

**90-DAY FINDING ON A PETITION TO LIST ALEXANDER ARCHIPELAGO WOLF
(*Canis lupus ligoni*) UNDER THE ENDANGERED SPECIES ACT AND
CONCURRENTLY DESIGNATE CRITICAL HABITAT**

Petitioned action being requested:

- List as an Endangered or a Threatened species
- Reclassify (uplist) from a threatened species to an endangered species

Petitioned entity:

- Species
- Subspecies
- DPS of vertebrates
- Subset of listed entity (species, subspecies, DPS, etc.)

Background

Section 4(b)(3)(A) of the Endangered Species Act (Act) requires that we make a finding on whether a petition to list, delist, uplist (reclassify the species from a threatened species to an endangered species), or downlist (reclassify the species from an endangered species to a threatened species) a species presents substantial scientific or commercial information indicating that the petitioned action may be warranted. Our standard for substantial scientific or commercial information within the Code of Federal Regulations (CFR) with regard to a 90-day petition finding is “credible scientific or commercial information in support of the petition’s claims such that a reasonable person conducting an impartial scientific review would conclude that the action proposed in the petition may be warranted” (50 CFR 424.14(h)(i)).

Petition History

On July 15, 2020, we received a petition dated the same, from the Center for Biological Diversity, Alaska Rainforest Defenders, and Defenders of Wildlife, requesting that the Alexander Archipelago wolf be listed as a threatened species or an endangered species and critical habitat be designated for this species under the Act. The petition clearly identified itself as such and included the requisite identification information for the petitioner, required at 50 CFR 424.14(c). This finding addresses the petition.

Evaluation of a Petition to List the Alexander Archipelago wolf as an Endangered Species Under the Act

Species and Range

Does the petition identify an entity that may be eligible for listing as an endangered species (i.e., is the entity a species, subspecies, or DPS)?

- Yes
- No

The Alexander Archipelago wolf is a valid subspecies of the gray wolf and is a listable entity under the Act (81 FR 437).

Alexander Archipelago wolf (*Canis lupus ligoni*)

Historical range: The historical range of the Alexander Archipelago wolf, since the last Pleistocene period when the last glacial sheets retreated, was similar to the current range with one minor exception. Between 1950 and 1970, wolves on Vancouver Island 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.

Current 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 (Person et al. 1996, p. 1; BCMO 2014, p. 14). The range of the Alexander Archipelago wolf is approximately 84,595 square miles (mi²) (219,100 square kilometers [km²]), 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.

Statutory and Regulatory Standards for Evaluation of the Petition

Section 4 of the Act (16 U.S.C. 1533) and its implementing regulations (50 CFR part 424) set forth the procedures for determining whether a species is an “endangered species” or a “threatened species.” The Act defines an endangered species as a species that is “in danger of extinction throughout all or a significant portion of its range,” and a “threatened species” as a species that is “likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.” The Act requires that we determine whether any species is an “endangered species” or a “threatened species” because of any of the following 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.

These factors represent broad categories of natural or human-caused actions or conditions that could have an effect on a species’ continued existence. In evaluating these actions and conditions at the petition review stage, we look for those that may have a negative effect on individuals of the species, as well as other actions or conditions that *may* ameliorate any negative effects or may have positive effects.

In reviewing the petition, we use the term “threat” to refer, in general, to actions or conditions that *may* be, or are *reasonably likely* to negatively affect individuals of a species. The term “threat” includes actions or conditions that have a direct impact on individuals (direct impacts), as well as those that affect individuals through alteration of their habitat or required resources (stressors).

The term “threat” may encompass—either together or separately—the source of the action or condition or the action or condition itself.

However, the mere identification of any threat(s) does not necessarily mean that the species may meet the statutory definition of an “endangered species” or a “threatened species.” In determining whether a species may meet either definition, we must evaluate all identified threats by considering the expected response by the species, and the effects of the threats—in light of those actions and conditions that will ameliorate the threats—on an individual, population, and species level.

Below we present the information from the petition, our analysis of that information, and our conclusion and petition finding relative to our substantial information standard which is “that amount of information that would lead a reasonable person to believe that the measure proposed in the petition may be warranted.”

Information in the Petition

When evaluating a petition at the 90-day finding stage, we evaluate the information in the petition and use any readily available information (e.g., in our files or published literature that we are aware of) to verify the credibility of the information presented in the petition. At this stage we do not conduct research or solicit additional information to complete the evaluation of the petition. Our implementing regulations at 50 CFR 424.14(h)(i) state conclusions drawn in the petition without the support of credible scientific or commercial information will not be considered “substantial information.” Therefore, below we identify those claims in the petition that are supported by credible scientific or commercial information and those claims that are not supported by credible scientific or commercial information. Any claims that are not supported by credible scientific or commercial information will not be further evaluated.

Petitioner claims of threats under Factor D will not be included in this table because claims under Factor D are not an independent basis for listing under the Act. We will include consideration of existing regulatory mechanisms or conservation efforts identified in the petition or from other readily available information that may ameliorate the threats in our evaluation of the credible information presented in the petition below in “Evaluation of Information”.

4(a)(1) Factor	Threat or Activity	Do the Claims made in the Petition Rely on Credible Scientific and Commercial Information Corroborating that the Threat Is Present and May Negatively Affect Individuals?	
		If No, Explain Why Not	If Yes, Briefly Describe the Credible Information (with citations) that the Petition Presents
A	Logging and road building		Logging and associated road building have contributed to threatened destruction, modification, or curtailment of the species habitat (Rofflet et al. 2018, entire; Roffler and Gregovich 2019; entire; USFWS SSA 2015, p. 51; Person et al. 1996, p. 9; Person 2001, pp. 62, 64–66; Person 2013, p. 15; 81 FR 441; USDA 2016a, p. 5–6; USDA 2016b, Appendix D; USDA 2016c, p. 7); reduced carrying capacity potential for primary food source (Roffler et al. 2018, p. 190–191; Albert 2019, p. 5; USFS 2019b, p. 3–90, 3–68, 3–105); increased road density (Person and Russell 2008, p. 1548; 81 FR 448).
B	Trapping and hunting		Trapping and hunting (both legal and illegal) have contributed to the overutilization for commercial, recreational, scientific, or educational purposes (Person and Russell 2008, p. 1548; 81 FR 448; USFWS SSA 2015, p. 68–71).
E	Climate change		Climate change has contributed to the indirect decline of the species through adverse effects upon prey species; Sitka black-tailed deer (Person and Brinkman 2013, p. 149); salmonids (Cavole et al. 2016, entire; Mann et al. 2017, entire; Walsh et al. 2017, entire; Frolicher et al. 2018, entire; Oliver et al. 2018, entire; Cheung and Frolicher 2020, entire).
E	Loss of genetic diversity and inbreeding depression		Loss of genetic diversity and inbreeding depression have contributed to the decline of the species. (Zarn 2019, p. 12)

Evaluation of Information

In this section we evaluate conclusions from the petition that we found to be based on credible information. When evaluating a petition at the 90-day finding stage, we evaluate the information in the petition and use any readily available information (e.g., in our files or published literature that we are aware of) to verify the credibility of the information presented in the petition. Conclusions in the petition based on credible information are then evaluated to determine if there is substantial information presented indicating the petitioned action may be warranted. The substantial information standard is “credible scientific or commercial information in support of the petition's claims such that a reasonable person conducting an impartial scientific review would conclude that the action proposed in the petition may be warranted.” (50 CFR(h)(1)(i)).”

Below we discuss our evaluation of each of the claims found to be ***based on credible information*** from the petition and consider any regulatory mechanisms or conservation efforts that may ameliorate the threats the species identified in the petition. When evaluating each of the factors in section 4(a)(1) of the Act, Factor D is considered in light of the other factors, not independently. The discussion of the conclusions under each factor above included a summary of information provided in the petition and contained other readily available information regarding how activities identified in the petition negatively affect the status of the entity.

Petition Threats/Claims or Activities

Factor A—Present or threatened destruction, modification or curtailment of the species habitat or range

1. Does the petitioner claim the entity warrants listing because of the present or threatened destruction, modification, or curtailment of the species habitat or range?

- Yes
 No

- a. If the answer to 1 is yes:

Identify the activity(ies) that the petitioner claims result(s) in present or threatened destruction, modification or curtailment of the species habitat or range such that listing may be warranted.

- Logging and road development

- b. If the answer to 1 is yes:

Do the sources cited in the petition provide substantial information to support the claim? Include consideration of existing regulatory mechanisms or conservation efforts identified in the petition or from other readily available information that may ameliorate the threats.

- Yes for industrial logging and associated road development
 No

The petition claims the primary threats to the Alexander Archipelago wolf are past and continued industrial logging and associated road development on the Tongass National Forest and adjacent

State and private lands. The petition suggests direct and indirect effects of these activities on habitat for the Alexander Archipelago wolf: (1) destroy and fragment essential habitat, and (2) reduce the prey base. Further, the petition asserts habitat loss and degradation from logging and road building under the 2016 Tongass Forest Plan and the proposed elimination of the Tongass Roadless Rule pose threats to the continued existence of Alexander Archipelago wolves in southeast Alaska.

Logging and Road Development

The petition claims past and continued industrial logging of old- and young-growth forests on the Tongass National Forest and adjacent State and private lands has direct and indirect harmful impacts on the Alexander Archipelago wolf. The petition claims logging harms Alexander Archipelago wolves as: (1) industrial logging has disproportionately affected Alexander Archipelago wolves and wolf habitat; (2) old-growth logging has deleterious effects for habitat of the Sitka black-tailed deer, the wolf's primary prey; (3) logging reduces denning and rendezvous habitat, and creates risks for den abandonment and reduced reproductive success; and (4) logging affects salmon, an important seasonal prey item through loss of stream channel complexity (Bryant and Everest 1988, p. 262), increased stream temperature (ADF&G 1985, p. 79; Holtby 1988, p. 513), and improperly placed culvert pipes which create migration barriers (Person and Brinkman 2013, p. 151).

The petition claims historical industrial logging has disproportionately affected Alexander Archipelago wolf habitat. Roffler et al. (2018, entire) conclude the Alexander Archipelago wolf shows a strong preference for habitat types including old-growth forest, high-quality deer habitat, and low-elevation flat terrain with limited use or avoidance of young-growth (Roffler et al. 2018, p. 197). The petition claims new research by Roffler and Gregovich (2019, p. 3) suggests wolf denning site selection is often associated with these same habitat configurations (i.e., low elevation, flat terrain, old-growth forests) and adjacent to open habitats and freshwater streams or lakes (Roffler and Gregovich, 2019, p. 3). The petition cites previously known literature to establish wolf use of the select forest habitat types (e.g., lower-elevation, large-tree, old-growth) for denning, pup-rearing, and hunting (Person and Ingle 1995, pp. 29–32; Person et al. 1996, p. 9; Person 2001, pp. 62, 64–66; Roffler et al. 2018, pp. 195, 196; Roffler and Gregovich 2019, p. 3; 81 Fed Reg. 441) and that these areas have been targeted by logging practices over the past 60 years (Albert and Schoen 2007, pp. 10–11; USFWS SSA 2015, pp. 50–55).

The petition claims intensive old-growth logging has reduced the carrying capacity for Sitka black-tailed deer, resulting in deleterious effects for the Alexander Archipelago wolf. The petition asserts that logging activities reduce Sitka black-tailed deer forage habitat, which reduces prey availability for wolves and consequently, declines in deer populations can result in declines in Alexander Archipelago wolf numbers. The petition claims the “succession debt” (Roffler et al. 2018, pp. 190–191) will render 300,000 hectares (ha) (741,316 acres [ac]) of logged habitat on the Tongass National Forest unsuitable for deer and wolf for the next 100 to 150 years as previously logged areas transition into dense even-aged stands which inhibit growth of deer forage. The petition claims precommercial thinning practices do not benefit or enhance wolf habitat despite its wide use for prolonged deer forage production and delayed stem exclusion (Roffler et al. 2018, p. 197). The petition cites Roffler et al. (2018, p. 197) to suggest population level consequences exist for wolves due to less habitat availability as forests transition to the stem exclusion stage; nearly half of the clear-cut stands greater than 30 years old are avoided by deer and wolves due to low-forage conditions lasting 100 to 150 years. The petition claims the age distribution of logged

forests across all land ownerships in southeastern Alaska have recently entered, or are about to enter, the greater than 30 year stem exclusion phase of providing unsuitable habitat for deer and wolves for the next 100 to 150 years (Roffler et al. 2018, p. 197; USFWS SSA 2015, p. 51).

The petition suggests logging jeopardizes wolf denning and reproductive success. The petition states Alexander Archipelago wolves require den sites that are protected from logging activities including road construction and other anthropomorphic disturbances (Roffler et al. 2018, p. 196; Roffler and Gregovich 2019, p. 8). Buffers around active wolf dens are currently set at 366 meters (m) (1,200 feet [ft]) within the Tongass Forest Plan (Wolf Technical Committee 2017, p. 26). Roffler and Gregovich (2019, p. 8) recommend expanding current wolf den buffers from 366 m (1,200 ft) to 3,756 m (12,323 ft). Roffler and Gregovich (2019, p. 1) report limited disturbance during denning is an important factor for increasing reproductive success. However, Person and Russell (2009, p. 222) suggest wolves may tolerate varied levels of disturbance and denning within altered landscapes in lieu of favorable food sources and habitat features. For example, one den studied in Southeast Alaska was located 170 m (557 ft) from a road and 12 m (39 ft) from a clear cut (Person and Russell 2019, p. 222). However, authors speculate that although avoidance of logged areas and roads is preferred, these factors may be of secondary importance compared to the proximity of freshwater, gentle slopes, and low elevation habitats (Person and Russell 2019, p. 222).

The petition claims logging negatively affects salmon, an important seasonal prey item for the Alexander Archipelago wolf. Wolves eat salmon at certain times of the year and are thus an important prey item for the Alexander Archipelago wolf (Roffler et al. 2018, pp. 191, 197). Logging and road building are well-documented as having negative effects upon salmon (ADF&G 1985, pp. 64–77; Bryant and Everest 1998, pp. 261–262; Person and Brinkman 2013, pp. 160, 163; Schoen et al. 2017, pp. 54, 55). Logging and road building are expected to continue in areas in Southeast Alaska where salmon occur (USDA 2016b, Appendix C, C-9). Therefore, continued logging and road building can have an indirect negative effect on wolf populations.

The petition claims continued old- and second-growth harvest of forest under the 2016 Forest Plan can exacerbate the cumulative habitat loss and degradation effects for Alexander Archipelago wolf and Sitka black-tailed deer. The petition states the 2016 Tongass Land Management Plan's transition away from logging old-growth forest is not anticipated until 2031. The petition claims the projected acreage of old-growth forest within the Tongass National Forest to be harvested is 34,417 ha (85,047 ac) by 2040 and 1,119,933 ha (2,767,416 ac) by 2115 (USDA 2016b, Appendix C, C-9). The petition claims the 2016 Tongass Land Management Plan authorizes second-growth logging in sensitive and rare wolf habitat, namely old-growth Land Use Designations (LUDs), riparian areas and the beach and estuary fringe (USDA 2016a, pp. 5, 6; USDA 2016b, Appendix D; USDA 2016c, p. 7). The petition states the habitats found in these areas (e.g., low elevation, flat terrain, old-growth forests adjacent to open habitats and freshwater streams or lakes) are important habitats for wolf denning (Roffler and Gregovich 2019, p. 3). Many of the foreseeable logging projects on Federal, State, and private lands will be concentrated on Prince of Wales (Game Management Unit (GMU) 2), the wolf islands of GMU 3, and GMU 1A (USDA 2016b, Appendix C, Table C-2).

The petition claims future timber sales authorized under the 2016 Tongass Forest Plan jeopardize Alexander Archipelago wolf habitat in critical areas including GMUs 2, 3, and 1A. These timber sales include: Big Thorne Timber Sale, Central Tongass Logging Project, South Revilla Project,

Alaska Mental Health Trust Land Exchange, and the Prince of Wales Landscape Level Assessment (POW LLA). The petitioners acknowledge the March 11, 2020, decision and opinion of the U.S. District Court for the District of Alaska finding the Forest Service violated the National Environmental Policy Act (NEPA) (42 U.S.C. § 4332(2)(C)), the Alaska National Interest Land Claims Act (ANILCA, 16 U.S.C. § 3120(a)), and the National Forest Management Act (16 U.S.C. § 1604(i)) in approving the POW LLA Project (*Se. Alaska Conservation Council v. United States Forest Serv.*, 2020 U.S. Dist. LEXIS 43499, 2020 WL 1190453 (D. Ak. Mar. 11, 2020)). The ruling also has implications for the Central Tongass Landscape Level Analyses as it used a similar planning process as the POW LLA. The petition asserts that “...*the Forest Service may yet appeal the ruling, and apparently intends to proceed with logging in the project area following future NEPA analysis. It is therefore reasonably foreseeable that logging of old growth on POW on the Tongass National Forest will continue in the coming years.*” We acknowledge the petitioner’s concerns, however they may no longer be valid based on current conditions and legal standing.

The Big Thorne project area contains important deer winter habitat which, if removed, may lead to the collapse of the predator-prey relationship between wolves and deer on Prince of Wales Island (Person 2013, p. 15). The 2016 Tongass Plan authorizes harvest activities for 230 million board feet of timber from within the Petersburg and Wrangell Ranger Districts, a vast projects area at 3.7 million acres (USFS 2019a, pp. 2, 23). The proposed area falls within GMUs 3, 1A, and 1B. Under the 2016 Tongass Forest Plan, the South Revilla Project proposes to harvest up to 2,225 ha (5,500 ac) of old-growth, and 404 ha (1,000 ac) of second-growth forest on Revillagigedo Island located in GMU 1A (84 FR 31288). The Alaska Mental Health Trust Land Exchange Act of 2017 authorized a land exchange which gives away three large tracts of forestlands located on Prince of Wales Island and Revillagigedo Island, in exchange for smaller fragmented parcels of Trust lands. Lands within the Tongass National Forest that were given away include a 4,383 ha block (10,833 ac block) and a 622 ha block (1,538 ac block) on Prince of Wales Island and an 3,328 ha black (8,224 ac block) on Revillagigedo Island (Alaska Mental Health Trust Act 2017, entire). The petitioners speculate the large tracts of forestlands received in the exchange will be clear-cut and subject to industrial logging practices which may further fragment habitats important for the Alexander Archipelago wolf.

The petition claims eliminating the Roadless Area Conservation Rule would exacerbate key threats by opening vast areas, which were previously protected, to logging activities and road construction. The petition states exempting the Tongass National Forest from the Roadless Rule would reduce deer habitat capability (Albert 2019, p. 5), increase wolf mortality from hunting and trapping (USFS 2019c p. 3-90), and increase Alexander Archipelago wolf habitat fragmentation and loss of connectivity (USFS 2019b, pp. 3–90, 3–68, 3–105). On July 16, 2020, nine Tribal nations in Southeastern Alaska (the Organized Village of Kasaan, Organized Village of Kake, Klawock Cooperative Association, Hoonah Indian Association, Ketchikan Indian Community, Skagway Traditional Council, Organized Village of Saxman, Yakutat Tlingit Tribe, and Central Council Tlingit and Haida Indian Tribes of Alaska) petitioned the U.S. Department of Agriculture and filed a petition through the Bureau of Indian Affairs to halt the removal of protections for the Tongass National Forest and commence a new rulemaking process in collaboration with the Tribes of Southeast Alaska (Southeast Tribes APA Petition 2020, entire). As of the writing of this 90-day Finding, the July 16 petition remains unresolved.

The Preferred Alternative within the Draft EIS Rulemaking for Alaska Roadless Areas converts a net total of 67,987 ha old-growth (168,000 ac old-growth) and 8,093 ha young-growth (20,000 ac

young-growth) within the Tongass National Forest to suitable timber lands for harvest (USFS 2020, p. ES-11). Large forested areas within the Roadless Area contain approximately 50 percent of the remaining winter deer habitat capability of the region-wide total (Albert 2009, pp. 14, 15). Fragmentation of Alexander Archipelago wolf habitat is a consequence with large adverse effects on the species from increasing road lengths and penetration into remote roadless areas on Prince of Wales Island (USFS 2019b, pp. 3-10).

The petition claims road building associated with logging activities jeopardizes wolf denning and reproductive success. The petition states Alexander Archipelago wolves require den sites that are protected from logging activities including road construction and other anthropomorphic disturbances (Roffler et al. 2018, p. 196; Roffler and Gregovich 2019, p. 8). Buffers around active wolf dens are currently set at 366 m (1,200 ft) within the Tongass Forest Plan (Wolf Technical Committee, 2017, p. 26). Roffler and Gregovich (2019, p. 8) recommend expanding current wolf den buffers from 366 m (1,200 ft) to 3,756 m (12,323 ft).

The petition claims road building associated with logging activities negatively affects salmon, an important seasonal prey item for the Alexander Archipelago wolf. Wolves eat salmon at certain times of the year and are thus an important prey item for the Alexander Archipelago wolf (Roffler et al. 2018 pp. 191, 197). Road building is well-documented as having negative effects upon salmon (ADF&G 1985, pp. 59-75; Bryant and Everest 1998, pp. 253, 254; Albert and Schoen 2007, p. 33; Person and Brinkman 2013, pp. 150, 153; Schoen et al. 2017, p. 552). Road building associated with logging activities is expected to continue in areas in Southeast Alaska where salmon occur (USDA 2016a, Appendix C, C-9). Therefore, continued road building can have an indirect negative effect on wolf populations.

After reviewing the petition's claims and available literature, the petition presents substantial information indicating the petition action may be warranted due to the effects of logging and road building.

Factor B—Overutilization for commercial, recreational, scientific, or educational purposes

2. Does the petitioner claim the entity warrants listing because of overutilization for commercial, recreational, scientific, or educational purposes?

Yes

No

- a. If the answer to 2 is yes:

Identify the purpose(s) for which the petitioner claims the entity is being overutilized such that listing may be warranted (check all that apply):

Commercial

Recreational

Scientific

Educational

Other:

b. If the answer to 2 is yes:

Do the sources cited in the petition provide substantial information to support the claim? Include consideration of existing regulatory mechanisms or conservation efforts identified in the petition or from other readily available information that may ameliorate the threats.

Yes

No

The petition claims the overutilization for commercial, recreational, scientific, or educational purposes poses a serious threat to the Alexander Archipelago wolf. The petition indicates wolves face threats from high levels of legal and illegal trapping and hunting within GMU 2, as well as GMUs 1, 3 and 5A. During the 2019–2020 trapping season, 165 wolves were legally harvested from within GMU2 (ADF&G 2020a, unpaginated). The petition points out the last population estimate for GMU 2 wolves was 170 individuals, determined in fall of 2018 (ADF&G 2020a, unpaginated). However, new information suggests DNA samples collected in the fall of 2019 resulted in a GMU 2 wolf population point estimate of 316 wolves, with the actual number of wolves occurring within the 95 percent confident interval range of 250 to 398 individuals (ADFG 2020b, p. 2). In a news release dated October 26, 2020, the Alaska Department of Fish and Game (ADF&G) and U.S. Forest Service (USFS; 2020b, p. 2) indicated in order to adequately evaluate the 2019 harvest rate of 165 wolves, it must be placed in context of the 2019 population estimate and other indicators of wolf abundance (ADF&G 2020b, p. 2).

The petition claims increasing road densities lead to higher wolf mortality from trapping and hunting. The petition asserts the best-available science and the standards and guidelines in the 2016 Tongass Forest Plan and 2017 Wolf Habitat Management Program indicate that 0.7 mi/mi² (1.81 km/km²) is the road-density threshold beyond which negative impacts to wolves are likely to occur. The U.S. Fish and Wildlife Service (Service) cited Person and Russell (2008) to assert that a road density of 1.45 mi/mi² (0.9 km/km²) was the “recommended road density threshold for wolves” (81 FR 448) and used the 1.45 mi/mi² (0.9 km/km²) as a threshold in its road impact analyses (81 FR 448; USFWS SSA 2015, pp. 68–71). The petition claims the 1.45 mi/mi² (0.9 km/km²) is not and was not a “recommended road density threshold” under the 1997 Forest Plan, 2008 Forest Plan, 2016 Forest Plan, 2017 Wolf Habitat Management Program, or Person and Russell (2008). Person and Russell (2008) suggest at that level of road density, trapping and hunting would eliminate about 35–39 percent of the autumn population, excluding natural mortality or illegal kills which are known to be high on Prince of Wales Island (Person and Russell 2008, p. 1548). The Alexander Archipelago wolf would be affected by potential increased hunting and trapping access via newly constructed or reopened roads (USFS 2019b pp. 3–90).

The petition states trapping and hunting are impacting GMU 2 wolves and contributing to the observed population decline (81 FR 448). A Wolf Habitat Management Program was developed in 2017 through collaboration with the USFS, and ADF&G to minimize mortality, as required by the 2016 Tongass Forest Plan (USDA 2016a, pp. 4–91). The petition states the recommendations within the Wolf Habitat Management Plan were ‘abandoned’ and in 2019, ADF&G proposed and implemented a management plan for GMU 2 wolves (Alaska Board of Game 2019a, pp. 43, 44, Alaska Board of Game 2019b p. 5). Reporting requirements for legally trapped animals were increased from 14 days after capture to 30 days after the close of the season, which, according to the petition, eliminates in-season monitoring (Alaska Board of Game 2019a, p. 44; Alaska Board

of Game 2019b, p. 5; ADF&G 2020a, p. 24). For the 2020 trapping and hunting seasons, federal and state managers are proposing to modify harvest guidelines to maintain the fall wolf population within the range of 150-200 individuals (ADF&G 2020b, p. 2). However, at the time of this review, the proposed changes had not been officially adopted and could not be evaluated for effectiveness in reducing harvest levels.

After reviewing the petition’s claims and available literature, the petition presents substantial information indicating the petition action may be warranted due to legal and illegal hunting and trapping.

Factor C–Disease or predation

3. Does the petitioner claim the entity warrants listing because of disease or predation?

Yes

No

a. If the answer to 3 is yes:

Identify which occurrence the petitioner claims is the reason that listing may be warranted.

Disease

Predation

b. If the answer to 3 is yes:

Do the sources cited in the petition provide substantial information to support the claim? Include consideration of existing regulatory mechanisms or conservation efforts identified in the petition or from other readily available information that may ameliorate the threats.

Yes

No

Factor E–Other natural or manmade factors affecting the species’ continued existence

4. Does the petitioner claim the entity warrants listing because of other natural or manmade factors affecting its continued existence?

Yes

No

a. If the answer to 4 is yes:

Identify the other natural or manmade factors that the petitioner claims is the reason that listing may be warranted.

- The “climate crisis,” hereafter referred to as the effects of climate change.
- Loss of genetic diversity and inbreeding depression

b. If the answer to 4 is yes:

Do the sources cited in the petition provide substantial information to support the claim? Include consideration of existing regulatory mechanisms or conservation efforts identified in the petition or from other readily available information that may ameliorate the threats.

Yes for the effects of climate change and loss of genetic diversity and inbreeding depression

No

The Effects of Climate Change

The petition claims climate change is a threat that may affect the Alexander Archipelago wolf's continued existence indirectly through adverse effects upon prey species including Sitka black-tailed deer and salmon. Further, the petition claims changes in forest composition structure due to yellow cedar (*Chamaecyparis nootkatensis*) die-offs may have detrimental impacts upon deer populations that exhibit reliance upon old-growth forests as winter refugia. The petition cites literature which predicts more frequent and periodic winter storm events for southeast Alaska (Haufler et al. 2010, pp. 11, 12; Wolken et al. 2011, p. 19; Shanley et al. 2015, p. 116; Wolf Technical Committee 2017, p. 6) as well as studies that predict continued snowfalls despite predicted temperature change (O'Gorman 2014, entire, Winski et al. 2017, pp. 2–4; Lader et al. 2018, p. 184). The petition links snowfall and stochastic events and their implications for Alexander Archipelago wolves and Sitka black-tailed deer. Mortality of deer during extreme snow and winter events may be high as was evident during the winter of 2006–2007 that substantially reduced the number of deer throughout southeast Alaska (Person and Brinkman 2013, p. 149). Further, Person and Brinkman (2013, p. 149) suggest increasingly extreme and stochastic winter events can negatively impact deer populations in southeast Alaska through losses during high snowfall events. However, Shanley et al. (2015, p. 164) report future climate projections of precipitation as snow for northern coastal temperate rainforests of southeastern Alaska may no longer be a limiting factor for deer in the region. Similarly, a greater proportion of precipitation as rain is projected to occur, which may have variable impacts to Sitka black-tailed deer and old-growth forests and winter refugia, notably yellow cedar (USFWS 2018, p. 68). Repeated freeze-thaw events predicted for Southeast Alaska and northern British Columbia are likely to reduce snow accumulations. Effects of projected future freeze-thaw events are likely to continue to impact yellow-cedar in the core of its range, potentially intensifying decline in some areas, through at least the end of this century and beyond (USFWS 2018, p. 68).

The petition also claims climate change threatens salmon by increasing water temperatures, decreasing summer stream flows, increasing sea levels, and increasing the frequency, intensity, and duration of marine heat waves. The petition provides literature supporting the claim of the potential negative effects of climate change on anadromous salmonids in freshwater habitats of southeast Alaska (Bryant 2009 entire; Crozier and Siegel 2018, entire; Sergeant et al. 2019, entire). The greatest amount of literature presented within the petition supports the negative effects of marine heat waves on coastal and ocean ecosystems (Cavole et al. 2016, entire; Mann et al. 2017, entire; Walsh et al. 2017, entire; Frolicher et al. 2018, entire; Oliver et al. 2018, entire; Cheung and Frolicher 2020, entire). The petition highlights broad factors regarding climate change impacts upon freshwater salmon and logging and road building upon habitat, and does not specify which species of salmon are impacted. The petition does not indicate causal linkages to declining populations of salmon stocks in southeast Alaska due to climate change. Neither does it indicate

which species of salmon are consumed by wolves within the Game Management Units.

Loss of genetic diversity and inbreeding depression

The petition suggests Alexander Archipelago wolves are vulnerable to loss of genetic diversity and are experiencing high levels of inbreeding depression. The petition claims that new genetics information published by Zarn (2019; entire) suggests inbreeding is likely affecting the POW population in GMU 2 and these findings are contrary to the USFWS 2016 Finding's conclusion (Zarn 2019, p. 16). Zarn (2019, p. 12) that wolves located within islands of GMU 3 and 1A exhibited the highest levels of genetic inbreeding, followed closely by POW wolves. The findings of Zarn (2019, p. 15) suggest POW wolves exhibit similar inbreeding patterns as the Isle Royale National Park inbred wolf population which was founded by two or three individuals, and may therefore be at a high risk for inbreeding depression. Further, Zarn (2019) asserted POW wolves may be reaching a point where inbreeding signs are beginning to show (Zarn 2019, p. 15). For example, between 2014 and 2017 at least three wolves were observed to have shorter tails, a possible skeletal deformity with a genetic basis and akin to vertebral defects observed within inbred wolves of Island Royale National Park (Zarn 2019, p. 15, Appendix 6). However, Zarn (2019, pp. 15–16) also points out shortened tails may be a result of trauma and not evidence of inbreeding. The findings of Zarn (2019, entire) provides new genetic evidence to suggest wolves in GMU 2 (POW wolves) are at high risk of inbreeding depression, as are wolves of the islands within GMU 3 and 1A.

The petition provides substantial information on the threat of the climate change on the Alexander Archipelago wolf via indirect effects, indicating the petitioned action may be warranted under Factor E (Other natural or manmade factors affecting its existence). Finally, the petition provides substantial information related to the effects of loss of genetic diversity and inbreeding depression for the Alexander Archipelago wolf.

Factor D–Inadequacy of existing regulatory mechanisms

Factor D is considered in light of the other factors discussed above. The discussion of the claims under each factor above included a summary of information provided in the petition and contained other readily available information regarding how activities identified in the petition negatively affect the status of the entity. Below, we discuss the extent to which existing regulatory mechanisms may ameliorate the threats such that the petitioned entity may or may not warrant listing or uplisting.

5. Does the petitioner claim that the entity warrants listing/uplisting because of the inadequacy of existing regulatory mechanisms?

Yes

No

If the answer to question 5 is yes:

Identify the threats that the petitioner claims are not adequately addressed by existing regulatory mechanisms.

The petition states that the Alexander Archipelago wolf warrants listing because existing regulatory mechanisms are inadequate for preventing the extinction of the species.

The petition discusses existing regulatory mechanisms and their lack of effectiveness. For example, the petition states that existing regulatory mechanisms are inadequate to mitigate threats from habitat destruction and modification from logging and road construction. The petition notes the 2016 Tongass Forest Plan is inadequate due to lack of science-based regulatory mechanisms and failures in implementation. The petition also asserts that proposed changes to the Roadless Rule further jeopardize the Alexander Archipelago wolf by further fragmenting large blocks of old-growth forest. Further, the petition asserts that regulatory mechanism in place for logging and road building on State and private lands are inadequate. The petition asserts regulatory mechanisms in place are inadequate to prevent or mitigate the overexploitation from trapping and hunting. The petition cites the results of the 2019–2020 trapping and hunting season, and suggests the ADF&G Board of Game eliminated trapping limits and in-season monitoring disregarding recommendations of the Wolf Habitat Management Program. The petition cites the unprecedented number of wolves harvested during the two month 2019–2020 trapping season as an example of regulatory failure.

The ADF&G acknowledges that levels of Alexander Archipelago wolf harvest in 2019–2020 were higher than intended or anticipated (165 wolves harvest from a population estimate of 316 individuals; ADF&G 2020b, p. 2; ADF&G 2020c, p. 15). Contrary to the claims of the petitioners, the ADF&G asserts their GMU 2 Wolf Management Plan, population objectives, sealing requirements, and Emergency Order Authority, further support adequate regulatory mechanisms (ADF&G 2020c, p. 11). However, the proposed changes to the 2020 harvest guidelines had not been adopted at the time of this review and cannot be evaluated for their effectiveness in addressing potential overharvest of wolves in GMU 2.

The ADF&G asserts GMU 2 wolf population estimates suggest the population remains productive and resilient (ADF&G 2020, p. 2). The ADF&G points to an average of 93 wolves per year (peaking with harvest of 130 wolves in 1996) harvest during the 1990s as support for a productive population where immigration appears to be limited (Zarn 2019, p. 15). In 2013 the ADF&G implemented DNA-based spatially explicit capture-recapture population estimate techniques for determining wolf population estimates and set regulatory year (RY) 2014 to RY 2018 harvest quotas based on these estimates. The ADF&G asserts that wolf population estimates derived with these methods suggests a stable and resilient GMU 2 wolf population from 2013–2018. (ADF&G 2020c, Appendix D, pp. 31–70). Following 2 years of estimates exceeding 200 individuals (2016 and 2017), ADF&G revised its management plan, guided by a wolf harvest management strategy, to incorporate adaptive management in response to the observed changes in the GMU 2 wolf population (ADF&G 2020c, Appendix B, pp. 19–24). In early 2019, a proposal put before the Board of Game proposed to manage wolf harvest in GMU 2 by annually adjusting the season length. The new management strategy intended to shift the management focus from the number of wolves harvested, to the number of wolves that should remain within the population (i.e. 150–200). While the Board of Game eliminated harvest guideline levels and the 14-day sealing requirements, the Unit 2 Wolf Management Plan was not adopted into regulation by the Board in order to allow ADF&G greater flexibility to implement adaptive management. However, even when taking the latest updated population into account, the revised harvest management approach resulted in a greater than 50 percent harvest rate of GMU 2 wolves. Regulatory changes by the Board of Game typically occur on a 3-year cycle which may inhibit timely adaptive management decisions.

The petition presents substantial information to indicate that the existing regulatory mechanisms

described may be inadequate to provide the necessary protections to prevent habitat loss and mitigate overexploitation from trapping and hunting.

Cumulative Effects

When we have a substantial finding, we do not assess cumulative effects at the 90-day finding stage, because we address cumulative effects of all threats in the 12-month finding. We only assess the cumulative effects of purported threats included in the petition if we find the petition does not present substantial information indicating the petitioned action may be warranted because of any one of the Factors (A, B, C, D, or E) individually. The petition did present substantial information indicating the petitioned action may be warranted because of other Factors (A, D, and E) individually, so cumulative effects were not assessed.

Summary

We reviewed the petition, sources cited in the petition, and other readily available information. We found there is substantial information related to the effects of logging and road development, legal and illegal trapping and hunting, the effects of climate change, loss of genetic diversity and inbreeding depression, indicating that the petitioned action may be warranted. Finally, we found the petition presents substantial information to indicate the existing regulatory mechanisms described above may be inadequate to ameliorate the effects from habitat destruction and modification from logging and road construction, overexploitation from trapping and hunting, and anthropogenic climate change to the Alexander Archipelago wolf.

Petition Finding

Substantial Finding:

We reviewed the petition, sources cited in the petition, and other readily available information. We considered the factors under section 4(a)(1) and assessed the effect that the threats identified within the factors—as may be ameliorated or exacerbated by any existing regulatory mechanisms or conservation efforts—may have on the species now and in the foreseeable future. We considered a “threat” as any action or condition that may be known to or is reasonably likely to negatively affect individuals of a species. This includes those actions or conditions that may have a direct impact on individuals, as well as those that may affect individuals through alteration of their habitat or required resources. The mere identification of “threats” is not sufficient to compel a finding that a listing may be warranted. We find that the petition presents substantial scientific or commercial information indicating that listing the Alexander Archipelago wolf (*Canis lupus ligoni*) as a threatened or endangered species may be warranted based on Factors A, B, and E, and because existing regulatory mechanisms may be inadequate to ameliorate the threats impacting the species (Factor D).

Author

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For substantial findings:
Gregory E. Siekaniec
Regional Director, Alaska Region,
U.S. Fish and Wildlife Service

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Specific Requests for Information

The USFWS would particularly like to request any additional information regarding:

- (1) New information on genetics of Alexander Archipelago wolves in Southeast Alaska.
- (2) Information related to population dynamics between wolves in coastal British Columbia and Southeast Alaska.