EARTHJUSTICE

October 24, 2022

Secretary Debra Haaland
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Director Martha Williams
U.S. Fish & Wildlife Service
Department of the Interior
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RE: Sixty-Day Notice of Intent to Sue to Remedy Violations of the Endangered Species Act in the U.S. Fish and Wildlife Service's Revised Twelve-Month Finding on a Petition to List the Upper Missouri River Distinct Population Segment of Arctic Grayling as an Endangered or Threatened Species, 85 Fed. Reg. 44,478

Dear Secretary Haaland and Director Williams,

On behalf of the Center for Biological Diversity, Western Watersheds Project, and Pat Munday, we hereby provide notice, in accordance with the citizen-suit provision of the Endangered Species Act and its implementing regulations, that the U.S. Fish and Wildlife Service violated the ESA in issuing its negative, July 23, 2020 finding on the petition to list the Upper Missouri River Distinct Population Segment of Arctic Grayling as an endangered or threatened species.[1] In light of the imperiled status of the Arctic grayling in the upper Missouri River basin—a result of both present and future threats to the population's survival—the Service's decision to deny the fish Endangered Species Act protections was arbitrary and unlawful under section 4 of the statute.[2]

In recent decades, while the Service has persisted in withholding ESA protections from the upper Missouri River's grayling, the population has continued to move toward the precipice of extinction. Today, grayling inhabit only a fraction of their once-extensive range in Montana's upper Missouri River ecosystem. The species continues to face a barrage of threats there, including a significant curtailment of its historic range, low flows and barriers in rivers, rising

[1] 85 Fed. Reg. 44,478 (July 23, 2020).

[2] 16 U.S.C. § 1533.

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water temperatures, increased pressure from nonnative fish, and very low population numbers and genetic diversity. These threats are further amplified by the projected impacts of climate change. Arctic grayling require protection under the ESA, in short, as they currently face a significant risk of extinction in the foreseeable future.

Instead of acknowledging this risk, the Service declared that the Arctic grayling's survival has been ensured by unenforceable and voluntary conservation efforts. The Service could not prove the effectiveness of these conservation efforts, however, and instead attempted to infer their success from grayling population trends. Contrary to the Service's assertions, though, grayling populations in the upper Missouri River basin are by no means stable. Thus, the agency's decision to deny ESA protections was arbitrary and unlawful.

The ESA requires the Service to follow the best-available science regarding threats to the Arctic grayling, but the agency's 12-month finding failed to do so. As a result, the Service's refusal to list the species will have severe consequences for the last remaining native population of Arctic grayling in the lower-48. Accordingly, pursuant to the citizen-suit provision of the ESA, this letter provides you with notice that, unless the Service promulgates a proposed listing rule for the Upper Missouri River DPS of Arctic grayling within 60 days, we intend to challenge the Service's 12-month finding in federal court.

I. Arctic Grayling in the Upper Missouri River Basin

A. Arctic Grayling

The Arctic grayling (*Thymallus arcticus*) is a member of the family Salmonidae, which includes salmon, trout, charr, and whitefishes. Grayling have long, trout-like bodies with deeply forked tails and a sail-like dorsal fin. Adults typically average 12 to 15 inches in length. Grayling are native to the Arctic Ocean drainages of Alaska and northwestern Canada, and across northern Eurasia as far west as the Ural Mountains. Arctic grayling are also native to the coterminous U.S., which has housed both the upper Missouri River basin population and a separate population in Michigan that is now extinct. The upper Missouri River basin grayling probably share common ancestry with the lineage of grayling found on the North Slope of Alaska, but they have been physically and reproductively isolated from these northern populations for millennia. Other U.S. populations have been stocked in lakes outside their native range in Arizona, Colorado, Idaho, Montana, New Mexico, Utah, Washington, and Wyoming. Stocking efforts in Montana have been particularly extensive.

Arctic grayling generally fall into one of two life-history forms: fluvial (river or stream-dwelling), or adfluvial (lake-dwelling). Historically, the fluvial form predominated in the Missouri River basin. In its 2014 finding, the Service noted that there "appears to be some plasticity in behavior where individuals from a population can exhibit a range of behaviors[,]" and in its 2020 finding the Service argued, arbitrarily, that "there appears to be a spectrum of behaviors" among grayling that might reduce the importance of ensuring that both life-history

forms are conserved.[3] However, the Service's 2020 finding ultimately acknowledged that "the frequent failure of introductions of Arctic grayling occupying lakes into flowing water habitats suggest preservation of the breadth of the known Arctic grayling life history spectrum"—meaning both fluvial and adfluvial populations—"is warranted."[4]

Arctic grayling require clear, cold water—their optimal thermal habitat is between approximately 7 and 17 degrees Celsius. In Montana, grayling generally spawn in the spring or early summer, from late April to mid-May, by depositing adhesive eggs over gravel substrate without excavating a nest. The time required for eggs to become fry depends on water temperature.

Grayling are migratory fish whose year consists of cyclical patterns of movement between refuge, rearing-feeding, and spawning habitats. In some drainages, individual fish may migrate considerable distances (over 90 miles) to overwintering habitats. In the Big Hole River, grayling migrate long distances to overwintering habitat.[5]

Arctic grayling in the upper Missouri River basin typically mature at age 2, for males, or age 3, for females; individuals older than 6 are rare. Arctic grayling of all ages feed primarily on aquatic and terrestrial invertebrates, but they will also feed on fish and fish eggs.

B. Distribution and Population Data

Arctic grayling were once abundant in all of the major rivers of the upper Missouri River basin, including the Missouri mainstem and the Smith, Sun, Jefferson, Madison, Gallatin, Big Hole, Beaverhead, and Red Rock rivers and their tributaries. Adfluvial populations were also found in a small number of lakes, including Red Rock Lakes in the Centennial Valley and Elk Lake. However, "[t]he range and distribution of Arctic grayling in the upper Missouri River basin was reduced over the past 100 years … primarily due to historical habitat fragmentation by dams and irrigation diversions and by habitat degradation or modification from unregulated land use."[6] This reduction has predominantly impacted the fish's fluvial populations.[7] Today, there are just a few remaining populations of grayling in the upper Missouri River basin, with the sole fluvial population limited to less than 200 miles of the Big Hole River and its tributaries.[8] There are adfluvial populations in 15 miles of the Madison River in and above Ennis Reservoir, Miner Lakes, Mussigbrod Lake, and Red Rock Lakes. The Smith, Sun, Jefferson, Beaverhead, Gallatin and mainstem Missouri River populations are considered extirpated.

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[3] 79 Fed. Reg. at 49,392; FWS, Revised 12-Month Finding on a Petition to List the Upper Missouri River Distinct Population Segment of Arctic Grayling (June 29, 2020), at 32.

[4] 2020 Finding at 35–36.

[5] *Id.* at 31.

[6] *Id.* at 77.

[7] *Id.* at 181.

[8] *Id.*

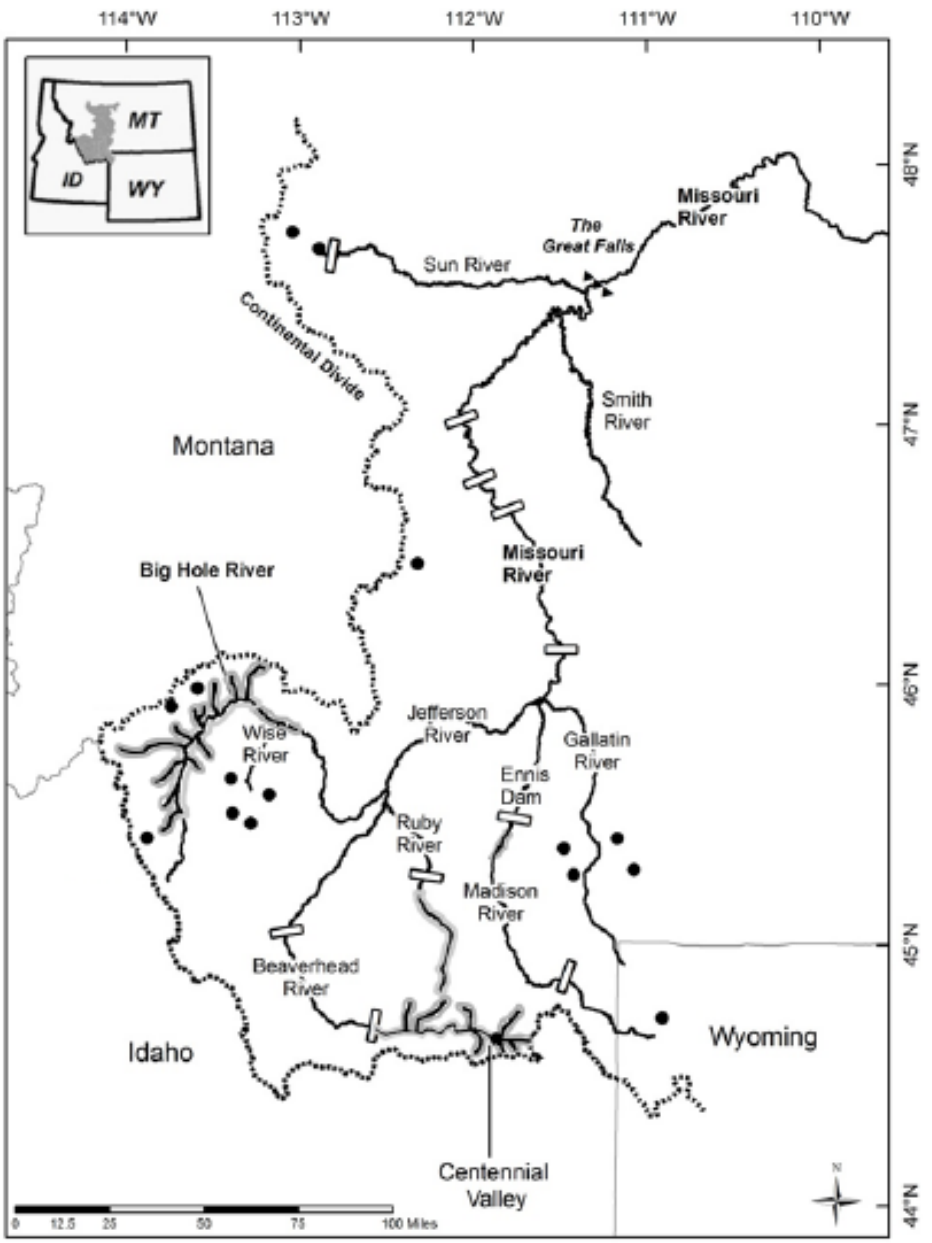
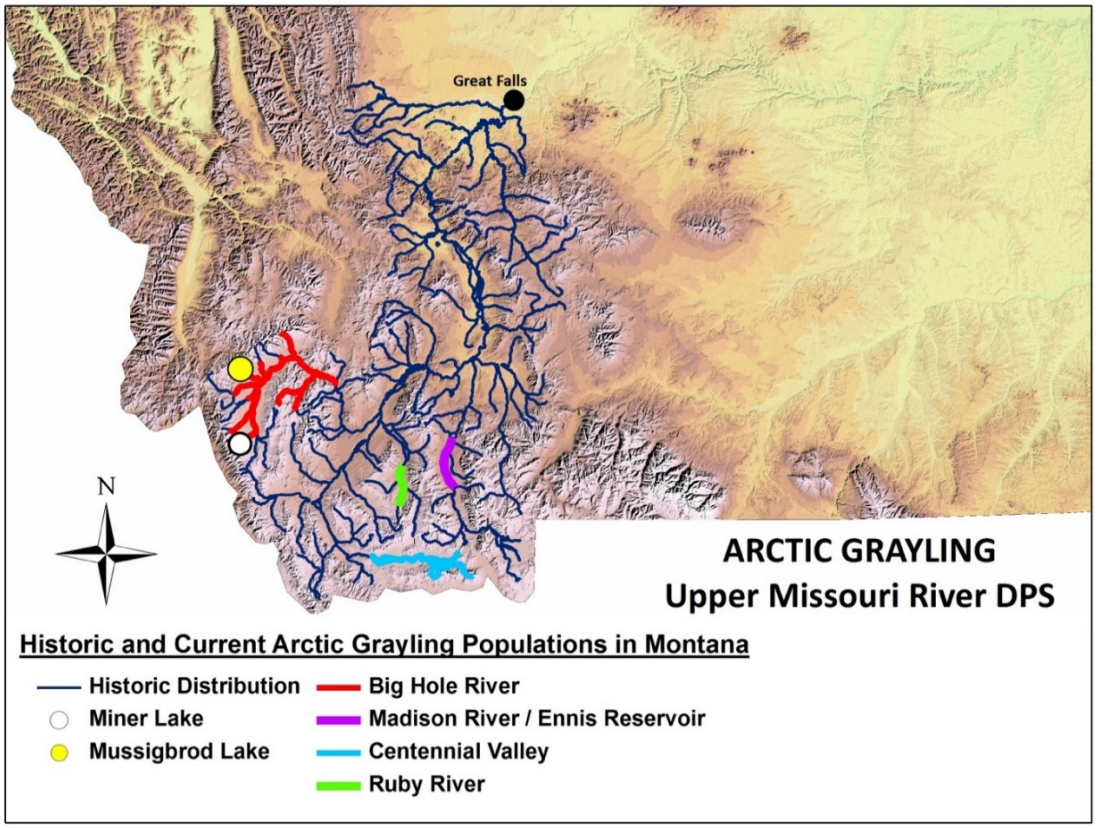


Figure 1. Approximate current distribution [gray outlines (rivers/streams) and black circles (lakes)] of Arctic grayling in the upper Missouri River basin. Small rectangles denote locations of mainstem river dams. Some smaller occupied tributaries in the Big Hole River and Centennial Valley are not shown due to the broad scale of the map.

Source: 2020 Finding at 14.

The remaining populations of Arctic grayling in the upper Missouri River basin are precariously small and at risk of extinction. The fluvial form occupies less than 4 percent of its historical range.[9]



Source: Arctic Grayling Monitoring Report 2013 at 2.

The past few years have only confirmed the grayling's plight in the upper Missouri River basin. The Big Hole River has recently experienced low stream flows and high water temperatures. And just this past year, snowpack was "well below average" and "[a]ir temperatures in the Big Hole were well above average throughout the summer."[10] Beaverhead County—where the Big Hole River is located—"reported the *warmest average temperature on record* during June-July, *with a +7.0°F departure from normal*."[11] This resulted in flow targets for the Big Hole River only being met *38 percent* of the time.[12]

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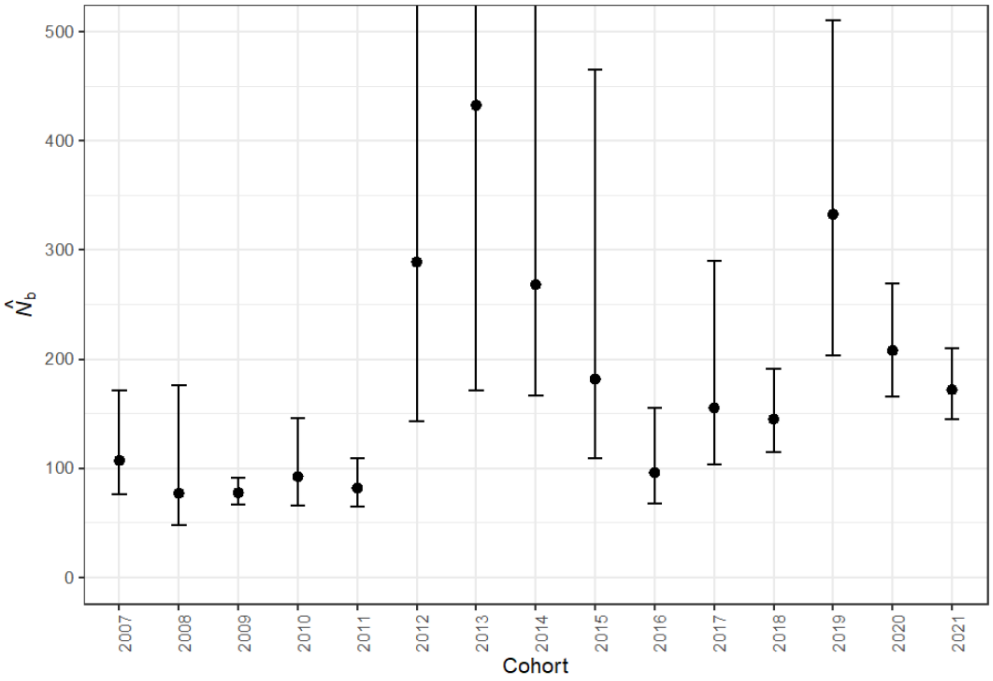
[9] Arctic Grayling Monitoring Report (2013), at 1; Vatland (2015), at 2.

[10] Montana Fish, Wildlife, and Parks, Candidate Conservation Agreement with Assurances for Fluvial Arctic Grayling in the Upper Big Hole River 2021 Annual Report (2021 BH CCAA Annual Report), at 21.

[11] *Id.* (emphasis added).

[12] *Id.* (emphasis added).

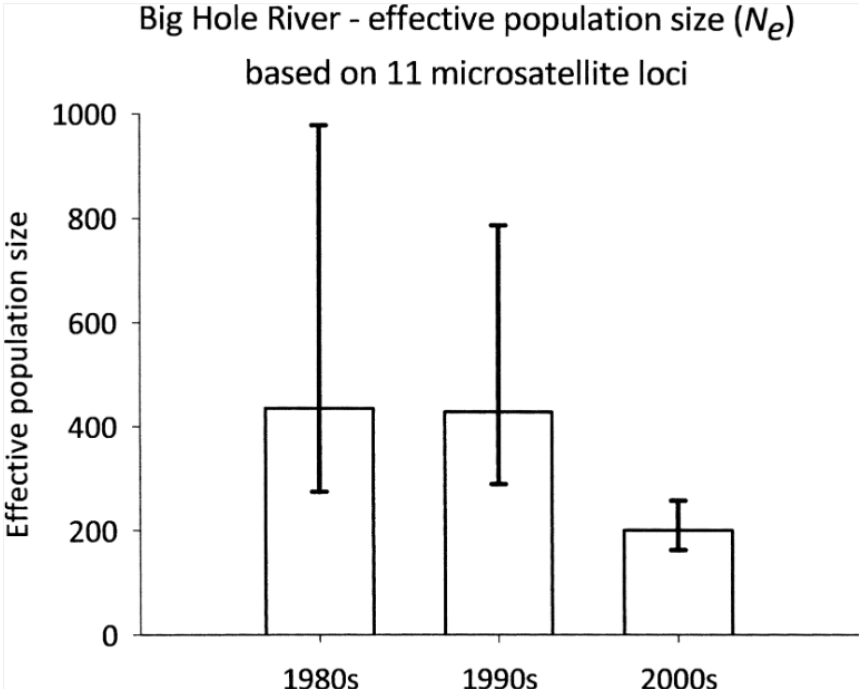
This dire situation extends to the number of grayling that have managed to survive the region's elevated temperatures and low waterflows. The 2021 CCAA Big Hole Annual Report shows a decrease in the number of breeding Arctic grayling (N_b) in the past few years. The present number of breeding Arctic grayling is lower than the effective population size of 208 that the Service examined in its 2010 finding that determined listing was warranted.[13] Figure 3 from the 2021 report illustrates this concerning downward trend in Arctic grayling numbers in the Big Hole River:



Estimates of the number of effective breeders (N_b) in Arctic grayling from the Big Hole River over time. Error bars indicate 95% confidence intervals. Source: 2021 CCAA BH Annual Report at 18.

In its 2010 finding, the Service was sufficiently concerned about the decline in Arctic grayling breeder numbers to find that listing was warranted. In light of the data reported in the agency's 2010 finding, it is evident that breeder numbers were even lower in 2021 than they were when the Service found that listing was warranted in 2010.

[13] 75 Fed. Reg. at 54,708, 54,722–23.



Source: 75 Fed. Reg. at 54,708, 54,723.

These numbers—like those the Service relied on in its 2020 finding—make it clear that the Upper Missouri River DPS of Arctic grayling is not doing well and that the increasing water temperatures, low water flows, and dropping breeder numbers warn of a potentially tragic fate for the species. The grayling's imperiled status has been evident throughout the past few decades, and the most recent data has only served to highlight it.

Despite the Service's optimistic conclusions in its most recent finding, efforts to reintroduce grayling in their historic range have had limited success. In the Ruby River, while some reproduction has taken place, the reintroduced population is still too small and unstable to contribute to redundancy of Arctic grayling in the upper Missouri River basin.[14]

In concluding that the basin's grayling should be listed, in 2010, the Service summarized the evidence that both the Big Hole and Madison River populations had undergone severe declines in recent years. The Service concluded that "the best available data" showed the Big Hole population "declined by one half between the early 1990s and the early 2000s," and the Madison population "currently exist[s] at only 10 to 20 percent of the abundance observed in the early 1990s."[15] In support of its warranted-but-precluded finding, the Service ran a simple population-viability analysis to determine extinction risk from demographic and genetic

[14] *See* Section III.A., *infra*.

[15] Notice of 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, 75 Fed. Reg. 54,708, 54,723–24 (Sept. 8, 2010).

stochasticity, and found that all of the grayling populations, with the exception of that in Mussigbrod Lake, were at risk of extinction within 30 years.[16] The Service further found that the Madison River population had the greatest probability of extinction by stochastic processes (36 to 55 percent), followed by the Big Hole (33 to 42 percent), Red Rock Lakes (31 to 40 percent), and Miner (13 to 37 percent) populations.[17]

In determining that Arctic grayling are no longer in need of Endangered Species Act protections, the Service arbitrarily failed to undertake additional viability analyses. Instead, the agency simply declared that the Big Hole River population is stable and increasing; that the Centennial Valley population includes a decreasing number of adult spawners but is nonetheless stable; that the Ruby River population is stable, despite its small size and volatility; that the Madison River population is "persist[ing] at presumably low abundance[;]" and that the Mussigbrod and Miner lake populations are stable.[18] These declarations were at odds with the Service's acknowledgment of concerning trends for many of the populations, including data indicating a "recent decline in the number of breeding adults contributing their genetics to individual cohorts of Arctic grayling" in the Ruby River, and a recent decline in spawning adults in the Centennial Valley population, where the most recent abundance estimates were below the management goal of 1,000 spawning adult fish.[19]

For listing purposes, the Service considered the 19 populations of Arctic grayling in the upper Missouri River basin to constitute the listable entity. Although the Service in 2010 determined that many of the introduced populations in the region had low conservation value, the Service arbitrarily reversed this finding in 2014 and 2020 by concluding that some of these introduced populations could provide a source for future reintroduction efforts.

C. Voluntary Conservation Efforts

In arbitrarily determining, again, that Arctic grayling do not require Endangered Species Act protections, the Service relied, again, on the voluntary conservation efforts established under the Big Hole River Candidate Conservation Agreement with Assurances ("CCAA"). The intent of the CCAA is to entice landowners to participate in grayling conservation by providing

[16] *Id.* at 54,725. Although the 2010 finding in one place states that the Service looked only at demographic and genetic stochasticity (that is, the effect of random changes in factors like reproductive rates and genetic drift), *id.*, the finding elsewhere suggested the analysis also considered environmental stochasticity (that is, the effect of random changes in environmental factors, such as drought), *id.* at 54,741. To the extent that the Service's analysis excluded consideration of environmental stochasticity, it drastically understated the populations' extinction risks.

[17] *Id.* at 54,725.

[18] *See* 2020 Finding at 55–75.

[19] *Id.* at 66, 72–73.

assurances that they would not be subject to additional requirements to protect the species if it is listed.[20]

The CCAA invites landowners in the upper Big Hole River drainage—the last remaining native refuge for fluvial Arctic grayling in the contiguous United States—to enter into voluntary conservation plans designed to improve grayling habitat. Specifically, the CCAA requires landowners who wish to participate in the program to develop and implement, in collaboration with state and federal agency representatives, site-specific conservation plans aimed at (1) improving stream flows, (2) protecting and enhancing functional riparian habitat, (3) identifying and reducing or eliminating entrainment threats, and (4) removing barriers to grayling migration.[21] For several reasons discussed below, the CCAA does not provide the upper Missouri's grayling and their habitat with adequate protections.[22]

II. The Endangered Species Act and Arctic Grayling

Congress enacted the Endangered Species Act in 1973 with the goal of protecting and recovering species that are in danger of extinction or are likely to become so within the foreseeable future. In the words of the statute, its purpose is "to provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved," and "to provide a program for the conservation of such endangered species and threatened species[.]"[23] In the seminal case on the Endangered Species Act, *Tennessee Valley Authority v. Hill*, the Supreme Court confirmed that it is "beyond doubt that Congress intended endangered species to be afforded the highest of priorities."[24]

To achieve the goal of conserving threatened and endangered species, section 4 of the ESA requires the Secretary of the Interior to determine whether a species is threatened or endangered; to designate critical habitat for threatened and endangered species; and to promulgate and implement a recovery plan for listed species.[25] Under the statute, a species is "endangered" if it is "in danger of extinction throughout all or a significant portion of its range[,]" and it is "threatened" if it is "likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range."[26] The ESA requires the

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[20] *See* Mont. Dep't of Fish, Wildlife & Parks and U.S. Fish & Wildlife Serv., Candidate Conservation Agreement with Assurances for Fluvial Arctic Grayling in the Upper Big Hole River (March 30, 2006), at 3.

[21] *Id.*

[22] *See* Section III.D. *infra*.

[23] 16 U.S.C. § 1531(b).

[24] 437 U.S. 153, 174 (1978).

[25] 16 U.S.C. §§ 1533(a)(1), (a)(3), (f).

[26] *Id.* §§ 1532(6), (20).

Secretary to "determine whether any species is an endangered species or a threatened species" because of "any" of the following five factors:

> (A) the present or threatened destruction, modification, or curtailment of … [the 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 its continued existence.[27]

The Secretary is required to evaluate these factors "solely on the basis of the best scientific and commercial data available to [her] after conducting a review of the status of the species[.]"[28]

Courts interpreting these statutory provisions have repeatedly held that an agency's failure to utilize the best-available science in making a listing determination is arbitrary and unlawful.[29] An agency's failure to draw rational conclusions from the evidence before it also constitutes arbitrary action.[30] The Service's listing and delisting actions have frequently been held arbitrary on these specific grounds. For instance, in a grizzly-bear case, a court vacated the Service's delisting rule because "[t]he Rule did not articulate a rational connection between the data before it and its conclusion[.]"[31] Further, even if "the Service relied on the best available science, [if] it did not interpret that science rationally[,]" then the Service acted arbitrarily and capriciously.[32] The requirement to use the best-available science—and the obligation of a reviewing court to overturn any decision that fails to do so—is therefore clear in the language of the Act and is also well established in ESA case law.

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[27] *Id.* § 1533(a)(1).

[28] *Id.* § 1533(b)(1)(A). *See also Nw. Ecosystem Alliance v. U.S. Fish & Wildlife Serv.*, 475 F.3d 1136, 1147 (9th Cir. 2007) ("The ESA instructs the Service to make its determinations 'solely on the basis of the best scientific and commercial data available[.]'") (quoting 16 U.S.C. § 1533(b)(1)(A)).

[29] *See, e.g.*, *Ctr. for Biological Diversity v. Zinke*, 900 F.3d 1053, 1060 (9th Cir. 2018); *Consol. Delta Smelt Cases*, 717 F. Supp. 2d 1021, 1060 (E.D. Cal. 2010).

[30] *Motor Vehicle Mfrs. Ass'n of U.S., Inc. v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 43 (1983).

[31] *Greater Yellowstone Coal., Inc. v. Servheen*, 665 F.3d 1015, 1030 (9th Cir. 2011). *See also Trout Unlimited v. Lohn*, 645 F. Supp. 2d 929, 944 (D. Or. 2007) (agency "violated the ESA by not relying on the best available science"); *Center for Biological Diversity v. Zinke*, 900 F.3d 1053, 1068 (9th Cir. 2018) ("We conclude that in ignoring available data FWS acted in an arbitrary and capricious manner.").

[32] *Crow Indian Tribe v. United States*, 343 F. Supp. 3d 999, 1019 (D. Mont. 2018), *aff'd in part, remanded in part on other grounds*, 965 F.3d 662 (9th Cir. 2020) (holding that the "Service's determination [wa]s arbitrary and capricious because it [wa]s both illogical and inconsistent with the cautious approach demanded by the ESA").

Though it considered the upper Missouri River basin population of fluvial Arctic grayling as a candidate for listing as early as 1982, the Service has failed to implement essential protections for this population that are required under the ESA.[33] Instead, over the past four decades, the Service has put forward a host of erroneous legal theories and flawed science to support its determination to delay or deny listing.

In 1991, the Center for Biological Diversity, which was then known as the Biodiversity Legal Foundation, petitioned the Service to list the Arctic grayling as an endangered species. In response to the petition and a lawsuit, the Service determined, in 1994, that listing the grayling was "warranted but precluded," and it assigned the species a low listing-priority number of 9 based on ongoing conservation efforts.[34]

In response to severe declines in grayling numbers and chronically low flows in the Big Hole River due to increased irrigation pressure, the Center again sued the agency for failing to protect the species. The Service then raised the listing priority of the grayling to a 3, which is the highest-priority number afforded a distinct population segment, and it also agreed to make a determination of the population's status by April 2007. However, when the time came for the Service's listing decision, the Service declared that grayling in the upper Missouri River basin no longer warranted protection—not because the grayling's status had improved, but rather based on an assertion that the population no longer qualified as a DPS.[35] The Center and Western Watersheds Project challenged this decision as well, resulting in yet another agreement by the Service to determine whether listing was warranted. Under this agreement, the Service determined in 2010 that the upper Missouri population did qualify as a distinct population segment that warranted protection—but it again determined that protection was precluded by other higher-priority listing actions.[36] On September 9, 2011, the Service agreed to submit either a proposed listing rule or a not-warranted finding by the end of 2014.

On August 20, 2014, the Service published a revised 12-month finding reversing its 2010 conclusion that listing was "warranted" and instead determining that the upper Missouri River basin DPS of Arctic grayling did not warrant listing.[37] This time, the agency did not claim that the region's grayling were not a DPS, but rather claimed that the habitat-related threats it had previously identified—including habitat fragmentation, dewatering, thermal stress, entrainment, riparian habitat loss, and effects from climate change—no longer justified listing, as 19 of the 20 grayling populations within the basin were either stable or increasing. Conservationists once again challenged the agency's decision.[38] After the Service prevailed in the district court, conservationists appealed, arguing that the agency had arbitrarily: 1) failed to evaluate whether

[33] 79 Fed. Reg. at 49,384.

[34] 59 Fed. Reg. 37,738 (July 25, 1994).

[35] 72 Fed. Reg. 20,305 (Apr. 24, 2007).

[36] 75 Fed. Reg. 54,708 (Sep. 8, 2010).

[37] 79 Fed. Reg. at 49,384.

[38] *Id.*

the Arctic grayling's unoccupied, historical habitat is a significant portion of its range in which it is threatened or endangered; 2) concluded that grayling populations were increasing, despite contrary evidence of population declines; 3) concluded that grayling were not threatened by low stream flows and high water temperatures; and 4) concluded that small population sizes did not threaten grayling.

On appeal, the Ninth Circuit Court of Appeals agreed with conservationists that the Service had acted arbitrarily and in violation of the ESA by: 1) concluding that the Big Hole River grayling population was increasing when available biological information showed that the population was declining; 2) relying on cold-water refugia in the Big Hole River without adequate support, given that data showed the river will experience low stream flows and high water temperatures; 3) not adequately explaining why the uncertainty presented by climate change with regard to low stream flows and higher water temperatures did not weigh in favor of listing the grayling; and 4) relying on the Ruby River grayling population to provide redundancy for the species outside of the Big Hole River.[39] As a result of the Ninth Circuit's opinion and order, the Service was required to reconsider its determination that the graying population in Montana did not require the protections of the Endangered Species Act.

On July 23, 2020, the Service issued a new negative finding on the petition to list the upper Missouri River basin's grayling population as an endangered or threatened species under the ESA.[40] The Service determined that listing was "not warranted at this time[.]"[41] Despite the agency's optimistic assessment of the population's predicament, however, the available data demonstrated that listing was required.

The Service's refusal to list the grayling in Montana threatens severe consequences for the population—one of the last remnants of the species in the lower-48. Accordingly, pursuant to the citizen suit provision of the ESA, this letter provides you with notice that, unless within 60 days of receipt of this letter the Service rescinds and reconsiders its finding, we intend to challenge the Service's decision in federal court.[42]

[39] *Center for Biological Diversity*, 900 F. 3d at 1053.

[40] 85 Fed. Reg. at 44,478.

[41] *Id.*

[42] 16 U.S.C. § 1540(g)(2).

III. The Service Acted Arbitrarily and Unlawfully in Denying ESA Protections to the Upper Missouri River Basin's Arctic Grayling Population

In its most recent finding, the Service attempted to resuscitate its flawed justifications from 2014 for denying ESA protections to the Upper Missouri River DPS of Arctic grayling. The Service acted arbitrarily and unlawfully because: 1) it did not rely on the best-available scientific information when claiming that the grayling population in the Big Hole River had increased and stabilized, despite ongoing and increasing threats to the very small population; 2) it ignored increasing habitat threats; 3) it arbitrarily discounted the synergistic effects of climate change; and 4) it improperly relied on conservation efforts that neither qualified as adequate regulatory mechanisms nor adequately ameliorated threats facing the species.

A. The Service Acted Arbitrarily in Concluding that Grayling Populations Within the Upper Missouri River Basin Are Sufficiently Stable to Ensure Their Long-Term Viability

In attempting to justify its decision to deny Arctic grayling the protections of the Endangered Species Act, the Service repeatedly relied on an arbitrary assessment of population trends within the upper Missouri River basin. According to the agency, despite the species' history of significant and recurring declines in the region, grayling populations in the Big Hole River, Centennial Valley, and Ruby River have now achieved a "relative stability" that will somehow ensure their viability over the long term.[43] This conclusion, however, defied the evidence that was before the agency—not to mention common sense.

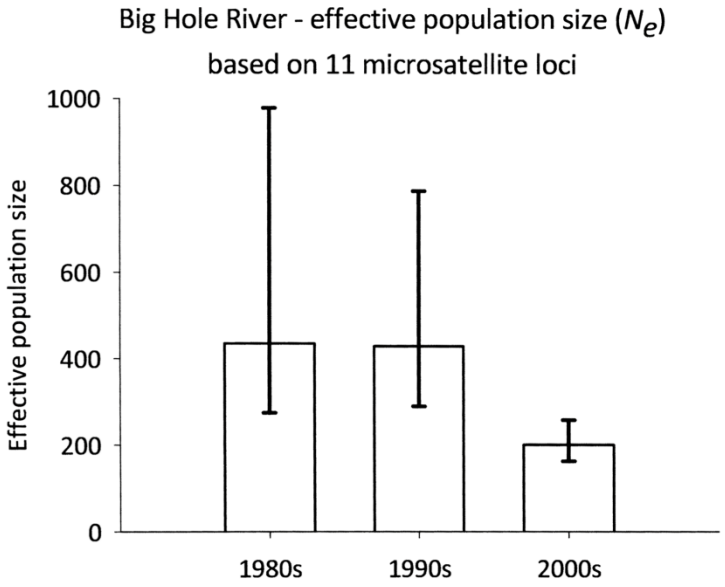
Much of the Service's demographic analysis focused on the Big Hole River, which has long stood as the last bastion of "the migratory fluvial ecotype that presumably dominated in the upper Missouri River basin[.]"[44] While it appears that grayling were historically "distributed throughout much of the Big Hole"—"including the lower reaches of many tributary streams, such as Big Lake, Deep, Doolittle, Fishtrap, Francis, Governor, Johnson, LaMarche, Miner, Mussigbrod, Odell, Pintlar, Rock, Sand Hollow, Swamp, Seymour, Steel, Swamp, and Wyman Creeks, as well as the Wise River"—the population's "overall range … contracted" in recent decades.[45] This contraction came, of course, with a significant reduction in grayling numbers. In the words of the Service's 2010 finding, the "adult population [in the Big Hole River] declined by one half between the early 1990s and the early 2000s … , which [wa]s equivalent to a decline

[43] 2020 Finding at 59–60 (declaring that the Big Hole River population "decline[d] to a period of relative stability from 2013-2016"); *id.* at 69 (asserting that the "Centennial Valley grayling population has a stable … but lower number of adult spawners than in the recent past"); *id.* at 72 (asserting that "[f]rom 2010 to 2018, density of Arctic grayling [in the Ruby River] … fluctuated up and down, as would be expected in a wild population affected by natural factors," but that it "otherwise appears stable").

[44] 2010 Finding, 75 Fed. Reg. at 54,741.

[45] *Id.* at 54,722; 2020 Finding at 56.

of 7 percent per year, on average."[46] The agency emphasized the scale of this loss by capturing it in a single chart:



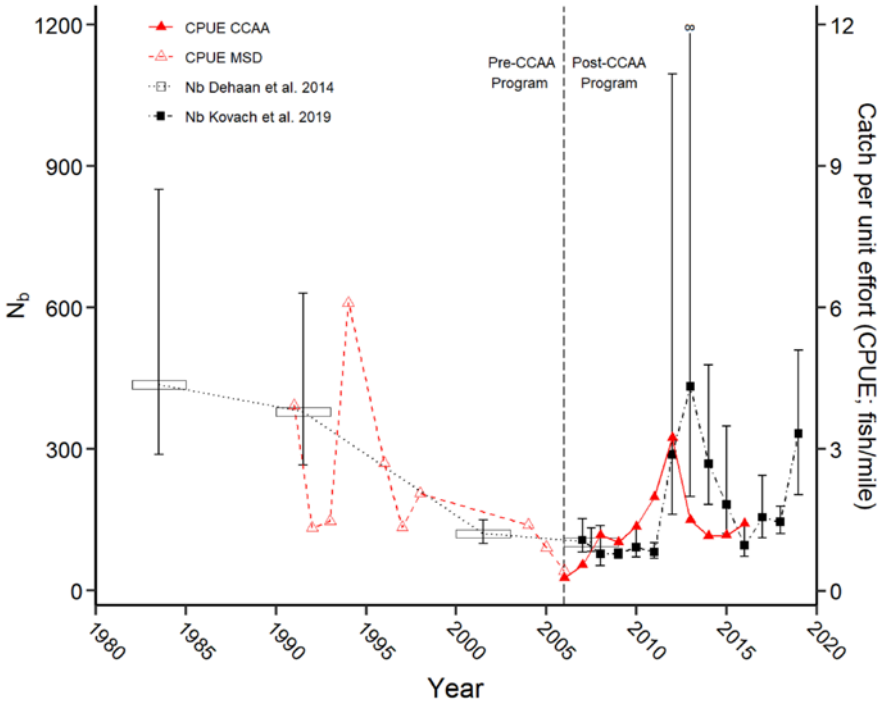
Effective population size (N_e) of Big Hole River Arctic grayling based on microsatellite DNA genotypes from fish collected in three time periods (USthe Service, unpublished data). The N_e are estimated using the linkage disequilibrium method of Waples and Do (2008, entire), and error bars represent 95% confidence intervals estimated by the jackknife method.[47]

The past twenty years, unfortunately, have been little better for the Big Hole's grayling population. As the Service noted in its most recent finding, the population "decreased to historical lows … [in] 2006[,]" rose back to 1990s levels around 2012, and then plummeted again—falling to the numbers seen in the early 2000s by 2015.[48] The resulting trend line was both dramatic and discouraging:

[46] 2010 Finding, 75 Fed. Reg. at 54,723.

[47] *Id.*

[48] 2020 Finding at 59–61.



Trends in abundance (indexed as catch-per-unit effort; CPUE) and effective number of breeders (N_b) of Arctic grayling in the Big Hole River population from multiple datasets through time. Effective number of breeders is the number of reproductively successful adults contributing genetic variation to a given cohort. Catch per unit effort data are from three long-term monitoring sections of the Big Hole River (1991-2006; Catch per unit effort MSD) before the inception of the CCAA in 2006 (dashed vertical line) and from standardized sections in the Big Hole CCAA Project Area (2006-2016; Catch per unit effort CCAA). N_b estimates from DeHaan et al. 2014 correspond to the biological range of years that the data represent (i.e., a sample taken in 1987/1988 actually represents individuals that were spawned 3-5 years prior to collection because a mixed age sample was taken). N_b estimates from Kovach et al. 2019 represent annual estimates of effective number of breeders because a single age sample (e.g., age-0) was taken.[49]

Rather than acknowledging that the Big Hole population remained volatile and at risk of extirpation, the Service's 2020 finding announced that the river's fish had attained a "relative stability" sufficient to ensure they will remain viable over the long term.[50] Given that the available evidence didn't support this conclusion, the agency seemed to rely, instead, on incantation—a repetition that disguised the baselessness of the finding's demographic claims. In a single paragraph, for instance, the Service returned to its flawed characterization of the Big Hole population's plight three times, declaring that "[c]atch per unit effort data indicates grayling abundance in the Big Hole River decreased to historical lows (~1991 to 2006), then recently

[49] *Id.* at 61.

[50] *Id.* at 59.

peaked in 2012, followed by a subsequent decrease and period of relative stability from 2013-2016[;]" that "grayling abundance ha[d] increased [since 2006] and peaked in 2012, after which abundance declined and was relatively stable from 2013-2016[;]" and that "data indicate a historical decline of age 1+ Arctic grayling in the Big Hole River from 1991 to 2006, followed by a temporary peak around 2012, then a decline to a period of relative stability from 2013-2016."[51] In later sections of the finding, the Service repeated this narrative many times more—offering it up as proof, ultimately, that the existing (and voluntary) conservation efforts had eliminated any need to list the species.[52]

The Service took the same arbitrary approach in discounting the grayling's struggles in the Centennial Valley. As the agency admitted in its 2020 Finding:

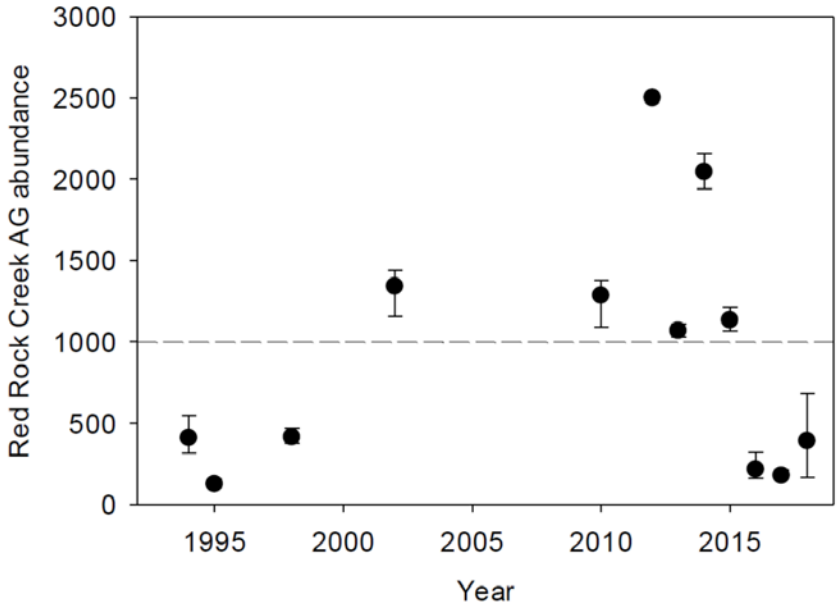
> The number of spawning adult Arctic grayling in a portion of Red Rock Creek used to monitor the Centennial Valley population has fluctuated through time[.] … Spawning adults occurred at lower abundance in the mid-late 1990s, followed by a period of greater abundance in the early 2000s to 2015, then more recently at lower abundance in 2016 through 2019[.][53]

[51] *Id.* at 59.

[52] *See, e.g.*, *id.* at 63 ("The most recent N_b data suggests the spawning grayling population in the Big Hole River has stabilized from the decline shown by DeHaan et al. 2014 and recently increased to a higher mean number of spawners in the past 7 years, relative to the 2007-2011 time period when MFWP initiated genetic monitoring. … Whatever the reason(s), it is clear that conservation measures are working, either singularly or in concert with one another, at a level high enough to increase the number of effective breeding Arctic grayling, on average, since 2006. Cumulatively, increases in N_b (number of effective breeding Arctic grayling) are contributing to a more robust population of Arctic grayling in the Big Hole River and adding resiliency to the population."); *id.* at 65–66 ("The general pattern of historical decline in abundance and number of breeders due to historical threats, followed by a stabilization of abundance and N_b as conservation actions began, next followed by an increase in N_b as more conservation actions were implemented, is how we would expect a natural population to respond as the benefits of conservation actions accrue. The population of Arctic grayling in the Big Hole River is demographically and genetically stable and appears to be responding favorably to conservation actions that have been implemented over the past several decades."); *id.* at 157 ("[R]ecent monitoring data indicate multiple stable Arctic grayling populations occurring above mainstem dams[.]"); *id.* at 178 ("Currently, we have updated information indicating that most populations of Arctic grayling are either stable or increasing.").

[53] *Id.* at 66.

When this data was plotted out by the agency, the resulting graph resembled the one the Service had made for the Big Hole River:



Abundance of spawning adult grayling in Red Rock Creek in the Centennial Valley through time. Dashed horizontal line indicates the management goal (1,000 spawners) for this population. Not shown on this figure is the estimate of number of adult spawners from 2019, which is similar to and not statistically different from any of the estimates in 2016-2018.[54]

In the face of this volatility, the Service again relied on repeated declarations of relative stability and viability. According to the agency's 2020 finding, "[m]onitoring of effective number of breeders (N_b) to characterize both the evolutionary and demographic status of the Centennial Valley Arctic grayling population … largely indicated stability through time … , with a recent decline in 2015[.]"[55] And the Service ultimately concluded—arbitrarily—that "[m]ultiple lines of evidence indicate[d] the Centennial Valley grayling population has a stable … but lower number of adult spawners than in the recent past, yet relatively high genetic diversity with a relatively robust effective population size."[56]

The Service's incantation approach was also evident, finally, in its discussions of the Ruby River population—a population that was created "using stocking and remote site incubators from 1997 to 2008 to establish a stable, naturally reproducing population and provide redundancy of the fluvial ecotype with the historical range of Arctic grayling[.]"[57] A decade of

[54] *Id.* at 67.

[55] *Id.*

[56] *Id.* at 69.

[57] *Id.* at 70.

electrofishing surveys by Montana Fish, Wildlife, and Parks had demonstrated that the Ruby River population was also struggling with dramatic demographic shifts:

Year	Number of YOY Grayling	Total Number of Grayling
2009	61	232
2010	39	96
2011	5	65
2012	11	98
2013	9	36
2014	1	35
2015	24	76
2016	5	70
2017	55	131
2018	3	37

Grayling electrofishing survey results from the upper Ruby River.[58]

And measurements of the effective number of breeders in the Ruby River only confirmed the population's troubles:

Year	H_e	A_r	N_b	Sample Size
2010	0.7930844	7.804212	23.5 (15.8, 36.9)	25 (48)
2011	0.8294469	9.054225	24.8 (12.6, 86.1)	27 (19)
2012	0.8554041	9.608342	42.1 (17.2, Inf.)	27 (20)
2013	NA	NA	NA	NA
2014	NA	NA	20.2 (11.6, 38.8)	NA (38)
2015	0.8573938	9.438658	13.4 (7.0, 26.1)	19 (36)
2016	0.8588745	9.59538	NA	28
2017	0.8244626	8.000473	6.9 (3.9, 9.8)	78 (76)
2018	0.8502296	8.903817	NA	33

Genetic monitoring results for grayling in the upper Ruby River, 2010 to 2018. Non-parenthesized sample sizes refer to mixed age samples used to estimate average expected heterozygosity (H_e) and allelic richness (A_r) in a given year. Parenthesized samples refer to the number of samples from a given cohort used to estimate effective number of breeders (N_b).[59]

While the Service's 2020 finding admitted that the available "data indicate[d] a recent decline in the number of breeding adults contributing their genetics to individual cohorts of Arctic grayling" in the Ruby River, it nonetheless concluded that a "diverse, stable population"

[58] Tim Gander, *et al.*, Ruby River Arctic Grayling Restoration Project Completion Report (May 1, 2019), at 4 (Table 2).

[59] *Id.* at 5 (Table 3) (noting that "declines in N_b suggest that periodic future monitoring is warranted, as the current estimates of N_b indicate that genetic diversity may decline in future generations").

had been established, and that "all objectives and goals of the Montana Fluvial Arctic Grayling Restoration Plan and Upper Ruby River Fluvial Arctic Grayling Reintroduction Plan have been met, indicating the Ruby River population of Arctic grayling is viable."[60] Just saying it, unfortunately, didn't make it so.

In short, the Service's 2020 not-warranted finding rested on a persistent effort to deny that Arctic grayling in the upper Missouri River basin are struggling demographically. When presented with evidence that the basin's grayling populations remained small and volatile, the agency chose simply to declare that stability had finally been achieved—"relatively," at least. This narrative—and the Service's ultimate decision to deny grayling ESA protections—was arbitrary and at odds with the Endangered Species Act.

B. The Service Acted Arbitrarily in Concluding that the Best-Available Science Demonstrates Arctic Grayling Are Not Impacted by Habitat Threats Sufficient to Warrant Listing

Arctic grayling in the Big Hole River are also threatened by historic and ongoing habitat degradation. The Service has acknowledged that degradation of the Big Hole River has dramatically reduced the suitability of grayling habitat, including shifts in channel form, increased erosion rates, reduced cover, increased water temperatures, and reduced recruitment of large wood debris.[61] Despite previously determining in its 2010 finding that Arctic grayling are threatened by habitat loss, the Service abruptly changed course in its 2020 finding, determining that the upper Missouri River basin's grayling population is not threatened by "[t]he present or threatened destruction, modification, or curtailment of its habitat or range[.]"[62] In reaching this conclusion, the Service failed to adequately grapple with the root causes of the significant curtailment of the species' range and to meaningfully evaluate whether the causes of that curtailment continue to pose an ongoing threat to the species, instead arbitrarily relying on projected and voluntary mitigation of further degradation through the CCAA.[63] The failure to

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[60] 2020 Finding at 73.

[61] *Id.* at 87–88.

[62] 16 U.S.C. § 1533(a)(1)(A) (requiring the Service to determine whether a species is threatened by "the present or threatened destruction, modification, or curtailment of its habitat or range").

[63] S*ee* 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, 37,584 (July 1, 2014) (stating that although "loss of historical range is not necessarily determinative of a species' status, … [it] must be considered in the context of all factors affecting a species[,]" including evaluation of the causes of historical loss and whether those causes present an ongoing threat); *Humane Soc'y of the U.S. v. Zinke*, 865 F.3d 585, 606 (D.C. Cir. 2017) ("[C]onsideration of material changes in a species' historical range is critical to a reliable assessment of sustainability within the current range. So whatever the Service prognosticates about future viability in certain portions of the current range cannot be reliably reasoned if it was made in a historical vacuum.").

fully evaluate these past and ongoing habitat threats that will be exacerbated by climate change renders the Service's conclusion arbitrary and unlawful. [64]

At the outset, the Service failed to employ the best-available science to rationally analyze whether the previously identified threats of habitat fragmentation, dewatering, thermal stress, entrainment, riparian-habitat loss, and climate change—all of which have contributed to the species' loss of historic range—continue to constitute threats to the species that warrant listing. The Service acknowledged that "decreases in available habitat for cold-water fish are predicted to occur from climate change," yet it then claimed that listing is not warranted.[65] In particular, the Service failed to rationally support its conclusions when it claimed in its findings that "these threats are being effectively mitigated on private land" due to the CCAA and, as a result, "do not appear to be present or acting at a level to warrant concern on most of the other populations."[66]

The best-available science demonstrates that habitat loss and degradation due to low stream flows and high stream temperatures continue to exist in the upper Missouri River basin despite the CCAA and other unenforceable conservation efforts. Water withdrawals due to irrigated agriculture and ranching result in habitat loss for grayling by reducing available space, increasing maximum water temperatures, stranding eggs and young fish, increasing inter- and intra-species predation by concentrating young and adult fish in remnant waters, and reducing food availability by reducing habitat for aquatic invertebrates. Higher water temperatures also favor nonnative fish species, such as brown trout, that compete with grayling. In the Big Hole River, irrigation reduced the range and distribution of grayling over the past century.[67] This dewatering from irrigated agriculture and ranching is the most likely cause of an approximately 50-percent reduction in the Big Hole population from the early 1990s to the early 2000s, and is almost certainly continuing to depress the existing population. About 90 percent of the fluvial population of Arctic grayling in the Big Hole River occurs within waters on private lands, which the Service identified as a challenge to conservation efforts because all such efforts need support from involved agencies and private landowners.[68]

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[64] Although courts have accepted the Service's interpretation of "range" as "current range" for the purpose of ESA's significant-portion policy, 2020 Finding at 7, the Service must still analyze the impacts of the loss of historical range on a species' current status. *Ctr. for Biological Diversity*, 900 F.3d at 1067 (nothing that the Service's 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"—a recognition of the fact that "loss of historical range can lead to reduced abundance, inhibited gene flow, and increased susceptibility to extinction"); *see also Defs. of Wildlife v. U.S. Fish & Wildlife Serv.*, 584 F. Supp. 3d 812, 829 (N.D. Cal. 2022) (finding the Service's wolf delisting arbitrary where the agency failed to thoroughly evaluate the impacts of lost historic range on the species).

[65] 2020 Finding at 170 (citing Vatland (2015), at 49, 65).

[66] *Id.* at 177.

[67] *Id.* at 77–78.

[68] *Id.* at 55.

Low flows caused by dewatering lead to higher water temperatures, as recently observed in the Big Hole River. Summer water temperatures have consistently exceeded 70 degrees in the river during every summer, which is above the 68-degree threshold for temperatures to be considered physiologically stressful for grayling—and several monitoring stations have recorded temperatures above 77 degrees at some point during the season.[69] Similar temperatures have been observed in the Madison River and Red Rock watersheds.[70] Thermal fish kills in the Big Hole River have been documented as the clear result of high water temperature.[71] At water temperatures below the level for fish kills, individual fish can still be affected.[72] These temperatures can cause chronic stress that impairs feeding and growth and ultimately reduces survival and reproduction.[73] Indeed, researchers have confirmed that stressful water temperatures are sufficient to constrict the range of cold-water fish like grayling, confirming the magnitude of the threat posed to Montana's grayling population by climate change and warming waters.[74]

The Service's response to this ongoing concern is that the CCAA is improving flow conditions in the Big Hole. The CCAA's goal, however, is merely to achieve flow targets *75 percent of the time* in *years of average or greater snowpack*.[75] In other words, even if the CCAA is meeting its "goal," flows may be below target levels *one out of every four* days in years with at least average snowpack. And the CCAA contains no flow targets at all for years in which snowpack is below average—as was the case in both 2019 and 2020—even though those are the very years in which low flows and high water temperatures are most likely to impair the grayling population. This is only more likely to occur with climate change. Although the Service stated that the CCAA is meeting the goal of achieving flow targets 80 percent of the time in years of at least average snowpack, the Service provided no analysis demonstrating that this goal itself is sufficient to alleviate the threat to grayling in the Big Hole from low flows and high water temperatures.[76] Thus, the Service acted arbitrarily in concluding that the CCAA's unenforceable—and sometimes inapplicable—flow targets were somehow sufficient to protect the grayling and its diminished habitat in the Big Hole River.

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[69] *Id.* at 95–96; 2017–2019 BH CCAA Annual Report at 20–21; 2020 BH CCAA Annual Report at 20.

[70] 2020 Finding at 106–09.

[71] 75 Fed. Reg. at 54,728.

[72] 2020 Finding at 91–93.

[73] *Id.*

[74] Chadwick (2015), at 8 (concluding that "the same temperatures that appear to limit brook trout distribution also represent the threshold for the stress response in th[e] species").

[75] 2020 Finding at 102.

[76] Furthermore, the Service concedes that "many other factors influence instream flows in the Big Hole River that are outside the control of landowners (e.g., snowpack, precipitation)." *Id.* The CCAA will not address all known flow issues and is limited in its efficacy.

Further, the CCAA does nothing at all to address low flows and high water temperatures affecting grayling populations outside the Big Hole River. As the Service acknowledged in 2010, "the Big Hole River constitutes one population in the DPS and high water temperatures are likely to continue to affect grayling in the Madison River and Red Rock Lakes. Thus, stream dewatering and high water temperatures are expected to remain a threat to the DPS in the foreseeable future."[77]

Though the Service acknowledged that summer water temperatures exceeding the grayling's 21°C stress threshold exist in the Centennial Valley, Ruby River, and Madison River, its 2020 finding nonetheless dismissed this threat by asserting that Arctic grayling "appear to be able to cope with these temperatures by using cooler tributaries and spring sources as thermal refugia[.]"[78] The Service offered no research to support this conclusion, however. Instead, the Service attempted to support its conclusions by citing to two or three emails that offered nothing more than conclusory speculation. The Service failed to explain how these emails support its conclusion that listing Arctic grayling is unwarranted when *average* temperatures in these waterbodies exceeded the level the Service previously deemed a threat.

The Service also stated that Arctic grayling in the lower-48 appear to have "an inherent ability … to adjust spawn timing with changing water temperature regimes[.]"[79] But in support of this assertion, the agency cited a study that was conducted on a fully protected grayling population in Switzerland, which is not analogous to the grayling in the upper Missouri River basin. Moreover, the referenced study concluded that, while grayling were able to spawn earlier, ultimately changes in water temperatures could be contributing to the overall decline in grayling abundance, and that "a temperature-induced onset of spawning may not fully compensate for the effects of climate change on embryos and fry[.]"[80] Accordingly, the study ultimately contradicts, rather than supports, the Service's conclusion that grayling can successfully adapt to warming stream temperatures.

Moreover, the Service failed to support its conclusion that the CCAA's adaptive-management measures are sufficient to address the current threat of habitat degradation.[81] Only 61 percent of the stream miles in the CCAA Management Area—207 of 340—are enrolled in the agreement.[82] And of these miles, only 110—less than one-third—are currently functioning as

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[77] 75 Fed. Reg. at 54,728.

[78] *See, e.g.*, 2020 Finding at 106 (citing Jaeger 2014b, pers. comm).

[79] *Id.* at 121 (citing Wedekind and Kung (2010)).

[80] Wedekind and Kung (2010), at 1421–22.

[81] As described below, in Section III.D., the Service's reliance on future implementation of the CCAA to dismiss current threats was improper, as the agency failed to evaluate the certainty that such implementation will continue to occur.

[82] 2020 Finding at 88.

"sustainable."[83] A "sustainable" rating indicates that an area is acting as a healthy riparian zone and that a stream can access its floodplain, among other criteria.[84] The Service did not analyze whether only 110 miles of sustainable habitat is sufficient to support the Arctic grayling population in the Big Hole. Moreover, given the history of habitat loss as a result of agricultural practices, coupled with the voluntary and unenforceable nature of the CCAA, the Service failed to evaluate the likelihood of decreased participation in the CCAA, especially in light of likely future drought conditions exacerbated by climate change.

For all of these reasons, the Service's determination that the grayling population in the upper Missouri River basin is not threatened by ongoing and future habitat threats was arbitrary and unlawful.

C. The Service Irrationally and Unlawfully Dismissed Climate-Change Threats

The Service also failed to rationally assess the threat posed by climate change to the Arctic grayling's survival. Under the ESA, the Service must determine whether a species is threatened or endangered due to "natural or manmade factors affecting its continued existence."[85] The Service's evaluation of the threat posed by such factors must be rational and grounded in the best-available scientific information.[86]

Despite it being well documented that the Arctic grayling is a cold-water, or "stenothermic," species that will be adversely impacted by climate change, the Service arbitrarily concluded that warming does not pose a significant threat to the survival of grayling in the upper Missouri River basin.[87]

1. The Service acted arbitrarily in concluding that Arctic grayling are able to find and use thermal refugia in the upper Missouri River basin.

The Service arbitrarily dismissed the increasing threat of high water temperatures to Arctic grayling by asserting that the fish are using thermal refugia to cope with high water temperatures.[88] In reaching this conclusion, the agency failed to address contrary evidence or square how thermal refugia can mitigate the host of habitat threats that will be further

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[83] *Id.*

[84] Natural Resources Conservation Service, Riparian Assessment Method (2004).

[85] 16 U.S.C. § 1533(a)(1)(E).

[86] *Greater Yellowstone Coal. v. Servheen*, 665 F.3d at 1024; 16 U.S.C. § 1533(b)(1)(A).

[87] 2020 Finding at 118–21 (citing Selong (2001) at 1032).

[88] *See, e.g.*, *id.* at 100 (stating that grayling in the Big Hole River "are seeking, finding, and using thermal refugia areas"); *id.* at 106 (citing Jaeger 2014b, pers. comm) (stating that grayling in Upper Red Rock Lake "appear to be able to cope with these temperatures by using cooler tributaries and spring sources as thermal refugia").

exacerbated by climate change.[89] As explained below, the Service's reliance on thermal refugia as a basis for avoiding listing was arbitrary because it assumed without support that accessible thermal refugia exist in the upper Missouri River basin; that grayling will somehow find and use these waters; and that the available refugia will be adequate to compensate for habitat loss and degradation over the long-term.

First, the Service asserted that Arctic grayling will use thermal refugia because "multiple lines of evidence suggest[] that water temperatures around 25°C may be prompting Arctic grayling to emigrate out of an area in search of cooler water."[90] According to the agency, this evidence includes the fact that fish do not appear to be dying in warmer water, as well as studies showing that grayling and other salmonids do actively seek thermal refugia.[91] The Service's optimistic conclusions about the grayling's coping skills, however, relied on emails containing nothing more than speculation about the potential benefits of thermal refugia.[92] According to the emails, because grayling have sometimes been found in cooler waters, this might suggest that the fish searched for and found thermal refugia in response to high water temperatures. But the relevant correspondence indicates that there may have been other reasons for the grayling's movement. Thus, the Service's conclusion that the grayling's supposed ability to migrate to colder waters sufficiently minimized the threat it faces from low stream levels and high water temperatures was once again unsupported and arbitrary.

Second, even if the Service had been able to show that grayling will seek out and use thermal refugia, it failed to demonstrate that adequate thermal refugia exist, and will continue to exist, in the Big Hole River. Relying on the Vatland (2015) study, the Service asserted that "modeled water temperatures in the Big Hole … indicate that cooler water sites used by Arctic grayling in the 2000s were expected to remain relatively cool through at least the 2060s[.]"[93] But the Service did not address Vatland's other conclusions that relate to usability of thermal refugia, such as the fact that conditions in the Big Hole River are going to severely decline with climate change and that thermal barriers could impact the grayling's ability to reach cooler waters, even in the river's main stem.[94] For example, with respect to thermal barriers, Vatland stated that "[c]ontiguous sections of the [Big Hole River] projected to exceed chronic and acute [temperature] thresholds *could act as thermal barriers to fish migration, especially in the main stem of the Big Hole River* …. These thermal barriers could negatively affect populations with

[89] *See WildEarth Guardians v. Haaland*, 561 F. Supp. 3d 890, 900–02 (C.D. Cal. 2021) (holding that the Service's selective reliance on data regarding climate change was arbitrary).

[90] 2020 Finding at 94–95.

[91] *Id.*

[92] *See* Email from Matt Jaeger, Fisheries Management Biologist, to James Boyd, Feb. 11, 2014; Email from Jim Olsen, Fisheries Biologist, to James Boyd, Oct. 28, 2019.

[93] 2020 Finding at 170 (citing Vatland (2015) at 49, 65).

[94] Vatland (2015), at 63–64.

migratory life history components, including fluvial Arctic grayling[.]"[95] In reaching its arbitrary conclusion that Arctic grayling will use thermal refugia to cope with rising temperatures, the Service failed to acknowledge or address these concerns related to usability and accessibility of thermal refugia. The mere existence of cooler areas is insufficient to support the agency's claim that grayling are not threatened by rising water temperatures, and the Service's failure to address contrary evidence, such as the presence of thermal barriers preventing the fish from finding and using cooler waters, was arbitrary.[96]

Even if thermal refugia could be found and used by Arctic grayling, the Service assumed that the tributaries of the Big Hole River provide cold enough habitats for the fish. Data show, however, that these tributaries are above the water temperatures that can be tolerated by the species. In particular, the Service's finding showed that the Big Hole's tributaries exceed 25°C about as much as the river's mainstem.[97] The Service even acknowledged that "[t]hese data indicate that stressful temperature conditions for Arctic grayling in the Big Hole River *and its tributaries* … [are] still present[.]"[98] The Service attempted to dodge this problem by noting that temperature recorders are typically "placed at locations near [the tributaries'] mouth (where the tributary meets the Big Hole River)," and that these sites "are often the warmest water temperatures in the entire tributary (MFWP 2019, unpublished data)."[99] Yet the Service did not provide any data to show how far Arctic grayling must go into the tributaries and whether that migration actually occurs, nor did it address how the one cited study concluded that most grayling are found at the mouth of tributaries.[100]

In an attempt to save its arbitrary finding, the Service again relied on the CCAA's "water conservation and restoration projects" to "increase instream flows and reduce water temperatures in the Big Hole River and [its] tributaries."[101] While the Service pointed to a reduction in the number of days the Big Hole's flows fell below 160 and 60 cubic feet per second (cfs),[102] the Ninth Circuit already acknowledged that despite "improvements in stream flow and water temperature" resulting from the CCAA, "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."[103] Additionally, for water flows, the 2020 finding and data in the record show that there were

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[95] *Id.* at 53.

[96] *See WildEarth Guardians*, 561 F. Supp. 3d at 900 (holding that the Service acted arbitrarily when it "selectively rel[ied] on portions of … studies to support its non-listing determination despite failing to address their contrary findings").

[97] 2020 Finding at 97–98.

[98] *Id.* at 97 (emphasis added).

[99] *Id.* at 99.

[100] Vatland (2009), at 3, 10.

[101] 2020 Finding at 101–03.

[102] *Id.*

[103] *Ctr. for Biological Diversity*, 900 F.3d at 1071.

multiple days where flows were under 60 cfs following the implementation of the CCAA, including 17 days below 20 cfs in 2015.[104] Once again, in the words of the Ninth Circuit, the Service's reliance on the CCAA does not "save the agency's flawed … Finding."[105]

Third, the Service arbitrarily assumed that thermal refugia would mitigate existing and future threats to the grayling's habitat, and it failed to address the additional threats that grayling face when gathering in cold-water areas.

Thermal refugia are far from ideal habitats. For example, in Chadwick (2015), a study that the Service relied on to claim that grayling use and find thermal refugia, the researchers noted that predation and competition increase when fish congregate at cool-water sites—a highly relevant factor the agency's decision ignored.[106] Additionally, the Service acknowledged that recent observations show an increase in the "abundance and distribution of brown trout in the upper reaches of the Big Hole River" that "may be consistent with the hypothesis that stream warming is facilitating encroachment[,]" and that "[r]ecent analyses indicate increasing abundance of brown trout is negatively correlated with age-0 Arctic grayling abundance in the Big Hole River[.]"[107] Despite recognizing an increase in competition with nonnative species that are "more tolerant of warm water" than Arctic grayling, the Service dismissed this concern by claiming that experts predicted only a five-percent reduction in grayling recruitment in the Big Hole River.[108] In reaching this conclusion, the Service failed to explain whether such a loss due to competition and predation threatens Arctic grayling in the Big Hole River, especially when climate change gives nonnative trout species an advantage and competition with others species has historically resulted in reduced grayling numbers.[109]

The Service's reasoning appears to assume that habitat loss won't threaten the grayling as long as there is some remaining habitat the fish can retreat to. What the agency arbitrarily dismissed or entirely ignored, however, are the increasing threats, such as predation and competition, that grayling will face in warming world—even when they are able to retreat to so-called thermal refugia. The Service's selective reliance on speculation regarding thermal refugia,

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[104] 2020 Finding at 105.

[105] *Ctr. for Biological Diversity*, 900 F.3d at 1070.

[106] 2020 Finding at 100, 172; Chadwick (2015), at 9.

[107] 2020 Finding at 168.

[108] *Id.*

[109] *Id.* at 144 ("Ecological interactions (predation and competition) with the brook trout, brown trout, and rainbow trout are among the long-standing hypotheses to explain the historical decline of Arctic grayling in the upper Missouri River basin system and the extirpation of some populations from specific waters[.]").

and its failure to consider and evaluate the threats that thermal refugia can pose to Arctic grayling, was arbitrary and unlawful.[110]

2. The Service's not-warranted finding arbitrarily discounted other, compounding effects of climate change.

To justify its not-warranted finding, the Service also arbitrarily dismissed the compounding effects of climate change, further exacerbating the agency's failure to adequately address the current threat to grayling caused by low flows and high stream temperatures.[111]

Both water temperature and stream flow are sensitive to climate change. For example, "[o]bservations on flow timing in the Big Hole River, upper Madison River, and Red Rock Creek in the Centennial Valley indicate a tendency toward earlier snowmelt runoff[.]"[112] These hydrologic alterations may be biologically significant for grayling in the Missouri River basin because the fish "typically spawn prior to the peak of snowmelt runoff[.]"[113]

In addition to earlier snowmelt, warmer air temperatures will harm grayling by further increasing stream temperatures. Climate analyses in the Big Hole River Valley and Centennial Valley indicate that air temperatures rose between 1 and 1.8 degrees Celsius per decade from the 1980s to mid-2000s. And the Service acknowledged that the land area of the upper Missouri River basin is predicted to warm even more through the end of the century.[114] Moreover, the agency's 2020 finding acknowledged that "[t]he most recent water temperature data … indicate[d] maximum daily water temperatures exceeded 21°C (70°F) in certain sections of the Ruby River [i]n some years (e.g., 2014 and 2015)," but it dismissed these temperature exceedances as likely "temporary and non-lethal" despite the increasing duration of the exceedances.[115] By the agency's own review of data, daily water temperature exceeded 21°C in some sections of the Ruby River for nearly 104 hours per year in 2015, an increase from

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[110] *See WildEarth Guardians*, 561 F. Supp. 3d at 900 (holding that the Service's selective reliance on data and failure to consider and evaluate contrary data in declining to list species was arbitrary).

[111] The Service's climate-change analysis in its 2010 decision resulted in the conclusion that grayling habitat will not be immune from the effects of warming, and that climate change may contract the species' range and "increase the species' risk of extinction over the next 30 to 40 years as climate impacts interact with existing stressors … , such as habitat degradation, stream dewatering, drought, and interactions with nonnative trout that are already affecting the DPS." 75 Fed. Reg. at 54,740. The Service acknowledged in 2010 that the CCAA would not ameliorate this risk for the DPS. *Id.*

[112] 2020 Finding at 117.

[113] *Id.*

[114] *Id.* at 121.

[115] *Id.* at 108.

approximately 54 hours per year in 2014.[116] This trend of increasingly long stretches in which water temperatures exceed the grayling's biological thresholds is only expected to be amplified with climate change—a threat the Service arbitrarily failed to adequately consider.[117]

With its inadequate consideration of rising water temperatures, the Service also failed to address flows in the Ruby River. This is particularly concerning because the agency's not-warranted finding depended on the survival of the Ruby River's inchoate population—a population that has seen a decrease in the effective number of breeding adults—to increase "redundancy and representation of life history diversity in the DPS."[118] The compounding effects of climate change mean that with rising water temperatures and decreasing water flows, grayling will be pushed into smaller suitable habitats. The Service, however, did not evaluate the risk of reduced genetic exchange, and a corresponding loss of genetic diversity, if grayling are forced into small habitats as a result of habitat degradation.

In its climate discussion, the Service acknowledged that both observed trends and climate models indicate that temperatures will increase in the upper Missouri River basin, and that these air-temperature increases will lead to warmer water, which will "decrease available habitat for cold-water fishes[.]"[119] The Service, however, claimed that many grayling habitats are expected to be "climate-resilient," noting that some "habitats capable of supporting cold-water fishes are predicted to remain at least into the 2080s[,]" and that certain higher-elevation habitats are likely to be more resilient to projected changes in water temperature.[120] To support its assertion, the agency pointed to an analysis, Isaak (2015), that examined trends in river and stream temperatures in Oregon, Montana, Idaho, and Washington. Yet the Service did not explain how a study focused *on other species*—a study that did not discuss Arctic grayling at all—could support the agency's sweeping predictions about the impacts of climate change on grayling across the upper Missouri River basin. The Isaak study examined only a portion of the grayling's habitat in the region, excluding areas that are significantly impacted by habitat loss and degradation. To shore up this flawed analysis, the Service attempted to extend the conclusions of the Isaak study by citing Vatland's modeling of water temperatures in the Big Hole River, but it failed to explain how studies focused on mostly different habitat and species could be interpreted together.[121] Furthermore, the Service cherry-picked data from both of the studies that appeared to support its conclusion without addressing contrary evidence, such as Vatland's determinations that conditions in the Big Hole River are going to severely decline with climate change, that thermal barriers could impact the grayling's ability to reach refugia, and that there is

[116] *Id.*

[117] *Id.* at 116 (noting that "[w]ater temperature and hydrology (stream flow) are sensitive to climate change").

[118] *Id.* at 179.

[119] *Id.* at 170.

[120] *Id.* at 170, 182.

[121] *Id.* at 170.

considerable uncertainty about whether the fish will be able to adapt and survive.[122] The agency also disregarded Isaak's projections that, as streams and rivers warm, there will be "significant biological implications for both the quality and quantity of habitats available to" certain fish species and that the frequency of thermal impacts is expected to increase in the future.[123]

The Service also rejected key findings in the studies it cited that did not support its preferred conclusions. For example, the agency relied on the Vatland and Isaak studies for some of its assertions, but then contradicted those studies by asserting that "changes in ambient air temperature predicted to occur as the climate changes are not likely to have as large an effect on water temperatures as solar radiation."[124] The Vatland study demonstrated, however, that ambient-air temperature is "highly correlated" with stream temperature trends.[125]

In concluding that much of the grayling's habitat is expected to be "climate-resilient[,]" the Service assumed the habitat will remain connected and that grayling will be able to reach these "suitable habitats."[126] This failed to address the ongoing threat of habitat degradation from historic sources—namely, agriculture and other activities involving stream diversions. As water becomes more scarce in the West, habitat degradation from historic threats such as agriculture will grow more pressing, and the voluntary protections of the CCAA will become increasingly inadequate—particularly given that the CCAA lifts its water-flow targets during below-average-snowpack years. Put simply, the Service's inconsistent and incomplete examination of climate change's future effects renders its conclusions arbitrary and unlawful.

D. The Service Arbitrarily Failed to Rationally Evaluate the Adequacy of Conservation Efforts to Protect Arctic Grayling

The Service's 2020 finding was further arbitrary and unlawful because it failed to rationally assess the adequacy of existing regulatory mechanisms, as required under ESA Section 4(a)(1)(D). The finding relied extensively on voluntary conservation actions to address acknowledged threats to Arctic grayling without determining whether the actions constituted "regulatory mechanisms" and without applying, even, its own "policy for the evaluation of conservation efforts."[127] The Service relied on future actions under the CCAA to support its finding that listing was not warranted, and it also discussed its optimism about the possibility of

[122] Vatland (2015), at 53–54.

[123] Isaak (2015), at 513.

[124] 2020 Finding at 118–19.

[125] Vatland (2015), at 39.

[126] 2020 Finding at 170.

[127] 16 U.S.C. § 1533(a)(1)(D); Policy for Evaluation of Conservation Efforts When Making Listing Decisions, 68 Fed. Reg. 15,100 (March 28, 2003) (PECE).

additional voluntary conservation efforts from landowners who chose not to enroll in the CCAA.[128]

In addition to the agency's failure to acknowledge the uncertainty inherent in voluntary action, the Service did not address the uncertainty created when it eliminated the grayling's status as a candidate for listing—a status that had provided an incentive for both voluntary conservation efforts and enrolling in the CCAA. Because future implementation of the CCAA and other voluntary efforts is uncertain, the Service's reliance was arbitrary and unlawful under the Endangered Species Act.[129] Accordingly, the Service's decision not to list Arctic grayling cannot be sustained.

[128] 2020 Finding at 125.

[129] 16 U.S.C. § 1533(b)(1)(A).

1. The CCAA is not a "regulatory mechanism" that can justify the Service's not-warranted finding.

In its 2020 finding, the Service arbitrarily failed to evaluate the CCAA to determine if it qualified as an adequate "regulatory mechanism" under the ESA. If the agency had undertaken such an analysis, it would have been forced to conclude that the voluntary conservation actions prescribed by the CCAA are not "regulatory mechanisms" at all, given that they are not enforceable.[130] As a matter of plain meaning, "regulation" demands more than voluntary compliance; to "regulate" is to "control, govern, or direct by rule."[131] Accordingly, adequate "regulatory mechanisms" under Section 4(a)(1)(D) must sufficiently control or direct activities as required to protect the Arctic grayling from extinction. For this reason, courts have repeatedly held that "the Service cannot rely on promised and unenforceable conservation agreements in evaluating existing regulatory mechanisms."[132]

In its 2020 finding, the Service consistently relied on the CCAA to address the present and future threats facing grayling. For example, the agency stated that:

> [s]ince 2006, multiple projects have been implemented to decrease dewatering and thermal stress and have resulted in increased streamflows, increased access to cold-water refugia, and marked temperature reductions. These improvements mitigate warming water temperatures due to climate change, and the CCAA projects have led to shorter durations of stressful water temperatures. In the future, we do not expect habitat to decline in the Big Hole River because of the proven track record of CCAA projects.[133]

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[130] 16 U.S.C. § 1533(a)(1)(D).

[131] 13 *Oxford English Dictionary* 524 (2d ed. 1989); *see United States v. Reynolds*, 710 F.3d 434, 435 (D.C. Cir. 2013) (statutory construction begins "with the statutory language and if its meaning is plain and unambiguous as to the disputed issue, that is where we stop") (citations omitted).

[132] *Colo. River Cutthroat Trout v. Salazar*, 898 F. Supp. 2d 191, 208 (D.D.C. 2012); *accord Ctr. for Biological Diversity v. Morgenweck*, 351 F. Supp. 2d 1137, 1141 (D. Colo. 2004) (rejecting FWS reliance on non-binding conservation plans); *Sw. Ctr. for Biological Diversity v. Norton*, 2002 WL 1733618, at *9 (D.D.C. July 29, 2002) (rejecting reliance on "future and uncertain actions" under ESA § 4(a)(1)(D), while affirming FWS reliance on binding forest plan); *Fed'n of Fly Fishers v. Daley*, 131 F. Supp. 2d 1158, 1165–66 (N.D. Cal. 2000) (rejecting reliance on promises of "future conservation actions" in listing determination); *Or. Natural Res. Council v. Daley*, 6 F. Supp. 2d 1139, 1153–55 (D. Or. 1998) (FWS "should not be able to rely on unenforceable efforts" to provide needed conservation measures); *Biodiversity Legal Found. v. Babbitt*, 943 F. Supp. 23, 26 (D.D.C. 1996) (FWS may not rely on "promises of proposed future actions" in ESA § 4 analysis).

[133] *See, e.g.*, 85 Fed. Reg. at 44,481.

The Service explicitly relied on the CCAA as a way to address "riparian habitats that have not improved."[134] To address climate-change impacts, the Service also relied on the CCAA, arguing that "while small cumulative impacts of warming water temperatures due to climate change are expected, they are expected to be less than modeling studies suggest and mitigated in large part by restoring riparian areas and restoring more flow to the mainstem Big Hole River, both of which are central tenets of the Big Hole CCAA."[135]

Because acknowledged threats to Arctic grayling such as insufficient stream flows and degraded habitat justify listing absent sufficient regulation, the agency may not rely on voluntary assurances to substitute for legally required regulatory guarantees.[136] As discussed below, conservation actions under the CCAA lack implementation deadlines and other quantifiable measures of compliance that are prerequisite to "regulatory" action. The Service unlawfully relied on such non-regulatory measures to address persistent threats to Arctic grayling.[137]

2. The CCAA does not satisfy the Service's "Policy for Evaluation of Conservation Efforts."

Even if the Service could rely on non-regulatory measures to address present, known threats to Arctic grayling—and it cannot—the CCAA and other voluntary conservation actions identified in the agency's finding are insufficiently certain to support its not-warranted determination. Although the Service must "tak[e] into account those efforts, if any, being made by any State … to protect such species,"[138] it may not rely on mere promises of future action.[139]

To ensure that conservation efforts satisfy the minimum requirements for certainty, the Service promulgated a "Policy for Evaluation of Conservation Efforts When Making Listing

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[134] 2020 Finding at 89.

[135] *Id.* at 174.

[136] *See Colo. River Cutthroat Trout*, 898 F. Supp. 2d at 207–08 (the Service may not rely on "promised and unenforceable" measures in evaluating "regulatory mechanisms"); *see also Am. Wildlands v. Norton*, 193 F. Supp. 2d 244, 256 (D.D.C. 2002) ("Having identified hybridization as a threat to [trout subspecies], the Service should have identified whether the regulatory mechanisms in place were adequate to protect a viable population of the subspecies.").

[137] 16 U.S.C. § 1533(a)(1)(D).

[138] *Id.* § 1533(b)(1)(A).

[139] *See, e.g.*, *In re Polar Bear ESA Listing & Section 4(d) Rule Litig.*, 794 F. Supp. 2d 65, 113 n.56 (D.D.C. 2011) ("[T]he ESA does not permit the Service to consider speculative future conservation actions when making a listing determination."), *aff'd*, 709 F.3d 1 (D.C. Cir. 2013); *Or. Natural Res. Council v. Daley*, at 1153 (the Service may not, under 16 U.S.C. § 1533(a)(1)(D) or § 1533(b)(1)(B), rely on future conservation efforts to decline listing a species as endangered or threatened).

Decisions," or "PECE."[140] The PECE is designed to "set a rigorous standard for analysis and assure a high level of certainty associated with formalized conservation efforts[.]"[141] Under this policy, the Service cannot rely on conservation efforts to eliminate the need for listing unless it is "*certain* that the formalized conservation effort improves the status of the species at the time [it] make[s] a listing determination."[142] To this end, the PECE requires the Service to assess the adequacy of existing conservation efforts based on two factors: (1) "the certainty of implementing the conservation effort," and (2) "the certainty that the effort will be effective."[143] The policy also provides specific criteria for these assessments.

The Service failed to evaluate the CCAA under the PECE, or even to mention the PECE in its 2020 finding. Furthermore, the CCAA does not provide the requisite high level of certainty that its voluntary conservation measures will maintain and restore fluvial Arctic grayling in the upper Missouri River basin to the extent that the DPS will not be endangered or threatened. The lack of certainty is particularly troubling given the Service's acknowledgments in the finding that the very conservation measures addressed in the CCAA—including dams and other obstructions which contributed to the significant curtailment of the species' historic range—continue to threaten the species. For example, the Service noted that "substantial losses from a population resulting from downstream entrainment of fish through dams could cause declines in reproductive potential and abundance[,]" and that the rate of such entrainment depends on dam operations which have "likely affected the Arctic grayling population" in various locations and "still impact individuals."[144] Similarly, the Service's assessment of the historical habitat fragmentation caused by smaller dams or diversions associated with irrigation structures throughout the grayling's range failed to analyze the risk of similar diversion structures being constructed in the future.[145] Thus, while the CCAA promotes conservation efforts that may benefit the grayling, the CCAA does not and cannot obviate the need for listing, either under 16 U.S.C. § 1533(b)(1)(A) or the PECE.

a. The CCAA omits specific objectives tied to conservation of grayling and quantifiable measures of compliance and effectiveness.

The CCAA does not contain "[e]xplicit incremental objectives … and dates for achieving them," which are essential to demonstrate a conservation effort's effectiveness.[146] Moreover, the plan provides no quantitative metrics for assessing whether conservation measures that are

[140] 68 Fed. Reg. at 15,100.

[141] *Id.* at 15,104.

[142] *Id.* at 15,101 (emphasis added).

[143] *Id.* at 15,113.

[144] 2020 Finding at 80–81.

[145] *Id.* at 85.

[146] 68 Fed. Reg. at 15,115.

implemented suffice to mitigate critical threats to grayling. The CCAA thus touts the effectiveness of planned mitigation without providing any quantitative benchmarks necessary to objectively evaluate the success of such mitigation.

For example, the CCAA identifies insufficient flows in the Big Hole River as a primary threat to the viability of fluvial Arctic grayling and requires that site-specific implementation plans include measures to address that threat.[147] But the CCAA does not quantify the contributions it will make to restoring flows, nor confirm whether such contributions will suffice to protect the species. Indeed, the CCAA expressly rejects such benchmarks, stating that it is not possible to estimate either the optimal flow regime for Arctic grayling in the Big Hole River nor the water savings associated with full implementation of the plan.[148] Nevertheless, it asserts that "[t]he combination of improved control over diversions, compliance with water rights, SFAs and irrigation management [prescribed by the plan] will lead to dramatic improvements in streamflows within the Project Area."[149] The promise of "dramatic improvements" is insufficient to satisfy the PECE, as it is not supported by assurances that the touted conservation measures—even if fully implemented—would suffice to sustain a fluvial grayling population that is not endangered or threatened.

The CCAA's assessment of the impact of individual conservation strategies prescribed in the plan is equally vague. For example, the CCAA relies on landowners' voluntary reductions in diversions but asserts that the quantity of water that will be returned to the river "is difficult to estimate."[150] Nevertheless, the CCAA surmises that enhancement of instream flows from such voluntary reductions "may be substantial given the heavy water use that has historically occurred and the over-allocation of unadjudicated water rights in the Project Area."[151] But even if voluntary reductions in diversions actually occur, the CCAA does not provide a high level of certainty that their effects will in fact be "substantial," let alone sufficient to obviate the need for listing the DPS as threatened or endangered.

Similarly, the CCAA relies on landowners upgrading existing irrigation systems or altering the composition and distribution of irrigated crops to reduce water use.[152] The plan emphasizes that landowners retain "flexibility" to choose among these strategies but assures, without factual support, that "[w]hichever option or combination of options is utilized, the water savings will be substantial and the saved water will be turned back at the point of diversion to

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[147] *See* CCAA at 22–25.

[148] *See id.* at 35–36; *see also id.* at 37 (stating that CCAA's stream flow targets "should be interpreted as [] general … because it is not currently possible to provide a valid quantitative prediction of streamflow improvements resulting from CCAA implementation").

[149] *Id.* at 35.

[150] *Id.* at 32.

[151] *Id.*

[152] *See id.* at 33.

provide beneficial use for instream flows."[153] Again, even if landowners in fact undertake changes that will yield "significant" reductions in withdrawals, the CCAA provides no assurance that such reductions will suffice to sustain the fluvial grayling population in the project area.

The omission of "[e]xplicit incremental objectives for the conservation effort" and "[q]uantifiable, scientifically valid parameters" to measure the sufficiency and achievement of such objectives rendered the CCAA insufficient to obviate the need for listing.[154]

b. The CCAA lacks a funding commitment.

The CCAA does not include any funding commitment; rather, the plan states that funding for its conservation measures "is not guaranteed"[155] and that implementation depends upon the future "appropriation, authorization, and allocation of funds."[156] With the exception of the USDA Natural Resources and Conservation Service, which is a cooperating agency under the agreement and commits in the CCAA to "[a]ctively pursue and provide available Federal funding to support implementation," no agency is charged with securing the necessary funds.[157] While the CCAA identifies a list of potential funding sources, it provides only the weak promise that the cooperating agencies "*may* utilize and/or pursue" funding from the identified sources.[158] Therefore, the CCAA neither qualifies as an "existing regulatory mechanism" nor satisfies the minimum standard articulated in the PECE, which is to assure at least one year of implementation funding and provide a documented commitment to secure future funding.[159]

c. The CCAA provides an inadequate schedule for completing and evaluating conservation measures.

The CCAA does not include schedules for completing and evaluating the prescribed conservation measures that provide a high level of certainty that those measures will be implemented. In fact, the agreement contains no concrete timelines for implementation of necessary conservation measures, as the timelines provided do not begin to run until the date that a particular landowner voluntarily enrolls in the program.[160] Furthermore, the CCAA's timelines are contingent on voluntary landowner enrollment. Thus, the plan provides no guarantee that its

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[153] *Id.*

[154] *See* 60 Fed. Reg. at 15,115.

[155] CCAA at 73.

[156] *Id.* at 88; *see also id.* at 97 (affirming that "*no funding* is allocated specifically for the implementation of this Agreement or private landowners[']site-specific plans") (emphasis added).

[157] *Id.* at 74.

[158] *Id.* at 97.

[159] 68 Fed. Reg. at 15,109.

[160] *See* CCAA at 68 (providing timelines for implementing three phases of the plan, measured in days, months, and years from the date an individual landowner enrolls).

conservation measures will be implemented within even an estimated time measured from the plan's adoption or any other date. There is also no way to determine when site-specific implementation of conservation measures will occur on any given parcel in the upper Big Hole River drainage and, accordingly, no method or timeframe by which the Service could effectively gauge whether the CCAA is being implemented as planned.

Courts have noted that the PECE:

> requires that future conservation efforts must be "sufficiently certain" to be effective. This inquiry requires that the Service consider not only whether the planned conservation measures are the *type* of measures that are likely, in the abstract, to be beneficial to the species. Rather, the Service must also consider the magnitude of the impact on the species that the measures can be expected to achieve, and "the estimated length of time that it will take for a formalized conservation effort to produce a positive effect on the species."[161]

Because the CCAA fails to include a method or timeframe to gauge whether the conservation measures have been beneficial to the species, the Service cannot consider "the estimated length of time that it will take for a formalized conservation effort to produce a positive effect on the species."[162]

Furthermore, the CCAA lacks specific implementation measures and benchmarks to ensure that it will *effectively* mitigate those threats "to the point that the species does not meet the definitions of threatened or endangered."[163] As a result, even if it were fully implemented, the CCAA cannot obviate the need for listing. The CCAA fails to provide detailed identification of the steps necessary for effective implementation. For example, as described in relation to the CCAA's insufficient articulation of implementation benchmarks, the plan does not identify the number of landowners who must reduce their water withdrawals and the magnitude of necessary reductions to meet the plan's overarching conservation objective. Identifying these necessary steps is apparently deferred until the development of site-specific implementation plans but, as already discussed, there is no concrete timeline for the development of such plans and no requirements for what each plan must achieve.

The CCAA also does not identify the level of landowner enrollment or the number and type of completed conservation projects necessary to assure that the affected grayling population will not be threatened or endangered. Relatedly, the CCAA does not provide any indication that the necessary level of voluntary participation will be reached. At the time of the Service's not-warranted finding, 31 landowners had enrolled 158,000 acres (52% of total enrollable land) in

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[161] *Desert Survivors v. U.S. Dep't of Interior*, 321 F. Supp. 3d 1011, 1065 (N.D. Cal. 2018).

[162] *Id.*

[163] 68 Fed. Reg. at 15,107.

the CCAA and had completed site-specific plans.[164] The Service stated that it did not consider future anticipated conservation efforts in unsigned site plans but was "very encouraged" by the fact that certain landowners did not enroll in the CCAA but were making some voluntary conservation efforts.[165]

Because the CCAA's timelines are contingent on voluntary landowner enrollment—and, even when triggered, largely have been disregarded—they cannot satisfy the PECE's demand for verifiable implementation schedules, which are "critical to determining that the effort will be implemented and effective and has improved the status of the species under the [Endangered Species] Act at the time [the Service] makes [its] listing determination."[166] Indeed, under the CCAA, there is no way to determine when site-specific implementation of conservation measures will occur on any given parcel in the upper Big Hole River drainage and, accordingly, no method or timeframe by which the Service could effectively gauge whether the CCAA is being implemented as planned. As one court stated:

> [T]he CCAA is a limited, voluntary conservation measure; it is not legally binding, nor are the incentives sufficient to ensure regulatory certainty. Landowners who enroll can withdraw at any time, and for any reason. The CCAA also does not preclude landowners from selling their property to developers, to whom the assurances, incentives, and promises under the CCAA would not transfer. The CCAA does not take into account climate change, drought, disease, and small population issues—all of which reasonably support the threatened listing.[167]

Thus, this fundamental uncertainty is unacceptable given the precarious status of fluvial Arctic grayling and renders the CCAA insufficient under the Service's PECE and the ESA.[168]

d. The CCAA contains inadequate provisions for monitoring and reporting implementation progress.

The CCAA's monitoring provisions also are insufficient. The CCAA requires monitoring and reporting of fluvial-grayling population data; stream-flow, stream-channel-morphology, and stream-temperature data; entrainment; riparian-habitat status; and fish-passage and exclusion information, as well as landowner compliance with site-specific plan provisions.[169] However, the CCAA lacks a verifiable implementation schedule and quantifiable parameters of conservation

[164] 2020 Finding at 122.

[165] *Id.* at 125.

[166] 68 Fed. Reg. at 15,103.

[167] *Colorado by & Through Colorado Dep't of Nat. Res., v. United States Fish & Wildlife Serv.*, 362 F. Supp. 3d 951, 975 (D. Colo. 2018).

[168] *See Desert Survivors*, 321 F. Supp. 3d at 1065.

[169] CCAA at 75–78.

effectiveness. This failing is particularly damaging given the extremely reduced size of the fluvial grayling population. Given the state of the population, general information regarding habitat conditions and landowner compliance, even if positive, is insufficient to inform the responsible agencies and the public whether the CCAA's conservation efforts are sufficing to hold the grayling population back from the brink. Thus, the CCAA's monitoring and reporting provisions fail, in letter and in practice, to satisfy the Service's standards articulated in the PECE.

The Service unlawfully relied on unenforceable voluntary conservation measures under the CCAA to support its finding that listing the Upper Missouri River DPS of Arctic grayling was not warranted. The Service's own contradictory statements in the 2020 finding make clear that it does not understand whether CCAA conservation efforts are benefitting Arctic grayling. In fact, the Service illogically claims that the conservation measures are working, but does not know the reasons.[170] This analysis is insufficient to show reasonable certainty that the CCAA will benefit Arctic grayling and is contrary to the dictates of the ESA and the Service's own PECE.

IV. Conclusion

As set forth above, the Service acted arbitrarily and unlawfully in determining that the upper Missouri River population of Arctic grayling is not threatened or endangered. The Service failed to rely on the best-available scientific information in determining that climate change and other threats will not significantly impact the population in the foreseeable future. The Service also failed to draw rational conclusions from the scientific information before it. If the Service does not retract its not-warranted finding and issue a proposed rule listing the upper Missouri River DPS within 60 days of the receipt of this letter, the parties to this notice letter intend to institute a legal action to challenge the Service's determination in federal district court.

Sincerely,

Emily T. Qiu
Amanda Galvan

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[170] 2020 Finding at 63 ("*Whatever the reason(s)*, it is clear that conservation measures are working, either singularly or in concert with one another, at a level high enough to increase the number of effective breeding Arctic grayling, on average, since 2006.") (emphasis added). An agency must articulate "a rational connection between the facts found and the choice made[,]" and cannot simply rely on "whatever the reasons[.]" *See Motor Vehicle Mfrs. Ass'n of U.S., Inc.*, 463 U.S. at 43; *see also Ass'n of Private Colleges & Univs. v. Duncan*, 870 F. Supp. 2d 133, 154 (D.D.C. 2012) ("That this explanation could be used to justify any [determination] at all demonstrates its arbitrariness"); *Am. Lung Ass'n v. EPA*, 134 F.3d 388, 392 (D.C. Cir. 1998) ("[J]udicial review can occur only when agencies explain their decisions with precision, for '[i]t will not do for a court to be compelled to guess at the theory underlying the agency's action ….'").