FOR PUBLICATION

UNITED STATES COURT OF APPEALS
FOR THE NINTH CIRCUIT

CENTER FOR BIOLOGICAL DIVERSITY; WESTERN WATERSHEDS PROJECT; GEORGE WUERTHNER; PAT MUNDAY, *Plaintiffs-Appellants*, v. RYAN K. ZINKE, Secretary, U.S. Department of the Interior, in his official capacity; DAN ASHE, Director, U.S. Fish and Wildlife Service, in his official capacity; U.S. FISH & WILDLIFE SERVICE, *Defendants-Appellees*, and STATE OF MONTANA; MONTANA DEPARTMENT OF FISH, WILDLIFE AND PARKS, *Intervenor-Defendants-Appellees*.	No. 16-35866 D.C. No. 2:15-cv-00004-SHE OPINION

Appeal from the United States District Court
for the District of Montana
Sam E. Haddon, Senior District Judge, Presiding

Argued and Submitted February 8, 2018
Seattle, Washington

Filed August 17, 2018

Before: Raymond C. Fisher, Ronald M. Gould, and Richard A. Paez, Circuit Judges.

Opinion by Judge Paez

SUMMARY*

Environmental Law

The panel affirmed in part and reversed in part the district court's summary judgment in favor of the U.S. Fish and Wildlife Service, in an action challenging the Service's decision, based on a 2014 Finding, not to list the arctic grayling as an endangered or threatened species under the Endangered Species Act.

In 2014, the Service promulgated its "Final Policy on Interpretation of the Phrase 'Significant Portion of Its Range' in the Endangered Species Act's Definitions of 'Endangered Species' and 'Threatened Species,'" 79 Fed. Reg. 37,578 (July 1, 2014) ("SPR policy").

The panel affirmed the district court's holding that the Service did not err in considering only the current range of the arctic grayling when determining whether it was in danger of extinction "in all or a significant portion of its range." 16 U.S.C. §§ 1532(6), (20). The panel rejected

* This summary constitutes no part of the opinion of the court. It has been prepared by court staff for the convenience of the reader.

plaintiffs' contention that it was bound by two prior decisions, *Defenders of Wildlife v. Norton*, 258 F.3d 1136 (9th Cir. 2001), and *Tucson Herpetological Society v. Salazar*, 566 F.3d 870 (9th Cir. 2009), in deciding whether "range" meant historical rather than current range. Applying *Chevron* analysis, the panel held that the meaning of "range" in 16 U.S.C. § 1532(6) and (20) was ambiguous; and concluded that the SPR policy's interpretation of "range" as "current range" for the purposes of 16 U.S.C. § 1532 was a reasonable interpretation of the statute, and warranted deference.

The panel held that the Service acted in an arbitrary and capricious manner in finding that the fluvial arctic grayling population was increasing because it ignored available biological data showing that the arctic grayling population in the Big Hole River in Montana was declining.

The panel held that the Service acted arbitrarily and capriciously by dismissing threats of low stream flows and high stream temperatures to the arctic grayling. Specifically, the panel held that the 2014 Finding's reliance on cold water refugia in the Big Hole River was arbitrary and capricious and the district court's summary judgment in favor of the Service of this issue was error, but the panel affirmed the district court's ruling on the cold water refugia issue in all other aspects.

The panel held that the Service acted in an arbitrary and capricious manner by failing to explain why the uncertainty of climate change favors not listing the arctic grayling when the 2014 Finding acknowledged the warming of water temperatures and decreasing water flow because of global warning.

The panel considered the Service's dismissal of threats of small population sizes. Affirming the district court, the panel held that the Service's determination that the arctic grayling's small population size did not pose a risk to genetic viability of the arctic grayling was not arbitrary or capricious. Reversing the district court, the panel held the 2014 Finding did arbitrarily rely on the Ruby River population to provide redundancy of fluvial arctic grayling beyond the Big Hole River and to minimize the risk from random environmental events.

The panel concluded that the 2014 Finding's decision that listing arctic grayling was not "warranted" was arbitrary and capricious. The panel remanded with directions to remand to the Service to reassess the 2014 Finding in light of this opinion.

COUNSEL

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OPINION

PAEZ, Circuit Judge:

This Endangered Species Act ("ESA") case concerns the Upper Missouri River Valley Distinct Population Segment of Arctic Grayling ("arctic grayling"), a cold-water fish in the Salmonidae family. Before us is a challenge to the Fish and Wildlife Service ("FWS")'s decision not to list the arctic grayling as an endangered or threatened species under the ESA. Plaintiffs-Appellants Center for Biological Diversity, Western Watersheds Project, George Wuerthner, and Pat Mundy (collectively "CBD") argue that FWS erred in using an incorrect definition of "range" in determining whether the arctic grayling is extinct or in threat of becoming extinct "in a significant portion of its range." Additionally, CBD challenges several aspects of the listing decision as arbitrary and capricious.

The district court granted summary judgment in favor of FWS. We have jurisdiction under 28 U.S.C. § 1291. Because we conclude that in certain respects FWS acted in an arbitrary and capricious manner, we reverse the district court's order granting summary judgment with instructions to remand the arctic grayling listing decision to FWS for further consideration.

I.

We begin by describing characteristics of the arctic grayling population, as relevant to the challenged listing decision. The arctic grayling is a cold-water fish belonging to the *Salmonidae* family. It has a trout-like body with a deeply forked tail and a sail-like dorsal fin. There are two types of arctic grayling: fluvial, which dwell in rivers and streams, and adfluvial, which dwell in lakes and migrate to streams to spawn. Historically, fluvial populations predominated in the Upper Missouri River. The two types of arctic grayling are genetically distinct, although experiments have shown some plasticity in the characteristics between adfluvial and fluvial populations. Although fluvial arctic grayling have been shown to adapt to lake environments, all attempts to introduce adfluvial arctic grayling to streams have failed. Given its adaptability, the fluvial population of arctic grayling is considered to be especially important to the survival of the species.

Within the contiguous United States, arctic grayling historically existed in Montana, Wyoming, and Michigan. Today, it exists only in the Upper Missouri River Basin in Montana. Due to a host of threats to the arctic grayling's habitat, it presently occupies only a small fraction of its historical range. Fluvial arctic grayling, for example, currently occupy less than ten percent of their historical range in the Missouri River system. There are presently twenty-six populations of arctic grayling in the Upper Missouri River Basin. Six of these—the Big Hole River, Ennis Reservoir/Madison River, Centennial Valley's lakes and tributaries, Mussigbrod Lake, Miner Lake, and Ruby

River populations—are native populations.[1] The other twenty populations have been introduced into habitat that was not part of the arctic grayling's historical range. Six of these introduced populations have no significant conservation value, as they have not yet become fully established. The other twenty populations—both native and introduced—have conservation value.[2] Two of the populations—the Big Hole River and Ennis Reservoir/Madison River populations—are located primarily on private land, whereas the remaining eighteen are found either entirely or primarily on federal land.

Arctic grayling prefer cooler water temperatures; temperatures over 20 degrees Celsius (approximately 70 degrees Fahrenheit) can cause physiological stress and impair biological functions such as breeding. The upper incipient lethal temperature ("UILT") is 25 degrees Celsius (77 degrees Fahrenheit).[3] The twenty-six arctic grayling populations in the Upper Missouri River Basin are "biogeographically important to the species" because they have adapted to warmer water temperatures in contrast to populations of arctic grayling outside of the Upper Missouri River Basin. Despite this adaptation, climate change threatens the arctic grayling. Less water in streams poses a

[1] Of these six native populations, only the Big Hole River population and Ruby River population—which contains just forty-two breeding adults—are entirely fluvial.

[2] Of these twenty populations, sixteen are adfluvial, two are fluvial, and two more are mixed fluvial/adfluvial.

[3] The UILT is the temperature at which there is a 50% survival for over a week in a "test population." Thus, if the water temperature were to remain this high for a week, scientists would predict 50% of the fish in the test population would perish.

threat to the arctic grayling. Droughts and warmer-than-normal air temperatures can reduce water levels and, consequently, raise water temperatures higher than the range of temperatures that the arctic grayling can tolerate.

II.

FWS must follow certain ESA requirements when deciding whether to list a species as endangered or threatened. We briefly review those requirements. We next discuss the decades-long history of FWS listing decisions involving the arctic grayling. We then briefly review the procedural history of this case.

A.

The ESA is "the most comprehensive legislation for the preservation of endangered species ever enacted by any nation." *Tenn. Valley Auth. v. Hill*, 437 U.S. 153, 180 (1978). It represents a commitment "to halt and reverse the trend toward species extinction, whatever the cost." *Id.* at 184; *see also* 16 U.S.C. § 1531(a)(1) (2012).

Under the ESA, the Secretary of the Interior ("Secretary") is charged with determining whether particular species should be listed as "threatened" or "endangered." 16 U.S.C. § 1533.[4] An endangered species is "any species which is in danger of extinction throughout all or a significant portion of its range." *Id.* § 1532(6). A threatened species is "any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range." *Id.* § 1532(20). The

[4] The Secretary has delegated his authority to implement the ESA—including his authority to make listing decisions—to FWS. *See* 50 C.F.R. § 402.01(b) (2017).

term "species" includes subspecies and "any distinct population segment of any species of vertebrate fish or wildlife which interbreeds when mature." *Id.* § 1532(16). Under this definition, a distinct population segment of a species can be listed as an endangered or threatened species.

FWS must base its listing decision on "the best scientific and commercial data available." *Id.* § 1533(b)(1)(A). To comply with this requirement, FWS "cannot ignore available biological information." *Conner v. Burford*, 848 F.2d 1441, 1454 (9th Cir. 1988); *see also San Luis & Delta-Mendota Water Auth. v. Locke*, 776 F.3d 971, 995 (9th Cir. 2014) ("An agency complies with the best available science standard so long as it does not ignore available studies, even if it disagrees with or discredits them."). In making a listing decision, FWS must evaluate five factors: "(a) the present or threatened destruction, modification, or curtailment of [a species'] 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 [the species'] continued existence." 16 U.S.C. § 1533(a)(1).

Anyone may petition FWS to list a species. *Id.* § 1533(b)(3)(A). "To the maximum extent practicable," within ninety days of the petition FWS must determine whether the petition presents "substantial scientific or commercial information indicating that the petitioned action may be warranted." *Id.* If it does, FWS reviews the status of the species and makes a "12-month finding" that listing the species is either (a) not warranted; (b) warranted; or (c) warranted but precluded by higher priority pending proposals. *Id.* § 1533(b)(3)(B); 50 C.F.R. § 424.14. Species in the third category become "candidates" for listing, and

FWS continues to review their status until it makes a "warranted" or "not warranted" finding. 16 U.S.C. § 1533(b)(3)(C)(i). Additionally, FWS assigns these species a listing-priority number. *See* Endangered Species Listing and Recovery Priority Guidelines, 48 Fed. Reg. 43,098, 43,098 (Sept. 21, 1983). A 12-month finding that listing is "not warranted" is subject to judicial review. 16 U.S.C. § 1533(b)(3)(C)(ii).

B.

FWS initially considered whether to list the arctic grayling as endangered or threatened in 1982. Endangered and Threatened Wildlife and Plants; Review of Vertebrate Wildlife for Listing as Endangered or Threatened Species, 47 Fed. Reg. 58,454 (Dec. 30, 1982). FWS determined that listing the arctic grayling was "possibly appropriate" but chose not to list it due to a lack of sufficient data. *Id.* at 58,454–55. Two of the plaintiffs in the current case—George Wuerthner and the Center for Biological Diversity[5]—then petitioned FWS to list the fluvial arctic grayling as an endangered species. In response to that petition, FWS determined in 1994 that listing the arctic grayling was "warranted but precluded" by other listing obligations, as threats were of moderate-to-low magnitude due to "ongoing cooperative conservation actions." Endangered and Threatened Wildlife and Plants; Finding on a Petition to List the Fluvial Population of the Arctic Grayling as Endangered, 59 Fed. Reg. 37,738, 37,740–41 (July 25, 1994). FWS therefore gave the arctic grayling a listing priority of nine. *Id.* The arctic grayling maintained this status until 2003, when the Center for Biological

[5] The Center for Biological Diversity was at the time called the Biodiversity Legal Foundation.

Diversity and the Western Watersheds Project challenged the 1994 "warranted but precluded" decision in a complaint filed in the United States District Court for the District of Columbia.[6] In response, FWS raised the listing priority of the arctic grayling to three, the highest priority that could be afforded to a distinct population segment. The plaintiffs responded with an amended complaint, requesting that FWS emergency list the arctic grayling as either endangered or threatened. The parties settled, with FWS agreeing to issue a revised listing determination by April 2007.

In April 2007, FWS concluded that the arctic grayling did not warrant protection because it was not a distinct population segment, and therefore could not be listed as an endangered or threatened species under the ESA. Endangered and Threatened Wildlife and Plants; Revised 12-Month Finding for Upper Missouri River Distinct Population Segment of Fluvial Arctic Grayling, 72 Fed. Reg. 20,305, 20,305 (Apr. 24, 2007). The Center for Biological Diversity, Federation of Fly Fishers, Western Watersheds Project, George Werthner, and Pat Munday filed an action in the District Court for District of Montana challenging the 2007 listing decision.[7] The parties ultimately settled, with FWS stipulating that by August 30, 2010 it would determine whether listing the arctic grayling was warranted. In 2010, FWS published a revised listing decision, concluding that the arctic grayling was a distinct population segment and that listing was "warranted but precluded" by higher priority actions ("2010 Finding"). Endangered and Threatened

[6] Ctr. for Biological Diversity v. U.S. Fish & Wildlife Serv., No. CIV.A. 03-1110(JDB) (D.D.C.).

[7] Ctr. for Biological Diversity v. U.S. Fish & Wildlife Serv., 1:07-cv-00152-RFC (D. Mont.).

Wildlife and Plants; Revised 12-Month Finding to List the Upper Missouri River Distinct Population Segment of Arctic Grayling as Endangered or Threatened, 75 Fed. Reg. 54,708, 54,708 (Sept. 8, 2010).

The 2010 Finding was based on a variety of threats facing the arctic grayling. For example, the 2010 Finding noted low abundance of arctic grayling and downward population trends, especially in the Big Hole River. *Id.* at 54,723. These trends played a role in FWS's evaluation of the arctic grayling's range and habitat. *Id.* The 2010 Finding also determined that low stream flows and high stream temperatures imperiled the arctic grayling, and showed resulting present and threatened destruction of grayling habitat or range. *Id.* at 54,726–30. Additionally, climate change was evaluated as an "other natural or manmade factor" that would "potentially intensify some of the significant current threats to all Arctic grayling populations." *Id.* at 54,739–40. In evaluating other factors relevant to the "warranted but precluded" decision, the 2010 Finding also found that small population sizes threatened the survival of the species. *Id.* at 54,740–41. The effective population was below the number needed for long-term genetic viability and stochastic events could threaten the survival of the arctic grayling due to its small population size. *Id.*

Shortly after the 2010 Finding, FWS settled numerous lawsuits in a multi-district litigation concerning the backlog of ESA listing decisions.[8] As part of that settlement, FWS stipulated that it would issue either a proposed listing rule or

[8] These cases were known as *In re Endangered Species Act Section 4 Deadline Litigation*, Misc. Action No. 10-377 (EGS), MDL Docket No. 2185 (D.D.C.).

a not-warranted finding for the arctic grayling by the end of fiscal year 2014.

As required, in 2014 FWS released its decision finding that listing the arctic grayling as endangered or threatened was not warranted ("2014 Finding"). Endangered and Threatened Wildlife and Plants; Revised 12-Month Finding on a Petition to List the Upper Missouri River Distinct Population Segment of Arctic Grayling as an Endangered or Threatened Species, 79 Fed. Reg. 49,384 (Aug. 20, 2014). The 2014 Finding was based on a number of conclusions, including some that were directly at odds with conclusions in the 2010 Finding. In contrast to the 2010 Finding, FWS found that the population of arctic grayling was actually increasing, including an increase in abundance of the two fluvial populations. The 2014 Finding relied on the Big Hole River Candidate Conservation Agreement with Assurances ("CCAA") and related Strategic Habitat Conservation Plan, in evaluating the threatened destruction, modification, or curtailment of arctic grayling habitat.[9] *Id.* at 49,400–02. FWS found that the CCAA would mitigate threats from low stream flows and high water temperatures. *Id.* Additionally, FWS found that climate change was not a threat because the arctic grayling's increased abundance and distribution in conjunction with riparian restoration efforts mitigated climate-change effects. *Id.* at 49,407. The 2014 Finding also dismissed the risks from inbreeding and environmental

[9] A CCAA is an agreement between FWS and non-Federal property owners. The property owners agree to manage their land in a manner that will reduce threats to a species in exchange for assurances against additional regulatory requirements if that species is later listed as threatened or endangered under the ESA. These CCAAs work to implement the broader Strategic Habitat Conservation Plan for the arctic grayling, which provides a framework for achieving positive biological outcomes for the arctic grayling.

disturbances because of increasing population numbers and geographic separation between populations.

In analyzing the curtailment of the arctic grayling's range, habitat fragmentation, and the effect of man-made disturbances on the arctic grayling, FWS considered the arctic grayling's historic range. In deciding whether the arctic grayling was threatened or endangered in a "significant portion of its range" as provided in 16 U.S.C. § 1532(6) and (20), however, FWS interpreted "range" as the arctic grayling's "current range" rather than the range it had historically inhabited.

C.

In February 2015, CBD challenged FWS's negative listing decision by filing this action in the District Court for the District of Montana. CBD alleged that the 2014 Finding (1) arbitrarily relied on unsupported population increases to conclude that the arctic grayling is not threatened by small population size; (2) did not properly evaluate whether the arctic grayling is threatened by lack of water in streams and high water temperatures, which will only be exacerbated by global warming; and (3) did not properly analyze whether lost historical range constitutes a "significant portion of [the arctic grayling's] range." The State of Montana and the Montana Department of Fish, Wildlife and Parks (collectively, "Montana") intervened as defendants in the action. The parties filed cross-motions for summary judgment and the district court granted summary judgment in favor of FWS and Montana, rejecting each of CBD's claims.

III.

We turn to the merits and address first CBD's claim that FWS erred in considering only the current range of the arctic grayling when determining whether it was in danger of extinction "in all or a significant portion of its range." 16 U.S.C. § 1532(6), (20). The district court concluded that FWS did not err by doing so. Reviewing the district court's summary judgment ruling de novo, we agree and affirm its ruling on this issue. *Greater Yellowstone Coal., Inc. v. Servheen*, 665 F.3d 1015, 1023 (9th Cir. 2011).

In 2014, FWS promulgated its "Final Policy on Interpretation of the Phrase 'Significant Portion of Its Range' in the Endangered Species Act's Definitions of 'Endangered Species' and 'Threatened Species,'" 79 Fed. Reg. 37,578 (July 1, 2014) ("SPR policy"). This policy defined "range" as follows:

> The range of a species is considered to be the general geographical area within which that species can be found at the time [FWS] makes any particular status determination. This range includes those areas used throughout all or part of the species' life cycle, even if they are not used regularly (e.g., seasonal habitats). Lost historical range is relevant to the analysis of the status of the species, but it cannot constitute a significant portion of a species' range.

Id. at 37,609.

As the SPR policy was enacted through notice-and-comment rulemaking procedures as required by 16 U.S.C. § 1533(h), we apply the deference framework established by

Chevron. *See Nw. Ecosystem All. v. U.S. Fish & Wildlife Serv.*, 475 F.3d 1136, 1141–42 (9th Cir. 2007). We ask if the meaning of "range" in 16 U.S.C. § 1532(6) and (20) is ambiguous. If the term "range" is ambiguous, then we must defer to the SPR policy unless it is an unreasonable interpretation of the statute. *See Chevron U.S.A., Inc. v. Nat. Res. Def. Council, Inc.*, 467 U.S. 837, 842–43 (1984).

A.

Before addressing the first step of *Chevron*, we consider the significance of two of our prior decisions—*Defenders of Wildlife v. Norton*, 258 F.3d 1136 (9th Cir. 2001), and *Tucson Herpetological Society v. Salazar*, 566 F.3d 870 (9th Cir. 2009). CBD argues that these two cases hold that "range" means historical range rather than current range for the purposes of 16 U.S.C. § 1532(6) and (20), and therefore we are bound by our precedent to invalidate the SPR policy. A prior appellate court decision construing a statute controls over a later agency decision "only if the prior court decision holds that its construction follows from the unambiguous terms of the statute and thus leaves no room for agency discretion." *Nat'l Cable & Telecomms. Ass'n v. Brand X Internet Servs.*, 545 U.S. 967, 982–83 (2005). We conclude that neither of our previous decisions held that "range" unambiguously means "historical range."

In *Defenders of Wildlife*, we held that it was error for the Secretary to fail to list the flat-tailed horned lizard as "endangered" or "threatened" based on a finding that adequate habitat existed on public land for the lizard, despite recognizing that the lizard faced threats on private land. 258 F.3d at 1140. We analyzed the phrase "in danger of extinction throughout . . . a significant portion of its range" to determine if it required considering the threats that the lizard faced on private land. *Id.* at 1140–41. We concluded

that "significant portion of its range" is inherently ambiguous, and therefore the Secretary has a "wide degree of discretion in delineating [what] 'a significant portion of its range'" means. *Id.* at 1145. We noted, however, that where "it is on the record apparent that the area in which the [species] is expected to survive is much smaller than its historical range, the Secretary must at least explain her conclusion that the area in which the species can no longer live is not a 'significant portion of its range.'" *Id*. Because the Secretary did not address whether the private land it discounted was sufficient to render the lizard "extinct . . . in a significant portion of its range," we reversed and remanded. *Id.* at 1146–47.

Tucson Herpetological Society, which also involved the flat-tailed horned lizard, interpreted *Defenders of Wildlife* to mean that the criteria for "significance" is undefined, but that FWS must "develop some rational explanation for why the lost and threatened portions of a species' range are insignificant before deciding not to designate the species for protection." 566 F.3d at 876–77. Additionally, we concluded that *Defenders of Wildlife* required FWS to analyze lost historical range. *Id.* We ultimately held that FWS had properly analyzed the flat-tailed horned lizard's lost historical range. *Id.* at 878.

Although *Defenders of Wildlife* and *Tucson Herpetological Society* held that FWS must at least explain why the lost and threatened portions of a species' range are insignificant before disregarding historical range, it does not follow from their holdings that the ESA's use of "range" in 16 U.S.C. § 1532 unambiguously refers to the species' current range. Rather, we have noted that the phrase "extinct throughout . . . a significant portion of [a species'] range" is ambiguous. *See Defs. of Wildlife*, 258 F.3d at 1141. Because

neither of these cases provide a clear statement that "range" unambiguously means "historical range," we proceed to consider CBD's other arguments in favor of such a reading. *See Brand X*, 545 U.S. at 982–83.

B.

Under *Chevron*, first we must ask if the meaning of "range" in 16 U.S.C. § 1532(6) and (20) is ambiguous. CBD argues that the term "range" unambiguously means a species' historical range. Although the term "range" is not defined in the ESA, CBD argues that using traditional tools of statutory construction, we can ascertain that Congress unambiguously intended "range" to mean "historical range" and therefore that "intention is the law and must be given effect." *Chevron*, 467 U.S. at 843 n.9.

Whether FWS's interpretation of range in the SPR policy deserves deference under *Chevron* is a question of first impression in this circuit. The D.C. Circuit recently considered this question in *Humane Society of the United States v. Zinke*, 865 F.3d 585 (D.C. Cir. 2017), and concluded that deference was warranted. In doing so it analyzed the dictionary definition of the word "range," its use in 16 U.S.C. § 1532(6) and (20) and the use of "range" in three other parts of the ESA to determine that "range" was ambiguous. *Id.* at 604. For the following reasons, we agree that "traditional rules of statutory construction do not answer the question of whether 'range' means current or historical range." *Id.*

Starting with the text of 16 U.S.C. § 1532(6) and (20), the word "range" is ambiguous as to whether it means current or historical range. "Range" is commonly defined as "a geographical reference to the physical area in which a species lives or occurs." *Id.* (citing 8 *The Oxford English*

Dictionary 139 (def. 7) (1933)). This definition, however, does not provide clarity to the meaning of "range." One could argue that the use of the present tense in the definition—"lives or occurs"—may suggest that range means "current range." As the D.C. Circuit observed, however, the use of the present tense is likely a function of dictionary drafting. *Id.* We agree with the D.C. Circuit that the dictionary definition of the word "range" itself does not shed much light on Congress's intent.

The text of 16 U.S.C. § 1532 as a whole tells us equally little. An endangered species is one that "is in danger of extinction throughout all or a significant portion of its range." 16 U.S.C. § 1532(6). Similarly, a "threatened species" is "any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range." 16 U.S.C. § 1532(20). The SPR policy explains that because these definitions are phrased in the present tense, "range" means current range. "[T]o say a species 'is in danger' in an area where it no longer exists—i.e., in its historical range where it has been extirpated—is inconsistent with common usage." 79 Fed. Reg. at 37,583.

Like the D.C. Circuit, we conclude that the use of the present tense in §1532(6) and (20) does not mean that "range" must mean "current range." The placement of the present-tense "is" seems to require that the species "*currently* be endangered or threatened within its range, not to dictate the temporal scope of geographical evidence [FWS] is to consider." *Humane Soc'y*, 865 F.3d at 604. As we explained in *Defenders of Wildlife*, "a species can be extinct 'throughout . . . a significant portion of its range' if there are major geographical areas in which it is no longer viable but once was." 258 F.3d at 1145. CBD similarly

notes that a species can be "in danger" even in an area where it does not currently exist but could in the future, if habitat degradation endangers the possibility of reintroduction to that habitat.[10] The statutory text does not demonstrate that Congress unambiguously intended "range" to mean either "current" or "historical range."

Because the text of 16 U.S.C. § 1532(6) and (20) does not conclusively shed light on the scope of the word "range," we next consider the statutory framework of the ESA and the other uses of the word "range" throughout the statute. *See Sullivan v. Everhart*, 494 U.S. 83, 89 (1990) ("In ascertaining the plain meaning of the statute, the court must look to the particular statutory language at issue, as well as the language and design of the statute as a whole." (citation omitted)). Outside of the definitions of "endangered" and "threatened" species, the term "range" appears three times in the ESA.

The first use of "range" is in section 4(a)(1) of the ESA, which lists "the present or threatened destruction, modification, or curtailment of [a species'] habitat or range" as one factor that FWS considers in its listing decision. 16 U.S.C. § 1533(a)(1)(A). This reference to "range" is "as textually indeterminate as the initial use of the term in [16 U.S.C. §] 1532." *Humane Soc'y*, 865 F.3d at 604. Indeed, while "present" may modify "habitat or range," it more likely modifies "destruction, modification, or

[10] This interpretation has some force in light of the ESA provisions that seek to recover lost range once a species is listed. *See, e.g.*, 16 U.S.C. §§ 1533(a)(3), 1539(j)(2)(A). Indeed, in this case many of the current arctic grayling populations were reintroduced into their current habitats.

curtailment." The use of the word "range" in this section does not shed any light on Congress's intent.

The next use of "range" is in section 4(c)(1), which requires FWS to specify "over what portion of its range [the species] is endangered or threatened, and specify any critical habitat within such range." 16 U.S.C. § 1533(c)(1). We acknowledge that legislative history indicates that in this section of the ESA, Congress used "[t]he term 'range' . . . in the general sense [to] refer[] to the historical range of the species." H.R. Rep. No. 95-1625, at 18 (1978), *reprinted in* 1978 U.S.C.C.A.N. 9453, 9468. Combined with the "presumption that a given term is used to mean the same thing throughout a statute," *see Brown v. Gardner*, 513 U.S. 115, 118 (1994), this legislative history provides support for interpreting "range" as meaning historical range in 16 U.S.C. § 1532(6) and (20) as well.

We are not convinced that this lone indicator of legislative intent disposes of all ambiguity as to the scope of "range" throughout the ESA. The SPR Policy reads section 4(c)(1) as "an informational rather than a substantive provision," that is, an instruction that the agency should specify where a species is endangered or threatened and identify the critical habitat in those areas. 79 Fed. Reg. at 37,583. Indeed, as FWS recognizes, reading section 4(c)(1) as a substantive provision may actually limit the scope of protection for species under the ESA, as in that case critical habitat could only be designated in the species' "range." *Id.* In sum, we agree with the D.C. Circuit that this section also does not unambiguously shed light on Congress's intended meaning of "range."

The third use of "range" in the ESA is found in section 10(j), which "authorize[s] the release . . . of any population . . . of an endangered species or a threatened species outside

the current range of such species." 16 U.S.C. § 1539(j)(2)(A). As the D.C. Circuit noted, this provision cuts both ways. *Humane Soc'y*, 865 F.3d at 604. On the one hand, the use of the word "current" as a qualifier to "range" in section 10(j) could indicate that elsewhere in the ESA "range" means "historical range." *See, e.g.*, *Duncan v. Walker*, 533 U.S. 167, 174 (2001) (describing the rule against surplusage). By using "current range" in section 10(j), Congress knew how to limit "range" to mean "current range," and therefore it could have intended the broader historical meaning in 16 U.S.C. § 1532(6) and (20). *See Hamdan v. Rumsfeld*, 548 U.S. 557, 578 (2006). On the other hand, the use of "current range" in section 10(j) "could also be read to corroborate [FWS's] view, since 'current range' . . . may refer to the listed range of the endangered or threatened species." *Humane Soc'y*, 865 F.3d at 604. The use of "range" in section 10(j) does not compel the conclusion that "range" should be read to unambiguously mean "historical range."

Considering the statutory framework as a whole, then, the term "range" in 16 U.S.C. § 1532(6) and (20) is ambiguous. Although traditional tools of statutory construction provide some support for interpreting "range" to mean "historical range," we are not persuaded that the "unambiguously expressed intent of Congress" was to define "range" as "historical range." *Chevron*, 467 U.S. at 843. We therefore conclude that the term "range" is ambiguous and proceed to evaluate whether the SPR policy is "based on a permissible construction of the statute." *Id.*

C.

Since "range" is ambiguous, we must next determine whether the SPR policy's interpretation of "range" as "current range" for the purposes of 16 U.S.C. § 1532 is a

reasonable interpretation of the statute. *Id.* We join the D.C. Circuit in holding that it is. *Humane Soc'y*, 865 F.3d at 605. As we discussed above, the statutory framework of the ESA provides at least some support for interpreting "range" as the current range of a species, although it may not compel this interpretation. Additionally, despite CBD's arguments to the contrary, the SPR policy does not run afoul of the purposes of the ESA. The largest threat to potentially endangered or threatened species is the loss of habitat that the species currently occupies. *See id.* (noting that where a species "currently lives often affect its continued survival the most and thus bear influentially on whether it should be listed"). It would therefore be reasonable for FWS to focus on the area the species currently occupies when evaluating whether the species is endangered through "a significant portion of its range." *Id.* at 604.

The SPR policy still requires that FWS consider the historical range of a species in evaluating other aspects of the agency's listing decision, including habitat degradation. *Id.* at 605–06. The SPR policy recognizes that loss of historical range can lead to reduced abundance, inhibited gene flow, and increased susceptibility to extinction. 79 Fed. Reg. at 37,584. The SPR policy's interpretation of "range" is "consonant with the purposes of the [ESA]," as it provides protections for species that have lost a substantial part of their historical range. *See Human Soc'y*, 865 F.3d at 605.

In sum, we hold that FWS's interpretation of "range" in 16 U.S.C. § 1532(6) and (20) as "current range" warrants deference. Consistent with that interpretation, FWS did consider the arctic grayling's historical range in evaluating the factors that contributed to its negative listing decision.

IV.

We next turn to CBD's other arguments that the 2014 Finding was arbitrary and capricious. FWS's decision not to list a species under the ESA is reviewed under the Administrative Procedure Act ("APA"), 5 U.S.C. §§ 701–706. *Native Ecosystems Council v. Dombeck*, 304 F.3d 886, 901 (9th Cir. 2002). We "shall" set aside agency actions, findings, or conclusions under the APA that are "arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law." *Japanese Vill., LLC v. Fed. Transit Admin.*, 843 F.3d 445, 453 (9th Cir. 2016) (quoting 5 U.S.C. § 706(2)(A)).

In reviewing whether an agency decision is arbitrary or capricious, we "ensure that the agency considered the relevant factors and articulated a rational connection between the facts found and the choices made." *Greater Yellowstone Coal.*, 665 F.3d at 1023 (citation omitted). "[A]n agency rule would be arbitrary and capricious if the agency has relied on factors which Congress has not intended it to consider, entirely failed to consider an important aspect of the problem, offered an explanation for its decision that runs counter to the evidence before the agency, or is so implausible that it could not be ascribed to a difference in view or the product of agency expertise." *Id.* (quoting *Motor Vehicle Mfrs. Ass'n v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 43 (1983)).

Agency decisions deserve the highest deference when "the agency is making predictions, within its area of special expertise." *Lands Council v. McNair*, 537 F.3d 981, 993 (9th Cir. 2008) (en banc) (alteration omitted). Even when an agency is acting within its area of expertise, however, we "need not defer to the agency when the agency's decision is without substantial basis in fact." *Ariz. Cattle Growers'*

Ass'n v. Salazar, 606 F.3d 1160, 1163 (9th Cir. 2010). When an agency changes a policy based on factual findings that contradict those on which the prior policy was based, an agency must provide a "reasoned explanation . . . for disregarding facts and circumstances that underlay or were engendered by the prior policy." *FCC v. Fox Television Stations, Inc.*, 556 U.S. 502, 515–16 (2009); *see also Organized Vill. of Kake v. U.S. Dep't of Agric.*, 795 F.3d 956, 966 (9th Cir. 2015) (en banc).

We review for substantial evidence an agency's factual conclusions based on the administrative record. *See Dickinson v. Zurko*, 527 U.S. 150, 164 (1999). Where "evidence is susceptible of more than one rational interpretation," we uphold the agency's finding if a "reasonable mind might accept [it] as adequate to support a conclusion." *San Luis & Delta-Mendota Water Auth. v. Jewell*, 747 F.3d 581, 601 (9th Cir. 2014).

A.

We first consider CBD's argument that the 2014 Finding arbitrarily found that fluvial arctic grayling population is increasing. CBD argues that this determination was not based on the "best scientific and commercial data available," as required by 16 U.S.C. § 1533(b)(1)(A). Although FWS has broad discretion to choose which expert opinions to rely on when making a listing decision, it cannot ignore available biological data. *See Conner*, 848 F.2d at 1454. Here, FWS acted in an arbitrary and capricious manner by ignoring available biological data showing that the arctic grayling population in the Big Hole River was declining.

FWS failed to account for a 2014 report ("DeHaan study") by four scientists at the FWS Abernathy Fish Technology Center, which found that the number of

effective breeders in the Big Hole River was declining.[11] The DeHaan study arrived at this conclusion by measuring the effective number of breeders in the Big Hole River during four different time periods: 1987–88; 1995–96; 2005–06; and 2011–12. The DeHaan study examined whether there was any change in the number of effective breeders between each time period and found that the number of effective breeders decreased in each time period, although the largest decrease occurred between 1996 and 2005.[12]

FWS cited to a portion of the DeHaan study in its 2014 Finding as indicating that a decrease in the number of effective breeders continued through the mid-2000s but did not mention that other aspects of the DeHaan study contradicted the data on which FWS relied (the "Leary study"). Although FWS is free to choose among experts, it must acknowledge that it is doing so. *See Conner*, 848 F.2d at 1454. FWS clearly stated in the 2014 Finding that the number of breeding arctic grayling increased in the Big Hole River, and omitted the DeHaan study's evidence to the

[11] The number of effective breeders in the population is determined through genetic analysis, which is one way of measuring a species population. FWS relied on the number of effective breeders to document population increases.

[12] The DeHaan study did find that several other population indicators, including effective population size, genetic diversity, and the number of individuals in the population, have remained relatively stable or increased over time. The DeHaan study also noted that despite a declining number of breeders "the number of offspring produced may not have similarly declined." FWS used the number of effective breeders as an indication of population abundance, which leads us to focus on this aspect of the DeHaan study as well.

contrary. We conclude that in ignoring available data FWS acted in an arbitrary and capricious manner. *Id.*

FWS's arguments to the contrary are unavailing. FWS points out that the 2014 Finding relied on yearly data that was "more current" than the longitudinal DeHaan study. Although that could be a reason ultimately to rely on the Leary study rather than the DeHaan study, the listing decision should have included "adequate explanation and support for its determinations." *San Luis*, 747 F.3d at 625. FWS must "provide[] a reasonable explanation for adopting its approach and disclose[] the limitations of that approach," which it fails to do by not discussing the DeHaan study's data that contradicts the Leary study. *Alaska Oil & Gas Ass'n v. Pritzker*, 840 F.3d 671, 679 (9th Cir. 2016). Because FWS did not provide a reason to credit the Leary study over the DeHaan study, "we are precluded from undertaking meaningful judicial review." *Humane Soc'y of U.S. v. Locke*, 626 F.3d 1040, 1049 (9th Cir. 2010).

Additionally, FWS cannot rely on its briefing in this case to explain why the 2014 Finding relied on the Leary study rather than the DeHaan study. The explanation must be evidenced from the listing decision itself. *See Greater Yellowstone Coal.*, 665 F.3d at 1027 n.4 ("[A]n agency's action must be upheld, if at all, on the basis articulated by the agency itself, not post-hoc rationalizations." (internal quotation marks omitted)). By failing to consider the DeHaan study's evidence of decreasing population, FWS acted in an arbitrary and capricious manner.[13] Because the

[13] CBD also argues that FWS acted in an arbitrary and capricious manner by ignoring state population monitoring data. For the Big Hole River, FWS provided a valid reason for discounting the fluctuating population data. In the 2014 Finding, FWS explained that the state

2014 Finding based its analysis of two of the five listing factors—the "present or threatened destruction, modification, or curtailment of [the arctic grayling's] habitat and range" and "other natural or manmade factors affecting [the arctic grayling's] continued existence"—on the fact that the arctic grayling's population was increasing, we reverse the district court's grant of summary judgment, with directions to remand the 2014 Finding to FWS for further consideration in light of this opinion.[14]

B.

Next we consider CBD's argument that the 2014 Finding arbitrarily dismissed threats of low stream flows and high stream temperatures to the arctic grayling. As discussed below, in rejecting these threats to the arctic grayling in the Big Hole River FWS acted arbitrarily and capriciously. The similar findings regarding the Centennial Valley's lakes and

population monitoring data showed a decline of arctic grayling in the Big Hole River in 2013 as resulting from unusually high flows that likely decreased capture efficiency, which is a sufficient explanation that is neither arbitrary nor capricious. *See San Luis*, 747 F.3d at 625. Additionally, while the 2014 Finding did not explicitly address state population data for the Ruby River, the data does not show the decrease that CBD claims it does. Although the Ruby River data did show a decrease in fish in 2013, the size of the area surveyed also decreased. The number of fish per unit, however, stayed roughly the same. Under the circumstances, we are not persuaded that FWS acted arbitrarily and capriciously by failing to address state monitoring data in its 2014 Finding.

[14] Given our disposition of this issue, we need not decide CBD's additional argument that the Leary study does not provide sufficient support for FWS's determination that the arctic grayling population is increasing, and therefore even if FWS did not improperly disregard the DeHaan study, its determination that the arctic grayling population is increasing would be arbitrary and capricious.

tributaries, however, were adequately supported. Any error in the 2014 Finding regarding the Madison River and its tributaries was harmless, as FWS expressly did not rely upon the survival of arctic grayling in the Madison River Valley in deciding that listing the arctic grayling was not warranted.

1.

In the 2014 Finding, FWS determined that the arctic grayling's ability to migrate to coldwater refugia minimizes the threat it faces from low stream levels and high water temperatures in the Big Hole River. FWS based this determination largely on a study that found that the tributaries of the Big Hole River provide important coldwater refugia to arctic grayling ("Vatland study"). Relying on the Vatland study, FWS determined that despite the existence of water temperatures that exceeded ideal temperatures for arctic grayling in many areas of the Big Hole River, arctic grayling could migrate to cold water refugia over the summer to survive.[15] Additionally, the 2014 Finding reasons that because fish ladders are included in the CCAA's conservation projects and the increased connectivity of the Big Hole River, the arctic grayling can

[15] CBD highlights that despite decreases in water temperatures since implementing the CCAA, the water temperature still frequently exceeds 70 degrees Fahrenheit. As mentioned above, 70 degrees Fahrenheit is the temperature above which arctic grayling experience "physiological stress." Montana contends that harm does not result from temperatures of 70 degrees Fahrenheit and that stream temperatures in the Big Hole River tributaries did not exceed 70 degrees in 2013. These arguments, however, are directly contradicted by data in FWS's 2014 Finding.

access cold water tributaries that they could not access in 2010.[16]

CBD disputes the 2014 Finding's conclusion that the arctic grayling seek refuge in coldwater tributaries of the Big Hole River when water temperatures rise. CBD also disputes that the Vatland study shows that arctic grayling migrate, as the study found "[l]imited movement" among arctic grayling during the summer. Additionally, CBD argues that evidence does not suggest that tributaries actually provide cold water refugia, as the temperatures in these tributaries frequently exceed 70 degrees. CBD's arguments are persuasive.

FWS's reliance on the ability of the arctic grayling to migrate to cold water refugia was arbitrary and capricious. The sole evidence of arctic grayling migrating to cold water refugia in the Big Hole River tributaries is the Vatland study. Notably, in 2010, FWS determined that despite the Vatland study's findings that arctic grayling have the ability to migrate to cold water refugia in tributaries, water temperatures were sufficiently high to warrant listing the arctic grayling. Water temperatures remained high enough to cause physiological stress in 2014, but the 2014 Finding stated that this could be overcome by the arctic grayling's ability to migrate to cold water refugia via CCAA fish ladders, without providing any additional evidence or scientific studies demonstrating that this would likely occur.

[16] In the 2010 Finding, FWS also determined that CCAA conservation measures would reduce but not eliminate threats of dewatering. Since CCAA conservation measures took effect, the record reflects that minimum flow targets have been achieved 78 percent of the time, up from 50 percent of the time pre-CCAA. Although this is an improvement, CBD notes that FWS previously stated that the flow target represented minimum values to promote recovery of the arctic grayling.

Because the 2010 Finding indicated that listing the arctic grayling was warranted irrespective of the Vatland study and recognized the ability of arctic grayling to migrate to tributaries, the 2014 Finding was required to provide a reasoned explanation for FWS's change in position. *See Organized Vill. of Kake*, 795 F.3d at 966 (stating that an "[u]nexplained inconsistency" between two agency actions can be grounds for holding that agency action is arbitrary and capricious (quoting *Brand X*, 545 U.S. at 981)).

Nor do lower water temperatures or the CCAA conservation measures save the agency's flawed 2014 Finding. As discussed above, temperatures are still higher than the scientific benchmarks cited by FWS as tolerable water temperatures for arctic grayling. *Cf. Greater Yellowstone Coal.*, 665 F.3d at 1028 ("Having determined what is necessary, the [FWS] cannot reasonably rely on something less to be enough." (internal quotation marks omitted)). Even the tributaries of the Big Hole River that supposedly serve as cold water refugia are above the desired temperature according to the scientific studies on which FWS relies. FWS disregarded this scientific evidence, and instead based its conclusion on a study finding "limited movements" of arctic grayling in the Big Hole River during summer months. Given that water temperatures—even in tributaries—still exceed temperatures where arctic grayling can live and breed, FWS did not sufficiently "articulate[] a rational connection between the facts found and the choices made." *Id.* at 1023 (internal quotation marks omitted). Similarly, FWS's reliance on the CCAA's fish ladders as evidencing a change in the status quo without any studies finding that these measures will aid migration is arbitrary and capricious—even if the ladders aid the arctic grayling in migrating to tributaries, as this would be of little value if the water in the tributaries is still too warm. *Id.* (stating that

agency rulings are arbitrary and capricious if the agency offers "an explanation for its decision that runs counter to the evidence before the agency" (quoting *State Farm*, 463 U.S. at 43)).

Although there have been improvements in stream flow and water temperature since 2010, the water temperatures are still above those that are ideal for the arctic grayling both in the main stem of the Big Hole River and its tributaries. In sum, the 2014 Finding that thermal refugia in the Big Hole River would aid survival of the arctic grayling was arbitrary and capricious.

2.

The 2014 Finding relied solely on the existence of thermal refugia to dismiss the threat of increased water temperatures in the Centennial Valley lakes and tributaries. CBD argues that because the evidence does not adequately support the existence of thermal refugia, FWS's decision as to the Centennial Valley lakes and tributaries was arbitrary and capricious.

FWS supported its determination that cold water refugia exist in the Centennial Valley primarily by relying on a study that observed two arctic graylings in a tributary in 1994 ("Mogen study"), and which stated that the tributary "possibly provid[ed] thermal refugia." The Mogen study was discussed in the 2010 Finding, but FWS still concluded that high water temperatures were a threat. Indeed, the 2010 Finding cited to the Mogen study's observation of two fish seeking refuge to support a finding of high water temperatures in the Centennial Valley lakes and tributaries.

FWS did not act in an arbitrary and capricious manner by reversing its 2010 Finding that cold water thermal refugia

were insufficient to mitigate high water temperatures in the Centennial Valley. Although FWS relies primarily on the same information in 2014 as it did in 2010, the 2014 Finding also relied on an email by a scientist named Matt Jaeger ("Jaeger email"). The Jaeger email stated that there was evidence that cold water refugia existed in the Centennial Valley, but noted uncertainty in terms of whether this would fully mitigate warm water temperatures. Given increasing population of arctic grayling in the Centennial Valley, however, the Jaeger email concluded that increasing temperatures likely are not a threat. The Jaeger email, and the corresponding increase in population in the Centennial Valley, provides a sufficient "reasoned explanation" for FWS's change in position. *See Organized. Vill. of Kake*, 795 F.3d at 968.

3.

CBD also challenges the findings of cold water refugia in the Madison River. The 2014 Finding cites no evidence to support a finding that cold water refugia exist in the tributaries of this river. Rather, FWS notes in the 2014 Finding that there are high water temperatures in the Madison River and that the arctic grayling population has been decreasing. Without any evidentiary support in the 2014 Finding record, FWS's finding that cold water refugia exist is improper.[17] *See State Farm*, 463 U.S. at 43.

This error, however, was harmless. In the 2014 Finding, which recognizes that the arctic grayling in the Madison

[17] FWS provides some support in its brief for the existence of cold water refugia, but this is an ex post rationalization, which is informative but of no force in evaluating FWS's listing decision. *Greater Yellowstone Coal.*, 665 F.3d at 1027 n.4.

River are endangered by high water temperatures and low population, FWS concluded that even if the arctic grayling were no longer able to survive in the Madison River and its tributaries, the population in the upper Missouri River Valley as a whole would not be compromised. Under these circumstances, any error in finding that refugia exist is harmless, as FWS did not rest its ultimate 2014 Finding on the continued existence of arctic grayling in the Madison River. *Cf. Organized. Vill. of Kake*, 795 F.3d at 969 (stating that the burden is on "the opponent of the action to demonstrate [that] an error is prejudicial").

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In sum, the 2014 Finding's reliance on cold water refugia in the Big Hole River was arbitrary and capricious. The district court erred in granting summary judgment in favor of FWS on this issue. We affirm, however, the district court's ruling on the cold water refugia issue in all other respects.

C.

We turn to CBD's contention that FWS disregarded the additive effects of climate change in considering the effects of low stream flows and high water temperatures. Specifically, CBD argues that FWS's 2014 assessment of the cumulative impacts of climate change arbitrarily relied on uncertainty to avoid making determinations about the threat of climate change. We have held that it is "not enough for [FWS] to simply invoke 'scientific uncertainty' to justify its action." *Greater Yellowstone Coal.*, 665 F.3d at 1028 (discussing uncertainty caused by the effects of climate change). Rather, FWS must explain why uncertainty justifies its conclusion, "[o]therwise, we might as well be deferring to a coin flip." *Id.* In its 2014 Finding, FWS states

that "[u]ncertainty about how different temperature and precipitation scenarios could affect water availability make projecting possible synergistic effects of climate change on the Arctic grayling too speculative at this time." With this statement, FWS expressly disclaimed making any projection as to the synergistic effects of climate change, simply because of the uncertainty.

Greater Yellowstone Coalition counsels that this approach is unacceptable. *See* 665 F.3d at 1028. There, we held that because FWS had data showing that the population of whitebark pine was declining due to climate change, it could not simply state that it was uncertain what impact this would have on grizzly bears. *Id.* Rather, FWS had to explain why this uncertainty favored delisting the grizzly bear rather than, for example, undertaking further studies to minimize the uncertainty. *Id.*

Similarly, in the 2014 Finding, FWS did not explain how uncertainty about water availability justifies not listing the arctic grayling as opposed to taking another course of action. Pursuing another course of action may have been particularly prudent given the ESA's policy of "institutionalized caution," *Ariz. Cattle Growers*, 606 F.3d at 1167, especially since the 2014 Finding expressly cites to evidence that climate change will increase water temperatures and threats of low water flow. According to the 2014 Finding, "water temperatures will likely increase with climate change in the future," 79 Fed. Reg. at 49,405, and dewatering threats will be exacerbated by "[i]ncreases in temperature and changes in precipitation [that] are likely to affect the availability of water in the West," *id.* at 49,419. By failing to explain why the uncertainty of climate change favors not listing the arctic grayling when the 2014 Finding acknowledges the warming of water temperatures and

decreasing water flow because of global warming, FWS acted in an arbitrary and capricious manner. *See Greater Yellowstone Coal.*, 665 F.3d at 1028; *see also State Farm*, 463 U.S. at 43.

D.

CBD also argues that FWS acted arbitrarily in dismissing threats of small population sizes, especially since the 2010 Finding was based in part on the finding that four of the five native arctic grayling populations are at risk because of their low population numbers. Specifically, CBD argues that FWS (1) did not provide a basis for determining the impact of low population numbers on long-term genetic viability and (2) concluded irrationally that stochastic events would not threaten the arctic grayling despite small populations. We address each argument in turn.

1.

When considering whether to list a species, FWS must determine whether the species "is likely to become an endangered species within the foreseeable future." 16 U.S.C. § 1532(20). Notably, FWS previously applied § 1532(20) to encompass long-term genetic effects. In the 2010 Finding, FWS defined "foreseeable future" as thirty years on the basis of a population viability analysis. 75 Fed. Reg. at 54,725. Additionally, in 2010, FWS found that while population levels were large enough for inbreeding not to be an immediate concern, they were still "below the level presumed to provide the genetic variation necessary to conserve long-term adaptive potential." *Id.* at 54,741. In the 2014 Finding, FWS found that genetic diversity does not pose a short-term threat to the arctic grayling. 79 Fed. Reg. at 49,418. It then discussed scientific literature debating the effective population size adequate to conserve genetic

diversity over the long term, and concluded that generally genetic diversity does not drive species to extinction and that other processes are more important. *Id.* at 49,418–19. The 2014 Finding acknowledged that loss of genetic diversity is a threat, but concluded that there are a sufficient number of breeding adults to minimize this threat. *Id.*

FWS's determination that the arctic grayling's small population size does not pose a risk to genetic viability of the arctic grayling is not arbitrary or capricious. CBD insists that FWS did not consider long-term genetic viability, but the record does not support this argument. FWS did consider long-term genetic viability and simply concluded that, given increased population and "[u]pdated genetic information that was not available in 2010," any concern about long-term genetic viability did not merit listing the arctic grayling. 79 Fed. Reg. at 49,420. FWS provided a reasoned explanation for why it did not view lack of genetic diversity as a threat. And that determination was not arbitrary or capricious; difference of opinion does not warrant a contrary conclusion. *See, e.g.*, *Lands Council*, 537 F.3d at 988. We affirm the district court's ruling on this issue.

2.

The 2014 Finding did, however, arbitrarily rely on the Ruby River population to provide redundancy of fluvial arctic grayling beyond the Big Hole River and to minimize the risk from random environmental events. In its 2010 Finding, FWS recognized the importance of having multiple populations as genetic reservoirs in case of unexpected "stochastic" events or environmental catastrophes that may wipe out one or more populations of a species. FWS concluded that "the lack of additional fluvial populations [beyond the Big Hole River] represents a current threat to the upper Missouri River [arctic grayling]." 75 Fed. Reg. at

54,741. In its 2014 Finding, FWS found that this was no longer a concern in part because the increase in the number of breeding individuals in the Ruby River over the last three years provided "a viable replicate of the fluvial ecotype." 79 Fed. Reg. at 49,419.

The 2014 Finding's reliance on the Ruby River's viability as a genetic reservoir contradicts FWS's criteria for judging viability, which requires "at least 10 years" of monitoring data to confirm that a population is viable. Additionally, the 2010 Finding noted that at least five to ten more years of monitoring would be needed at Ruby River to determine if it is a viable population. The 2014 Finding relies on the Leary study, which shows population increases in Ruby River, but does not provide a reasoned explanation for disregarding FWS's prior criteria for judging viability or the statement in the 2010 Finding about needing five to ten more years of monitoring. *See, e.g.*, *Organized Vill. of Kake*, 795 F.3d at 968–69; *see also Greater Yellowstone Coal.*, 665 F.3d at 1028.

Instead, the 2014 Finding describes the Ruby River population as viable despite only five years of monitoring data. This is less than the viability criteria recommends. It is also only four more years of data than that used to support the 2010 Finding, which indicated at least five to ten more years of data would be needed. This lack of data is a crucial omission as the Ruby River population is one of only two fluvial populations. The 2014 Finding's determination that the Ruby River population was viable and could provide

redundancy was arbitrary and capricious, and we therefore reverse the district court's ruling on this issue.[18]

V.

For the foregoing reasons, we hold that the 2014 Finding's decision that listing the arctic grayling was "not warranted" was arbitrary and capricious because it (1) ignored the DeHaan study's evidence that shows decreasing numbers of breeders and instead heavily relied on a contrary finding showing increasing population; (2) did not provide a reasoned explanation for relying on the existence of cold water refugia in the Big Hole River; (3) failed to consider the synergistic effects of climate change solely because of "uncertainty"; and (4) concluded that the Ruby River population is viable based on data collected over a shorter period than that underlying the 2010 Finding and FWS's own established criteria for viability. We therefore reverse the district court's grant of summary judgment with

[18] CBD raises an additional argument that FWS acted arbitrarily in basing its 2014 Finding in part on the geographic separation between populations without explaining why it changed its position from 2010. *See, e.g.*, *Organized Vill. Of Kake*, 795 F.3d at 968–69. But, as FWS points out, the 2010 and 2014 Findings each discussed how separation of populations reduces the risk of multiple populations being negatively impacted by a single environmental catastrophe. In 2010, however, FWS concluded that these populations were at risk from other environmental factors, which in turn increased the risk of harm of a stochastic event. In 2014, FWS determined that these other factors no longer counseled in favor of listing the arctic grayling. Therefore, its conclusion that separation between populations would help prevent a stochastic event was not arbitrary or capricious.

directions to remand to FWS to reassess the 2014 Finding in light of this opinion.

AFFIRMED in part; REVERSED in part; and REMANDED.

The parties shall bear their own costs on appeal.