

**IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF COLUMBIA**

NATURAL RESOURCES DEFENSE)
COUNCIL, INC., *et al.*,)

Plaintiffs,)

v.)

JANET COIT, in her official capacity as)
Assistant Administrator for Fisheries,)
National Marine Fisheries Service, *et al.*,)

Defendants.)

Case No. 1:20-cv-01150-CRC

**PLAINTIFFS' REPLY IN SUPPORT OF MOTION FOR SUMMARY JUDGMENT AND
OPPOSITION TO DEFENDANTS' CROSS-MOTION FOR SUMMARY JUDGMENT**

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INTRODUCTION

The National Marine Fisheries Service’s (NMFS) refusal to protect alewife and blueback herring (collectively, river herring) under the Endangered Species Act (ESA) flunked basic standards of reasoned decisionmaking. NMFS repeatedly ignored important factors, its policies and past practice, and the best available science. As a result, the agency excluded significant evidence regarding climate change-related harms and failed to analyze threats to some of the most imperiled blueback herring populations.

NMFS’s opposition merely underscores those analytical gaps. As to its foreseeable future analysis, the agency offers no meaningful support for its key contention that river herring populations are highly variable and continues to ignore important factors—including those from its own guidance and past decisions—in determining the foreseeable future for climate impacts. So too for the agency’s recolonization theory: NMFS identifies no evidence to support its theory that just because river herring can stray into nearby rivers, they will recolonize large areas where the species recently went extinct. And NMFS fails to explain why it did not consider key factors influencing recolonization, such as the suitability of habitat in those areas, in reaching its conclusions. NMFS’s post hoc rationales cannot cure these fundamental defects.

The Court should vacate NMFS’s listing decision and set a date certain for the agency to again respond to this decade-old petition.

ARGUMENT

I. The Listing Decision adopted a 12- to 18-year “foreseeable future” for climate harms based on a faulty premise and without considering important factors.

The ESA required NMFS to determine whether river herring were threatened—that is, whether they were “likely to become an endangered species within the foreseeable future.” 16 U.S.C. § 1532(20). There is ample record evidence that climate change poses an unusually

significant threat to river herring. *See* Pls. Opening Br. (Pls.) 14-18, ECF No. 34-1. Both the Status Review Report and the Listing Decision acknowledged the severity of these threats and their effects on these species. *Id.* at 14-15. Warming river and ocean temperatures will shrink available habitat and disrupt critical spawning and juvenile life stages. *Id.* at 15. Changes to water availability and flow in rivers, bays, and estuaries, including increased magnitude and frequency of extreme storms, will compound these harms. *See id.*; Listing Decision at AR 23-24.

NMFS swept these threats under the rug by limiting its “foreseeable future” evaluation to 12 to 18 years. *See* Pls. 27-28. NMFS’s “threatened” analysis thus excluded some of the most severe threats to river herring, even though, as the agency stressed, climate threats are “magnified because there will be minimal opportunity to control negative climatic effects as they become more apparent.” Listing Decision at AR 24. In its brief, NMFS defends its foreseeable future decision based entirely on the Listing Decision’s assertion that river herring’s four- to six-year generation times result in high population variability, which “could lead to considerable uncertainty” in projecting the species’ response to any threats. Listing Decision at AR 18; NMFS Opening Br. (NMFS) 23-27, ECF No. 38-1.¹ NMFS’s defense fails.

A. The Listing Decision’s underlying premise that river herring experience high population variability lacks record support and ignores contrary data.

NMFS’s uncertainty rationale rests on the factual premise that river herring have high population variability. That assertion is unsupported by the record and ignores contrary data.

NMFS’s uncertainty rationale thus “fails with the failure of its underlying premise.” *Am. Equity Inv. Life Ins. Co. v. SEC*, 613 F.3d 166, 179 (D.C. Cir. 2010).

¹ The Listing Decision’s rationales that the “impacts of present threats . . . could be realized” and “the impact of current levels of mortality” could be projected over that timeframe, Listing Decision at AR 18, were improper, *see* Pls. 23. NMFS’s brief does not try to rehabilitate that reasoning.

NMFS’s evidence does not support its contention that river herring populations are highly variable. The 2017 assessment update—which, unlike the 2012 benchmark assessment and other studies cited by Plaintiffs, *see* Pls. 4-5, was not peer-reviewed—did characterize some populations as “increasing” or “stable” from 2006 to 2015. *See* NMFS 24. But the update used a different label, “no trend,” to describe populations with “relatively high inter-annual variability.” AR 6336. Less than 20 percent of populations reviewed had “no trend,” AR 6339, and NMFS does not claim those populations support its species-wide high variability premise.

NMFS’s suggestion that a greater number of “increasing” or “stable” populations in the update compared to the 2012 assessment shows high population variability, *see* NMFS 24, is misplaced. To the contrary, the “updated trend analyses generally indicate[d] similar conditions as observed in recent years of the benchmark assessment.” AR 6339. Moreover, the vast majority of “increasing” populations were alewife and alewife-dominated runs and in northern New England states. *See* AR 6275, 6339; AR 2262-63. The update indicated little sign of recovery for other populations. *See* AR 1511 (river herring scientist observing that it was “clear that other stocks are not recovering”); AR 1484. Indeed, a “stable” designation referred only to recent years, so populations could be—and were—“stable at historically low levels.” *See* AR 6336; *see also* AR 1512 (scientist comment that “increasing” or “stable” labels were “completely misleading” because “many of the runs in question are barely persisting—sometimes at levels of fewer than 100 fish detected annually”).² And the update found that total mortality in recent years was above the sustainability threshold in 12 out of 14 rivers. *See* AR 6337-38; AR 6276

² The masking of those historically low levels is one reason why “trend analysis is not an appropriate tool when spawning runs are near extirpation.” AR 1512; *see also id.* (expressing concern about “no data” runs for which monitoring had been discontinued due to lack of fish); AR 1485 (state official commenting that any further decline would extirpate “no trend” run).

(yellow and red highlights reflecting rivers above benchmarks).³ More fundamentally, NMFS conflates the description of recent short-term trends with the 2012 assessment’s conclusion that 22 out of 23 populations with sufficient data were “depleted” relative to historic levels. AR 5542, 5544-45; *compare* NMFS 24, *with* Pls. 4. Nothing was “markedly different,” NMFS 24, about the update’s overall conclusion: “[T]he coastwide river-herring meta-population being depleted to near historic lows remains unchanged since the benchmark stock assessment.” AR 6339.

NMFS failed to engage—first in its decision, then again in its brief—with this and other record evidence showing that most river herring populations have remained at historically low levels for decades. *See* AR 5542; AR 11133; Pls. 24-25 n.10. This was arbitrary and capricious. *See Ctr. for Biological Diversity v. Zinke*, 900 F.3d 1053, 1068 (9th Cir. 2018) (holding arbitrary and capricious Fish and Wildlife Service (FWS) decision that “ignor[ed] available data”); *WildEarth Guardians v. Haaland*, -- F. Supp. 3d --, No. 19-cv-9473, 2021 WL 4263831, at *5 (C.D. Cal. Sept. 20, 2021) (faulting FWS’s failure to “evaluate [studies], acknowledge their contrary data, or explain why the Service disregarded this apparently material data”); *Oceana, Inc. v. Ross*, 363 F. Supp. 3d 67, 76-77 (D.D.C. 2019) (faulting agency for ignoring available data).⁴ Indeed, the only evidence cited in the Listing Decision’s foreseeable future discussion—a

³ This is why hundreds of thousands of blueback herring, NMFS 9, can be insufficient to sustain populations. *See* AR 1759 (peer reviewer explaining that the population of a single predator, striped bass, can exceed river herring in a single river); AR 6710 (describing study estimating striped bass consumed hundreds of thousands of blueback herring annually in a single river).

⁴ The record also undercuts NMFS’s related premise that high fecundity increases resilience. Listing Decision at AR 18. Responding to other statements regarding high fecundity, one peer reviewer questioned its relevance, “given that high fecundity does not positively influence recovery potential or resilience.” AR 1787 (citing Cole 1954 and Hutchings *et al.* 2012). Neither the Status Review Team nor NMFS refuted that point with evidence that fecundity *does* increase resilience. *Cf.* AR 1818-27. Instead, the final report simply removed the offending statements. *Compare* AR 1666, 1688, *with* Status Review Report at AR 2183, 2207.

2002 interagency review of treaty guidelines, which NMFS’s brief ignores—underscores NMFS’s failure. That review emphasized that “recent trends in population size” can “easily be misinterpreted if not considered in the context of the historical data.” AR 11248 (cited at Listing Decision at AR 18); *see also* AR 11302 (stressing “importance” of historical perspective, such as whether “the most recent population peak was well below the historical average”).

B. The Listing Decision failed to consider important factors for assessing uncertainty related to climate change impacts.

Even assuming NMFS’s threshold premise regarding population variability is correct, the agency failed to consider important factors for assessing uncertainty in determining the foreseeable future for climate change effects. *See* Pls. 18-24. NMFS’s brief contends that uncertainty regarding river herring’s response to threats was the “limiting factor” justifying its 12- to 18-year foreseeable future. NMFS 23.⁵ But NMFS’s own guidance, the agency’s prior listing decisions, and judicial opinions all make clear that NMFS’s conclusory finding of “uncertainty” did not satisfy its duty to consider the foreseeability of climate impacts.

NMFS’s 2016 guidance specifically addresses how the agency should proceed given “the nature and magnitude of the risk added by potential climate change effects and the associated increase in uncertainty.” AR 4002. NMFS cannot rely solely on the lack of “projections at a particular geographic scale or . . . a complete understanding of the biological reasons for and extent of the species’ sensitivity to climate change,” *id.*, or an inability “to know with precision the magnitude of change over the relevant time period,” AR 4004. Rather, NMFS must consider

⁵ NMFS does not dispute that it had an obligation to consider the specific foreseeable future period for climate change impacts, given the agency’s consistent policy and practice of determining the appropriate period on a threat-specific basis. *See* Pls. 25-26.

the period for which it can “reasonably project the directionality of climate change and overall extent of effects to the species or its habitat.” AR 4004.

Several of NMFS’s seal listing decisions illustrate similar principles. In the bearded seal decision, for example, NMFS determined that the “clear and unidirectional” nature of projected warming and associated sea ice loss justified using a foreseeable future extending to 2100. 77 Fed. Reg. 76,740, 76,753-54 (Dec. 28, 2012); *see also* 77 Fed. Reg. 76,706, 76,723 (Dec. 28, 2012) (same for ringed seal); 75 Fed. Reg. 65,239, 65,243 (Oct. 22, 2010) (defending 2050 timeframe for spotted seals because “[a]lthough the uncertainty associated with climate projections is greater the farther out that projections extend, it is clear that loss of sea ice habitat is a significant risk factor”). The agency reached this conclusion despite acknowledging “inherent uncertainty” in then-current climate change projections that increased over time, 77 Fed. Reg. at 76,741, and uncertainty in the species’ response, *see, e.g., id.* at 76,755 (noting uncertainty regarding “the nature, direction, and magnitude” of “biological responses” and “unknown resilience of bearded seals to whatever changes may occur”); *see also* 77 Fed. Reg. at 76,711 (“The precise extent and timing of [ocean warming and acidification] is uncertain, yet the overall trend is clear: Ringed seals will face an increasing degree of habitat modification through the foreseeable future.”).

As NMFS noted in its guidance, judicial decisions have also “affirmed the importance of considering climate change in determinations and decisions under the ESA, despite the uncertainty that makes predicting specific impacts from climate change challenging.” AR 4002. Subsequent cases have continued to emphasize that critical point. *See, e.g., Alaska Oil & Gas Ass’n v. Pritzker*, 840 F.3d 671, 680 (9th Cir. 2016) (upholding NMFS’s bearded seal listing and explaining that “uncertainty” in 2050-2100 climate projections regarding the “magnitude of

warming, the speed with which warming will take place, and the severity of its effect” did “not deprive those projections of value in the rulemaking process”); *Ctr. for Biological Diversity v. Zinke*, 900 F.3d at 1072 (rejecting FWS’s attempt to “disclaim[] making any projection as to the synergistic effects of climate change, simply because of the uncertainty”).

NMFS ignored that robust consensus here. Neither the Listing Decision nor the Status Review Report even mentioned the agency’s on-point 2016 guidance. And, even after Plaintiffs briefed that issue, Pls. 13-14, 18-19, 23, NMFS’s brief *still* does not acknowledge the guidance, let alone defend the Listing Decision’s failure to do so. An agency cannot simply “whistle past th[e] factual graveyard” of its relevant policies—that flaw alone is fatal. *Am. Wild Horse Pres. Campaign v. Perdue*, 873 F.3d 914, 927 (D.C. Cir. 2017).

NMFS’s attempt to demonstrate consistency with its prior listing decisions, NMFS 25-27, fares no better. NMFS’s argument that it properly considered river herring’s life history, *see* NMFS 24-26, is a strawman. Plaintiffs never suggested that species’ life histories were irrelevant or that NMFS’s prior listing decisions had ignored them. Rather, it is NMFS’s unacknowledged and unexplained departure from its past practice—as synthesized in its 2016 guidance—of grappling with uncertainty related to climate impacts and species’ response that renders NMFS’s foreseeable future determination arbitrary. NMFS’s reliance on the foreseeable future periods adopted in other prior listing decisions, without considering their extensive analysis of uncertainty related to climate change, is therefore misplaced. *See* 82 Fed. Reg. 4022, 4049-51 (Jan. 12, 2017) (Alabama shad decision acknowledging 2016 guidance and considering the possible impacts of projections of “the predicted increase in temperature . . . to the end of the 21st century” and “the projected increase in sea level for [that] period”); 80 Fed. Reg. 51,235, 51,243-45 (Aug. 24, 2015) (orange clownfish decision considering “projections for future levels

of acidification [that] go out to the year 2100” and explaining why effects were not “foreseeable over that timeframe”).⁶ That NMFS reached those foreseeable future conclusions, based on the evidence regarding those species, does not excuse its failure to even acknowledge the guidance or conduct a proper analysis here.⁷

NMFS also misrepresents the seal listing decisions’ foreseeable future analyses, which did not turn on “life history traits” providing certainty regarding those species’ response to climate change. *Contra* NMFS 25. In the ringed seal decision, for example, NMFS did acknowledge that long generation times and low productivity would “challenge [ringed seal’s] ability to adapt” to climate change. 77 Fed. Reg. at 76,709. But NMFS also identified several factors that “suggest resilience in the face of environmental variability,” *id.*, and further noted that “[w]hether ringed seals [and their prey] will continue to move north, . . . is uncertain and speculative,” *id.* at 76,710; *see also* 77 Fed. Reg. at 76,743 (“The extent to which bearded seals might adapt to more frequent years with early ice melt by shifting the timing of reproduction is

⁶ Similarly, in NMFS’s subsequent dwarf seahorse decision, the agency apparently could not determine even *the direction* of climate change’s effects. 85 Fed. Reg. 45,377, 45,385 (July 28, 2020) (The “thermal tolerance of seagrasses and rising sea levels may affect future distribution and meadow health, while warming seawater temperatures could increase the available habitat for dwarf seahorses along the northern Gulf of Mexico.”). And NMFS specifically discussed the foreseeable future for climate change impacts, acknowledging that an eight-generation period was “shorter than that estimated for other species” but warranted by, among other things, evidence that the seahorse’s “highly dynamic” populations have previously rebounded from “large population declines,” *id.* at 45,381—evidence that is entirely lacking here, *supra* pt. I.A.

⁷ For instance, NMFS’s orange clownfish decision identified record evidence hampering evaluation of the directionality of climate effects in the distant future, including that orange clownfish habitat already “experienced substantial diel fluctuations in temperature and pH similar to the magnitudes of warming and acidification expected over the next century.” 80 Fed. Reg. at 51,244. And the decision articulated a rationale that was directly linked to generation times—namely, “evidence that susceptibility to acute changes in ocean pH may decrease or disappear over several generations.” *Id.*; *see also id.* at 51,245 (discussing studies showing that clownfish “offspring performed better at higher temperatures if the parents had experienced these temperatures as well”).

uncertain.”), 76,755 (noting “unknown resilience of bearded seals to whatever changes may occur”). Comparable uncertainty about whether river herring will expand northward, NMFS 24, thus cannot justify departing from those decisions.⁸

Try as it might, NMFS cannot simply wish away its guidance and past practice. NMFS identifies nowhere in its uncertainty rationale where it considered the relevant factors, such as the period for which the agency could “reasonably project the directionality of climate change and overall extent of effects to [river herring] or its habitat.” AR 4004. The Listing Decision’s brief foreseeable future discussion did not incorporate any of the record evidence projecting climate change’s future effects on river herring, let alone evaluate that evidence using the principles described above. *See* Listing Decision at AR 18; Pls. 14-18 (summarizing evidence).⁹ That omission, whether viewed as NMFS’s failure to explain its deviation from its guidance and past practice, Pls. 21-23, or failure to consider the important aspects of the problem they identify, Pls. 18-20, was arbitrary and capricious. *See, e.g., Physicians for Soc. Resp. v. Wheeler*, 956 F.3d 634, 648 (D.C. Cir. 2020) (concluding that agency’s “earlier determination . . . was clearly a ‘relevant factor’ the agency had to consider” (cleaned up)); *Env’t Def. Fund v. FERC*, 2 F.4th 953, 975 (D.C. Cir. 2021) (faulting agency’s “ostrich-like approach” that ignored evidence pertaining to factors in “guidelines set forth in [its] Certificate Policy Statement”).

⁸ NMFS also overstates the extent to which river herring are “habitat generalists,” and by the agency’s account, more resilient. NMFS 26 (quoting Listing Decision at AR 10). River herring “are habitat generalists in the marine environment, however, they require specialized habitat during the estuary and freshwater portions of their life cycle.” Status Review Report at AR 2170-71, 2195-96; *id.* at AR 2172, 2196 (“Their unique life history vulnerabilities provide several pinch points where climate change can have negative effects on individual populations.”).

⁹ Indeed, the only evidence the Listing Decision cited to support its foreseeable future determination was the 2002 interagency review, *see supra* at 4-5, which did not specifically discuss river herring and mentioned climate change only once—on a list of “[v]ulnerability factors that would increase concern,” AR 11255, notwithstanding short generation times.

C. NMFS’s post hoc arguments distort the Listing Decision and the evidence, and still fail to supply the missing analysis.

Perhaps recognizing these critical gaps in the Listing Decision’s foreseeable future determination, NMFS now attempts to supplement its analysis in its brief. *See* NMFS 24-25. That fails for multiple reasons: the arguments are improper post hoc rationales, are not supported by the record, and do not justify the agency’s foreseeable future conclusion in any event.

For instance, NMFS cites examples from the Listing Decision’s threats analysis, in which the agency mentioned uncertainty in river herring’s response to climate change, to assert that the Listing Decision did consider river herring’s short generation times (and presumably, high population variability) in the specific context of the foreseeable future timeframe for climate change impacts. NMFS 24 (citing Listing Decision at AR 24). But neither the Listing Decision nor the Status Review Report referenced these or any other examples of climate-related uncertainty to explain the choice of a 12- to 18-year foreseeable future.

The Listing Decision “must be upheld, if at all, on the basis articulated by the agency itself.” *Motor Vehicle Mfrs. Ass’n of U.S., Inc. v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 50 (1983). NMFS therefore cannot use its brief to offer new explanations for its decision. *See NRDC v. Rauch*, 244 F. Supp. 3d 66, 92 (D.D.C. 2017) (rejecting NMFS’s post hoc rationale in prior river herring case); *Ctr. for Biological Diversity v. Haaland*, 998 F.3d 1061, 1070 (9th Cir. 2021) (declining to consider FWS brief’s “detailed explanation” for limiting foreseeable future for climate impacts to 2060, where explanation appeared “in neither the [Listing] Decision nor the [Status] Assessment”). Nor does NMFS’s post hoc analysis bolster what the Listing Decision did say. Both new examples relate to whether river herring in the southern portion of the range can expand northward in response to warming temperatures. *See* NMFS 24; Listing Decision at AR 24. NMFS does not connect this asserted uncertainty to river herring’s short generation times

and purported high population variability, the stated rationale for limiting the foreseeable future period. *Cf.* 80 Fed. Reg. at 51,244 (discussing evidence that orange clownfish’s “susceptibility to acute changes in ocean pH may decrease or disappear over several generations”).

The agency likewise relies on improper “post hoc rationalizations for disregarding” the peer-reviewed scientific evidence of climate effects on river herring when determining the foreseeable future. *WildEarth Guardians*, 2021 WL 4263831, at *5; *see also Ctr. for Biological Diversity v. Zinke*, 900 F.3d at 1069 (explaining that “FWS cannot rely on its briefing in this case to explain why” it relied on one study rather than another, because that “explanation must be evidenced from the listing decision itself”). Nowhere in the Listing Decision did NMFS address uncertainty regarding the conclusions of the Lynch or Hare studies. *Cf.* Listing Decision at AR 23 (citing Lynch study for proposition that river herring are “likely to be impacted by climate change through changes in the amount of preferred marine habitat”); *id.* (citing Hare study’s “literature summary” of changes to northeast U.S. ocean climate). Nor did the Listing Decision examine whether, as NMFS now asserts, any such uncertainties precluded the agency from relying on the studies to project climate effects on river herring beyond 18 years.

NMFS’s belated arguments about the climate change science also fail on the merits. NMFS misrepresents the central conclusions of the Lynch study. The study is explicit that it projected “declines in river herring density and occurrence in *nearly all* combinations of initial abundance . . . , emission scenario, and season by the period 2060-2100.” AR 11207 (emphasis added). NMFS seizes on part of the next sentence stating that “increases in density projected in spring . . . could serve to buffer the net impacts of climate change on river herring,” but omits that this describes the “exceptions” to “across-the-board decreases.” *Compare id.*, with NMFS 25. Indeed, the study found that “[r]egardless of initial population size, the direction of projected

responses to climate change”—that is, across-the-board decreases—“was similar for nearly all scenarios.” AR 11209. NMFS’s contrary suggestion that only low abundance populations might be “adversely affected,” NMFS 20, not only overlooks river herring’s historically low levels, *see* AR 6339, but also misstates the study’s conclusion that it was the “the *magnitude* of climate effects [that] increased” for those populations, AR 11210 (emphasis added); *see also* AR 11200 (noting “increased sensitivity to climate change under a low abundance scenario”).

NMFS’s brief similarly distorts the Hare study and its lead author’s recommendations to the agency. NMFS contends that Dr. Hare considered only whether the agency “could predict the potential effects of climate change out to 2100,” but not the predictability of how river herring “may respond to the change[s].” NMFS 22. Dr. Hare’s presentation makes clear, however, that he was providing recommendations on “the longest time period over which we can foresee the effects of climate change on the species status,” AR 2415, as directed by the 2016 guidance, AR 2413; AR 4004.¹⁰ The Hare study similarly considered both climate effects and species response, including examining “i) environmental variables expected to change that could impact species (termed exposure factors) and ii) sensitivity attributes that predict a species[’] intrinsic resilience to change.” AR 18868; *see also* AR 18874-75 tbl. 2 (summarizing sensitivity attributes examined, including habitat specificity and population productivity). As NMFS concedes, the study concluded that alewife and blueback herring each have “very high climate vulnerability overall,” NMFS 19—a conclusion that incorporated scores of “very high” climate exposure and “high” biological sensitivity, with 95-100 percent certainty. AR 18880 (Fig. 3); Pls. 16-17.

¹⁰ NMFS’s suggestion that Dr. Hare’s recommendation was based on an irrelevant standard, NMFS 22, is thus exactly backward. The agency not only failed to acknowledge its own guidance, but arbitrarily disregarded its own expert’s recommendation applying it to this case. *See* Pls. 20; *NRDC v. Pritzker*, 828 F.3d 1125, 1139 (9th Cir. 2016).

At bottom, NMFS's belated attempts to manufacture uncertainty from these studies underscore that the agency failed to consider them through the lens of the important factors recognized in its own guidance.¹¹ For example, while the Lynch study acknowledged uncertainty regarding effects on individual river runs, NMFS 25 (citing AR 11211), the guidance explains that climate impact "projections at a particular geographic scale" are not a prerequisite for listing, AR 4002.¹² More generally, NMFS's post hoc critiques, including about the "degree" of impacts, *see* NMFS 21, do not show an inability to determine the overall direction of climate change's effects and river herring's response. *See* AR 4004. The agency still does not engage with the relevant conclusions on that central point. *See, e.g.*, AR 11207 (projecting "declines in river herring density and occurrence in nearly all [scenarios] . . . by the period 2060-2100").

II. The Listing Decision's "distinct population segment" conclusions rest on an unsupported recolonization theory and overlook important factors.

Plaintiffs previously explained that NMFS's distinct population segment analysis for blueback herring's Mid-New England and Southern New England stock complexes rested on a speculative "recolonization" theory that violated the ESA and APA. *See* Pls. 30-40. NMFS's response emphasizes that the agency did not follow the Status Review Team's arbitrary approach to recolonization in one respect. NMFS 27-28. That observation does not make up for the holes

¹¹ Whether NMFS considered those studies for other points, *see* NMFS 21-22, is irrelevant. NMFS did not consider those studies in determining the foreseeable future, and its arbitrary foreseeable future period excluded the studies' evidence of climate impacts from the ultimate determination of river herring's threatened status. Thus, neither determination was based on the best available science. 16 U.S.C. § 1533(b)(1)(A); Pls. 19-20, 27-28. For the same reason, the peer reviewers' concurrence with the Status Review Team's findings about the nature of the threats and extinction risk to river herring *within* the next 12 to 18 years is beside the point.

¹² The Lynch study "focus[ed] on river herring in their marine phase," demonstrating that the species are "vulnerable to the effects of ocean warming." AR 11211. "[E]xtreme riverine temperatures" and "changes to riverine flows" will cause *additional* harms to river herring in their spawning and juvenile phases. Listing Decision at AR 23.

in the Listing Decision’s rationale, which hinged on the unsupported claim that blueback herring from other stock complexes “may” recolonize those regions. *See* Listing Decision at AR 16.

The Status Review Team’s recolonization analysis, even though now partially abandoned by NMFS, is critical to understanding NMFS’s decision. The Status Review Team decided that a stock complex’s loss would leave a “significant gap” if the relevant river herring species (alewife or blueback herring) would not recolonize that gap within ten generations (40 to 60 years). *See* Listing Decision at AR 15-16; Status Review Report at AR 2144-45, 2154-55. Moreover, the Status Review Team found that any recolonization that did occur “would most likely” happen “in a step-wise fashion with fish moving in from the borders of the nearest stock complexes.” Status Review Report at AR 2149. In its report, the Status Review Team concluded that the loss of any alewife stock complex and all but two blueback herring stock complexes would leave a significant gap because recolonization would not occur within 60 years. *Id.* at AR 2144-45, 2154-55. By contrast, the Status Review Team theorized that the gap left by either the Mid- or Southern New England stock complexes of blueback herring would be insignificant because recolonization would likely happen within this timeframe. *Id.* at AR 2151.

The Status Review Team’s 10-generation formula was arbitrary and capricious. *See* Pls. 37-38. NMFS’s abandonment of that formula, however, does not salvage the agency’s defective analysis. *Contra* NMFS 27-28. To be sure, the selection of a 40- to 60-year timeframe for recolonization was “entirely arbitrary,” AR 1789; *see also* Pls. 37-38; irreconcilable with NMFS’s use of a 12- to 18-year foreseeable future period, *see* Pls. 40-41; and untethered to any evidence suggesting river herring could recolonize a new river every year or two, *see* Pls. 37.

Yet after disavowing the Status Review Team’s reasoning, NMFS provided *no* alternative analysis to support adopting the Team’s significance conclusions. The Listing Decision simply

stated that the 10-generation formula was “not . . . necessary” to adopt the Team’s findings that most stock complexes *were* significant. Listing Decision at AR 16. This is so, according to NMFS’s decision, because “the large geographic scope” of the gaps that would be left by the loss of those stock complexes would cause problems with connectivity, habitat diversity, and reduced resilience. *Id.* But NMFS offered only one sentence to explain its conclusion that the two other gaps were not significant: “In contrast, a small gap in the range, such as either the potential loss of the Bb-Mid New England or Bb-Southern New England stock complex, *may* be less important to these species because their straying behavior and fecundity *may* allow them to regain or even maintain connectivity between neighboring stock complexes.” *Id.* (emphases added).

Without the Status Review Team’s (flawed) theory that these gaps “would likely be recolonized to self-sustaining levels within the 40-60 year period,” Status Review Report at AR 2151, NMFS’s rationale boils down to the assertion that, if one of those stock complexes were lost, straying “may” allow blueback herring to recolonize and restore connectivity, Listing Decision at AR 16. The agency declined to even identify a timeframe in which this would occur, although its brief now suggests that it would happen within 12 to 18 years. *See* NMFS 28 n.10 (denying that NMFS “adopted one time frame for its foreseeable future time frame and another for significance”). Mere speculation that recolonization “may” occur, to unspecified levels, within (perhaps) a much faster timeframe than even the Status Review Team assumed, Listing Decision at AR 16, does not meet the demands of reasoned decisionmaking.

A. The Listing Decision did not identify evidence of river herring naturally recolonizing extirpated rivers or provide any supporting analysis.

The Listing Decision provided no analysis to support its leap from river herring’s straying behavior to conclusions about recolonization of extirpated stock complexes, nor did it identify any empirical support for that proposition. *See* Pls. 33-38. Neither does NMFS’s brief.

NMFS devotes several pages to defending the proposition that river herring stray, which just means that some fish return to a different river from where they were born. *See* NMFS 30-33. This is beside the point. Plaintiffs do not dispute that river herring do sometimes stray.¹³ But straying is not the same as recolonization—the reestablishment of the species where it has been extirpated. *See* Pls. 34. And while evidence of straying is necessary to support a recolonization theory, it is not sufficient to show recolonization is likely to occur. NMFS has pointed to no evidence to bridge the gap between the fact that some river herring will stray and its conclusion that so many will stray so quickly and find such suitable habitat that they will successfully recolonize extirpated stock complexes within a few generations. This “speculation or surmise” does not satisfy the ESA. *Trout Unlimited v. Lohn*, 645 F. Supp. 2d 929, 958 (D. Or. 2007) (citing *Bldg. Indus. Ass’n of Superior Cal. v. Norton*, 247 F.3d 1241, 1247 (D.C. Cir. 2001)).

Indeed, there is no record evidence of *any* natural recolonization of a river where alewife or blueback herring have been wholly extirpated. NMFS did not identify any such empirical evidence in the Listing Decision. Pls. 35. NMFS still has not done so. NMFS’s brief repeatedly touts an instance where river herring expanded farther up the same stream after the removal of a dam. NMFS 31-32 (citing AR 6736); NMFS 34 (citing two more places in the record describing the same event, AR 2174-75, 2199, for the proposition that river herring are “known to recolonize habitat swiftly”). But that example involves recolonization of previously inaccessible habitat within the same stream—with no indication that the habitat was otherwise unsuitable. AR

¹³ The parties agree that there is evidence documenting homing (i.e., not straying) rates of 63 to 97 percent for river herring. Pls. 34 (citing AR 10176); *accord* Listing Decision at AR 12. NMFS’s marginal dispute regarding one study’s statement that actual rates “are likely at the higher end of that range,” AR 17090; NMFS 32, cannot disguise the lack of evidence or analysis to support NMFS’s leap from *any* straying rate to conclusions regarding recolonization.

6736. This says nothing about river herring's ability to successfully recolonize a different complex of distant rivers where the conditions have driven the prior population to extinction.

The "conceptual model" theorized in the Pess study, estimating the relative recolonization tendency of a number of diadromous species, cannot make up for NMFS's lack of empirical evidence for river herring recolonization. AR 15287; *see also* NMFS 31; Listing Decision at AR 12. Plaintiffs have explained the limits of that model and why it is inadequate to support NMFS's unexplained and unsupported leap to specific projections of recolonization for individual stock complexes. *See* Pls. 35-36. NMFS does not respond to those critiques.

NMFS instead defaults to the assertion that it was entitled to "draw a conclusion" from that article. NMFS 32. But that does not relieve the agency of its duty to articulate "a rational connection between the facts found and the choice made." *Sorenson Commc'ns Inc. v. FCC*, 755 F.3d 702, 707 (D.C. Cir. 2014) (quoting *State Farm*, 463 U.S. at 43); *see also* 16 U.S.C. § 1533(b)(8). Courts have rejected similarly unsupported theories regarding a species' ability to move to new habitat. In *Center for Biological Diversity v. Zinke*, for instance, FWS had determined that "water temperatures [in the relevant river] were sufficiently high to warrant listing the arctic grayling." 900 F.3d at 1070. In reversing that position, FWS asserted that the detrimental impacts of the high temperatures "could be overcome by the arctic grayling's ability to migrate to cold water refugia," but did so "without providing any additional evidence or scientific studies demonstrating that this [migration] *would likely occur*." *Id.* (emphasis added). The Ninth Circuit held that this unsupported assertion did not reasonably explain the agency's newfound reliance on migration. *Id.* Courts have reached the same conclusion when the agency writes on a blank slate. *See, e.g., WildEarth Guardians*, 2021 WL 4263831, at *7 (rejecting reliance on Joshua tree's ability "to migrate to climate refugia" as "inadequately supported and

counter to the data on which [FWS] relies”); Pls. 31 (collecting cases). NMFS’s speculation regarding recolonization is likewise arbitrary and capricious.

B. The Listing Decision ignored habitat suitability and the condition of neighboring populations.

Even if NMFS had provided more than mere speculation for its recolonization conclusion, the agency failed to consider, by the Pess study’s own account, the most important factors influencing recolonization: “accessibility, proximity to a donor stock, productivity and condition of the donor stock, and habitat suitability.” AR 15288. NMFS’s Atlantic sturgeon listing decision confirms that these are critical questions. *See* AR 4080 (“[R]ecolonization is dependent upon both immigration from adjacent, healthy populations and habitat suitability.”). NMFS’s failure to consider these factors was arbitrary and capricious.

First, NMFS failed to consider the fundamental issue of habitat suitability. *See* Pls. 31-33; AR 4080; AR 15288. As NMFS has previously recognized, when “unsuitable conditions” cause extirpation, “the local habitat is likely to remain unsuitable after extinction and be unavailable for effective recolonization.” AR 4080. NMFS had to account for that possibility here, especially given that many of the gravest threats to river herring, including the long-term warming of rivers and oceans due to climate change, are structural factors that will likely persist and prevent recolonization. *See* Pls. 33. *Center for Biological Diversity v. Zinke* is again instructive. There, the Ninth Circuit held the agency’s reliance on the benefits of fish ladders was arbitrary because “even if the ladders aid the arctic grayling in migrating to tributaries, . . . this would be of little value if the water in the tributaries is still too warm.” 900 F.3d at 1070-71. So too here. The straying behavior of individual blueback herring is “of little value” to recolonization if those fish encounter the same threats (e.g., increased water temperatures, *see supra* at 2) that caused the

loss of the stock complex.¹⁴ Accordingly, NMFS had to consider whether those potential conditions would impede the agency’s theorized recolonization or preclude it all together.

Rather than identify anywhere that the Listing Decision did so, NMFS tries to change the subject. The agency’s brief posits a series of distinctions between river herring and Atlantic sturgeon, NMFS 33-34, a species for which NMFS did consider habitat suitability when assessing the possibility of recolonization, *see* AR 4080; Pls. 32. To be sure, these purported distinctions—differences in straying rates, spawning patterns, and habitat, NMFS 33-34; *but see supra* at 9 n.8—might indicate that river herring have *different* suitable habitat needs than Atlantic sturgeon. But they do not undermine the need for habitat that is suitable to *river herring*. NMFS’s significant gap analysis takes as a given that river herring have been extirpated from the stock complex at issue, a process which—as explained above—would likely involve the local environment becoming inhospitable. Whether the conditions in that vacant stock complex are nonetheless suitable for recolonization remains a central question. *See* AR 15288; AR 4080; *cf. Ctr. for Biological Diversity v. Zinke*, 900 F.3d at 1070-71. NMFS did not ask it.

Second, by assessing the potential loss of each stock complex in isolation, NMFS ignored the likely health of neighboring stock complexes, i.e., the “productivity and condition of the donor stock,” or indeed, whether a donor stock in “proximity” to the gap would remain viable. AR 15288; *see also* AR 4080. NMFS’s segmented analysis irrationally assumed that the threats that wiped out an individual complex would not affect the viability of its neighbors. As Plaintiffs

¹⁴ That differences in neutral genetic markers are not themselves “linked to adaptive traits,” NMFS 35, is irrelevant. As Dr. Palkovacs explained, it is “differences in the [stocks’] ‘ecological setting’ combined with” the gene flow patterns those markers reveal that “strongly suggest that adaptive differences between groups exist.” AR 18731. In any event, NMFS does not explain why river herring with *no* adaptive differences from the extirpated population could recolonize rivers when faced with the same conditions. *See* AR 15279 (noting whether “life history variants in the donor population” could use “the newly opened habitat” as key recolonization factor).

pointed out, this error was particularly acute with respect to the Mid- and Southern New England stock complexes of blueback herring, given their precarious status. *See* Pls. 38-39.¹⁵ NMFS’s cursory response—that the two stock complexes are discrete, NMFS 30—misses the point. Plaintiffs did not suggest that NMFS consider those combined populations as a single potential distinct population segment. Rather, in considering whether the loss of an individual stock complex would be mitigated by recolonization, the agency had to consider the likely condition of neighboring stock complexes. *See* AR 4080; AR 15288.

For these reasons, NMFS’s appeal to the deference often accorded an agency’s predictive determinations is misplaced. *Contra* NMFS 28, 30. That agencies “do not require *complete* factual support” for such determinations does not license them to “ignore important factors in making predictions” or “reach judgments that are irrational given the relevant evidence in the record.” *Int’l Ladies’ Garment Workers’ Union v. Donovan*, 722 F.2d 795, 821 n.56 (D.C. Cir. 1983). To the contrary, agency predictions “must be based on some logic and evidence, not sheer speculation.” *Sorenson Commc’ns*, 755 F.3d at 708 (citation omitted); *see also Nat’l Lifeline Ass’n v. FCC*, 921 F.3d 1102, 1113 (D.C. Cir. 2019) (declining to defer to prediction based on “summar[y]” conclusion and “no evidence”). Here, the only predictive aspect of NMFS’s reasoning—that blueback herring “may . . . regain or even maintain connectivity,” Listing Decision at AR 16—lacks record support and “ignore[s] important factors in making [those] predictions.” *Int’l Ladies’ Garment Workers’ Union*, 722 F.2d at 821 n.56.

¹⁵ Indeed, NMFS elsewhere stressed that the Mid-New England stock complex, in its *current* condition, “does not have the population numbers or habitat capacity to buffer surrounding stocks against environmental threats such as droughts, or flooding.” Listing Decision at AR 42.

C. NMFS’s post hoc alternative theory is improper and unsupported.

Apparently recognizing the flaws in its Listing Decision’s rationale, NMFS now appears to resort to another post hoc theory. NMFS twice attempts to distinguish between recolonization and “the geographic size of potential gaps.” NMFS 28; *see also id.* at 10 n.7.¹⁶ And relying on that distinction, NMFS suggests that, recolonization aside, the loss of either the Mid- or Southern New England stock complexes would not create a significant gap because they constitute less than five percent of the watershed area for blueback herring’s range. *Id.* at 29-30.

This post hoc argument cannot sustain NMFS’s determination. *See Physicians for Soc. Resp.*, 956 F.3d at 648. In the Listing Decision, NMFS did not find that “the geographic scope, in and of itself,” of the Mid- and Southern New England stock complexes rendered any resulting gap insignificant. NMFS 27-28. Instead, NMFS’s explanation consisted of a single reason: blueback herring’s “straying behavior and fecundity may allow them to regain or even maintain connectivity,” Listing Decision at AR 16—that is, that the gaps would not persist. *See also id.* at AR 12 (discussing straying and the possibility that it would enable river herring “to colonize new streams”). NMFS nowhere disclaimed the Status Review Team’s conclusion that recolonization was the determinative factor in a gap’s significance, let alone justified such a disclaimer.¹⁷

¹⁶ NMFS’s current position is unclear, as it still defends its “determination that river herring most likely may recolonize a gap in the range of the species in a step-wise manner from the borders or maintain connectivity between neighboring stock complexes.” NMFS 34; *see also id.* at 30-31 (citing Listing Decision’s “explan[ation] that river herring stock complexes could re-colonize spatial gaps that occur in their range based on [their] propensity to stray from their natal rivers”).

¹⁷ To the extent NMFS now suggests that—contrary to the Status Review Team’s conclusion—recolonization is unnecessary because straying of individual fish is sufficient to maintain connectivity across the entire Mid- or Southern New England gap, that theory fails. *Cf.* NMFS 28. NMFS points to no evidence of similar occurrences or analysis to support that possibility. Nor does NMFS reconcile that theory with its “finding that river herring are more likely to stray

NMFS also fails to justify applying its post hoc five-percent threshold in this case. NMFS attempts to derive a one-size-fits-all significance rule from cases involving pygmy owls, *Nat'l Ass'n of Home Builders v. Norton*, 340 F.3d 835, 848 (9th Cir. 2003), and marbled murrelets, *Am. Forest Res. Council v. Ashe*, 601 F. App'x 1, 5 (D.C. Cir. 2015) (per curiam). See NMFS 28-29.¹⁸ NMFS neglects to explain, however, why it is important to consider potential differences between river herring and seals, NMFS 25-26, or river herring and Atlantic sturgeon, *id.* at 33-34, but not river herring and bird species. Nor does its brief link that five-percent threshold to any biological aspect of river herring. And it was particularly incumbent upon the agency to identify some basis for that threshold here, given its conclusion that the gap from the potential loss of the Southern New England stock complex of alewives—which represents just seven percent of that species' watershed area—was so clearly significant that neither the Status Review Team's formula nor any further analysis was necessary. See Listing Decision at AR 16.

III. The Listing Decision's "significant portion of its range" analysis was arbitrary and capricious.

NMFS cannot justify its failure to examine whether the Southern New England stock complex of blueback herring represents a significant portion of that species' range. See Pls. 41-43. NMFS latches on to a statement in the Listing Decision that the Status Review Team "first identified geographic areas where there may be a concentration of threats," Listing Decision at

to nearby rivers," NMFS 31, or the warning that "small straying numbers of fish found in rivers should not constitute a gap being filled," Status Review Report at AR 2150.

¹⁸ Contrary to NMFS's assertion, neither of those cases endorsed a five-percent rule. See *Norton*, 340 F.3d at 848 (reasoning that FWS's significant gap finding was inadequate because agency did not find that the loss of "a small percentage" of species' total range "would substantially curtail that range"); *Ashe*, 601 F. App'x at 5 (rejecting claim that FWS had departed from prior policy by finding gap significant without "stat[ing] explicitly that loss of [the] geographic area would be a 'substantial reduction' of the subspecies' range" and citing *Norton* for proposition that there was "no case *holding* that the agency has to invoke this magic phrase").

AR 40, to argue that when the agency followed that first step, its analysis “by definition include[d] the area occupied by the Bb-Southern New England complex,” NMFS 38. But NMFS still has not identified anywhere in the record indicating that it considered the significant threats faced by the Southern New England stock complex, much less why they would not rise to the level of requiring further analysis. *See* Pls. 43. Reasoned decisionmaking demands more. *See Cigar Ass’n of Am. v. FDA*, 964 F.3d 56, 61 (D.C. Cir. 2020) (“Merely referencing a requirement is not the same as complying with that requirement. And stating that a factor was considered—or found—is not a substitute for considering or finding it.” (quoting *Gerber v. Norton*, 294 F.3d 173, 185 (D.C. Cir. 2002))); *Magneson v. Mabus*, 85 F. Supp. 3d 221, 228 (D.D.C. 2015) (rejecting argument that “essentially asks the Court to assume—with no written record to corroborate—that the [agency] must have considered [an] argument and found it unavailing, because otherwise the [agency] would not have ruled the way that it did”).¹⁹

NMFS similarly offers no meaningful explanation for failing to consider the significance of the portion of blueback herring’s range encompassed by the Mid- and Southern New England stock complexes together. *See* Pls. 43-44. The agency suggests it lacked a “biological basis” to do so, NMFS 39, but does not address the likelihood that the complexes face overlapping threats, *see* Pls. 44, or the Status Review Team’s finding that the Mid-New England complex is at a “high risk of extinction,” Listing Decision at AR 41. And NMFS ignores that the complexes are linked by the agency’s recolonization theory. *See supra* at 19-20; Pls. 44. The agency’s reliance on its post hoc and arbitrary five-percent threshold, *see supra* at 21-22, fails here too.

¹⁹ NMFS’s alternative contention that it did consider two rivers within the Southern New England stock complex, NMFS 38, is also inadequate, given the agency’s obligation to consider the significance of the full portion of the range in question.

Finally, the flaws in NMFS’s recolonization theory, *supra* pt. II, infect the agency’s conclusion that the Mid-New England complex itself is not a significant portion of the range. *See* Pls. 44-45. Although NMFS protests that it considered other factors, NMFS 39-40, its “erroneous conclusion” about the likelihood of recolonization “surely influenced” this analysis. *Ctr. for Biological Diversity v. FWS*, 246 F. Supp. 3d 1272, 1286 (N.D. Cal. 2017) (explaining that, due to agency’s errors in the rangewide analysis regarding a listing factor, “it could not have properly assessed” the species’ vulnerability for purposes of the significant portion of the range analysis).

IV. The Court should vacate the Listing Decision.

“The ordinary practice is to vacate unlawful agency action.” *United Steel v. Mine Safety & Health Admin.*, 925 F.3d 1279, 1287 (D.C. Cir. 2019) (citing 5 U.S.C. § 706(2)). Remand without vacatur is reserved for “rare cases.” *Id.*; *see also Allied-Signal, Inc. v. U.S. Nuclear Regul. Comm’n*, 988 F.2d 146, 150-51 (D.C. Cir. 1993) (setting forth standard). “Because vacatur is the default remedy, . . . defendants bear the burden to prove that vacatur is unnecessary.” *Standing Rock Sioux Tribe v. U.S. Army Corps of Eng’rs*, 471 F. Supp. 3d 71, 79 (D.D.C. 2020) (citation omitted), *aff’d in relevant part*, 985 F.3d 1032 (D.C. Cir. 2021).

Rather than address its burden, NMFS seeks to punt remedy to another set of briefs. NMFS 40-41. The Court need not wait. The facts here support the default remedy of vacatur. NMFS’s errors are serious. The D.C. Circuit “has repeatedly vacated agency actions” where, as here, the agency ignores “an important aspect of the problem.” *Cigar Ass’n of Am. v. FDA*, 436 F. Supp. 3d 70, 89 (D.D.C. 2020). NMFS’s errors resulted in the exclusion of most climate change impacts from the agency’s determination, *see* Status Review Report at AR 2177, and denied species status to a stock complex deemed at “high risk of extinction,” *id.* at AR 2216. There is at least “substantial doubt whether [NMFS] chose correctly” in its listing determination.

See Humane Soc’y of U.S. v. Zinke, 865 F.3d 585, 614 (D.C. Cir. 2017) (internal quotation marks and citation omitted) (vacating delisting where “major shortcomings [went] to the heart” of decision). Vacatur also presents “no risk of disruption.” *St. Lawrence Seaway Pilots Ass’n v. U.S. Coast Guard*, 357 F. Supp. 3d 30, 38 (D.D.C. 2019). NMFS’s decision to not protect river herring did not change the status quo; vacatur would only require NMFS to try a third time to comply with the law.²⁰ As in 2017, vacatur is warranted. *See Rauch*, 244 F. Supp. 3d at 100.

Finally, NMFS’s objections to a remand order requiring a new listing decision within a year are misplaced. The Court is “empowered to set deadlines which the agency must meet” on remand. *Cal. Cmty. Against Toxics v. Pruitt*, 241 F. Supp. 3d 199, 204, 207 (D.D.C. 2017). And Congress has made clear how quickly it expects NMFS to respond to listing petitions: within twelve months. 16 U.S.C. § 1533(b)(3)(B); accord *Friends of Animals v. Ashe*, 808 F.3d 900, 902 (D.C. Cir. 2015). Plaintiffs merely seek a remand that reflects Congress’s express intent for expeditious resolution of listing petitions—particularly for this petition, filed a decade ago.

CONCLUSION

The Court should grant summary judgment to Plaintiffs, vacate and remand the Listing Decision, and order that NMFS complete a new listing determination within one year.

²⁰ The cases NMFS cites lend it no support. In *In re Polar Bear ESA Listing and 4(d) Rule Litigation*, Judge Sullivan remanded a question of statutory interpretation for further explanation but left the agency’s decision to list the polar bear as threatened in place because he had not yet ruled on the ultimate lawfulness of that decision. 748 F. Supp. 2d 19, 30 (D.D.C. 2010). And in *Comcast Corp. v. FCC*, the D.C. Circuit vacated a regulation in part because it was the second time the agency had failed to adequately explain its action. 579 F.3d 1, 9 (D.C. Cir. 2009).

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