existing regulatory mechanisms; or

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

In making this finding, information pertaining to the Alexander Archipelago wolf in relation to the five factors provided in section 4(a)(1) of the Act is discussed below. In considering what factors might constitute threats, we must look beyond the mere exposure of the species to the factor to determine whether the species responds to the factor in a way that causes actual impacts to the species. If there is exposure to a factor, but no response, or only a positive response, that factor is not a threat. If there is exposure and the species responds negatively, the factor may be a threat; we then attempt to determine if that factor rises to the level of a threat, meaning that it may drive or contribute to the risk of extinction of the species such that the species warrants listing as an endangered or threatened species as those terms are defined by the Act. This does not necessarily require empirical proof of a threat. The combination of exposure and some corroborating evidence of how the species is likely impacted could suffice. The mere identification of factors that could impact a species negatively is not sufficient to compel a finding that listing is appropriate, however; we require evidence that these factors are operative threats that act on the species to the point that the species meets the definition of an endangered or threatened species under the Act.

In making our 12-month finding on the petition we considered and evaluated the best available scientific and commercial information.

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

The Alexander Archipelago wolf uses a variety of habitats and, like other gray wolves, is considered to be a habitat generalist. Further, it is an opportunistic predator that eats ungulates, rodents, mustelids, fish, and marine mammals, typically killing live prey, but also feeding on carrion if fresh meat is not available or circumstances are desirable (*e.g.,* large whale carcass). For these reasons and others (*e.g.,* dispersal capability), we found that wolf populations often are resilient to changes in their habitat and prey. Nonetheless, we also recognize that the Alexander Archipelago wolf inhabits a distinct ecosystem, partially composed of island complexes, that may restrict wolf movement and prey availability of some populations, thereby increasing their vulnerability to changes in habitat.

In this section, we review stressors to terrestrial and intertidal habitats used by the Alexander Archipelago wolf and its primary prey, specifically deer. We identified timber harvest as the principal stressor modifying wolf and deer habitat in southeastern Alaska and coastal British Columbia, and, therefore, we focus our assessment on this stressor by evaluating possible direct and indirect impacts to the wolf at the population and rangewide levels. We also consider possible effects of road development, oil development, and climate-related events on wolf habitat. We describe the information presented here in more detail in the Status Assessment (Service 2015, ''Cause and effect analysis'').

Timber Harvest

Throughout most of the range of the Alexander Archipelago wolf, timber harvest has altered forested habitats, especially those at low elevations, that are used by wolves and their prey. Rangewide, we estimate that 19 percent of the productive old-growth forest has been logged, although it has not occurred uniformly across the landscape or over time. A higher percentage of productive old-growth forest has been logged in coastal British Columbia (24 percent) compared to southeastern Alaska (13 percent), although in both areas, most of the harvest has occurred since 1975 (85 percent and 66 percent, respectively). Within coastal British Columbia, the majority of harvest (66 percent of total harvest) has happened in Region 1, where 34 percent of the forest has been logged; in the coastal portions of Regions 2, 5, and 6, timber harvest has been comparatively lower, ranging from 12 to 17 percent of the productive forest in these regions. Similarly, in southeastern Alaska, logging has occurred disproportionately in GMU 2, where 23 percent of the forest has been logged (47 percent of all timber harvest in southeastern Alaska); in other GMUs, only 6 to 14 percent of the forest has been harvested. We discuss spatial and temporal patterns of timber harvest in more detail in the Status Assessment (Service 2015, ''Timber harvest'').

Owing to past timber harvest in southeastern Alaska and coastal British Columbia, portions of the landscape currently are undergoing succession and will continue to do so. Depending on site-specific conditions, it can take up to several hundred years for harvested stands to regain old-growth forest characteristics fully (Alaback 1982, p. 1939). During the intervening period, these young-growth stands undergo several successional stages that are relevant to herbivores such as deer. Briefly, for 10 to 15 years following clearcut logging, shrub and herb biomass production increases (Alaback 1982, p. 1941), providing short-term benefits to herbivores such as deer, which select for these stands under certain conditions (*e.g.,* Gilbert 2015, p.

129). After 25 to 35 years, early seral stage plants give way to young-growth coniferous trees, and their canopies begin to close, intercepting sunlight and eliminating most understory vegetation. These young-growth stands offer little nutritional browse for deer and therefore tend to be selected against by deer (*e.g.,* Gilbert 2015, pp. 129–130); this stage typically lasts for at least 50 to 60 years, at which point the understory layer begins to develop again (Alaback 1982, pp. 1938–1939). An understory of deciduous shrubs and herbs, similar to pre-harvest conditions, is re-established 140 to 160 years after harvest. Alternative young-growth treatments (*e.g.,* thinning, pruning) are used to stimulate understory growth, but they often are applied at small spatial scales, and their efficacy in terms of deer use is unknown; regardless, to date, over 232 mi² (600 km²) of young-growth has been treated in southeastern Alaska (summarized in Service 2015, ''Timber harvest'').

We expect timber harvesting to continue to occur throughout the range of the Alexander Archipelago wolf, although given current and predicted market conditions, the rate of future harvest is difficult to project. In southeastern Alaska, primarily in GMUs 2 and 3, some timber has been sold by the USFS already, but has not yet been cut. In addition, new timber sales currently are being planned for sale between 2015 and 2019, and most of this timber is expected to be sourced from GMUs 2 and 3; however, based on recent sales, it is unlikely that the planned harvest will be implemented fully due to lack of bidders. Also, we anticipate at least partial harvest of approximately 277 km² of land in GMU 2 that was transferred recently from the Tongass National Forest to Sealaska Native Corporation. In coastal British Columbia, we estimate that an additional 17 percent of forest will be harvested by 2100 on Vancouver Island (Region 1) and an additional 39 percent on the mainland of coastal British Columbia; however, some of this timber volume would be harvested from old young-growth stands. See the Status Assessment for more details (Service 2015, ''Future timber harvest'').

Since 2013, the USFS has been developing a plan to transition timber harvest away from primarily logging old-growth and toward logging young-growth stands, although small amounts of old-growth likely will continue to be logged. An amendment to the current Tongass Land and Resource Management Plan is underway and is expected to be completed by the end of 2016. Although this transition is expected to reduce further modification of habitat used by wolves and deer, the amendment that outlines the transition is still in the planning phase.

Potential Effects of Timber Harvest

After reviewing the best available information, we determined that the only potential direct effect from timber harvest to Alexander Archipelago wolves is the modification of and disturbance at den sites. Although coastal wolves avoided using den sites located in or near logged stands, other landscape features such as gentle slope, low elevation, and proximity to freshwater had greater influence on den site use (Person and Russell 2009, pp. 217–219). Further, our review of the best available information did not indicate that denning near logged stands had fitness consequences to individual wolves or that wolf packs inhabiting territories with intensive timber harvest were less likely to breed due to reduced availability of denning habitat. Therefore, we conclude that modification of and disturbance at den sites as a result of timber harvest does not constitute a threat to the Alexander Archipelago wolf at the population or rangewide level.

We then examined reduction in prey availability, specifically deer, as a potential indirect effect of timber harvest to the Alexander Archipelago wolf. Because deer selectively use habitats that minimize accumulation of deep snow in winter, including productive old-growth forest (*e.g.,* Schoen and Kirchhoff, 1990, p. 374; Doerr *et al.* 2005, p. 322; Gilbert 2015, p. 129), populations of deer in areas of intensive timber harvest are expected to decline in the future as a result of long-term reduction in the carrying capacity of their winter habitat (*e.g.,* Person 2001, p. 79; Gilbert *et al.* 2015, pp. 18–19). However, we found that most populations of Alexander Archipelago wolf likely will be resilient to predicted declines in deer abundance largely owing to their ability to feed on alternate ungulate prey species and non-ungulate species, including those that occur in intertidal and marine habitats (greater than 15 percent of the diet; see ''Food Habits,'' above) (Szepanski *et al.* 1999, p. 331; Darimont *et al.* 2004, p. 1871, Darimont *et al.* 2009, p. 130). Moreover, in our review of the best available information, we found nothing to suggest that these intertidal and marine species, non-ungulate prey, and other ungulate species within the range of the Alexander Archipelago wolf (*i.e.,* moose, goat, elk) are affected significantly by timber harvest (Service 2015, ''Response of wolves to timber harvest''). Therefore, we focus the remainder of this section on predicted response of wolves to reduction in deer numbers as a result of timber harvest and availability of alternate ungulate prey.

In coastal British Columbia, where a greater proportion of productive old-growth forest has been harvested compared to southeastern Alaska, deer populations are stable (Regions 1, 2, and 5) or decreasing (Region 6) (BCMO 2015b, p. 1). Yet, corresponding wolf populations at the regional scale are stable or slightly increasing (Kuzyk and Hatter 2014, p. 881; BCMO 2015a, p. 1). We attribute the stability in wolf numbers, in part, to the availability of other ungulate species, specifically moose, mountain goat, and elk (Region 1 only), which primarily have stable populations and do not use habitats affected by timber harvest. Therefore, we presume that these wolf populations have adequate prey available and are not being affected significantly by changes in deer abundance as a result of timber harvest.

Similarly, throughout most of southeastern Alaska, wolves have access to multiple ungulate prey species in addition to deer. Along the mainland (GMUs 1 and 5A), where deer densities are low naturally, moose and mountain goats are available, and, in GMU 3, moose occur on all of the larger islands and elk inhabit Etolin and Zarembo islands. Also, although we expect deer abundance in these GMUs to be lower in the future, deer will continue to be available to wolves; between 1954 and 2002, deer habitat capability was reduced by only 15 percent in parts of GMU 1 and by 13 to 23 percent in GMU 3 (Albert and Schoen 2007, p. 16). Thus, although we lack estimates of trend in these wolf populations, we postulate that they have sufficient prey to maintain stable populations and are not being impacted by timber harvest.

Only one Alexander Archipelago wolf population, the GMU 2 population, relies solely on deer as an ungulate prey species and therefore it is more vulnerable to declines in deer numbers compared to all other populations. Additionally, timber harvest has occurred disproportionately in this area, more so than anywhere else in the range of the wolf except Vancouver Island (where the wolf population is stable). As a result, in GMU 2, deer are projected to decline by approximately 21 to 33 percent over the next 30 years, and, correspondingly, the wolf population is predicted to decline by an average of 8 to 14 percent (Gilbert *et al.* 2015, pp. 19, 43). Further, the GMU 2 wolf population already has been reduced by about 75 percent since 1994, although most of the apparent decline occurred over a 1-year period between 2013 and 2014 (see ''Abundance and Trend,'' above), suggesting that the cause of the decline was not specifically long-term reduction in deer carrying capacity, although it probably was a contributor. These findings indicate that for this wolf population, availability of non-ungulate prey does not appear to be able to compensate for declining deer populations, especially given other present stressors such as wolf harvest (see discussion under *Factor B*). Therefore, we conclude that timber harvest is affecting the GMU 2 wolf population by reducing its ungulate prey and likely will continue to do so in the future.

In reviewing the best available information, we conclude that indirect effects from timber harvest likely are not having and will not have a significant effect on the Alexander Archipelago wolf at the rangewide level. Although timber harvest has reduced deer carrying capacity, which in turn is expected to cause declines in deer populations, wolves are opportunistic predators, feeding on a variety of prey species, including intertidal and marine species that are not impacted by timber harvest. In addition, the majority (about 94 percent) of the rangewide wolf population has access to ungulate prey species other than deer. Further, currently the wolf populations in coastal British Columbia, which constitute 62 percent of the rangewide population, are stable or slightly increasing despite intensive and extensive timber harvest.

However, we also conclude that the GMU 2 wolf population likely is being affected and will continue to be affected by timber harvest, but that any effects will be restricted to the population level. This wolf population represents only 6 percent of the rangewide population, is largely insular and geographically peripheral to other populations, and appears to function as a sink population (see ''Abundance and Trend'' and ''Dispersal and Connectivity,'' above). For these reasons, we find that the demographic and genetic contributions of the GMU 2 wolf population to the rangewide population are low. Thus, although we expect deer and wolf populations to decline in GMU 2, in part as a result of timber harvest, we find that these declines will not result in a rangewide impact to the Alexander Archipelago wolf population.

Road Development

Road development has modified the landscape throughout the range of the Alexander Archipelago wolf. Most roads were constructed to support the timber industry, although some roads were built as a result of urbanization, especially in southern coastal British Columbia. Below, we briefly describe the existing road systems in southeastern Alaska and coastal British Columbia using all types of roads (*e.g.,* sealed, unsealed) that are accessible with any motorized vehicle (*e.g.,* passenger vehicle, all-terrain vehicle). See the Status Assessment for a more detailed description (Service 2015, ''Road construction and management'').

Across the range of the Alexander Archipelago wolf, the majority (86 percent) of roads are located in coastal British Columbia (approximately 41,943 mi [67,500 km] of roads), where mean road density is 0.76 mi per mi^2 (0.47 km per km^2), although road densities are notably lower in the northern part of the province (Regions 5 and 6, mean = 0.21–0.48 mi per km^2 [0.13–0.30 km per km^2]) compared to the southern part (Regions 1 and 2, mean = 0.85–0.89 mi per mi^2 [0.53–0.55 km per km^2]), largely owing to the urban areas of Vancouver and Victoria. In southeastern Alaska, nearly 6,835 mi [11,000 km] of roads exist within the range of the Alexander Archipelago wolf, resulting in a mean density of 0.37 mi per mi^2 (0.23 km per km^2). Most of these roads are located in GMU 2, where the mean road density is 1.00 mi per mi^2 (0.62 km per km^2), more than double that in all other GMUs, where the mean density ranges from 0.06 mi per mi^2 (0.04 km per km^2) (GMU 5A) to 0.42 mi per mi^2 (0.26 km per km^2) (GMU 3). Thus, most of the roads within the range of the Alexander Archipelago wolf are located in coastal British Columbia, especially in Regions 1 and 2, but the highest mean road density occurs in GMU 2 in southeastern Alaska, which is consistent with the high percentage of timber harvest in this area (see ''Timber Harvest,'' above). In addition, we anticipate that most future road development also will occur in GMU 2 (46 mi [74 km] of new road), with smaller additions to GMUs 1 and 3 (Service 2015, ''Road construction and management'').

Given that the Alexander Archipelago wolf is a habitat generalist, we find that destruction and modification of habitat due to road development likely is not affecting wolves at the population or rangewide level. In fact, wolves occasionally use roads as travel corridors between habitat patches (Person *et al.* 1996, p. 22). As reviewed above in ''Timber Harvest,'' we recognize that wolves used den sites located farther from roads compared to unused sites; however, other landscape features were more influential in den site selection, and proximity to roads did not appear to affect reproductive success or pup survival, which is thought to be high (Person *et al.* 1996, p. 9; Person and Russell 2009, pp. 217–219). Therefore, we conclude that roads are not a threat to the habitats used by the Alexander Archipelago wolf, although we address the access that they afford to hunters and trappers as a potential threat to some wolf populations under *Factor B.*

Oil and Gas Development

We reviewed potential loss of habitat due to oil and gas development as a stressor to the Alexander Archipelago wolf. We found no existing oil and gas projects within the range of the coastal wolf, although two small-scale exploration projects occurred in Regions 1 and 2 of coastal British Columbia, but neither project resulted in development. In addition, we considered a proposed oil pipeline project (*i.e.,* Northern Gateway Project) intended to transport oil from Alberta to the central coast of British Columbia, covering about 746 mi (1,200 km) in distance. If the proposed project was approved and implemented, risk of oil spills on land and on the coast within the range of the Alexander Archipelago wolf would exist. However, given its diverse diet, terrestrial habitat use, and dispersal capability, we conclude that wolf populations would not be affected by the pipeline project even if an oil spill occurred because exposure would be low. Further, oil development occurs in portions of the range of the gray wolf (*e.g.,* Trans Alaska Pipeline System) and is not thought to be impacting wolf populations negatively. We conclude that oil development is not a threat to the Alexander Archipelago wolf now and is not likely to become one in the future.

Climate-Related Events

We considered the role of climate and projected changes in climate as a potential stressor to the Alexander Archipelago wolf. We identified three possible mechanisms through which climate may be affecting habitats used by coastal wolves or their prey: (1) Frequency of severe winters and impacts to deer populations; (2) decreasing winter snow pack and impacts to yellow cedar; and (3) predicted hydrologic change and impacts to salmon productivity. We review each of these briefly here and in more detail in the Status Assessment (Service 2015, ''Climate-related events'').

Severe winters with deep snow accumulation can negatively affect deer populations by reducing availability of forage and by increasing energy expenditure associated with movement. Therefore, deer selectively use habitats in winter that accumulate less snow, such as those that are at low elevation, that are south-facing, or that can intercept snowfall (*i.e.,* dense forest canopy). Timber harvest has reduced some of these preferred winter habitats. However, while acknowledging that severe winters can result in declines of local deer populations, we postulate that those declines are unlikely to affect wolves substantially at the population or rangewide level for several reasons.

First, in southern coastal British Columbia where 24 percent of the rangewide wolf population occurs, persistent snowfall is rare except at high elevations. Second, in GMU 2, where wolves are limited to deer as ungulate prey and therefore are most vulnerable to declines in deer abundance, the climate is comparatively mild and severe winters are infrequent (Shanley *et al.* 2015, p. 6); Person (2001, p. 54) estimated that six winters per century may result in general declines in deer numbers in GMU 2. Lastly, climate projections indicate that precipitation as snow will decrease by up to 58 percent over the next 80 years (Shanley *et al.* 2015, pp. 5–6), reducing the likelihood of severe winters. Therefore, we conclude that winter severity, and associated interactions with timber harvest, is not a threat to the persistence of the Alexander Archipelago wolf at the population or rangewide level now or in the future.

In contrast to deer response to harsh winter conditions, recent and ongoing decline in yellow cedar in southeastern Alaska is attributed to warmer winters and reduced snow cover (Hennon *et al.* 2012, p. 156). Although not all stands are affected or affected equally, the decline has impacted about 965 mi^2 (2,500 km^2) of forest (Hennon *et al.* 2012, p. 148), or less than 3 percent of the forested habitat within the range of the Alexander Archipelago wolf. In addition, yellow cedar is a minor component of the temperate rainforest, which is dominated by Sitka spruce and western hemlock and neither of these tree species appears to be impacted negatively by reduced snow cover (*e.g.,* Schaberg *et al.* 2005, p. 2065). Therefore, we conclude that any effects (positive or negative) to the wolf as a result of loss of yellow cedar would be negligible given that it constitutes a small portion of the forest and that the wolf is a habitat generalist.

Predicted hydrologic changes as a result of changes in climate are expected to reduce salmon productivity within the range of the Alexander Archipelago wolf (*e.g.,* Edwards *et al.* 2013, p. 43; Shanley and Albert 2014, p. 2). Warmer winter temperatures and extreme flow events are predicted to reduce egg-to-fry survival of salmon, resulting in lower overall productivity. Although salmon compose 15 to 20 percent of the lifetime diet of Alexander Archipelago wolves in southeastern Alaska (Szepanski *et al.* 1999, pp. 330–331) and 0 to 16 percent of the wolf diet in coastal British Columbia (Darimont *et al.* 2004, p. 1871; Darimont *et al.* 2009, p. 13) (see ''Food Habits,'' above), we do not anticipate negative effects to them in response to projected declines in salmon productivity at the population or rangewide level owing to the opportunistic predatory behavior of wolves.

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

We are not aware of any nonregulatory conservation efforts, such as habitat conservation plans, or other voluntary actions that may help to ameliorate potential threats to the habitats used by the Alexander Archipelago wolf.

Summary of Factor A

Although several stressors such as timber harvest, road development, oil development, and climate-related events may be impacting some areas within the range of the Alexander Archipelago wolf, available information does not indicate that these impacts are affecting or are likely to affect the rangewide population. First and foremost, wolf populations in coastal British Columbia, where most (62 percent) of the rangewide population occurs, are stable or slightly increasing even though the landscape has been modified extensively. In fact, a higher proportion of the forested habitat has been logged (24 percent) and the mean road density (0.76 mi per mi^2 [0.47 km per km^2]) is higher in coastal British Columbia compared to southeastern Alaska (13 percent and 0.37 mi per mi^2 [0.23 km per km^2], respectively). Second, we found no direct effects of habitat-related stressors that resulted in lower fitness of Alexander Archipelago wolves, in large part because the wolf is a habitat generalist. Third, although deer populations likely will decline in the future as a result of timber harvest, we found that most wolf populations will be resilient to reduced deer abundance because they have access to alternate ungulate and non-ungulate prey that are not impacted significantly by timber harvest, road development, or other stressors that have altered or may alter habitat within the range of the wolf. Only the GMU 2 wolf population likely is being impacted and will continue to be impacted by reduced numbers of deer, the only ungulate prey available; however, we determined that this population does not contribute substantially to the other Alexander Archipelago wolf populations or the rangewide population. Therefore, we posit that most (94 percent) of the rangewide population of Alexander Archipelago wolf likely is not being affected and will not be affected in the future by loss or modification of habitat.

We conclude, based on the best scientific and commercial information available, that the present or threatened destruction, modification, or curtailment of its habitat or range does not currently pose a threat to the Alexander Archipelago wolf at the rangewide level, nor is it likely to become a threat in the future.

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

The Alexander Archipelago wolf is harvested by humans for commercial and subsistence purposes. Mortality of wolves due to harvest can be compensated for at the population or rangewide level through increased survival, reproduction, or immigration (*i.e.,* compensatory mortality), or harvest mortality may be additive, causing overall survival rates and population growth to decline. The degree to which harvest is considered compensatory, partially compensatory, or at least partially additive is dependent on population characteristics such as age and sex structure, productivity, immigration, and density (*e.g.,* Murray *et al.* 2010, pp. 2519–2520). Therefore, each wolf population (or group of populations) is different, and a universal rate of sustainable harvest does not exist. In our review, we found rates of human-caused mortality of gray wolf populations varying from 17 to 48 percent, with most being between 20 and 30 percent (Fuller *et al.* 2003, pp. 184–185; Adams *et al.* 2008, p. 22; Creel and Rotella 2010, p. 5; Sparkman *et al.* 2011, p. 5; Gude *et al.* 2012, pp. 113–116). For the Alexander Archipelago wolf in GMU 2, Person and Russell (2008, p. 1547) reported that total annual mortality greater than 38 percent was unsustainable and that natural mortality averaged about 4 percent (SE

= 5) annually, suggesting that human-caused mortality should not exceed 34 percent annually. In our review, we did not find any other estimates of sustainable harvest rates specific to the coastal wolf.

Across the range of the Alexander Archipelago wolf, hunting and trapping regulations, including reporting requirements, vary substantially. In southeastern Alaska, wolf harvest regulations are set by the Alaska Board of Game for all resident and nonresident hunters and trappers, and by the Federal Subsistence Board for federally-qualified subsistence users on Federal lands. In all GMUs, each hunter can harvest a maximum of five wolves, and trappers can harvest an unlimited number of wolves; all harvested wolves must be reported and sealed within a specified time following harvest. In GMU 2 only, an annual harvest guideline is applied; between 1997 and 2014, the harvest guideline was set as 25 to 30 percent of the most recent fall population estimate, and in 2015, this guideline was reduced to 20 percent in response to an apparent decline in the population (see ''Abundance and Trend,'' above). If the annual harvest guideline is exceeded, then an emergency order closing the hunting and trapping seasons is issued. In coastal British Columbia, the provincial government manages wolf harvest, following an established management plan. The hunting bag limit is three wolves per hunter annually, and, similar to southeastern Alaska, no trapping limit is set. In Regions 1 and 2, all wolf harvest is required to be reported, but no compulsory reporting program exists for Regions 5 and 6.

In this section, we consider wolf harvest as a stressor to the Alexander Archipelago wolf at the population and rangewide levels. Given that harvest regulations and the biological circumstances (*e.g.,* degree of insularity; see ''Dispersal and Connectivity,'' above) of each wolf population vary considerably, we examined possible effects of wolf harvest to each population by first considering the current condition of the population. If the population is stable or increasing, we presumed that wolves in that population are not being overharvested; if the population is declining or unknown, we assessed mean annual harvest rates based on reported wolf harvest. Because some wolves are harvested and not reported, even in areas where reporting is required, we then applied proportions of unreported harvest to reported harvest for a given year to estimate total harvest, where it was appropriate to do so. We used the population-level information collectively to evaluate impacts of total harvest to the rangewide population of the Alexander Archipelago wolf. We present our analyses and other information related to wolf harvest in southeastern Alaska and coastal British Columbia in more detail in the Status Assessment (Service 2015, ''Wolf harvest'').

In coastal British Columbia, populations of the Alexander Archipelago wolf are considered to be stable or slightly increasing (see ''Abundance and Trend,'' above), and, therefore, we presume that current harvest levels are not impacting those populations. Moreover, in Regions 1 and 2, where reporting is required, few wolves are being harvested on average relative to the estimated population size; in Region 1, approximately 8 percent of the population was harvested annually on average between 1997 and 2012, and in Region 2, the rate is even lower (4 percent). It is more difficult to assess harvest in Regions 5 and 6 because reporting is not required; nonetheless, based on the minimum number of wolves harvested annually from these regions, we estimated that 2 to 7 percent of the populations are harvested on average with considerable variation among years, which could be attributed to either reporting or harvest rates. Overall, we found no evidence indicating that harvest of wolves in coastal British Columbia is having a negative effect on the Alexander Archipelago wolf at the population level and is not likely to have one in the future.

In southeastern Alaska, the GMU 2 wolf population apparently has declined considerably, especially in recent years, although the precision of individual point estimates was low and the confidence intervals overlapped (see ''Abundance and Trend,'' above). In our review, we found compelling evidence to suggest that wolf harvest likely contributed to this apparent decline. Although annual reported harvest of wolves in GMU 2 equated to only about 17 percent of the population on average between 1997 and 2014 (range = 6–33 percent), documented rates of unreported harvest (*i.e.,* illegal harvest) over a similar time period were high (approximately 38 to 45 percent of total harvest) (Person and Russell 2008, p. 1545; ADFG 2015b, p. 4). Applying these unreported harvest rates, we estimate that mean total annual harvest was 29 percent with a range of 11 to 53 percent, suggesting that in some years, wolves in GMU 2 were being harvested at unsustainable rates; in fact, in 7 of 18 years, total wolf harvest exceeded 34 percent of the estimated population (following Person and Russell [2008, p. 1547], and accounting for natural mortality), suggesting that harvest likely contributed to or caused the apparent population decline. In addition, it is unlikely that increased reproduction and immigration alone could reverse the decline, at least in the short term, owing to this population's insularity (see ''Dispersal and Connectivity,'' above) and current low proportion of females (see ''Abundance and Trend,'' above). Thus, we conclude that wolf harvest has impacted the GMU 2 wolf population and, based on the best available information, likely will continue to do so in the near future, consistent with a projected overall population decline on average of 8 to 14 percent (Gilbert *et al.* 2015, pp. 43, 50), unless total harvest is curtailed.

Trends in wolf populations in the remainder of southeastern Alaska are not known, and, therefore, to evaluate potential impact of wolf harvest to these populations, we reviewed reported wolf harvest in relation to population size and considered whether or not the high rates of unreported harvest in GMU 2 were applicable to populations in GMUs 1, 3, and 5A. Along the mainland (GMUs 1 and 5A) between 1997 and 2014, mean percent of the population harvested annually and reported was 19 percent (range = 11–27), with most of the harvest occurring in the southern portion of the mainland. In GMU 3, the same statistic was 21 percent, ranging from 8 to 37 percent, but with only 3 of 18 years exceeding 25 percent. Thus, if reported harvested rates from these areas are accurate, wolf harvest likely is not impacting wolf populations in GMUs 1, 3, and 5A because annual harvest rates typically are within sustainable limits identified for populations of gray wolf (roughly 20 to 30 percent), including the Alexander Archipelago wolf (approximately 34 percent) (Fuller *et al.* 2003, pp. 184–185; Adams *et al.* 2008, p. 22; Person and Russell 2008, p. 1547; Creel and Rotella 2010, p. 5; Sparkman *et al.* 2011, p. 5; Gude *et al.* 2012, pp. 113–116). In our review, we found evidence indicating that unreported harvest occasionally occurs in GMUs 1 and 3 (Service 2015, ''Unreported harvest''), but we found nothing indicating that it is occurring at the high rates documented in GMU 2.

Harvest rates of wolves in southeastern Alaska are associated with access afforded primarily by boat and motorized vehicle (85 percent of successful hunters and trappers) (ADFG 2012, ADFG 2015d). Therefore, we considered road density, ratio of shoreline to land area, and the total number of communities as proxies to access by wolf hunters and trappers and determined that GMU 2 is not representative of the mainland (GMUs 1 and 5A) or GMU 3 and that applying unreported harvest rates from GMU 2 to other wolf populations is not appropriate. Mean road density in GMU 2 (1.00 mi per mi² [0.62 km per km²]) is more than twice that of all other GMUs (GMU 1 = 0.13 [0.08], GMU 3 = 0.42 [0.26], and GMU 5A = 0.06 [0.04]). Similarly, nearly all (13 of 15, 87 percent) of the Wildlife Analysis Areas (smaller spatial units that comprise each GMU) that exceed the recommended road density threshold for wolves (1.45 mi per mi² [0.9 km per km²]) (Person and Russell 2008, p. 1548) are located in GMU 2; one each occurs in GMUs 1 and 3. In addition, the ratio of shoreline to land area, which serves as an indicator of boat acess, in GMU 2 (1.30 mi per mi² [0.81 km per km²]) is greater than all other GMUs (GMU 1 = 0.29 [0.18], GMU 3 = 1.00 [0.62], and GMU 5A = 0.19 [0.12]). Lastly, although the human population size of GMU 2 is comparatively smaller than in the other GMUs, 14 communities are distributed throughout the unit, more than any other GMU (GMU 1 = 11, GMU 3 = 4, and GMU 5A = 1).

Collectively, these data indicate that hunting and trapping access is greater in GMU 2 than in the rest of southeastern Alaska and that applying unreported harvest rates from GMU 2 to elsewhere is not supported. Therefore, although we recognize that some level of unreported harvest likely is occurring along the mainland of southeastern Alaska and in GMU 3, we do not know the rate at which it may be occurring, but we hypothesize that it likely is less than in GMU 2 because of reduced access. We expect wolf harvest rates in the future to be similar to those in the past because we have no basis from which to expect a change in hunter and trapper effort or success. Consequently, we think that reported wolf harvest rates for GMUs 1, 3, and 5A are reasonably accurate and that wolf harvest is not impacting these populations nor is it likely to do so in the future.

In summary, we find that wolf harvest is not affecting most populations of the Alexander Archipelago wolf. In coastal British Columbia, wolf populations are stable or slightly increasing, suggesting that wolf harvest is not impacting those populations; in addition, mean annual harvest rates of those populations appear to be low (2 to 8 percent of the population based on the best available information). In southeastern Alaska, we determined that the GMU 2 wolf population is being affected by intermediate rates of reported harvest (annual mean = 17 percent) and high rates of unreported harvest (38 to 45 percent of total harvest), which have contributed to an apparent population decline that is projected to continue. We also find that wolf populations in GMUs 1, 3, and 5A experience intermediate rates of reported harvest, 19 to 21 percent of the populations annually, but that these populations likely do not experience high rates of unreported harvest like those estimated for GMU 2 because of comparatively low access to hunters and trappers. In addition, these GMUs are less geographically isolated than GMU 2 and likely have higher immigration rates of wolves. Therefore, based on the best available information, we conclude that wolf harvest of these populations (GMUs 1, 3, and 5A) is occurring at rates similar to or below sustainable harvest rates proposed for gray wolf (roughly 20 to 30 percent) and the Alexander Archipelago wolf (approximately 34 percent) (Fuller *et al.* 2003, pp. 184–185; Adams *et al.* 2008, p. 22; Person and Russell 2008, p. 1547; Creel and Rotella 2010, p. 5; Sparkman *et al.* 2011, p. 5; Gude *et al.* 2012, pp. 113–116).

Although wolf harvest is affecting the GMU 2 wolf population and likely will continue to do so, we conclude that wolf harvest is not impacting the rangewide population of Alexander Archipelago wolf. The GMU 2 wolf population constitutes a small percentage of the rangewide population (6 percent), is largely insular and geographically peripheral to other populations, and appears to function as a sink population (see ''Abundance and Trend'' and ''Dispersal and Connectivity,'' above). Therefore, although we found that this population is experiencing unsustainable harvest rates in some years, owing largely to unreported harvest, we think that the condition of the GMU 2 population has a minor effect on the condition of the rangewide population. The best available information does not suggest that wolf harvest is having an impact on the rangewide population of Alexander Archipelago wolf, nor is it likely to have an impact in the future.

Our review of the best available information does not suggest that overexploitation of the Alexander Archipelago wolf due to scientific or educational purposes is occurring or is likely to occur in the future.

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

The ADFG has increased educational efforts with the public, especially hunters and trappers, in GMU 2 with the goal of improving communication and coordination regarding management of the wolf population. In recent years, the agency held public meetings, launched a newsletter, held a workshop for teachers, and engaged locals in wolf research. We do not know if these efforts ultimately will be effective at lowering rates of unreported harvest.

We are not aware of any additional conservation efforts or other voluntary actions that may help to reduce overutilization for commercial, recreational, scientific, or educational purposes of the Alexander Archipelago wolf.

Summary of Factor B

We find that wolf harvest is not affecting most Alexander Archipelago wolf populations. In coastal British Columbia, wolf harvest rates are low and are not impacting wolves at the population level, as evidenced by stable or slightly increasing populations. In southeastern Alaska, we found that the GMU 2 wolf population is experiencing high rates of unreported harvest, which has contributed to an apparent population decline, and, therefore, we conclude that this population is being affected by wolf harvest and likely will continue to be affected. We determined that wolf harvest in the remainder of southeastern Alaska is occurring at rates that are unlikely to result in population-level declines. Overall, we found that wolf harvest is not having an effect on the Alexander Archipelago wolf at the rangewide level, although we recognize that the GMU 2 population likely is being harvested at unsustainable rates, especially given other stressors facing the population (*e.g.,* reduced prey availability due to timber harvest). Thus, based on the best available information, we conclude that overexploitation for commercial, recreational, scientific, or educational purposes does not currently pose a threat to the Alexander Archipelago wolf throughout its range, nor is it likely to become a threat in the future.

Factor C. Disease or Predation

In this section, we briefly review disease and predation as stressors to the Alexander Archipelago wolf. We describe information presented here in more detail in the Status Assessment (Service 2015, ''Disease'').

Disease

Several diseases have potential to affect Alexander Archipelago wolf populations, especially given their social behavior and pack structure (see ''Social Organization,'' above). Wolves are susceptible to a number of diseases that can cause mortality in the wild, including rabies, canine distemper, canine parvovirus, blastomycosis, tuberculosis, sarcoptic mange, and dog louse (Brand *et al.* 1995, pp. 419–422). However, we found few incidences of diseases reported in Alexander Archipelago wolves; these include dog louse in coastal British Columbia (Hatler *et al.* 2008, pp. 88–91) and potentially sarcoptic mange (reported in British Columbia, but it is unclear whether or not it occurred along the coast or inland; Miller *et al.* 2003, p. 183). Both dog louse and mange results in mortality only in extreme cases and usually in pups, and, therefore, it is unlikely that either disease is having or is expected to have a population- or rangewide-level effect on the Alexander Archipelago wolf.

Although we found few reports of diseases in Alexander Archipelago wolves, we located records of rabies, canine distemper, and canine parvovirus in other species in southeastern Alaska and coastal British Columbia, suggesting that transmission is possible but unlikely given the low number of reported incidences. Only four individual bats have tested positive for rabies in southeastern Alaska since the 1970s; bats also are reported to carry rabies in British Columbia, but we do not know whether or not those bats occur on the coast or inland. Canine distemper and parvovirus have been found in domestic dogs on rare occasions; we found only one case of canine distemper, and information suggested that parvovirus has been documented but is rare due to the high percentage of dogs that are vaccinated for it. Nonetheless, we found no documented cases of rabies, canine distemper, or canine parvovirus in wolves from southeastern Alaska or coastal British Columbia.

We acknowledge that diseases such as canine distemper and parvovirus have affected gray wolf populations in other parts of North America (Brand *et al.* 1995, p. 420 and references therein), but the best available information does not suggest that disease, or even the likelihood of disease in the future, is a threat to the Alexander Archipelago wolf. We conclude that, while some individual wolves may be affected by disease on rare occasions, disease is not having a population- or rangewide-level effect on the Alexander Archipelago wolf now or in the future.

Predation

Our review of the best available information did not indicate that predation is affecting or will affect the Alexander Archipelago wolf at the population or rangewide level. As top predators in the ecosystem, predation most likely would occur by another wolf as a result of inter- or intra-pack strife or other territorial behavior. The annual rate of natural mortality, which includes starvation, disease, and predation, was 0.04 (SE = 0.05) for radio-collared wolves in GMU 2 (Person and Russell 2008, p. 1545), indicating that predation is rare and is unlikely to be having a population or rangewide effect. Therefore, we conclude that predation is not a threat to the Alexander Archipelago wolf, nor is it likely to become one in the future.

Conservation Efforts To Reduce Disease or Predation

We are not aware of any conservation efforts or other voluntary actions that may help to reduce disease or predation of the Alexander Archipelago wolf.

Summary of Factor C

We identified several diseases with the potential to affect wolves and possible vectors for transmission, but we found only a few records of disease in individual Alexander Archipelago wolves, and, to the best of our knowledge, none resulted in mortality. Further, we found no evidence that disease is affecting the Alexander Archipelago wolf at the population or rangewide level. Therefore, we conclude that disease is not a threat to the Alexander Archipelago wolf and likely will not become a threat in the future.

We also determined that the most likely predator of individual Alexander Archipelago wolves is other wolves and that this type of predation is a component of their social behavior and organization. Further, predation is rare and is unlikely to be having an effect at population or rangewide levels. Thus, we conclude that predation is not a threat to the Alexander Archipelago wolf, nor is it likely to become one in the future.

Factor D. The Inadequacy of Existing Regulatory Mechanisms

In this section, we review laws aimed to help reduce stressors to the Alexander Archipelago wolf and its habitats. However, because we did not find any stressors examined under *Factors A, B,* and *C* (described above) and *Factor E* (described below) to rise to the level of a threat to the Alexander Archipelago wolf rangewide, we also did not find the existing regulatory mechanisms authorized by these laws to be inadequate for the Alexander Archipelago wolf. In other words, we cannot find an existing regulatory mechanism to be inadequate if the stressor intended to be reduced by that regulatory mechanism is not considered a threat to the Alexander Archipelago wolf. Nonetheless, we briefly discuss relevant laws and regulations below.

Southeastern Alaska

National Forest Management Act (NFMA)

The National Forest Management Act (NFMA; 16 U.S.C. 1600 *et seq.*) is the primary statute governing the administration of National Forests in the United States, including the Tongass National Forest. The stated objective of NFMA is to maintain viable, well-distributed wildlife populations on National Forest System lands. As such, the NFMA requires each National Forest to develop, implement, and periodically revise a land and resource management plan to guide activities on the forest. Therefore, in southeastern Alaska, regulation of timber harvest and associated activities is administered by the USFS under the current Tongass Land and Resource Management Plan that was signed and adopted in 2008.

The 2008 Tongass Land and Resource Management Plan describes a conservation strategy that was developed originally as part of the 1997 Plan with the primary goal of achieving objectives under the NFMA. Specifically, the conservation strategy focused primarily on maintaining viable, well-distributed populations of old-growth dependent species on the Tongass National Forest, because these species were considered to be most vulnerable to timber harvest activities on the forest. The Alexander Archipelago wolf, as well as the Sitka black-tailed deer, was used to help design the conservation strategy. Primary components of the strategy include a forest-wide network of old-growth habitat reserves linked by connecting corridors of forested habitat, and a series of standards and guidelines that direct management of lands available for timber harvest and other activities outside of the reserves. We discuss these components in more detail in the Status Assessment (Service 2015, ''Existing conservation mechanisms'').

As part of the conservation strategy, we identified two elements specific to the Alexander Archipelago wolf (USFS 2008a, p. 4–95). The first addresses disturbance at and modification of active wolf dens, requiring buffers of 366 m (1,200 ft) around active dens (when known) to reduce risk of abandonment, although if a den is inactive for at least 2 years, this requirement is relaxed. The second pertains to elevated wolf mortality; in areas where wolf mortality concerns have been identified, a Wolf Habitat Management Program will be developed and implemented, in conjunction with ADFG; such a program might include road access management and changes to wolf harvest limit guidelines. However, this element, as outlined in the Plan, does not offer guidance on identifying how, when, or where wolf mortality concerns may exist, but instead it is left to the discretion of the agencies. The only other specific elements relevant to the Alexander Archipelago wolf in the strategy are those that relate to providing sufficient deer habitat capability, which is intended first to maintain sustainable wolf populations, then to consider meeting estimated human deer harvest demands. The strategy offers guidelines for determining whether deer habitat capability within a specific area is sufficient or not.

We find the 2008 Tongass Land and Resource Management Plan, including the conservation strategy, not to be inadequate as a regulatory mechanism aimed to reduce stressors to the Alexander Archipelago wolf and its habitats. Although some parts of the Tongass National Forest have sustained high rates of logging in the past, the majority of it occurred prior to the enactment of the Plan and the conservation strategy. We think that the provisions included in the current Plan are sufficient to maintain habitat for wolves and their prey, especially given that none of the stressors evaluated under *Factors A, B, C,* and *E* constitutes a threat to the Alexander Archipelago wolf.

However, we recognize that some elements of the Plan have not been implemented fully yet, as is required under the NFMA. For example, despite evidence of elevated mortality of wolves in GMU 2 (see discussion under *Factor B,* above), the USFS and ADFG have not developed and implemented a Wolf Habitat Management Program for GMU 2 to date. The reason for not doing so is because the agencies collectively have not determined that current rates of wolf mortality in GMU 2 necessitate concern for maintaining a sustainable wolf population. Although we think that a Wolf Habitat Management Program would benefit the GMU 2 wolf population, we do not view the lack of it as enough to deem the entire Plan, or the existing regulatory mechanisms driving it, to be inadequate for the Alexander Archipelago wolf rangewide. Thus, we conclude that the 2008 Tongass Land and Resource Management Plan is not inadequate to maintain high-quality habitat for the Alexander Archipelago wolf and its prey.

Roadless Rule

On January 12, 2001, the USFS published a final rule prohibiting road construction and timber harvesting in ''inventoried roadless areas'' on all National Forest System lands nationwide (hereafter Roadless Rule) (66 FR 3244). On the Tongass National Forest, 109 roadless areas have been inventoried, covering approximately 14,672 mi^2 (38,000 km^2), although only 463 mi^2 (1,200 km^2) of these areas have been described as ''suitable forest land'' for timber harvest (USFS 2008a, p. 7–42; USFS 2008b, pp. 3–444, 3–449). All of these roadless areas are located within the range of the Alexander Archipelago wolf. However, the Roadless Rule was challenged in court and currently a ruling has not been finalized and additional legal challenges are pending; in the meantime, the Tongass is subject to the provisions in the Roadless Rule, although the outcome of these legal challenges is uncertain. Thus, currently, the Roadless Rule protects 14,672 mi^2 (38,000 km^2) of land, including 463 mi^2 (1,200 km^2) of productive forest, from timber harvest, road construction, and other development, all of which is within the range of the Alexander Archipelago wolf.

State Regulations

The Alaska Board of Game sets wolf harvest regulations for all resident and nonresident hunters and trappers, and the ADFG implements those regulations. (However, for federally-qualified subsistence users, the Federal Subsistence Board sets regulations, and those regulations are applicable only on Federal lands.) Across most of southeastern Alaska, State regulations of wolf harvest appear not to be resulting in overutilization of the Alexander Archipelago wolf (see discussion under *Factor B*, above). However, in GMU 2, wolf harvest is having an effect on the population, which apparently has declined over the last 20 years (see ''Abundance and Trend,'' above). Although the population decline likely was caused by multiple stressors acting synergistically (see *Cumulative Effects from Factors A through E*, below), overharvest of wolves in some years was a primary contributor, suggesting that the wolf harvest regulations for GMU 2 have been allowing for greater numbers to be harvested than would be necessary to maintain a viable wolf population.

In March 2014, ADFG and the USFS, Tongass National Forest, as the in-season manager for the Federal Subsistence Program, took emergency actions to close the wolf hunting and trapping seasons in GMU 2, yet the population still declined between fall 2013 and fall 2014, likely due to high levels of unreported harvest (38 to 45 percent of total harvest, summarized under *Factor B*, above). In early 2015, the agencies issued another emergency order and, in cooperation with the Alaska Board of Game, adopted a more conservative wolf harvest guideline for GMU 2, but an updated population estimate is not available yet, and, therefore, we do not know if the recent change in regulation has been effective at avoiding further population decline. Therefore, based on the best available information, we think that wolf harvest regulations in GMU 2 are inadequate to avoid exceeding sustainable harvest levels of Alexander Archipelago wolves, at least in some years. In order to avoid future unsustainable harvest of wolves in GMU 2, regulations should consider total harvest of wolves, including loss of wounded animals, not just reported harvest. Although we found that regulations governing wolf harvest in GMU 2 have been inadequate, we do not expect their inadequacy to impact the rangewide population of Alexander Archipelago wolf for reasons outlined under *Factor B*, above.

The Alexander Archipelago wolf receives no special protection as an endangered species or species of concern by the State of Alaska (AS 16.20.180). However, in the draft State Wildlife Action Plan, which is not yet finalized, the Alexander Archipelago wolf is identified as a ''species of greatest conservation need'' because it is a species for which the State has high stewardship responsibility and it is culturally and ecologically important (ADFG 2015e, p. 154).

Coastal British Columbia

In coastal British Columbia, populations of the Alexander Archipelago wolf have been stable or slightly increasing for the last 15 years (see ''Abundance and Trend,'' above). Nonetheless, we identified several laws that ensure its continued protection such as the Forest and Range Practices Act (enacted in 2004), Wildlife Act of British Columbia (amended in 2008), Species at Risk Act, Federal Fisheries Act, Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), and other regional land use and management plans. We review these laws in more detail in the Status Assessment (Service 2015, ''Existing conservation measures'').

In 1999, the gray wolf was designated as ''not at risk'' by the Committee on the Status of Endangered Wildlife in Canada, because it has a widespread, large population with no evidence of a decline over the last 10 years (BCMO 2014, p. 2). In British Columbia, the gray wolf is ranked as ''apparently secure'' by the Conservation Data Centre and is on the provincial Yellow list, which indicates ''secure.'' We note here that Canada does not recognize the Alexander Archipelago wolf as a subspecies of gray wolf that occupies coastal British Columbia, and, therefore, these designations are applicable to the province or country scale.

Summary of Factor D

The laws described above regulate timber harvest and associated activities, protect habitat, minimize disturbance at den sites, and aim to ensure sustainable harvest of Alexander Archipelago wolves in southeastern Alaska and coastal British Columbia. As discussed under *Factors A, B, C,* and *E,* although we recognize that some stressors such as timber harvest and wolf harvest are having an impact on the GMU 2 wolf population, we have not identified any threat that would affect the taxon as a whole at the rangewide level. Therefore, we find that the existing regulatory mechanisms authorized by the laws described above are not inadequate for the rangewide population of the Alexander Archipelago wolf now and into the future.

Factor E. Other Natural or Manmade Factors Affecting Its Continued Existence

In this section, we consider other natural or manmade factors that may be affecting the continued persistence of the Alexander Archipelago wolf and were not addressed in *Factors A* through *D* above. Specifically, we examined effects of small and isolated populations, hybridization with dogs, and overexploitation of salmon runs.

Small and Isolated Population Effects

In the petition, island endemism was proposed as a possible stressor to the Alexander Archipelago wolf. An endemic is a distinct, unique organism found within a restricted area or range; a restricted range may be an island, or group of islands, or a restricted region (Dawson *et al.* 2007, p. 1). Although small, isolated populations are more vulnerable to extinction than larger ones due to demographic stochasticity, environmental variability, genetic problems, and catastrophic events (Lande 1993, p. 921), endemism or ''rarity'' alone is not a stressor. Therefore, we instead considered possible effects associated with small and isolated populations of the Alexander Archipelago wolf.

Several aspects of the life history of the Alexander Archipelago wolf result in it being resilient to effects associated with small and isolated populations. First, the coastal wolf is distributed across a broad range and is not concentrated in any one area, contributing to its ability to withstand catastrophic events, which typically occur at small scales (*e.g.,* wind-caused disturbance) in southeastern Alaska and coastal British Columbia. Second, the Alexander Archipelago wolf is a habitat and diet generalist with high reproductive potential and high dispersal capability in most situations, making it robust to environmental and demographic variability. However, owing to the island geography and steep, rugged terrain within the range of the Alexander Archipelago wolf, some populations are small (fewer than 150 to 250 individuals, following Carroll *et al.* 2014, p. 76) and at least partially isolated, although most are not. Nonetheless, we focus the remainder of this section on possible genetic consequences to small, partially isolated populations of the Alexander Archipelago wolf.

The primary genetic concern of small, isolated wolf populations is inbreeding, which, at extreme levels, can reduce litter size and increase incidence of skeletal effects (*e.g.,* Liberg *et al.* 2005, p. 17; Raikkonen *et al.* 2009, p. 1025). We found only one study that examined inbreeding in the Alexander Archipelago wolf. Breed (2007, p. 18) tested for inbreeding using samples from Regions 5 and 6 in northern British Columbia and GMUs 1 and 2 in southern southeastern Alaska, and found that inbreeding coefficients were highest for wolves in GMU 1, followed by GMU 2, then by Regions 5 and 6. This finding was unexpected given that GMU 2 is the smaller, more isolated population, indicating that inbreeding likely is not affecting the GMU 2 population despite its comparatively small size and insularity. Further, we found no evidence of historic or recent genetic bottlenecking in the Alexander Archipelago wolf (Weckworth *et al.* 2005, p. 924; Breed 2007, p. 18), although Weckworth *et al.* (2011, p. 5) speculated that a severe bottleneck may have taken place long ago (over 100 generations).

Therefore, while we recognize that some populations of the Alexander Archipelago wolf are small and insular (*e.g.,* GMU 2 population), our review of the best available information does not suggest that these characteristics currently are having a measurable effect at the population or rangewide level. However, given that the GMU 2 population is expected to decline by an average of 8 to 14 percent over the next 30 years, inbreeding depression and genetic bottlenecking may be a concern for this population in the future, but we think that possible future genetic consequences experienced by the GMU 2 population will not have an effect on the taxon as a whole. Thus, we conclude that small and isolated population effects do not constitute a threat to the Alexander Archipelago wolf, nor are they likely to become a threat in the future.

Hybridization With Dogs

We reviewed hybridization with domestic dogs as a potential stressor to the Alexander Archipelago wolf. Based on microsatellite analyses, Munoz-Fuentes *et al.* (2010, p. 547) found that at least one hybridization event occurred in the mid-1980s on Vancouver Island, where wolves were probably extinct at one point in time, but then recolonized the island from the mainland. Although hybridization has been documented and is more likely to occur when wolf abundance is unusually low, most of the range of the Alexander Archipelago wolf is remote and unpopulated by humans, reducing the risk of interactions between wolves and domestic dogs. Therefore, we conclude that hybridization with dogs does not rise to the level of a threat at the population or rangewide level and is not likely to do so in the future.

Overexploitation of Salmon Runs

As suggested in the petition, we considered overexploitation of salmon runs and disease transmission from farmed Atlantic salmon (*Salmo salar*) in coastal British Columbia as a potential stressor to the Alexander Archipelago wolf (Atlantic salmon are not farmed in southeastern Alaska). The best available information does not indicate that the status of salmon runs in coastal British Columbia is having an effect on coastal wolves. First, Alexander Archipelago wolf populations in coastal British Columbia are stable or slightly increasing, suggesting that neither overexploitation of salmon runs nor disease transmission from introduced salmon are impacting the wolf populations. Second, in coastal British Columbia, only 0 to 16 percent of the diet of the Alexander Archipelago wolf is salmon (Darimont *et al.* 2004, p. 1871; Darimont *et al.* 2009, p. 130). Given the opportunistic food habits of the coastal wolf, we postulate that reduction or even near loss of salmon as a food resource may impact individual wolves in some years, but likely would not result in a population- or rangewide-level effect. Further, our review of the best available information does not suggest that this is happening or will happen, or that coastal wolves are acquiring diseases associated with farmed salmon. Therefore, we conclude that overexploitation of salmon runs and disease transmission from farmed salmon do not constitute a threat to the Alexander Archipelago wolf at the population or rangewide level and are not likely to do so in the future.

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

We are not aware of any conservation efforts or other voluntary actions that may help to reduce effects associated with small and isolated populations, hybridation with dogs, overexploitation of salmon runs, disease transmission from farmed salmon, or any other natural or manmade that may be affecting the Alexander Archipelago wolf.

Summary of Factor E

We find that other natural or manmade factors are present within the range of the Alexander Archipelago wolf, but that none of these factors is having a population or rangewide effect on the Alexander Archipelago wolf. We acknowledge that some populations of the coastal wolf are small and partially isolated, and therefore are susceptible to genetic problems, but we found no evidence that inbreeding or bottlenecking has resulted in a population or rangewide impact to the Alexander Archipelago wolf. In addition, even though some populations are small in size, many populations of the Alexander Archipelago wolf exist and are well distributed on the landscape, greatly reducing impacts from any future catastrophic events to the rangewide population. We also found that the likelihood of hybridation with dogs is low and that any negative impacts associated with the status of salmon in coastal British Columbia are unfounded at this time; neither of these potential stressors is likely to affect the continued persistence of the Alexander Archipelago wolf at the population or rangewide level. Therefore, based on the best available information, we conclude that other natural or manmade factors do not pose a threat to the Alexander Archipelago wolf, nor are they likely to become threats in the future.

Cumulative Effects From Factors A Through E

The Alexander Archipelago wolf is faced with numerous stressors throughout its range, but none of these individually constitutes a threat to the taxon as a whole now or in the future. However, more than one stressor may act synergistically or compound with one another to impact the Alexander Archipelago wolf at the population or rangewide level. Some of the identified stressors described above have potential to impact wolves directly (*e.g.,* wolf harvest), while others can affect wolves indirectly (*e.g.,* reduction in ungulate prey availability as a result of timber harvest); further, not all stressors are present or equally present across the range of the Alexander Archipelago wolf.

In this section, we consider cumulative effects of the stressors described in *Factors A* through *E*. If multiple factors are working together to impact the Alexander Archipelago wolf negatively, the cumulative effects should be manifested in measurable and consistent demographic change at the population or species level. Therefore, for most populations such as those in coastal British Columbia and in GMU 2, we relied on trend information to inform our assessment of cumulative effects. For populations lacking trend information (*e.g.,* GMUs 1, 3, and 5A), we examined the severity, frequency, and certainty of stressors to those populations and relative to the populations for which we have trend information to evaluate cumulative effects. We then assess the populations collectively to draw conclusions about cumulative effects that may be impacting the rangewide population.

In coastal British Columbia, Alexander Archipelago wolf populations are stable or slightly increasing (see ''Abundance and Trend,'' above), despite multiple stressors facing these populations at levels similar to or greater than most populations in southeastern Alaska. The stability of the wolf populations in coastal British Columbia over the last 15 years suggests that cumulative effects of stressors such as timber harvest, road development, and wolf harvest are not negatively impacting these populations.

The GMU 2 population of the Alexander Archipelago wolf apparently experienced a gradual decline between 1994 and 2013, and then declined substantially between 2013 and 2014, although the overall decline is not statistically significant owing to the large variance surrounding the point estimates (see ''Abundance and Trend,'' above). Nonetheless, we found evidence that timber harvest (*Factor A*) and wolf harvest (*Factor B*) are impacting this population, and these two stressors probably have collectively caused the apparent decline. Given reductions in deer habitat capability as a result of extensive and intensive timber harvest, we expect the GMU 2 wolf population to be somewhat depressed and unable to sustain high rates of wolf harvest. However, in our review of the best available information, we found that high rates of unreported harvest are resulting in unsustainable total harvest of Alexander Archipelago wolves in GMU 2 and that roads constructed largely to support the timber industry are facilitating unsustainable rates of total wolf harvest. Based on a population model specific to GMU 2, Gilbert *et al.* (2015, p. 43) projected that the wolf population will decline by another 8 to 14 percent, on average, over the next 30 years, largely owing to compounding and residual effects of logging, but also wolf harvest, which results in direct mortality and has a more immediate impact on the population. These stressors and others such as climate related events (*i.e.,* snowfall) are interacting with one another to impact the GMU 2 wolf population and are expected to continue to do so in the future provided that circumstances remain the same (*e.g.,* high unreported harvest rates).

In the remainder of southeastern Alaska where the Alexander Archipelago wolf occurs (*i.e.,* GMUs 1, 3, and 5A), we lack trend and projected population estimates to inform our assessment of cumulative effects, and, therefore, we considered the intensity, frequency, and certainty of stressors present. We found that generally the stressors facing wolf populations in GMUs 1, 3, and 5A occur in slightly higher intensity compared to populations in coastal British Columbia (Regions 5 and 6), but significantly lower intensity than the GMU 2 population. In fact, the percent of logged forest and road densities are among the lowest in the range of the Alexander Archipelago wolf. Although wolf harvest rates were moderately high in GMUs 1, 3, and 5A, given the circumstances of these populations, we found no evidence to suggest that they were having a population-level effect. Importantly, our review of the best available information did not suggest that unreported harvest was occurring at high rates like in GMU 2, and hunter and trapper access was comparatively lower (*i.e.,* road density, ratio of shoreline to land area). In addition, the populations in GMUs 1, 3, and 5A are most similar biologically to the coastal British Columbian populations; all of these wolf populations have access to a variety of ungulate prey and are not restricted to deer, and none is as isolated geographically as the GMU 2 population. We acknowledge that elements of GMU 3 are similar to those in GMU 2 (*e.g.,* island geography), but ultimately we found that GMU 3 had more similarities to GMUs 1 and 5A and coastal British Columbia.

Therefore, in considering all of the evidence collectively, we presume that Alexander Archipelago wolf populations in GMUs 1, 3, and 5A likely are stable and are not being impacted by cumulative effects of stressors because these populations face similar stressors as the populations in coastal British Columbia, which are stable or slightly increasing. The weight of the available information led us to make this presumption regarding the Alexander Archipelago wolf in GMUs 1, 3, and 5A, and we found no information to suggest otherwise. We think our reasoning is fair and supported by the best available information, although we recognize the uncertainties associated with it.

In summary, we acknowledge that some of the stressors facing Alexander Archipelago wolves interact with one another, particularly timber harvest and wolf harvest, but we determined that all but one of the wolf populations do not exhibit impacts from cumulative effects of stressors. We found that about 62 percent of the rangewide population of the Alexander Archipelago wolf is stable (all of coastal British Columbia), and another 32 percent is presumed to be stable (GMUs 1, 3, and 5A), suggesting that approximately 94 percent of the rangewide population is not experiencing negative and cumulative effects from stressors, despite their presence. Therefore, we conclude that cumulative impacts of identified stressors do not rise to the level of a threat to the Alexander Archipelago wolf and are unlikely to do so in the future.

Finding

As required by the Act, we considered the five factors in assessing whether the Alexander Archipelago wolf is an endangered or threatened species throughout all of its range. We examined the best scientific and commercial information available regarding the past, present, and future threats faced by the Alexander Archipelago wolf. We reviewed the petition, information available in our files, and other available published and unpublished information, and we consulted with recognized wolf experts and other Federal, State, and tribal agencies. We prepared a Status Assessment that summarizes all of the best available science related to the Alexander Archipelago wolf and had it peer reviewed by three experts external to the Service and selected by a third-party contractor. We also contracted the University of Alaska Fairbanks to revise an existing population model for the GMU 2 wolf population, convened a 2-day workshop with experts to review the model inputs and structure, and had the final report reviewed by experts (Gilbert *et al.* 2015, entire). As part of our review, we brought together researchers with experience and expertise in gray wolves and the temperate coastal rainforest from across the Service to review and evaluate the best available scientific and commercial information.

We examined a variety of potential threats facing the Alexander Archipelago wolf and its habitats, including timber harvest, road development, oil development, climate change, overexploitation, disease, and effects associated with small and isolated populations. To determine if these risk factors individually or collectively put the taxon in danger of extinction throughout its range, or are likely to do so in the foreseeable future, we first considered if the identified risk factors were causing a population decline or other demographic changes, or were likely to do so in the foreseeable future.

Throughout most of its range, the Alexander Archipelago wolf is stable or slightly increasing or is presumed to be stable based on its demonstrated high resiliency to the magnitude of stressors present. In coastal British Columbia, which constitutes 67 percent of the range and 62 percent of the rangewide population, the Alexander Archipelago wolf has been stable or slightly increasing over the last 15 years. In mainland southeastern Alaska (GMUs 1 and 5A) and in GMU 3, approximately 29 percent of the range and 32 percent of the rangewide population, we determined that the circumstances of these wolf populations were most similar to those in coastal British Columbia, and, therefore, based on the best available information, we reasoned that the Alexander Archipelago wolf likely is stable in GMUs 1, 3, and 5A. In GMU 2, which includes only 4 percent of the range and 6 percent of the rangewide population, the Alexander Archipelago wolf has been declining since 1994, and is expected to continue declining by another 8 to 14 percent, on average, over the next 30 years. Nonetheless, we conclude that the Alexander Archipelago wolf is stable or slightly increasing in nearly all of its range (96 percent), representing 94 percent of the rangewide population of the taxon.

We then identified and evaluated existing and potential stressors to the Alexander Archipelago wolf. We aimed to determine if these stressors are affecting the taxon as a whole currently or are likely to do so in the foreseeable future, are likely to increase or decrease, and may rise to the level of a threat to the taxon, rangewide or at the population level. Because the Alexander Archipelago wolf is broadly distributed across its range and is a habitat and diet generalist, we evaluated whether each identified stressor was expected to impact wolves directly or indirectly and whether wolves would be resilient to any impact.

We examined several stressors that are not affecting the Alexander Archipelago wolf currently and are unlikely to occur at a magnitude and frequency in the future that would result in a population- or rangewide-level effect. We found that oil and gas development, disease, predation, effects associated with small and isolated populations, hybridization with domestic dogs, overexploitation of salmon runs, and disease transmission from farmed salmon are not threats to the Alexander Archipelago wolf (see discussions under *Factors A, C,* and *E,* above). Most of these stressors are undocumented and speculative, rarely occur, are spatially limited, or are not known to impact gray wolves in areas of overlap. Although disease is known to affect populations of gray wolves, we found few reports of disease in the Alexander Archipelago wolf, and none resulted in mortality. Therefore, based on the best available information, we conclude that none of these stressors is having a population- or rangewide-level effect on the Alexander Archipelago wolf, or is likely to do so in the foreseeable future.

Within the range of the Alexander Archipelago wolf, changes in climate are occurring and are predicted to continue, likely resulting in improved conditions for wolves. Climate models for southeastern Alaska and coastal British Columbia project that precipitation as snow will decrease substantially in the future, which will improve winter conditions for deer, the primary prey species of wolves. Although severe winters likely will continue to occur and will affect deer populations, we expect them to occur less frequently. Therefore, based on the best available information, we conclude that the effects of climate change are not a threat to the Alexander Archipelago wolf, nor are they likely to become a threat in the foreseeable future.

We reviewed timber harvest and associated road development as stressors to the Alexander Archipelago wolf and found that they are not affecting wolves directly, in large part because the wolf is a habitat generalist. Although wolves used den sites farther from logged stands and roads than unused sites, den site selection was more strongly influenced by natural features on the landscape such as slope, elevation, and proximity to freshwater. Further, we did not find evidence indicating that denning near logged stands and roads resulted in lower fitness of wolves. Thus, we conclude that timber harvest and associated road development are not affecting wolves at the population or rangewide levels by decreasing suitable denning habitat. We did not identify any other potential direct impacts to wolves as a result of timber harvest or road development, so next we examined potential indirect effects, specifically reduction of deer habitat capability.

Although the Alexander Archipelago wolf is an opportunistic predator that feeds on a variety of marine, intertidal, and terrestrial species, ungulates compose at least half of the wolf's diet throughout its range, and deer is the most widespread and abundant ungulate available to wolves. Timber harvest has reduced deer habitat capability, which in turn is predicted to reduce deer populations, especially in areas that have been logged intensively. However, based largely on the stability of wolf populations in coastal British Columbia despite intensive timber harvest, we conclude that wolves are resilient to changes in deer populations provided that they have other ungulate prey species available to them. We found that nearly all of the Alexander Archipelago wolves (94 percent of the rangewide population) have access to alternate ungulate prey such as mountain goat, moose, and elk, and, based on wolf diet, Alexander Archipelago wolves are consuming these prey species in areas where they are available. We identified only one Alexander Archipelago wolf population as an exception.

In GMU 2, deer is the only ungulate species available to wolves, and, therefore, wolves in this population have a more restricted ungulate diet and likely are being affected by cascading effects of timber harvest. Both deer and wolves are projected to decline in GMU 2 in the future, largely due to long-term reduction in deer habitat capability. However, we find that the GMU 2 population contributes little to the rangewide population because it constitutes only 4 percent of the range and 6 percent of the rangewide population, is largely insular and geographically peripheral, and appears to function as a sink population. Therefore, while we recognize that timber harvest and associated road development has modified a considerable portion of the range of the Alexander Archipelago wolf, and will continue to do so, we find that the taxon as a whole is not being affected negatively, in large part because the wolf is a habitat and diet generalist. Based on the best available information, we conclude that timber harvest and associated road development do not rise to the level of a threat to the Alexander Archipelago wolf, and are not likely to do so in the future.

Throughout its range, the Alexander Archipelago wolf is harvested for commercial and subsistence purposes, and, therefore, we examined overutilization as a stressor at the population and rangewide levels. In coastal British Columbia, we presume that wolf harvest is not having an effect at the population level given that populations there are stable or slightly increasing. This presumption is supported by the comparatively low rates of reported wolf harvest in coastal British Columbia, although reporting of harvest is required only in Regions 1 and 2, and, therefore, we considered these rates as minimum values. Nonetheless, we found no information suggesting that wolf harvest in coastal British Columbia is affecting wolves at the population level, as evidenced by the stability of the populations.

Within southeastern Alaska, where reporting is required, rates of reported harvest on average are similar across all populations (17 to 21 mean percent of population annually). However, in GMU 2, unreported harvest can be a substantial component of total harvest (38 to 45 percent), resulting in high rates of total harvest in some years, which likely has contributed to the apparent population decline in GMU 2. Although unreported harvest probably occurs in other parts of southeastern Alaska, our review of the best available information does not indicate that it is occurring at the same high rate as documented in GMU 2. Further, access by hunters and trappers is significantly greater in GMU 2 compared to elsewhere (see discussion under *Factor B,* above), and, therefore, we find that applying rates of unreported harvest from GMU 2 to other wolf populations in southeastern Alaska is not appropriate. Thus, based on the best available information, we think that wolf harvest in most of southeastern Alaska (*i.e.,* GMUs 1, 3, and 5A) is not affecting wolves at the population level, but that total wolf harvest in GMU 2 likely has occurred, at least recently, at unsustainable rates, largely due to high rates of unreported harvest, and has contributed to or caused an apparent decline in the population. However, for the same reasons described above, we determined that negative population impacts in GMU 2 do not affect the rangewide population significantly, and, therefore, we conclude that wolf harvest is not having a rangewide-level effect. In conclusion, we find that overutilization is not a threat to the Alexander Archipelago wolf, nor is it likely to become a threat in the foreseeable future.

In summary, we found that the Alexander Archipelago wolf experiences stressors throughout its range, but based on our consideration of the best available scientific and commercial information, we determined that the identified stressors, individually or collectively, do not pose a threat to the taxon at the rangewide level now or in the foreseeable future. We determined that many of the life-history traits and behaviors of the Alexander Archipelago wolf, such as its variable diet, lack of preferential use of habitats, and high reproductive potential, increase its ability to persist in highly modified habitats with numerous stressors. Only one population of the Alexander Archipelago wolf has declined and likely will continue to decline, but this population contributes little to the taxon as a whole, and, therefore, while we acknowledge the vulnerability of this population to stressors such as timber harvest and wolf harvest, we find that its status does not affect the rangewide status significantly. Further, we found that approximately 94 percent of the rangewide population of the Alexander Archipelago wolf is stable or increasing, or presumed with reasonable confidence to be stable. Therefore, based on our review of the best available scientific and commercial information pertaining to the five factors, we find that the threats are not of sufficient imminence, intensity, or magnitude to indicate that the Alexander Archipelago wolf is in danger of extinction (endangered), or likely to become endangered within the foreseeable future (threatened), throughout all of its range.

Significant Portion of the Range

Under the Act and our implementing regulations, a species may warrant listing if it is in danger of extinction or likely to become so throughout all or a significant portion of its range. The Act defines ''endangered species'' as any species which is ''in danger of extinction throughout all or a significant portion of its range,'' and ''threatened species'' as any species which is ''likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.'' The 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.'' We published a final policy interpreting the phrase ''significant portion of its range'' (SPR) (79 FR 37578, July 1, 2014). The final policy states that (1) if a species is found to be endangered or threatened throughout a significant portion of its range, the entire species is listed as an endangered or a threatened species, respectively, and the Act's protections apply to all individuals of the species wherever found; (2) a portion of the range of a species is ''significant'' if the species is not currently endangered or threatened throughout all of its range, but the portion's contribution to the viability of the species is so important that, without the members in that portion, the species would be in danger of extinction, or likely to become so in the foreseeable future, throughout all of its range; (3) the range of a species is considered to be the general geographical area within which that species can be found at the time the Service or the National Marine Fisheries Service makes any particular status determination; and (4) if a vertebrate species is endangered or threatened throughout an SPR, and the population in that significant portion is a valid DPS, we will list the DPS rather than the entire taxonomic species or subspecies.

The SPR policy is applied to all status determinations, including analyses for the purposes of making listing, delisting, and reclassification determinations. The procedure for analyzing whether any portion is an SPR is similar, regardless of the type of status determination we are making. The first step in our analysis of the status of a species is to determine its status throughout all of its range. If we determine that the species is in danger of extinction, or likely to become so in the foreseeable future, throughout all of its range, we list the species as an endangered (or threatened) species and no SPR analysis will be required. If the species is neither in danger of extinction nor likely to become so throughout all of its range, we determine whether the species is in danger of extinction or likely to become so throughout a significant portion of its range. If it is, we list the species as an endangered or a threatened species, respectively; if it is not, we conclude that listing the species is not warranted.

When we conduct an SPR analysis, we first identify any portions of the species' range that warrant further consideration. The range of a species can theoretically be divided into portions in an infinite number of ways. However, there is no purpose to analyzing portions of the range that are not reasonably likely to be significant and endangered or threatened. To identify only those portions that warrant further consideration, we determine whether there is substantial information indicating that (1) the portions may be significant and (2) the species may be in danger of extinction in those portions or likely to become so within the foreseeable future. We emphasize that answering these questions in the affirmative is not a determination that the species is endangered or threatened throughout a significant portion of its range; rather, it is a step in determining whether a more detailed analysis of the issue is required. In practice, a key part of this analysis is whether the threats are geographically concentrated in some way. If the threats to the species are affecting it uniformly throughout its range, no portion is likely to warrant further consideration. Moreover, if any concentration of threats apply only to portions of the range that clearly do not meet the biologically based definition of ''significant'' (*i.e.,* the loss of that portion clearly would not be expected to increase the vulnerability to extinction of the entire species), those portions will not warrant further consideration.

If we identify any portions that may be both (1) significant and (2) endangered or threatened, we engage in a more detailed analysis to determine whether these standards are indeed met. The identification of an SPR does not create a presumption, prejudgment, or other determination as to whether the species in that identified SPR is endangered or threatened. We must go through a separate analysis to determine whether the species is endangered or threatened in the SPR. To determine whether a species is endangered or threatened throughout an SPR, we will use the same standards and methodology that we use to determine if a species is endangered or threatened throughout its range.

Depending on the biology of the species, its range, and the threats it faces, it may be more efficient to address the ''significant'' question first, or the status question first. Thus, if we determine that a portion of the range is not ''significant,'' we do not need to determine whether the species is endangered or threatened there; if we determine that the species is not endangered or threatened in a portion of its range, we do not need to determine if that portion is ''significant.''

We evaluated the current range of the Alexander Archipelago wolf to determine if there is any apparent geographic concentration of potential threats to the taxon. We examined potential threats from timber harvest, oil and gas development, road development, climate change, effects of small and isolated populations, hybridization with dogs, overexploitation of salmon runs, disease transmission from farmed salmon, overutilization, disease, and predation. We found that potential threats are concentrated in GMU 2, where they are substantially greater than in other portions of its range. We considered adjacent parts of the range that are contained in GMUs 1 and 3, but, based on the best available information, we did not find any concentrations of stressors in those parts that were similar in magnitude and frequency to the potential threats in GMU 2. Therefore, we then considered whether GMU 2 is ''significant'' based on the Service's SPR policy, which states that a portion of its range is ''significant'' if the taxon is not currently endangered or threatened throughout all of its range, but the portion's contribution to the viability of the taxon is so important that, without the members in that portion, the taxon would be in danger of extinction, or likely to become so in the foreseeable future, throughout all of its range.

We reviewed population and rangewide metrics in relation to GMU 2 to estimate the numerical contribution of GMU 2 to the viability of the Alexander Archipelago wolf. We determined that GMU 2 constitutes only 4 percent of the total range and 9 percent of the range below 1,312 ft (400 m) in elevation where these wolves spend most of their time (see ''Space and Habitat Use,'' above). In addition, based on the most current population estimate for GMU 2, which was assessed in 2014, we estimated that only 6 percent of the rangewide population occupies GMU 2. Recognizing the apparent recent decline in the GMU 2 population (see ''Abundance and Trend,'' above), we then estimated that in 2013, the GMU 2 population composed about 13 percent of the rangewide population. We expect wolf abundance to fluctuate annually at the population and rangewide scales, but generally in recent years, we find that the GMU 2 population composes a somewhat small percentage of the rangewide population. Therefore, we conclude that, numerically, the GMU 2 population contributes little to the viability of the taxon as a whole given that it composes a small percentage of the current rangewide population and it occupies a small percentage of the range of the Alexander Archipelago wolf.

We then considered the biological contribution of the GMU 2 population to the viability of the Alexander Archipelago wolf. We found that given its insularity and peripheral geographic position compared to the rest of the range, the GMU 2 population contributes even less demographically and genetically than it does numerically. In fact, it appears to function as a sink population with gene flow and dispersal primarily occurring uni-directionally from other areas to GMU 2 (see ''Dispersal and Connectivity,'' above). Therefore, overall, we found that GMU 2 represents a small percentage of the range and rangewide population of the Alexander Archipelago wolf, it is insular and geographically peripheral, and it appears to be functioning as a sink population to the Alexander Archipelago wolf. We conclude that, although potential threats are concentrated in GMU 2, this portion's contribution to the viability of the taxon as a whole is not so important that, without the members of GMU 2, the Alexander Archipelago wolf would be in danger of extinction, or likely to become so in the foreseeable future, throughout all of its range.

Our review of the best available scientific and commercial information indicates that the Alexander Archipelago wolf is not in danger of extinction (endangered) nor likely to become endangered within the foreseeable future (threatened), throughout all or a significant portion of its range. Therefore, we find that listing the Alexander Archipelago wolf as an endangered or threatened species under the Act is not warranted at this time.

Evaluation of the GMU 2 Population of the Alexander Archipelago Wolf as a Distinct Population Segment

After determining that the Alexander Archipelago wolf is not endangered or threatened throughout all or a significant portion of its range and is not likely to become so in the foreseeable future, we then evaluate whether or not the GMU 2 wolf population meets the definition of a distinct population segment (DPS) under the Act, as requested in the petition.

To interpret and implement the DPS provisions of the Act and Congressional guidance, we, in conjunction with the National Marine Fisheries Service, published the Policy Regarding the Recognition of Distinct Vertebrate Population Segments (DPS policy) in the **Federal Register** on February 7, 1996 (61 FR 4722). Under the DPS policy, two basic elements are considered in the decision regarding the establishment of a population of a vertebrate species as a possible DPS. We must first determine whether the population qualifies as a DPS; this requires a finding that the population is both: (1) Discrete in relation to the remainder of the taxon to which it belongs; and (2) biologically and ecologically significant to the taxon to which it belongs. If the population meets the first two criteria under the DPS policy, we then proceed to the third element in the process, which is to evaluate the population segment's conservation status in relation to the Act's standards for listing as an endangered or threatened species. These three elements are applied similarly for additions to or removals from the Federal Lists of Endangered and Threatened Wildlife and Plants.

Discreteness

In accordance with our DPS policy, we detail our analysis of whether a vertebrate population segment under consideration for listing may qualify as a DPS. As described above, we first evaluate the population segment's discreteness from the remainder of the taxon to which it belongs. Under the DPS policy, a population segment of a vertebrate taxon 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. Quantitative measures of genetic or morphological discontinuity may provide evidence of this separation.

(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.

We found that the GMU 2 population is markedly separated as a consequence of physical, physiological, ecological, or behavioral factors from other populations of the Alexander Archipelago wolf. It occupies a portion of the Alexander Archipelago within the range of wolf that is physically separated from adjacent populations due to comparatively long and swift water crossings and the fact that few crossings are available to dispersing wolves. Although low levels of movement between the GMU 2 population segment and other populations likely occur (see ''Dispersal and Connectivity,'' above), the GMU 2 wolf population is largely insular and geographically peripheral to the rest of the range of the Alexander Archipelago wolf; further, the Service's DPS policy does not require absolute separation to be considered discrete.

In addition, several studies have demonstrated that, based on genetic assignment tests, the GMU 2 wolf population forms a distinct genetic cluster when compared to other Alexander Archipelago wolves (Weckworth *et al.* 2005, pp. 923, 926; Breed 2007, p. 21). Further, estimates of the fixation index (F_{ST}, the relative proportion of genetic variation explained by differences among populations) are markedly higher between the GMU 2 population and all other Alexander Archipelago wolf populations than comparisons between other populations (*e.g.,* Weckworth *et al.* 2005, p. 923; Cronin *et al.* 2015, p. 7). Collectively, these findings indicate genetic discontinuity between wolves in GMU 2 and those in the rest of the range of the Alexander Archipelago wolf. We review these studies and others in more detail in the Status Assessment (Service 2015, ''Genetic analyses'').

We found that the GMU 2 population of the Alexander Archipelago wolf is markedly separated as a consequence of physical (geographic) features and due to genetic divergence from other populations of the taxon. Therefore, we conclude that it is discrete under the Service's DPS policy.

Significance

If a population is considered discrete under one or more of the conditions described in the Service's DPS policy, its biological and ecological significance will be considered in light of Congressional guidance that the authority to list DPSs be used ''sparingly'' while encouraging the conservation of genetic diversity. In making this determination, we consider available scientific evidence of the discrete population segment's importance to the taxon to which it belongs. As precise circumstances are likely to vary considerably from case to case, the DPS policy does not describe all the classes of information that might be used in determining the biological and ecological importance of a discrete population. However, the DPS policy describes four possible classes of information that provide evidence of a population segment's biological and ecological importance to the taxon to which it belongs. As specified in the DPS policy (61 FR 4722), this consideration of the population segment's significance 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 a taxon;

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

(4) Evidence that the discrete population segment differs markedly from other populations of the taxon in its genetic characteristics.

Given our determination that the GMU 2 wolf population is discrete under the Service's DPS policy, we now evaluate the biological and ecological significance of the population relative to the taxon as a whole. A discrete population segment is considered significant under the DPS policy if it meets one of the four elements identified in the policy under significance (described above), or otherwise can be reasonably justified as being significant. Here, we evaluate the four potential factors suggested by our DPS policy in evaluating significance of the GMU 2 wolf population.

Persistence of the Discrete Population Segment in an Ecological Setting Unusual or Unique to the Taxon

We find that the GMU 2 population does not persist in an ecological setting that is unusual or unique to the Alexander Archipelago wolf. To evaluate this element, we considered whether or not the habitats used by Alexander Archipelago wolves in GMU 2 include unusual or unique features that are not used by or available to the taxon elsewhere in its range. We found that the Alexander Archipelago wolf is a habitat generalist, using a variety of habitats on the landscape and selecting only for those that occur below 1,312 ft (400 m) in elevation (see ''Space and Habitat Use,'' above). Throughout its range, habitats used by and available to the Alexander Archipelago wolf are similar with some variation from north to south and on the mainland and islands, but we found no unique or unusual features specific to GMU 2 that were not represented elsewhere in the range. Although karst is more prevalent in GMU 2, we found no evidence indicating that wolves selectively use karst; in addition, karst is present at low and high elevations in GMUs 1 and 3 (Carstensen 2007, p. 24).

The GMU 2 wolf population has a more restricted ungulate diet, comprised only of deer, than other populations of the Alexander Archipelago wolf (see ''Food Habits,'' above). However, given that the coastal wolf is an opportunistic predator, feeding on intertidal, marine, freshwater, and terrestrial species, we find that differences in ungulate prey base are not ecologically unique or unusual. In addition, Alexander Archipelago wolves feed on deer throughout their range in equal or even higher proportions than wolves in GMU 2 (*e.g.,* Szepanski *et al.* 1999, p. 331; Darimont *et al.* 2009, p. 130), demonstrating that a diet based largely on deer is not unusual or unique. Thus, compared to elsewhere in the range, we found nothing unique or unusual about the diet or ecological setting of wolves in GMU 2. Further, we did not identify any morphological, physiological, or behavioral characteristics of the GMU 2 wolf population that differ from those of other Alexander Archipelago wolf populations, which may have suggested a biological response to an unusual or unique ecological setting. Therefore, we conclude that the GMU 2 wolf population does not meet the definition of significance under this element, as outlined in the Service's DPS policy.

Evidence That Loss of the Discrete Population Segment Would Result in a Significant Gap in the Range of a Taxon

We find that loss of the GMU 2 population of the Alexander Archipelago wolf, when considered in relation to the taxon as a whole, would not result in a significant gap in the range of the taxon. It constitutes only 6 percent of the current rangewide population, only 4 percent of the range, and only 9 percent of the range below 1,312 (400 m) in elevation where the Alexander Archipelago wolf selectively occurs. In addition, the GMU 2 population is largely insular and geographically peripheral to other populations, and appears to function as a sink population (see ''Abundance and Trend'' and ''Dispersal and Connectivity,'' above). For these reasons, we found that the demographic and genetic contributions of the GMU 2 wolf population to the rangewide population are low and that loss of this population would have a minor effect on the rangewide population of the Alexander Archipelago wolf. Also, although rates of immigration to GMU 2 likely are low (see ''Dispersal and Connectivity,'' above), recolonization of GMU 2 certainly is possible, especially given the condition of the remainder of the rangewide population. Therefore, we conclude that the GMU 2 wolf population does not meet the definition of significance under this element, as outlined in the Service's DPS policy.

Evidence That the Discrete Population Segment Represents the Only Surviving Natural Occurrence of a Taxon That May Be More Abundant Elsewhere as an Introduced Population Outside Its Historical Range

The GMU 2 population does not represent the only surviving natural occurrence of the Alexander Archipelago wolf throughout the range of the taxon. Therefore, we conclude that the discrete population of the Alexander Archipelago wolf in GMU 2 does not meet the significance criterion of the DPS policy under this factor.

Evidence That the Discrete Population Segment Differs Markedly From Other Populations of the Taxon in Its Genetic Characteristics

We find that the GMU 2 population does not differ markedly from other Alexander Archipelago wolves in its genetic characteristics. As noted above in *Discreteness*, the GMU 2 population exhibits genetic discontinuities from other Alexander Archipelago wolves due to differences in allele and haplotype frequencies. However, those discontinuities are not indicative of rare or unique genetic characterisics within the GMU 2 population that are significant to the taxon. Rather, several studies indicate that the genetic diversity within the GMU 2 population is a subset of the genetic diversity found in other Alexander Archipelago wolves. For example, the GMU 2 population does not harbor unique haplotypes; only one haplotype was found in the GMU 2 population, and it was found in other Alexander Archipelago wolves including those from coastal British Columbia (Weckworth *et al.* 2010, p. 367; Weckworth *et al.* 2011, p. 2). In addition, the number and frequency of private alleles in the GMU 2 population is low compared to other Alexander Archipelago wolves (*e.g.,* Breed 2007, p. 18). The lack of unique haplotypes and the low numbers of private alleles both indicate that the GMU 2 population has not been completely isolated historically from other Alexander Archipelago wolves. Finally, these genetic studies demonstrate that wolves in GMU 2 exhibit low genetic diversity (as measured through allelic richness, heterozygosity, and haplotype diversity) compared to other Alexander Archipelago wolves (Weckworth *et al.* 2005, p. 919; Breed 2007, p. 17; Weckworth *et al.* 2010, p. 366; Weckworth *et al.* 2011, p. 2).

Collectively, results of these studies suggest that the genetic discontinuities observed in the GMU 2 population likely are the outcome of restricted gene flow and a loss of genetic diversity through genetic drift or founder effects. Therefore, although the GMU 2 population is considered discrete under the Service's DPS policy based on the available genetic data, it does not harbor genetic characteristics that are rare or unique to the Alexander Archipelago wolf and its genetic contribution to the taxon as a whole likely is minor. Moreover, while we found no genetic studies that have assessed adaptive genetic variation of the Alexander Archipelago wolf, the best available genetic data do not indicate that the GMU 2 population harbors significant adaptive variation, which is supported further by the fact that the GMU 2 population is not persisting in an unusual or unique ecological setting. Therefore, we conclude that the GMU 2 population does not meet the definition of significance under this element, as outlined in the Service's DPS policy.

Summary of Significance

We determine, based on a review of the best available information, that the GMU 2 population is not significant in relation to the remainder of the taxon. Therefore, this population does not qualify as a DPS under our 1996 DPS policy and is not a listable entity under the Act. Because we found that the population did not meet the significance element and, therefore, does not qualify as a DPS under the Service's DPS policy, we will not proceed with an evaluation of the status of the population under the Act.

Determination of Distinct Population Segment

Based on the best scientific and commercial information available, as described above, we find that, under the Service's DPS policy, the GMU 2 population is discrete, but is not significant to the taxon to which it belongs. Because the GMU 2 population is not both discrete and significant, it does not qualify as a DPS under the Act.

Conclusion of 12-Month Finding

Our review of the best available scientific and commercial information indicates that the Alexander Archipelago wolf is not in danger of extinction (endangered) nor likely to become endangered within the foreseeable future (threatened), throughout all or a significant portion of its range. Therefore, we find that listing the Alexander Archipelago wolf as an endangered or threatened species under the Act is not warranted at this time.

We request that you submit any new information concerning the status of, or threats to, the Alexander Archipelago wolf to our Anchorage Fish and Wildlife Field Office (see **ADDRESSES**) whenever it becomes available. New information will help us monitor the Alexander Archipelago wolf and encourage its conservation. If an emergency situation develops for the Alexander Archipelago wolf, we will act to provide immediate protection.

References Cited

A complete list of references cited is available on the Internet at *http://www.regulations.gov* and upon request from the Anchorage Fish and Wildlife Field Office (see **ADDRESSES**).

Authors

The primary authors of this document are the staff members of the Anchorage Fish and Wildlife Field Office.

Authority

The authority for this section is section 4 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*).

Dated: December 15, 2015.

Stephen Guertin,

Acting Director, Fish and Wildlife Service.

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