IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF MONTANA
BUTTE DIVISION

CENTER FOR BIOLOGICAL DIVERSITY, WESTERN WATERSHED PROJECT, and PAT MUNDAY,

Plaintiffs,

vs.

DEBRA A. HAALAND, Secretary of the U.S. Department of the Interior; MARTHA WILLIAMS, Director of the U.S. Fish and Wildlife Service; and the U.S. FISH AND WILDLIFE SERVICE,

Defendants,

and

STATE OF MONTANA and MONTANA DEPARTMENT OF FISH, WILDLIFE, AND PARKS,

Defendant-Intervenors.

CV 23–02–BU–DLC

ORDER

Before the Court are the parties' cross-motions for summary judgment. (Docs. 29, 32, 34.) Plaintiffs challenge the United States Fish and Wildlife Service's ("FWS") Revised 12-Month Finding on a Petition to List the Upper Missouri River Distinct Population Segment ("DPS") of Arctic Grayling published in the Federal Register on July 23, 2020, (the "2020 Finding") under the Endangered Species Act ("ESA"). The Court held a hearing on the summary

judgment motions on July 12, 2024. For the reasons discussed below, the parties' motions are granted in part and denied in part, the 2020 Finding is vacated and remanded for further analysis, and FWS is directed to make a new finding as to the status of the upper Missouri River basin DPS of Arctic grayling within twelve months of the date of this order.

BACKGROUND

I. Arctic Grayling

The Arctic grayling (*Thymallus arcticus*) is a salmonid native to Arctic Ocean drainages of Alaska and northwestern Canada. FWS10963–64. Arctic grayling occupy a variety of habitats, including small streams, large rivers, lakes, and bogs. FWS10981. As is typical among salmonids, Arctic grayling follow cyclic patterns of movement between refuge, rearing-feeding, and spawning habitats, both as part of a regular seasonal migration and in response to episodic stressors. FWS10984.

Arctic grayling have defined thermal tolerances. At 21°C (70°F) adult Arctic grayling begin to experience sublethal physiological stress that can manifest as increased metabolism, reduced growth, and other effects. FWS11045. Fifty percent of juvenile Arctic grayling are expected to die if exposed to water temperatures of 25°C (77°F) constantly for seven days. FWS11046. And, at 26.9°C (80.4°F), adult Arctic grayling lose equilibrium and cannot escape

conditions that will promptly lead to death. FWS11046. Arctic grayling exhibit a spectrum of fluvial (spending their entire lives history in flowing water) and adfluvial (primarily residing in ponds/lakes/bogs and only using flowing water for spawning) life histories. FWS10986. In general, Arctic grayling are capable of occupying varying sizes of ponds/lakes/bogs, as long as water temperatures are within tolerable limits and there is an inlet or outlet stream for spawning. FWS10983.

FWS recognizes two distinct groups of Arctic grayling that were native to the conterminous United States: one in the upper Missouri River basin in Montana and Wyoming and another in Michigan that was extirpated in the late 1930s. FWS10964. Historically, Arctic grayling were widely but irregularly distributed in the upper Missouri River system above Great Falls in Montana and in northwest Wyoming within the present-day boundaries of Yellowstone National Park. FWS10965. The distribution of Arctic grayling in the upper Missouri River basin has been reduced and the populations that formerly resided in the Smith, Sun, Jefferson, Beaverhead, Gallatin, and mainstem Missouri Rivers are considered extirpated. FWS10966.

Today, FWS has identified nineteen Arctic grayling populations that collectively make up the upper Missouri River basin DPS. FWS11009. To be included in the upper Missouri River basin DPS, a population must: "(1) occupy

natural habitat; (2) reproduce naturally[;] and (3) not be part of the captive brood (genetic) reserve program." FWS10969. These populations occur in the Big Hole River and its tributaries, the Centennial Valley, the Madison River, the Ruby River, and fifteen high elevation mountain lakes and reservoirs. FWS11010. In total, Arctic grayling occupy an estimated 314 miles of rivers and streams and 6,045 hectares of lakes and reservoirs. FWS11009. Fifteen of these nineteen populations occur solely on Federal land, two mostly on Federal land (~70% of the Ruby River and ~90% of the Centennial Valley), and two occur primarily (>90%) on private land (Big Hole River and Ennis Reservoir/Madison River). FWS11009.

II. Historical Agency Action and Management

A. Listing decisions

Arctic grayling have a long history of being petitioned for listing under the ESA. In 1982, FWS published its first status review for the Montana Arctic grayling (then thought to be a subspecies of the Arctic grayling). FWS10956. In that review, the agency designated the species a "Category 2 species," which meant that listing the species as endangered or threatened was possibly appropriate, but the agency did not have enough data to support a proposed rule to list the species. FWS10956.

Nearly a decade later, in 1991, the agency was petitioned to list the fluvial populations of Arctic grayling in the upper Missouri River basin as an endangered

species throughout its historical range in the conterminous United States. FWS10956. In 1993, FWS published its notice of a 90-day finding, which concluded that the petitioners had presented substantial information indicating that listing may be warranted. FWS10956–57. In 1994, the agency published its notice of a 12-month finding (the "1994 Finding"), which concluded that listing the fluvial Arctic grayling of the upper Missouri River basin was warranted but precluded by other higher priority listing actions. FWS10957. The 1994 Finding placed the species on the candidate list and assigned it a listing priority of nine, indicating that threats were imminent but of moderate to low magnitude. FWS10957. In 2003, environmental plaintiffs challenged the 1994 Finding. FWS10957. In response, FWS elevated the listing priority from nine to three, indicating threats that were imminent and of a high magnitude. FWS10957. The parties settled the dispute in August 2005, with FWS agreeing to submit a revised finding by April 2007.

In April 2007, FWS published a revised 12-month finding (the "2007 Finding"), which concluded that the fluvial Arctic Grayling of the upper Missouri River basin do not constitute a species, subspecies, or DPS under the ESA, and, therefore, the upper Missouri River basin population of fluvial Arctic grayling was not a listable entity under the ESA. FWS10958. The Arctic grayling was thereby removed from the candidate list. FWS10958. Environmental plaintiffs

subsequently challenged the 2007 Finding. FWS10958. The parties again reached a settlement, with FWS agreeing to solicit, via publication in the Federal Register, information on the status of the upper Missouri River Arctic grayling and to submit a new 12-month finding by the end of August 2010. FWS10958.

In September 2010, FWS published a revised 12-month finding (the "2010 Finding"), which concluded that fluvial and adfluvial Arctic grayling of the upper Missouri River basin do constitute a DPS under the ESA. FWS10959. The agency further concluded that the DPS was warranted for listing under the ESA but precluded by other higher priority listing actions. FWS10959. In 2011, as part of a settlement agreement in *In Re Endangered Species Act Section 4 Deadline Litigation*, Misc. Action No. 10–377 (EGS), MDL Docket No. 2165 (D.D.C 2011), FWS agreed to submit for publication in the Federal Register either a proposed listing rule for the upper Missouri River DPS of Arctic grayling or a not-warranted finding no later than the end of fiscal year 2014. FWS10959.

In August 2014, FWS published a revised 12-month finding (the "2014 Finding"), which concluded that listing the DPS was not warranted and removed the DPS from the candidate list. FWS10960. The agency found that the habitat-related threats it had previously identified, including habitat fragmentation, dewatering, thermal stress, entrainment, riparian habitat loss, and effects from climate change, had been sufficiently ameliorated and that nineteen of twenty

populations of Arctic grayling were either stable or increasing. FWS10960. Environmental plaintiffs challenged the 2014 Finding in this Court. FWS10961; *Ctr. for Biological Diversity v. Jewell*, No. CV 15-4-BU-SHE, 2016 WL 4592199 (D. Mont. Sept. 2, 2016). The Court ruled in favor of the government on all claims and plaintiffs appealed to the Ninth Circuit Court of Appeals.

In August 2018, the Ninth Circuit issued a decision affirming in part and reversing in part this Court's order. *Ctr. for Biological Diversity v. Zinke*, 900 F.3d 1053, 1075 (9th Cir. 2018) (hereinafter "*Zinke*"). The Ninth Circuit identified four errors in the 2014 Finding: (1) FWS should not have concluded that the Big Hole River grayling population was increasing when available biological information showed that the population was declining; (2) FWS should not have relied on cold water refugia in the Big Hole River because the agency failed to consider information showing that the river will experience low stream flows and high water temperatures; (3) FWS did not adequately explain why the uncertainty presented by climate change, specifically regarding low stream flows and higher water temperatures, did not weigh in favor of listing; and (4) FWS arbitrarily determined that the Ruby River grayling population was viable. *Id.* at 1068–75. The Ninth Circuit vacated the 2014 Finding and remanded to FWS for reconsideration. *Id.* at 1074–75.

In July 2020, FWS published the 2020 Finding, which is the focus of the

current litigation. Endangered and Threatened Wildlife and Plants; Four Species Not Warranted for Listing as Endangered or Threatened Species**,** 85 Fed. Reg. 44478 (July 23, 2020). In the 2020 Finding, FWS supplemented the 2014 Finding with new information and analysis in direct response to the errors identified by the Ninth Circuit. FWS10962. The agency again concluded that listing of the upper Missouri River DPS of Arctic grayling is not warranted at this time. FWS10955.

B. Management actions

In 1987, the Montana Arctic Grayling Recovery Program ("AGRP") was formed to address declines in the Big Hole River Arctic grayling population. FWS001424. The AGRP's technical workgroup, the Arctic Grayling Workgroup ("AGW"), is chaired by Montana Fish, Wildlife & Parks (MTFWP), and includes biologists from universities, state and federal resource management agencies, and representatives of private interest groups. FWS001424.

The AGW developed the Montana Fluvial Arctic Grayling Restoration Plan (the "Montana Restoration Plan"). FWS0001424. The Montana Restoration Plan, issued in November 1995, provides "general guidance for the restoration of fluvial Arctic grayling in Montana." FWS10336. The Montana Restoration Plan's restoration goal is "the presence, by the year 2020, of at least five stable, viable populations distributed among at least three of the major river drainages (e.g., Big Hole, Jefferson, Beaverhead, Madison, Gallatin, Sun, Smith) within the historic

range of Montana grayling in the Missoula River system upstream from Great Falls including those upper Missouri Basin waters within Yellowstone National Park." FWS10338. The plan also directs the development of reintroduction plans for specific "candidate streams." FWS10348–49. These plans are "designed to preserve the genetic/adaptive fluvial characteristics of any extent stocks of gray[l]ing in the drainage, with a goal of gathering pertinent data and establishing self-sustaining populations." FWS10349.

In December 1996, pursuant to the direction of the Montana Restoration Plan, MTFWP issued the Upper Ruby River Reintroduction Plan ("Ruby River Plan") to address population declines in the Ruby River. The Ruby River Plan sets forth objectives for establishing a "stable, naturally reproducing population" of Arctic grayling "above the Ruby Reservoir by 2005." FWS002559. These objectives are:

1) Monitor survival, movements and densities of introduced grayling to determine factors affecting success of reintroduction, and
2) Through monitoring, document natural reproduction by 2002, [and]
3) Attain stable to increasing population densities in sampling sections where natural reproduction equals or exceeds annual mortality for three consecutive years.

FWS002559. In 1997, pursuant to the Ruby River Plan, Arctic grayling were reintroduced to the Ruby River. In 2019, MTFWP determined that restoration efforts had "satisfied all project goals and is considered successful and complete." FWS010273.

Another product of the AGRP is the Big Hole River Candidate Conservation Agreement with Assurances (the "Big Hole CCAA"), issued March 30, 2006. FWS001165. A CCAA is "an agreement between the [FWS] and any non-Federal entity whereby non-Federal property owners who voluntarily agree to manage their lands or water to remove threats to species at risk of becoming threatened or endangered receive assurances against additional regulatory requirements should that species be subsequently listed under the [ESA]." FWS001167. The goal of the Big Hole CCAA "is to secure and enhance the population of fluvial . . . Arctic [g]rayling . . . within the upper reaches of their historic range in the Big Hole River drainage." FWS001167.

Under the Big Hole CCAA, "site-specific conservation plans will be developed with each landowner by an interdisciplinary technical team." FWS001167. The Big Hole CCAA implements conservation measures that:

1) Improve streamflows
2) Improve and protect the function of riparian habitats
3) Identify and reduce or eliminate entrainment threats for Arctic [g]rayling
4) Remove barriers to Arctic [g]rayling migration.

FWS001167. The plan has a twenty-year lifespan and is set to expire in 2026. FWS001239. MTFWP must notify FWS prior to expiration of the agreement if it desires to extend the CCAA past this timeframe. FWS001239. Site-specific plans have a minimum duration of 10 years from their inception but landowners may

seek an extension from MTFWP. FWS001239. As of December 31, 2019, the Big Hole CCAA had enrolled 32 private landowners, accounting for 148,320 acres of land, as well as 6,230 acres of Montana Department of Natural Resources and Conservation leased lands. FWS010221.

III. Current Litigation

Plaintiffs filed their Complaint on January 30, 2023, challenging FWS's 2020 Finding. In their first cause of action, Plaintiffs allege that FWS failed to analyze the adequacy of existing regulatory mechanisms, namely the Big Hole CCAA, thereby rendering the 2020 Finding arbitrary and capricious. (Doc. 1 at 50–51.) In their second cause of action, Plaintiffs allege that FWS "ignored and failed to utilize the best available scientific information in concluding that Arctic grayling in the upper Missouri River basin are not threatened by factors including small population size, small effective population size, habitat degradation, low genetic diversity, and climate change . . . , [and] failed to articulate a rational connection between the facts found and the choice ultimately made by the agency," thereby rendering the 2020 Finding arbitrary, capricious, and not in accordance with law. (*Id.* at 52.) Plaintiffs seek vacatur of the 2020 Finding and remand to FWS for further analysis. (*Id.* at 53.) Both parties, as well as Intervenor-Defendants the State of Montana and MTFWP, have moved for summary

judgment on all claims.[1] (Docs. 29, 32, 34.)

LEGAL STANDARDS

I. APA

The APA requires a reviewing court to set aside an agency's decision if it is "arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law." 5 U.S.C. § 706(2)(A). A decision is arbitrary and capricious "if the agency has relied on factors which Congress has not intended it to consider, entirely failed to consider an important aspect of the problem, offered an explanation for its decision that runs counter to the evidence before the agency, or is so implausible that it could not be ascribed to a difference in view or the product of agency expertise." *Motor Vehicle Mfrs. Ass'n of U.S., Inc. v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 43 (1983). An agency action likewise is arbitrary and capricious if the agency fails to articulate a satisfactory explanation for its action, including a rational connection between the facts found and the choice made. *Id.* A court may not accept an agency's post hoc rationalizations for its action. *Id.* at 50. "It is well-established that an agency's action must be upheld, if at all, on the basis articulated by the agency itself." *Id.*

ESA claims are reviewed under the APA standard, "[i]rrespective of whether

[1] Because Intervenor-Defendants present arguments that are entirely consistent with and largely repetitive of the arguments presented by Federal Defendants, the Court focusses its discussion on Federal Defendants' briefing.

an ESA claim is brought under the APA or the citizen-suit provision." *All. for the Wild Rockies v. Krueger*, 664 F. App'x 674, 675 (9th Cir. 2016) (quoting *W. Watersheds Project v. Kraayenbrink*, 632 F.3d 472, 491 (9th Cir. 2011)).

II. ESA

Under the ESA, FWS must "identify and list species that are 'endangered' or 'threatened.'" *Ctr. for Biological Diversity v. Zinke*, 868 F.3d 1054, 1057 (9th Cir. 2017) (quoting 16 U.S.C. § 1533). A threatened species "is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range," 16 U.S.C. § 1532(20), while an endangered species is "in danger of extinction throughout all or a significant portion of its range," *id.* § 1532(6). FWS must make listing and delisting determinations according to a five-factor analysis of potential threats, considering:

> (A) the present or threatened destruction, modification, or curtailment of [a species'] habitat or range;
> (B) overutilization for commercial, recreational, scientific, or educational purposes;
> (C) disease or predation;
> (D) the inadequacy of existing regulatory mechanisms; or
> (E) other natural or manmade factors affecting its continued existence.

16 U.S.C. § 1533(a)(1). The agency must make any determination "solely on the basis of the best scientific and commercial data available." *Id.* § 1533(b)(1)(A).

Any "interested person" may petition FWS to list a species. *Id.* § 1533(b)(3)(A). Upon receiving a petition, the agency must determine whether it

presents sufficient information to suggest that listing may be warranted. *Id.* If so, the Secretary must review the species' status and issue a "12-month finding" that listing is either (1) warranted, (2) not warranted, or (3) warranted but precluded by higher priority listing actions. *Id.* § 1533(b)(3)(B). Species in the third category become listing candidates, and their status is reviewed annually pending a final "warranted" or "not warranted" finding. *Id.* § 1533(b)(3)(C)(i).

III. Summary Judgment

The Court can resolve an issue summarily if "there is no genuine dispute as to any material fact" and the prevailing party is "entitled to judgment as a matter of law." Fed. R. Civ. P. 56(a). Material facts are those which may affect the outcome of the case. *Anderson v. Liberty Lobby, Inc.*, 477 U.S. 242, 248 (1986). A factual dispute is genuine when there is sufficient evidence for a reasonable factfinder to return a verdict for the other party. *Id.* If the moving party meets its initial responsibility, the burden then shifts to the opposing party to establish that a genuine issue of fact exists. *Matsushita Elec. Indus. Co. v. Zenith Radio Corp.*, 475 U.S. 574, 586 (1986).

DISCUSSION

Plaintiffs raise a number of challenges to FWS's 2020 Finding categorized into four topics: (1) population size and stability, (2) high stream temperatures and low water flows, (3) cumulative effects of climate change, and (4) durability of the

Big Hole CCAA. The Court will address each in turn.

I. Population Size and Stability

Plaintiffs claim that FWS "acted arbitrarily in dismissing the threats posed to the Upper Missouri's grayling as a result of their small and unstable population numbers." (Doc. 29-1 at 19.)

A. Relative stability of the Big Hole River grayling population

Plaintiffs argue that FWS's "repeated assertion that the population of grayling in the Big Hole River has achieved 'relative stability' was unfounded and arbitrary" because it runs counter to the evidence before the agency. (Doc. 29-1 at 20.) Federal Defendants contend that FWS's finding of relative stability within the Big Hole River population is supported by "multiple data sets and new information on population status trends." (Doc. 33 at 20.) Federal Defendants also counter that Plaintiffs have not identified any specific evidence that the agency failed to consider and, instead, only offer their own interpretation of the evidence before the agency. (Doc. 33 at 21.) The Court finds that Defendants are entitled to summary judgment on this issue.

In *Zinke*, the Ninth Circuit found that, in its 2014 Finding, FWS arbitrarily determined that the fluvial arctic grayling population was increasing. The Court explained that the agency had failed to account for the DeHaan et al. (2014) study, which found that the number of effective breeders in the Big Hole River was

declining, and by ignoring this data, FWS had acted in an arbitrary and capricious manner. 900 F.3d at 1068.

In its 2020 Finding, FWS concluded that the "population of Arctic grayling in the Big Hole River is demographically and genetically stable and appear to be responding favorably to conservation actions that have been implemented over the past several decades." FWS11020. FWS based its finding on several datasets and studies: the MTFWP electrofishing dataset; DeHaan et al. (2014); Leary (2014); Whiteley et al. (2018); and Kovach (2019). FWS11011–12. The agency compared the methodologies and results of these five datasets and explained the shift from using catch-per-unit to N_b as the most effective measure of numerical abundance.[2] FWS11016. The agency acknowledged that the MTFWP and DeHaan et al. (2014) datasets "indicate population declines in abundance of Arctic grayling and [N_b] in the Big Hole River from the 1990s to 2006." FWS11019. However, the agency went on to explain that data from DeHaan et al. (2014), Leary (2014), Whiteley et al. (2018), and Kovach et al. (2019) "indicate N_b estimates stabilized in the Big Hole River from 2003 to 2011," and from 2012 to 2019 "N_b estimates increased 11% on average, compared to estimates from 2007 [to] 2011." FWS11019. Additionally, "[d]espite historical declines in both abundance and number of

[2] N_b is the number of reproductively successful adults contributing genetic variation to a given cohort. FWS11016.

breeding adults," data from these same studies "indicate that little genetic variation has been lost in the Big Hole River population, and current rates of expected loss are very low." FWS11019. Accordingly, the agency concluded that "[m]ultiple lines of evidence indicates that the Big Hole River Arctic grayling population has more effective breeders on average than when the CCAA started, stable genetic diversity[,] and is more robust and resilient than in the past." FWS11019.

Plaintiffs argue that these studies show that the Big Hole River grayling population is "small and volatile" not stable. (Doc. 29-1 at 23.) Although the Court agrees that the scientific data does not immediately present a clear picture of a stable population, the Court must defer to the agency's interpretation of complex scientific data where the agency has relied on the best available scientific information and has provided a rational explanation for its decision. *Nw. Ecosystem All. v. U.S. Fish & Wildlife Serv.*, 475 F.3d 1136, 1150 (9th Cir. 2007) (citing *United States v. Alpine Land & Reservoir Co.*, 887 F.2d 207, 213 (9th Cir. 1989) ("Deference to an agency's technical expertise and experience is particularly warranted with respect to questions involving engineering and scientific matters.")). Although Plaintiffs offer their own interpretation of the scientific data, FWS supported its decision with sufficient evidence and Plaintiffs have not identified any scientific data that FWS failed to consider. Furthermore, FWS addressed the error identified by the Ninth Circuit by expressly considering the

data of DeHaan et al. (2014) and explaining how that information supports the agency's determination. Accordingly, the Court finds that the agency did not err in determining that the Big Hole River population of Arctic grayling is relatively stable.

B. Reliance on the viability of the Ruby River grayling population

Plaintiffs argue that FWS's "attempt to rely on the viability of grayling within the Ruby River was also arbitrary." (Doc. 29-1 at 25.) Plaintiffs specifically challenge FWS's determination that the Ruby River grayling population is a "stable and viable" genetic reservoir as defined by the Montana Restoration Plan. (*Id.* at 25–28.) Federal Defendants contend that the Ruby River population meets the viable population criteria outlined by the Montana Restoration Plan and the Ruby River Plan based on ten consecutive years of natural reproduction. (Doc. 33 at 23.) The Court finds that Plaintiffs are entitled to summary judgment on this issue because FWS's viability determination is inconsistent with the Montana Restoration Plan's definition of viability.

Under the Montana Restoration Plan, "[a] population will be considered stable and viable in a stream when monitoring confirms that, for at least 10 years, successful stock recruitment exceeds mortality of reproductive adults to successfully compensate for stochastic factors and perpetuate the species within suitable habitats." FWS10338. In *Zinke*, the

Ninth Circuit held that the 2014 Finding's determination that the Ruby River population was viable and could provide redundancy was arbitrary and capricious. *Zinke*, 900 F.3d at 1074. The court explained that the agency's "reliance on the Ruby River's viability as a genetic reservoir contradicts FWS's criteria for judging viability [under the Montana Restoration Plan], which requires 'at least 10 years' of monitoring data to confirm that a population is viable" because the agency relied on only five years of monitoring data. *Id.*

In its 2020 Finding, FWS again concluded that the Ruby River population is viable and provides redundancy, this time based on monitoring that took place from 2009 to 2018—Gander et al. (2019)—that demonstrated "natural reproduction" for ten consecutive years. FWS11025. Based on this monitoring data and observed genetic diversity in the Ruby River population, FWS concluded that all objectives of the Montana Restoration Plan and Ruby River Plan had been met. FWS11027.

Plaintiffs first argue that FWS "failed to consider whether evidence of natural reproduction was alone enough to demonstrate 'successful stock recruitment.'" (Doc. 29-1 at 27.) Federal Defendants respond that evidence of natural reproduction is an accurate measure of recruitment in the Ruby River. (Doc. 33 at 23.) The Montana Restoration Plan does not define

recruitment; however, as Plaintiffs point out, pursuant to FWS's own experts, Arctic grayling recruit at "age-3" when they join the adult breeding population. FWS000048, 52; FWS10839. Thus, it would appear that "successful stock recruitment" is not just a measure of natural reproduction—i.e., the number of fish that are born—but a measure of the number of grayling that are born *and* survive to breeding age. Yet, FWS relied on natural reproduction data that includes "young-of-year" or "age-0" fish, which are not of recruitment age. Gander et al. (2019) explains that "[n]atural reproduction of grayling was documented by electrofishing surveys in each of the past 10 years" and "[n]aturally-produced young-of-year grayling (YOY) were captured in all sampling events from 2009 to 2018." FWS010271. Accordingly, the evidence in the record supports Plaintiffs' position that natural reproduction data is an inaccurate measure of successful stock recruitment.

Federal Defendants next respond that FWS satisfied the Montana Restoration Plan's "stable and viable" criteria by "directly address[ing] the relevant factors in the Ruby River Plan used for determining 'successful stock recruitment' including monitoring natural reproduction, survival, movement, and density." (Doc. 33 at 24.) Although the Ruby River Plan was developed pursuant to the direction of the Montana Restoration Plan,

nothing in the language of either plan supports Federal Defendants' argument. There is no evidence that the Montana Restoration Plan's definition of a stable and viable population is superseded by the Ruby River Plan's restoration goals. Nor is there any indication that the Ruby River Plan's restoration goals provide a proxy metric for successful stock recruitment. Again, this argument appears to rest on the presumption that natural reproduction is synonymous with successful stock recruitment, which is unsupported by the record.

Plaintiffs next argue that even if successful stock recruitment could be reasonably inferred from natural reproduction, the agency still failed to quantify the river's annual mortality of reproductive adults and compare this mortality rate to the rate of recruitment. (Doc. 33 at 28.) The Court need not address this argument because there is no evidence that successful stock recruitment can be reasonably inferred from natural reproduction. Accordingly, the 2020 Finding's determination that the Ruby River population was viable and could therefore provide redundancy was arbitrary and capricious.

C. Reliance on the Centennial Valley and Madison River grayling populations

Plaintiffs argue that FWS "could not reasonably rely on grayling in the Centennial Valley or Madison River drainage to provide needed redundancy"

because those populations are too "precarious." (Doc. 29-1 at 28, 29.) Federal Defendants contend that Plaintiffs mischaracterize the agency's findings by mistaking redundancy for resiliency and ignoring the agency's findings as to the Centennial Valley population's status. (Doc. 33 at 26–27.) The Court finds that Defendants are entitled to summary judgment on this issue.

In its 2020 Finding, FWS explained that the four primarily fluvial populations of Arctic grayling in the Upper Missouri River DPS (Big Hole, Centennial, Madison, and Ruby River) "may be an important source of adaptive capacity for the DPS as a whole" because "they contain the only populations with a fluvial component on the spectrum of life histories within the DPS." FWS11138. Given the potential significance of this portion of the DPS, the agency gave further consideration to "whether Arctic grayling may be, in that portion, either in danger of extinction or likely to become so in the foreseeable future." FWS11138. The agency determined that "there is sufficient redundancy within the primarily fluvial systems to protect from catastrophic events, as there are four river systems within this group that are separated by tens to hundreds of miles." FWS11138.

When considering whether the Madison River provides some redundancy for the fluvial portion of the DPS, the agency acknowledged that the Madison River has a low abundance of grayling and a higher density of nonnative trout relative to other populations and "may potentially be considered in danger of extinction or

likely to become so in the foreseeable future." FWS11140. Further, because the "Madison River contains only 15 miles of habitat occupied by Arctic grayling, representing [5%] of the total miles of occupied [A]rctic grayling river habitat . . . , its contributions to redundancy and representation are small." FWS11140. Nonetheless, the agency found that the Madison River provides some redundancy because it does not share the same common catastrophic risks as other fluvial populations. FWS11138.

Regarding the Centennial Valley, FWS found that there is "substantial redundancy" within the Centennial Valley population itself, "in the form of multiple, occupied tributaries and mainstem habitats." FWS11139. Grayling "habitat has been stable or improving, and there are few threats of concern," and, like the Big Hole River, the Centennial Valley's tributaries "have cooler water temperatures that rarely exceed the stress threshold for Arctic grayling" and intact riparian areas that are expected to provide buffering against climate change. FWS11139.

Plaintiffs argue that the Madison River and Centennial Valley populations are either declining or are unstable, and therefore do not provide the needed redundancy that FWS relies upon. (Doc. 29-1 at 27.) Plaintiffs cite to *Zinke* for the premise that FWS "cannot reasonably rely on a population to provide needed redundancy—and protection from catastrophic events—unless the population is

itself viable." (Doc. 39 at 13.) Federal Defendants respond that "redundancy occurs when populations do not share catastrophic risks. And FWS considered separation in fluvial systems, occupation of habitats, resilience to climate change, and resiliency of populations in determining redundancy." (Doc. 33 at 26.) Federal Defendants also contend that Plaintiffs' reliance on *Zinke* is misplaced. (Doc. 44 at 11.)

Plaintiffs appear to confuse redundancy in the fluvial portion of the DPS as a whole with population size and stability of individual fluvial populations within the DPS. Redundancy exists where "populations do not all share common catastrophic risks." FWS11119. Redundancy is just one component of a population's resiliency—that is, the capacity to withstand stochastic threats that could lead to a population's extirpation. FWS11119. Resiliency is also determined by life-history diversity as well as population distribution, productivity, and size. FWS11119–21. Thus, a particular population's size, stability, or viability is not determinative of redundancy within the DPS as a whole. Plaintiffs' reliance on *Zinke* is also misplaced. The court in *Zinke* did not hold that the agency must demonstrate the viability of a population in order to establish that the population provides redundancy to the fluvial portion of the DPS; rather, the court held that the agency must adhere to its own criteria for determining viability when the agency relies on a population's viability in reaching its final decision.

Because the agency provided a rational basis supported by evidence in the record for its finding that the Madison River and Centennial Valley populations of Arctic grayling provide redundancy for the fluvial portion of the DPS and the agency did not rely on a finding of viability within either population, the agency's determination was not arbitrary or capricious.

D. Genetic threats posed by the grayling's small and isolated subpopulations

Plaintiffs' final argument under the umbrella of small and unstable populations is that FWS "acted arbitrarily in dismissing the genetic threats posed by the grayling's small and isolated subpopulations within Montana." (Doc. 29-1 at 30.) Federal Defendants respond that the Ninth Circuit has already addressed and dismissed Plaintiffs' argument. (Doc. 33 at 27.) The Court finds that Defendants are entitled to summary judgment on this issue because the agency supported its decision with the best available scientific evidence and provided a rational explanation for its decision.

In *Zinke*, the Ninth Circuit held that "FWS's determination [in its 2014 Finding] that the [A]rctic grayling's small population size does not pose a risk to genetic viability of the [A]rctic grayling is not arbitrary or capricious." 900 F.3d at 1073. The court explained:

> FWS did consider long-term genetic viability and simply concluded that, given the increased population and 'updated genetic information that was not available in 2010,' any concern about long-term genetic

> viability did not merit listing the [A]rctic grayling. FWS provided a reasoned explanation for why it did not view lack of genetic diversity as a threat. And that determination was not arbitrary or capricious; difference of opinion does not warrant a contrary conclusion.

Id. at 1073–74.

In its 2020 Finding, FWS acknowledge that the "Upper Missouri River DPS of Arctic grayling exists largely as a collection of isolated populations with little or no gene flow among populations." FWS11119. "While the inability of fish to move between populations limits genetic exchange and demographic support, large population sizes coupled with adequate number of breeding individuals minimizes the effects of isolation." FWS11119. Based on a review of the available science, FWS determined that "loss of genetic diversity is typically not an immediate threat, even in isolated populations with an N_e <100, but rather is a symptom of deterministic processes acting on the population."[3] FWS11120 (internal citations omitted). In other words, "loss of genetic diversity due to small effective population size typically does not drive species to extinction"; instead, "other processes, such as habitat degradation, have a more immediate and greater impact on species persistence." FWS11120. Thus, the agency concluded that while "loss of genetic diversity can occur in small populations . . . in this case, it appears that there are adequate numbers of breeding adults to minimize loss of genetic diversity

[3] N_e is the genetic "effective population" size, which dictates the rate at which genetic variation is lost and inbreeding accumulates within a population. FWS11018.

in many of the [upper Missouri River basin DPS] populations." FWS11120.

Plaintiffs argue that FWS "arbitrarily attempted to dismiss genetic threats altogether," (Doc. 29-1 at 31), by "narrowly focusing its analysis on 'immediate' threats" and "fail[ing] to give reasonable consideration to the possibility that the Upper Missouri's grayling [are threatened] as a result of their isolation, limited genetic diversity, and already 'imminent' prospects of further genetic losses," (*id.* at 32). Plaintiffs attempt to distinguish from the Ninth Circuit's holding in *Zinke* by pointing to "new" evidence in the record that was not available in 2014 and which "confirm[s] the threat posed to the Upper Missouri's river-dwelling populations by their small numbers and genetic isolation." (*Id.* at 33.) Plaintiffs specifically cite to a purported decline in the effective population size in the Big Hole River, Centennial Valley, Ruby River, and Madison River grayling populations. (*Id.* at 33–34.) Plaintiffs also cite to the scientific study Jamieson & Allendorf (2012), which concluded that an N_e<500 is insufficient to maintain long-term genetic diversity. (*Id.* at 33.)

FWS's analysis in its 2020 Finding, like its analysis in its 2014 Finding, considered the effects of small subpopulations of grayling on genetic diversity and determined that long-term genetic viability was not a threat to the Upper Missouri River DPS of Arctic grayling. Furthermore, FWS did consider the Jamieson & Allendorf (2012) study but determined that a threshold of N_e <100 is supported by

the best available science. FWS11120. Again, Plaintiffs offer their own interpretation of the evidence in the record but they have not met their burden to show that FWS acted in an arbitrary or capricious manner.

II. High Stream Temperatures and Low Water Flows

Plaintiffs next claim that FWS "arbitrarily dismissed current and future habitat threats posed by high stream temperatures and low flows." (Doc. 29-1 at 35.)

A. Higher water temperatures in the Big Hole River

Plaintiffs argue that FWS arbitrarily dismissed data indicating that water temperatures exceeding 70°F are of increasing duration in the Big Hole River and its tributaries. (*Id.* at 36.) Federal Defendants contend that FWS supported its decision with the best available scientific evidence. (Doc. 33 at 30.) The Court finds that Defendants are entitled to summary judgment on this issue.

In its 2020 Finding, FWS found that, "on average, [the] cumulative number of hours that maximum daily water temperatures reached or exceeded the 21°C [70°F] and 25°C [77°F] water temperature thresholds in the mainstem Big Hole River and tributaries has trended downward since the inception of the CCAA." FWS11050–51. The "data indicate[s] that stressful water temperature conditions for Arctic grayling in the Big Hole River and its tributaries, although still present, have decreased in duration since the inception of the CCAA." FWS11051. The

agency went on to find that "considerable heterogeneity in water temperatures (changes in water temperature over short distances) exists in the Big Hole River and its tributaries." FWS110151. The agency explained that "[t]his heterogeneity is often in the form of groundwater mixing or tributary mouths . . . and is important because it provides thermal refugia for Arctic grayling . . . when water temperatures elsewhere in the system become stressful." FWS110151–52. Relatedly, the agency noted that the Big Hole River and its tributaries exhibit a "pattern of cooler water upstream and warmer water downstream." FWS11053.

Plaintiffs argue that FWS relied on temperature fluctuations throughout the Big Hole River and its tributaries without evidence that such heterogeneity exists. (Doc. 29-1 at 37). In its 2020 Finding, the agency acknowledged that the "extent of water heterogeneity in the Big Hole River and its tributaries" is not accurately captured by existing monitoring stations and water temperature recorders. FWS11052–53. However, FWS cited several scientific studies that support their heterogeneity finding. FWS11051–53. Vatland et al. (2015) found "considerable spatial and temporal heterogeneity in summer stream temperatures in the study portion of the Big Hole River." FWS009310. Likewise, McCullough (2019) observed "heterogeneous thermal regimes" in the Big Hole River, "with cooler water temperatures in upstream reaches," FWS0067087, and Vatland (2015) noted that "areas of groundwater influence . . . may provide cold-water refugia,"

FWS009379. Plaintiffs do not cite any contrary evidence or provide any alternative interpretation of the cited evidence.

Next, Plaintiffs argue that FWS dismissed high water temperatures recorded at downstream monitoring locations by asserting that temperatures would be cooler upstream despite evidence that grayling require both upstream and downstream habitats and therefore overlooked an important aspect of the problem. (Doc. 29-1 at 38.) Plaintiffs cite to Lamothe & Magee (2003) and an email from MTFWP biologist Jim Olsen in support of their argument. However, the record demonstrates that FWS did consider Arctic grayling migration up and downstream and neither source cited by Plaintiffs contradicts the agency's findings.

In the 2020 Finding, FWS described the Arctic grayling's movement patterns throughout their habitat in response to cyclical and episodic warming, rearing-feeding, and spawning. *See, e.g.*, FWS10984, FWS11053. The agency cited to Lamothe & Magee (2003), which observed that Arctic grayling are "capable of long distance movements, in excess of ten miles, in a very short period of time," and ""[i]ndividual fish are using different parts of the watershed during different times." FWS006265. The study further noted that "some Arctic grayling are moving downstream after spawning, possibly to access more productive feeding areas," grayling showed a preference for deep pools that are more abundant in the lower sections of the Big Hole River, and peak movement for

grayling occurred between May 24 and June 12, which appeared to correlate with "the high flows that occurred during this period of time." FWS006265. The agency also cited MTFWP biologist Olsen's email, which states that "habitat quality for adult fish also improves downstream" where "[s]ubstrate size increases and pools are more frequent and of higher quality than upstream." FWS000911. Thus, contrary to Plaintiffs' argument, FWS did consider this important aspect of the problem.

Finally, Plaintiffs argue that FWS disregarded science indicating that "high temperatures, even if experience for part of the day, harm grayling." (Doc. 29-1 at 39.) Plaintiffs claim that FWS "ignored monitoring data demonstrating that stressful water temperatures persist, on average, from 32 to 175 hours *each time they occur*" and that "high temperatures, even if experienced for part of the day, harm grayling." (*Id.*) The record demonstrates that FWS did not disregard scientific evidence on this issue.

FWS described the thermal thresholds for Arctic grayling and cited the scientific studies that support them. FWS11045–46. In doing so, FWS acknowledged that higher water temperatures, although not always lethal, may negatively impact grayling. FWS11045. However, the agency also found that grayling are generally only exposed to these higher temperatures for a portion of the day, "not constantly over consecutive days." FWS11049. Moreover, the

evidence demonstrates that grayling will migrate to cooler areas to mitigate the harms of these warmer temperatures. FWS11049.

Additionally, the temperature data cited by Plaintiffs—which FWS also cites in the 2020 Finding—does not indicate an average of 32 to 175 hours of stressful temperatures per exposure. FWS010326–27. Rather, the highest average daily duration above 21°C (70°F) was below ten hours, with several locations recording zero hours. FWS010326–27. The highest average daily duration above 25°C (77°F) was approximately six hours, with the majority of locations recording zero hours. Accordingly, this data does not demonstrate the persistently high temperatures argued by Plaintiffs.

The Court is satisfied that FWS did not act in an arbitrary and capricious manner or contrary to law when addressing the water temperatures in the Big Hole River.

B. Ability to access thermal refugia in the Big Hole River

Plaintiffs argue that FWS "arbitrarily analyzed the grayling's ability to access thermal refugia." (Doc. 29-1 at 40.) Plaintiffs raise several specific challenges to the agency's reliance on thermal refugia. Federal Defendants again contend that FWS relied on the best available science. (Doc. 33 at 29.) The Court finds that Defendants are entitled to summary judgment on this issue because FWS provided a reasoned and supported analysis of the grayling's use of thermal

refugia.

In *Zinke*, the Ninth Circuit found that, in its 2014 Finding, FWS had erroneously relied on cold water refugia in the Big Hole River to mitigate against the threat of low stream flows and high water temperatures. 900 F.3d at 1069. The court found that FWS had "based its determination [that cold water refugia minimizes these threats] largely on a study[, Vatland (2015),] that found that the tributaries of the Big Hole River provide important cold water refugia." *Id.* at 1070. The agency had also relied on the installation of fish ladders under the Big Hole CCAA to increase connectivity to cold water tributaries. *Id.* The court concluded that the agency had acted in an arbitrary and capricious manner because it had failed to provide any evidence or scientific studies demonstrating that use of fish ladders to access thermal refugia was likely to occur. *Id.* The court also found it notable that in its 2010 Finding, the agency concluded that access to thermal refugia would not overcome the threats of high water temperatures and the agency erred by failing to provide a reasoned explanation for its change in position. *Id.* The court further explained that "[a]lthough there have been improvements in stream flow and water temperatures since 2010, the water temperatures are still above those that are ideal for the [A]rctic grayling both in the main stem of the Big Hole River and its tributaries." *Id.* at 1071.

In response to *Zinke*, FWS revised its discussion of cold water refugia and

provided additional scientific data and studies to support its position. In its 2020 Finding, FWS explained that "[f]ish response to changing water temperatures are a well-studied phenomenon," especially with respect to salmonids, with some studies indicating that fish have the ability to detect changes in water temperature as small as 0.5°C (0.9°F). FWS11053–54. The agency found that Arctic grayling, in particular, "have demonstrated their ability to seek, find, and use thermal refugia in tributaries when water temperatures in the mainstem become warm." FWS11053. In the Big Hole River, Arctic grayling are utilizing "thermal refugia in the lower part of the CCAA Project Area, or parts of the mainstem Big Hole River downstream of the CCAA areas that have high quality pool habitats and cooler water temperatures, when other areas of the mainstem Big Hole River or [its] tributaries become warm." FWS11054 (internal citations omitted). Thus, according to FWS, the Arctic grayling's ability to access and utilize thermal refugia plays a critical role in the species' continued survival.

Plaintiffs argue that FWS relied on speculative evidence that Arctic grayling actually utilize refugia. (Doc. 29-1 at 40.) The Court disagrees. In the 2020 Finding, FWS cited to several studies that support their findings on the grayling's use of thermal refugia. For example, Lamothe & Magee (2003) observed that Arctic grayling moved to the lower sections of the Big Hole River, and one possible explanation for this behavior "is that the smaller tributaries in this area

may serve as important refugia during periods of thermal extreme." FWS006265. FWS also relied on the opinion of MTFWP biologist Jim Olsen, who observed that grayling had migrated and suggested that one explanation for this movement could be thermal refugia from cooler surface and groundwater sources. FWS000911.

Plaintiffs characterize this evidence as "speculative," but this is inaccurate. Although there may be some uncertainty as to the ultimate reason(s) for the grayling's movement in particular instances, the evidence, as a whole, supports the premise that grayling utilize thermal refugia. MTFWP's Arctic grayling monitoring reports repeatedly note that grayling "[t]ributaries are acting as critical refugia during stressful thermal regimes," FWS009928, and that observed migration may be attributed to thermal refugia. FWS009939, FWS009945, FWS009977. This premise is further supported by the large body of research regarding use of thermal refugia by salmonids, like Arctic grayling, cited by FWS in the 2020 Finding. *See* FWS 11053–54.

Next, Plaintiffs argue that FWS arbitrarily concluded that "sufficient refugia remain to offset the negative effects of heat-caused degradation." (Doc. 29-1 at 41). The Court again disagrees. The agency found that historical warming was happening more slowly since enactment of the Big Hole CCAA. FWS11050. Based on recent monitoring, the agency found that "on average, [the] cumulative number of hours that maximum daily water temperatures reached or exceeded the

21°C [70°F] and 25°C [77°F] water temperature thresholds in the mainstem Big Hole River and tributaries has trended downward since the inception of the CCAA. FWS11050–51. The agency also concluded that the Big Hole CCAA would continue to result in cooler water temperatures and improved access to refugia despite the effects of climate change. FWS11086, FWS11126. Based on these findings, coupled with the observed trends in the Big Hole River's grayling population in recent years, the Court is satisfied that the agency did not act arbitrarily. To the extent Plaintiffs argue it was erroneous for FWS to rely on the continued success of the Big Hole CCAA in reaching this determination, the Court addresses that argument below.

Lastly, Plaintiffs argue that FWS "disregarded science demonstrating that high temperatures and low flows could block grayling movement, potentially rendering refugia inaccessible when they are needed most." (Doc. 29-1 at 42.) Plaintiffs cite to Magoulick & Kobza (2003) and Vatland (2015) in support of their argument. (*Id.* at 43.) In Magoulick & Kobza (2003), researchers observed that "[i]n drying streams, riffles or other habitat patches may act as barriers to fish movement even before habitats dry completely," FWS006512, and "[d]rought in aquatic systems leads to shifts in refugia spacing and connectance at multiple spatial and temporal scales," FWS006513. Vatland (2015) discussed the possibility that "[c]ontiguous sections of the [Big Hole River] projected to exceed

chronic and acute thresholds could act as thermal barriers to fish migration, especially in the main stem," which could "negatively affect populations with migratory life history components, including fluvial Arctic grayling." FWS009379.

Contrary to Plaintiffs' argument, FWS did address access to refugia in its 2020 Finding. FWS found that grayling will seek refugia before temperatures reach a stressful or lethal point. FWS11045–55, FWS006255. FWS also found, based on the most recent monitoring data, that conservation actions associated with the Big Hole CCAA "have reduced water temperatures in tributaries, increased instream flows in tributaries and the mainstem Big Hole River, decreased the duration of stressful or lethal water temperatures for Arctic grayling, connected almost all core habitat so Arctic grayling can access thermal refugia if water temperatures become too warm in parts of the Big Hole River system, and improved riparian health." FWS11129. Thus, the Court concludes that the agency did not arbitrarily ignore this aspect of the problem or disregard science that was contrary to its position. The Court is also satisfied that the agency remedied the errors identified by the Ninth Circuit in *Zinke*.

C. Low stream flows in the Big Hole River

Plaintiffs next argue that FWS's "analysis of low stream flows in the Big Hole was arbitrary." (Doc. 29-1 at 43.) Plaintiffs claim that the voluntary

irrigation withdrawal limits and "minimum flow targets" of the Big Hole CCAA are "insufficient to alleviate the threat posed by low flows" and, therefore, the agency's reliance on these components of the Big Hole CCAA was arbitrary. (*Id.* at 44.) Federal Defendants contend that the agency fully addressed how the Big Hole CCAA's flow targets contribute to the stabilization of the Big Hole River's grayling population. (Doc. 33 at 35.) The Court finds that Defendants are entitled to summary judgment on this issue because the agency's reliance on the Big Hole CCAA's minimum flow targets was not arbitrary or capricious.

The Big Hole CCAA sets "minimum flow targets" for the segments of the Big Hole River that are managed under the agreement. FWS001199–200. The flow targets are "based on the best available data and application of the wetted perimeter inflection point method . . . in conjunction with professional judgment." FWS001199. These flow targets are intended to "ensure instream flow resources sufficient to promote the recovery of grayling above their current population level." FWS001199. The CCAA explains that "[t]he optimal flow regime for each life stage of grayling in the Big Hole River is currently unknown, but the minimum target values presented are considered adequate to protect their habitat." FWS001200. Separate flow targets are set for Spring (April to June) and Summer through Fall (July to October). FWS001200.

The CCAA recognizes that these targets may not always be met due to

factors such as "delayed spring run-off, water use by non-enrolled landowners, and cumulative drought conditions." FWS001200. "The Agencies estimate that after 10 years of Agreement implementation, stream flows in the Project Area will meet or exceed target values at least 75% of the days during the spring period and during the summer and fall period in years with an average snowpack." FWS001201. However, the targets were set at a level so that flows approaching the established target "will still provide benefits to the system when compared to present conditions." FWS001200. In its 2020 Finding, FWS concluded that its target of 75% compliance has been exceeded, and that the minimum flow targets have contributed to increased instream flows and reduced water temperatures. FWS11037; FWS11055; FWS11073.

Plaintiffs' primary contentions appear to be that the minimum flow targets are inadequate because "even when the CCAA's goals are fully met, there can be insufficient water in the Big Hole a quarter of the time—and even greater shortages during years with less-than-average snowpack." However, Plaintiffs' argument ignores that, when setting the minimum flow targets, the agency considered that the targets would not always be met and set flow targets that would nonetheless provide the necessary benefit to the species. Indeed, it appears that these benefits have been realized, both in terms of increased instream flow since implementation of the CCAA and corresponding improvement in the Big Hole's grayling

population. Plaintiffs have not provided any evidence that is contrary to the flow targets set in the CCAA or the agency's finding that these targets have resulted in improvement to instream flow. Accordingly, the Court is satisfied that FWS's analysis of low stream flows in the Big Hole was not arbitrary. However, to the extent Plaintiffs' argument rests on the durability of the Big Hole CCAA, the Court addresses this argument below.

D. Temperature and stream flow in the Ruby River

Plaintiffs' final argument under the umbrella of high stream temperatures and low water flows is that FWS arbitrarily "disregarded potential thermal threats" to the Ruby River population. (Doc. 29-1 at 45.) Specifically, Plaintiffs claim that FWS ignored evidence that shows "frequent exceedances of the chronic [temperature] threshold" in the Ruby River and arbitrarily dismissed concerns regarding potential harms to the Ruby River population resulting from these increasing temperatures. (*Id.*) Federal Defendants contend that the agency "fully considered all relevant threats" to the Ruby River grayling population. (Doc. 33 at 37.) The Court finds that Defendants are entitled to summary judgment on this issue because FWS did consider thermal threats to the Ruby River population using the best available science.

Regarding water temperatures, in its 2020 Finding, FWS referenced the "most recent water temperature data" for the Ruby River, which indicated

"maximum daily water temperatures exceeded 21°C (70°F) in certain sections of the Ruby River" in 2014 and 2015, but that other portions of the river "did not exceed 21°C (70°F) during those same years." FWS11062. This same data also indicated that the total annual duration of these temperature threshold exceedances was less than 104 hours in 2015 and 54 hours in 2014. FWS11062. FWS determined that "these durations are low relative to the total duration of time during summer and even if all the hours of stressful water temperatures occurred sequentially, effects would be expected to be temporary and non-lethal," even assuming that the grayling do not utilize thermal refugia, which has not been documented in the Ruby River population. FWS11062. Furthermore, "[m]aximum daily water temperatures did not exceed 25°C (77°F) in either 2014 or 2015 in any section of the Ruby River, thus no mortality would be expected." FWS11062–63 (internal citation omitted). The agency further noted that because monitoring of temperature data occurs at fixed sites, the data does not capture heterogeneity within the river system. FWS11063.

Thus, contrary to Plaintiffs' argument, FWS did take into consideration thermal threats to the Ruby River grayling population and did not improperly speculate that grayling utilize thermal refugia in the Ruby River. Plaintiffs do not cite to any available evidence that FWS failed to consider. Accordingly, the Court finds that FWS did not act in an arbitrary and capricious manner when assessing

the threats to the Ruby River grayling population.

III. Cumulative Effects of Climate Change

Plaintiffs next argue that FWS "irrationally and unlawfully dismissed climate-change threats." (Doc. 29-1 at 46.) Federal Defendants respond that the agency "thoroughly analyzed the threats associated with climate change." (Doc. 33 at 39.) The Court finds that Defendants are entitled to summary judgment on this issue because FWS adequately considered the effects of climate change.

In *Zinke*, the Ninth Circuit held that FWS acted in an arbitrary and capricious manner "[b]y failing to explain why the uncertainty of climate change favors not listing the [A]rctic grayling when the 2014 Finding acknowledges the warming of water temperatures and decreasing water flow because of global warming." 900 F.3d at 1073. In its 2020 Finding, FWS supplemented its climate change analysis using new "climate change studies that provide more information about [the] potential interactions" between climate change and other potential stressors. FWS11122. The agency explained that, according to recent studies, the "projected effects of climate change on water temperature and water availability are not expected to be synergistic (i.e., that the collective sum of effects is greater than the sum of individual effects), but rather cumulative (i.e., increasing by successive additions)." FWS11123. Thus, the agency focused its discussion "on the potential cumulative effects of climate change on the properties of water."

FWS11123.

Based on this new information, FWS found that warming air temperatures are expected in the upper Missouri River basin, which are expected to result in increased water temperatures in some streams or portions of streams. FWS11123. However, "warming of regional water temperatures (including in most of the upper Missouri River basin) has progressed slower than previously modeled, and future predicted warming is likely to continue at a similar, slow rate." FWS11123. Furthermore, although "warming water temperatures . . . are predicted to decrease available habitat for cold-water fishes . . . , habitats capable of supporting cold-water fishes are predicted to remain at least into the 2080s." FWS11124. Some evidence shows that cooler water sites used by Arctic grayling in the Big Hole River in the 2000s are expected to remain relatively cool through at least the 2060s. FWS11124. Recent data also shows that riparian area restoration along tributaries in the Big Hole River as part of the Big Hole CCAA "has been successful in mitigating warming water temperatures due to climate change." FWS11126. "Water temperatures considered stressful or lethal to Arctic grayling are trending downward since the inception of the CCAA," and thermal refugia "are expected to be present and available to Arctic grayling in the future." FWS11128.

Plaintiffs first argue that the "record evidence universally supported a finding that climate change will harm grayling in the foreseeable future." (Doc.

29-1 at 46.) Plaintiffs cite to three studies in support of their argument, Vatland (2015), Isaak (2015), and Isaak (2016). (*Id.* at 47.) Plaintiffs claim that, although FWS cited to these studies, the agency erroneously discounted their "dire predictions" and selectively relied on portions of their findings. (*Id.* at 47–48.) The Court disagrees with Plaintiffs' characterization of this evidence and FWS's reliance on it.

Vatland (2015) "used a statistical modeling approach to evaluate the effects of climate change on summer water temperatures in the valley-bottom stream network of the upper Big Hole River watershed." FWS009355. The study's "simulations projected significant stream warming because of climate change from the 1980s through the 2060s," with water temperatures in 50% of the stream network exceeding the chronic threshold (21°C or 70°F) for half of the summer or more in the 2060s and 35% of the stream network exceeding the acute threshold (25°C or 77°F) for half of the summer or more in the 2060s. FWS009355. However, "water temperatures in some sections of stream remained below both thermal tolerance thresholds through the 2060s and could provide thermal refugia critical to the persistence of grayling and non-native salmonids." FWS009355. Furthermore, "[s]ites that were relatively warm (or cool) in the 2000s were projected to be relatively warm (or cool) in the 2060s, independent of sensitivity to climate change." FWS009375.

Isaak (2015) studied the persistence of cold water refugia under "moderate and extreme climate change scenarios" with a focus on the implications for salmonid species, in particular, bull trout and cutthroat trout. FWS005432. The study predicted that cold-water habitat (measured in stream kilometers) would decrease by 33-40% (depending on the species) in the moderate change scenario and 57-61% in the extreme change scenario. FWS005437. Despite declines in cold-water habitat, the researchers concluded that "some climate refugia were predicted to exist for both species during both climate periods." FWS005438. Ultimately, the researchers opined that "continued warming through at least mid-century means that extirpations of some populations are inevitable . . . , especially for organisms like salmonid fishes that are dependent on cold water habitats undergoing net global decline." FWS005443. Nonetheless, "[i]n the Northern Rocky Mountains, . . . some habitats appear likely to persist, albeit in lower numbers." FWS005443.

Finally, Isaak (2016) used "large stream temperature and biological databases" to show "that thermal habitat in mountain streams is highly resistant to temperature increases and that many populations of cold-water species exist where they are well-buffered from climate change." FWS005461. Accordingly, while "populations of many species are declining along warm-edge boundaries as temperatures increase . . . , those declines may proceed more slowly than

previously thought." FWS005463. Although, the researchers also acknowledged that ultimately there are a number of factors that will determine a species' survival, such as changes in precipitation and stochastic disturbances. FWS005464.

Each of these studies were cited by FWS and appear to support the agency's analysis, or, at the very least, are not so clearly contradictory such that the agency's explanation runs counter to the evidence before it. Moreover, the Court notes that these studies do not all share the same "dire predictions" regarding the effects of climate change, but instead offer a range of scientific conclusions and predictions from which the agency derived its conclusions.

Plaintiffs next argue that FWS erroneously relied on the "effectiveness of riparian-restoration efforts to maintain thermal refugia in Big Hole tributaries and measures to boost streamflows in the river's mainstem under the CCAA." (Doc. 29-1 at 49.) The Court is again unpersuaded by Plaintiffs' argument. FWS noted that riparian-restoration and intact riparian areas increase resilience to climate change stressors and the agency observed that the riparian-restoration efforts under the Big Hole CCAA have resulted in improved resilience in the Big Hole River system. These observations were supported by sufficient evidence in the record, including those studies cited above. Again, to the extent Plaintiffs' argument raises questions about the durability of the Big Hole CCAA, those arguments are addressed below.

Lastly, Plaintiffs argue that FWS failed to consider increased impacts from thermal barriers and increased competition and predation from non-native brown trout. (Doc. 29-1 at 51.) Contrary to Plaintiffs' assertion, FWS did address both of these issues. As already discussed above, FWS addressed the ability of Arctic grayling to access thermal refugia in the context of warming water temperatures. Furthermore, FWS discussed the increase in brown trout populations and encroachment into Arctic grayling habitat due to climate change but found that predation would have a small effect on recruitment in the future. FWS11104, FWS11122.

In conclusion, FWS adequately considered the cumulative effects of climate change and remedied the errors identified in *Zinke*.

IV. Durability of the Big Hole CCAA

Plaintiffs' final argument is that FWS "arbitrarily failed to evaluate the durability of the Big Hole CCAA." (Doc. 29-1 at 52.) Plaintiffs claim that the agency erred by failing to consider whether the CCAA will persist past its July 2026 expiration date, failing to consider whether its not-warranted finding would eliminate landowners' main incentive to participate in the CCAA, and failing to consider whether private landowners might opt to not renew their site-specific conservation plans for other reasons. (*Id.* at 54–57.) Defendants contend that they had no duty to speculate as to the motivations of private landowners or consider

the CCAA's durability past its 2026 expiration date. (Doc. 33 at 45–46.) The Court finds that Plaintiffs are entitled to summary judgment on this issue insofar as FWS acted arbitrarily by failing to consider the termination of the Big Hole CCAA and the rate of renewal for site-specific conservation plans in its analysis.

The Court finds guidance from *Rocky Mountain Wild v. Walsh*, 216 F. Supp. 3d 1234, 1254 (D. Colo. 2016). In that case, a conservation agreement to protect the Graham's beardtongue—a species of flowering plant endemic to portions of the Uinta basin in Utah and Rio Blanco County, Colorado—was entered into on July 22, 2014, the same day that FWS issued a final decision on whether to list the species under the ESA. *Id.* at 1239–41. The conservation agreement designated 44,373 acres—a mix of public and private lands—of the beardtongue's habitat as "conservation areas." *Id.* at 1240. Relying, in part, on the promised benefits of the conservation agreement, FWS found that listing the beardtongue as a threatened or endangered species was "not warranted." *Id.* at 1242.

Given the agency's reliance on the benefits of the conservation agreement in reaching its "not warranted" decision, the District of Colorado found that FWS had acted arbitrarily and capriciously by failing to explain why the beardtongue would not be threatened in the foreseeable future—specifically, after the conservation agreement expired in 2029. *Id.* at 1254. The court noted that the conservation agreement would expire within the agency's own timeframe for the "foreseeable

future" and that the conservation agreement lacked any sort of renewal mechanism, and therefore there was no certainty as to whether the agreement would be renewed. *Id.* The court further explained that its holding "does not mean to imply that conservation agreements must have in indefinite duration;" rather,"[a] conservation agreement may reasonably have a limited duration if FWS can explain, based on the best scientific and commercial data available, why the species would not warrant listing after the agreement's expiration." *Id.*

As in *Walsh*, here, FWS relied on the benefits of the Big Hole CCAA in reaching its "not warranted" finding. Throughout the 2020 Finding, FWS relied on the Big Hole CCAA to provide benefits that mitigate against existential threats to the grayling. *See, e.g.*, FWS11039 (reduced habitat fragmentation); FWS11042 (reduced water temperatures); FWS11054–56 (access to thermal refugia, increased instream flows, and reduced water temperatures); FWS11126 (riparian-restoration and climate change impacts). In other words, the Big Hole CCAA is integral to the agency's "not warranted" finding, yet the agency failed to consider the impact of the Big Hole CCAA expiring in 2026.

Federal Defendants contend that the "durable" aspects of the Big Hole CCAA will still exist past the CCAA's expiration and, therefore, will continue to provide benefits. However, there are several flaws with this argument. First, it is not clear what constitutes a "durable" benefit. For example, during the hearing,

counsel for Federal Defendants stated that concrete structures, such as fish ladders, would last well into the future and riparian revegetation would last "for a time" and argued that both constituted durable improvements. This broad definition of "durable" is both amorphous and nowhere to be found in the 2020 Finding. Nor is there any evidence in the record to support the conclusion that improvements, such as revegetation of riparian areas, will remain into the future without the continued existence of the Big Hole CCAA. Second, the agency relied on some benefits that are inarguably non-durable, at least in a physical sense, such as voluntary limits on irrigation water withdrawals that help to ensure minimum flow targets are met. Finally, the agency's argument regarding "durable" benefits is a *post hoc* justification not found in the 2020 Finding, and therefore cannot serve as a basis to support the agency's finding. *Motor Vehicle Mfrs. Ass'n of U.S., Inc.*, 463 U.S. at 43.

Federal Defendants also attempt to distinguish the present case from *Walsh* by pointing out that, in *Walsh*, the conservation agreement had not yet been implemented, whereas, here, the Big Hole CCAA has a proven track record and existing improvements. (Doc. 33 at 47.) But this distinction does not make the holding of *Walsh* any less persuasive. In both cases, FWS relied on the benefits of a conservation agreement to reach a "not warranted" conclusion but failed to consider the impacts of the agreement ceasing to exist in the foreseeable future.

During the hearing on the motions, Federal Defendants also argued that the Big Hole CCAA differs from the conservation agreement in *Walsh* because the Big Hole CCAA has a built-in renewal provision. However, the "renewal provision" in the CCAA only provides that MTFWP must notify FWS if an extension is desired. Just as the court observed in *Walsh*, this really says nothing more than, "[n]othing stops the parties from coming to a new agreement." 216 F. Supp. 3d at 1254. This is does not make renewal any more certain and there is nothing in the record indicating that MTFWP has sought to extend the CCAA.

Next are Plaintiffs' arguments regarding private landowners renewing their commitment to the Big Hole CCAA and their respective site-specific projects. The Court agrees that the agency does not have a duty to speculate as to the motivations of private landowners following the agency's decision not to list the Arctic grayling. *Cf. San Luis & Delta-Mendota Water Auth. v. Locke*, 776 F.3d 971, 995 (9th Cir. 2014) (FWS may not rely on speculation). However, the agency does have data—historic rates of renewal for site-specific projects—from which it could derive a reasonable estimate of future renewal rates, assuming the continued existence of the Big Hole CCAA. As already explained, the agency relied on the continued benefits of the Big Hole CCAA and its site-specific projects. Thus, renewal of site-specific projects is an important aspect of the problem and it was arbitrary and capricious for FWS to ignore this issue.

In summary, although the Court considers the efforts made under the Big Hole CCAA commendable, and by many measures effective, it was arbitrary and capricious for FWS to rely on the benefits of the CCAA without considering the very real possibility that the CCAA, and at least some of its existing benefits, may cease to exist in the foreseeable future or that site-specific plans may not be renewed.

CONCLUSION

Accordingly, IT IS ORDERED that Plaintiffs' Motion for Summary Judgment (Doc. 29) is GRANTED IN PART and DENIED IN PART. Plaintiffs are entitled to summary judgment on their claims insofar as: (1) FWS's determination that the Ruby River population was viable and could therefore provide redundancy was arbitrary and capricious; and (2) it was arbitrary and capricious for FWS to rely on the benefits of the Big Hole CCAA without considering whether the CCAA may cease to exist in the foreseeable future or whether site-specific projects will be renewed.

IT IS FURTHER ORDERED that Federal Defendants' Cross-Motion for Summary Judgment (Doc. 32) is GRANTED IN PART and DENIED IN PART. Federal Defendants are entitled to summary judgment on Plaintiffs' claims in all other respects.

IT IS FURTHER ORDERED that Intervenor-Defendants' Cross-Motion for

Summary Judgment (Doc. 34) is GRANTED IN PART and DENIED IN PART. Intervenor-Defendants are likewise entitled to summary judgment on Plaintiffs' claims in all other respects.

IT IS FURTHER ORDERED that the 2020 Finding is VACATED and REMANDED to FWS for further consideration consistent with this order. FWS is directed to make a new finding as to the status of the upper Missouri River basin DPS of Arctic grayling within twelve months of the date of this order.

DATED this 6th day of August, 2024.

Dana L. Christensen, District Judge
United States District Court