

RESTORING THE EMERGENCY ROOM: HOW TO FIX SECTION 7(A)(2) OF THE ENDANGERED SPECIES ACT

BY

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Biodiversity conservation policy in the United States, particularly as developed through the Endangered Species Act, has come to focus primarily on merely avoiding calamity. Section 7(a)(2) of the ESA prohibits federal agencies from carrying out, funding, or permitting actions that jeopardize threatened and endangered (listed) species, or destroy or adversely modify, their critical habitat. These prohibitions are among the ESA's most important protections, which Congress envisioned as creating an "emergency room" for vanishing species. However, improperly narrow agency interpretations undercut these protections' effectiveness, allowing continued adverse effects to both listed species and critical habitat so long as each incremental impact does not imperil the entire species or render ineffective an entire critical habitat reserve—a threshold almost never crossed.

There is a better way. Federal agencies charged with administering section 7(a)(2) should instead focus on maintaining minimum survival thresholds and species' timely progress toward recovery in interpreting what it means to "jeopardize" listed species. These agencies should also embrace a "no net loss" approach to conservation of the physical and biological features of critical habitat that are essential to species' recovery. While far-reaching, these reforms require no amendments to the ESA itself, and only minor changes to regulations interpreting the law. Additionally, this approach to biodiversity conservation is consistent with both the vision of the Congress that passed the ESA and the language of the ESA itself and would significantly advance U.S. protections for its most imperiled species and the ecosystems upon which they depend. At the same time, these reforms would improve standards for management of protected areas in the U.S. and thus help fulfill

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President Biden’s commitment to advancing biodiversity conservation and slowing climate change through protecting at least 30% of land and marine areas under U.S. jurisdiction.

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I. INTRODUCTION

Consider the following nightmare scenario: Paramedics rush an accident victim to a hospital’s emergency room, her life threatened by serious injuries. Examining the patient, the attending physician renders a diagnosis with a twist. “She’s in bad shape,” the doctor tells the victim’s distressed family members, “but it’s almost noon and she probably won’t be *too* much worse after my lunch break. When I come back in a couple of hours or so I’ll do my best to save her.”

Though such a scene seems inconceivable, it concisely describes the United States’ longstanding policy toward protections for listed species set out in section 7 of the federal Endangered Species Act (ESA).¹ For decades, commentators, reporters, and government officials have analogized the ESA’s efforts to set forth a program for halting and reversing many species’ slides toward extinction to an emergency room for imperiled creatures.² Lawmakers imposed prohibitions on the federal

¹ Endangered Species Act of 1973 (ESA), 16 U.S.C. §§ 1531–1544 (2018). Section 7 is codified at 16 U.S.C. § 1536 (2018).

² See, e.g., JAMES SALZMAN & BARTON H. THOMPSON, JR., ENVIRONMENTAL LAW AND POLICY 294 (5th ed. 2019) (“The ESA thus takes an ‘emergency room’ approach to biodiversity.”); J. Michael Scott et al., *Species Richness: A Geographic Approach to*

government itself as a centerpiece of the statute; section 7 of the ESA bans all discretionary federal actions that “jeopardize the continued existence” of species listed as threatened or endangered, or that result in the “destruction or adverse modification” of specific habitat for these species formally designated as “critical.”³ While lawmakers envisioned these restrictions as “the institutionalization of . . . caution,”⁴ implementation of the statute has instead allowed a steady drumbeat of adverse impacts from federal actions that incrementally push protected species further toward the brink.⁵ The U.S. Fish and Wildlife Service (FWS) and National Marine Fisheries Service (NMFS), the two expert agencies responsible for assessing other federal agencies’ compliance with section 7’s prohibitions (collectively the Services), routinely sanction actions that negatively affect both listed species and the habitat designated as essential to their conservation—leaving species’ recovery to an often unspecified, uncertain, and distant date in the future.⁶

Though this dangerous and counter-intuitive interpretation of the ESA’s central protections for listed species has persisted for years—through Executive Branch administrations headed by both Democrats and Republicans—President Biden’s promise to emphasize biodiversity conservation as a key component of U.S. efforts to battle climate change provides a window of opportunity to return to the lawmakers’ emphasis on urgent efforts to both stem threatened and endangered species’ declines and make steady progress toward recovering listed species.⁷ This Article sets out a means for accomplishing these goals by implementing the law as Congress arguably intended. Significantly, this path requires no legislative changes to section 7 itself and only modest clarification of existing regulations. At the same time, it necessitates a change in the

Protecting Future Biological Diversity, 37 BIOSCIENCE 782, 783 (1987) (“The motivation to rescue otherwise doomed species rests upon philosophical as much as biological grounds, and may be compared to emergency room treatment for the critically ill.”). Innumerable articles in the popular press also feature this analogy. *See, e.g.*, Sarah Gold, *The Endangered Species Act Won’t Save Animals. It’s Not Designed To*, SLATE (May 30, 2017), <https://perma.cc/29LF-CQUU> (“The ESA may be most effective when it’s thought of as the emergency room of conservation—the last resort. It’s unfortunate that right now, an emergency room is all we’ve got.”).

³ 16 U.S.C. § 1536(a)(2).

⁴ H.R. REP. NO. 93-412, at 5 (1973) (“The institutionalization of that caution lies at the heart of H.R. 37.”).

⁵ *See* Daniel J. Rohlf, *Jeopardy Under the Endangered Species Act: Playing a Game Protected Species Can’t Win*, 41 WASHBURN L.J. 114, 150 (2001) [hereinafter Rohlf, *Jeopardy*] (“[A]s the list of imperiled species has grown over the years, [U.S. Fish and Wildlife Service’s and National Marine Fisheries Service’s] evolving interpretation and implementation of the jeopardy standard has dimmed not only the prospects that listed species will recover, but has also placed at risk the very existence of many.”).

⁶ *Id.* at 115.

⁷ *See* Exec. Order No. 14008, 86 Fed. Reg. 7619, 7622 (Feb. 1, 2021) (“It is the policy of my Administration to organize and deploy the full capacity of its agencies to combat the climate crisis to implement a Government-wide approach that reduces climate pollution in every sector of the economy; increases resilience to the impacts of climate change; protects public health; conserves our lands, waters, and biodiversity.”).

outlook and implementation policies of many federal agencies. Led by FWS and NMFS, all arms of the federal government must recognize the ESA's role as prescribing urgent "emergency room" measures for imperiled species and forego the predominant current approach of procedural hoops and modest tweaks that amount to the conservation equivalent of "take a couple of aspirin and call me in the morning."

The extinction crisis, of course, extends far beyond U.S. borders.⁸ The start of a new decade in 2020 saw increasing global concerns about the tenuous state of the planet's biodiversity, set against a backdrop of the related "omnicrises" of climate change and the covid pandemic.⁹ Recognizing that cooperative efforts to improve the status of biodiversity worldwide have stumbled badly, nations at the 2022 Convention on Biological Diversity (CBD or Convention) adopted a new Global Biodiversity Framework setting forth steps aimed at improving the deteriorating state of biodiversity worldwide and progressing toward the 2050 vision of living in harmony with nature.¹⁰ One of the Framework's "action targets" has garnered significant interest and media attention—a call to protect at least 30% of both terrestrial and marine areas across the globe by 2030 "through effectively and equitably managed, ecologically representative and well-connected systems of protected areas and other effective area-based conservation measures."¹¹ Despite leading the only nation on the planet that has not ratified the Convention (along with the Holy See),¹² President Biden has nevertheless embraced this so-called "30x30" benchmark for the United States as part of his plan for battling climate change.¹³ Days after his inauguration, Biden ordered the Secretary of Interior, in consultation with other cabinet officials and agency heads, to outline a path for conserving additional lands and waters so that 30% enjoy some degree of protection by 2030.¹⁴ An initial report to the National Climate Task Force a few months later stressed that loss of species and biodiversity poses "grave risks to the abundance, resilience, and accessibility of the natural resources that are at the foundation of America's economy and well-being."¹⁵

⁸ See U.N. Convention on Biological Diversity, *First Draft of the Post-2020 Global Biodiversity Framework*, U.N. Doc. CBD/WG2020/3/3, at 3 (July 5, 2021) [hereinafter U.N. Framework] (stating the global need for biodiversity protection).

⁹ *Id.* Science writer Ed Yong coined the term "omnicrisis" to refer to an overwhelming threat that "has warped and upended every aspect of our lives." See Ed Yong, *What Even Counts as Science Writing Anymore?*, THE ATLANTIC (Oct. 2, 2021), <https://perma.cc/6D9L-6SKG>.

¹⁰ U.N. Framework, *supra* note 8, at 3.

¹¹ *Id.* at 6.

¹² See *List of Parties*, CONVENTION ON BIOLOGICAL DIVERSITY, <https://perma.cc/T5HT-J59R> (last visited Oct. 4, 2022).

¹³ Helen O'Shea et al., *Biden Administration Lays Out 30x30 Vision to Conserve Nature*, NAT. RES. DEF. COUNCIL (May 6, 2021), <https://perma.cc/9AFV-RZ5Z>.

¹⁴ See Exec. Order No. 14008 at Sec. 216, 86 Fed. Reg. 7,619, 7,623, 7,627 (Feb. 1, 2021) (announcing the mission and work of the group).

¹⁵ U.S. DEPT OF THE INTERIOR, *CONSERVING AND RESTORING AMERICA THE BEAUTIFUL 9* (2021), <https://perma.cc/8CQJ-DZ8D> [hereinafter *CONSERVING AND RESTORING AMERICA*].

Biden's call to protect and restore biodiversity sensibly emphasizes forward progress—an increase in protected areas to conserve species and their habitat.¹⁶ A similar push to reform the current implementation of the ESA's section 7(a)(2) prohibitions would advance 30x30 goals by largely abandoning the biologically dangerous and legally defective idea that things can get worse for endangered and threatened species before they get better. An interpretation of section 7(a)(2)'s ban on federal actions that “jeopardize” listed species that is more in line with the statute and its legislative history—as well as consistent with sound science—would prevent actions that push species below their “survival” threshold, as well as avoid appreciably delaying their recovery.¹⁷ Additionally, contrary to long-time rationalizations for piecemeal loss of habitat essential for recovering listed species, section 7's prohibition on destruction or adverse modification of designated critical habitat should mean what it says. At the same time, the statute does provide a measure of flexibility by permitting assessment of such impacts across critical habitat designations as a whole that results in a “no net loss” standard for physical and biological features essential for species' recovery.¹⁸

Although the revisions in implementing section 7 discussed below would have no effect on most federal projects and authorizations that do not adversely affect listed species or designated critical habitat, the common-sense reading of section 7 proposed here would undoubtedly impose additional limitations or costs on some agency activities and authorizations. This said, the benefits would outweigh the costs; as President Biden has himself emphasized, increasing protections for biodiversity would produce large-scale environmental improvements, including reducing carbon emissions and enhancing climate resilience.¹⁹ Moreover, familiar administrative techniques and market mechanisms for implementing compensatory mitigation would provide additional economic opportunities while efficiently conserving imperiled species and their habitat.

This Article explains how the Services should adjust their interpretation of section 7(a)(2)'s twin prohibitions to increase protections for listed species by dispensing with the idea, in most cases, that federal

¹⁶ While the President's Executive Order on climate emphasizes increasing protected land and marine areas in the United States, many experts and conservation advocates have found the federal government's efforts to define protected areas, for purposes of the 30x30 goal, underwhelming. For example, environmental groups have called for reforming regulations governing grazing on federal lands managed by the Bureau of Land Management and Forest Service before those lands can count toward 30x30 conservation goals. See, e.g., Jennifer Yachnin, *Could Conservation Plan Prompt Tougher Grazing Oversight?*, E&E NEWS: GREENWIRE (Nov. 1, 2021), <https://perma.cc/6AAY-MU2R> (explaining the criticism from environmental groups about counting lands leased for grazing toward the 30x30 goal); Michael C. Blumm et al., *Federal Grazing Lands and Their Suitability as “Conservation Lands” in the 30 by 30 Program*, 52 ENV'T L. REP. 10279, 10279 (2022).

¹⁷ See *infra* notes 86–106 and accompanying text.

¹⁸ See *infra* notes 146–170 and accompanying text.

¹⁹ See Exec. Order No. 14008, 86 Fed. Reg. at 7626.

actions can continue to have incremental negative impacts on those species and their designated critical habitat. Part II provides a brief overview of section 7(a)(2) and how the Services have interpreted it over time, including recent regulatory changes under the Trump Administration. Part III explains how to implement section 7's prohibition on federal actions that jeopardize listed species, as well as the law's ban on agency actions that destroy or adversely modify critical habitat, in a manner that both hews more closely to the statute and makes more sense biologically. Part IV looks at the implications of changing the longstanding approach to section 7(a)(2) and how a more conservation-oriented implementation of its prohibitions would advance U.S. efforts to achieve its 30x30 goals, simultaneously mitigating the extinction crisis and enhancing the nation's carbon reduction efforts and climate resiliency. Part V provides a brief conclusion.

II. BACKGROUND

A steep decline in the overall condition of biodiversity in the United States was already well underway when Congress first created a means of legally classifying and protecting imperiled species over five decades ago. While prohibitions under section 7(a)(2) that apply to federal agencies' actions should represent some of the ESA's strongest protections for such species, interpretations limiting the scope of key elements of this part of the statute have allowed for continuing declines of many threatened and endangered species.

A. *Biology*

Providing a grim reminder of the precarious state of biodiversity in the United States, in 2021 FWS announced that 23 species protected by the ESA are now extinct.²⁰ This list includes several bird species from Hawai'i and Guam; eight freshwater mussel species from the Southeast United States; two freshwater fish species from Ohio and Texas; and ivory-billed woodpeckers, the largest species of woodpecker, whose breathtaking appearance inspired its nickname as the "lord-god" bird.²¹

²⁰ U.S. Fish and Wildlife Service Proposes Delisting 23 Species from Endangered Species Act Due to Extinction, U.S. DEP'T OF THE INTERIOR (Sept. 29, 2021), <https://perma.cc/9QPF-NQLJ> [hereinafter *Delisting*].

²¹ *Id.*; Andrew Del-Colle, *Ivory-Billed Woodpecker to Be Officially Declared Extinct in U.S.*, AUDUBON (Sept. 29, 2021), <https://perma.cc/F7T8-AMJD>; but see Oliver Milman, *Back From the Dead? Elusive Ivory-Billed Woodpecker Not Extinct, Researchers say*, THE GUARDIAN (Apr. 13, 2022), <https://perma.cc/CJV6-Z2TT> (suggesting that the ivory-billed woodpecker is not extinct according to a team of scientists from the National Aviary that spotted the bird in Louisiana, despite the FWS announcement). For a preprint of the study, see Steven C. Latta et al., *Multiple Lines of Evidence Indicate Survival of the Ivory-billed Woodpecker in Louisiana 4* (forthcoming paper, 2022), <https://perma.cc/LS7B-UXDN> (paper pending peer review). For an audio recording of the ivory-billed woodpecker's distinctive sound, see The Memory Palace, *The Woods*, RADIOTOPIA, at 06:40–07:21 (Oct. 23, 2021),

Unsurprisingly, major causes of these species' extinction included habitat loss and degradation compounded by the effects of climate change.²² At a broader level, FWS's sobering announcement highlighted the weaknesses in American efforts to protect its biological heritage.

In the air, on the ground, and in the nation's waters, about a third of all U.S. species are at risk of extinction.²³ What scientists do not know adds to this dire state; biologists have evaluated only about 20% of the country's more than 200,000 identified species to assess extinction risk, meaning that the actual percentage of imperiled plants and animals is likely much higher.²⁴ With the loss of biodiversity also comes a loss in biomass and natural services that biodiversity provides, lessening the capacity of ecosystems to sustain life in a frightening spiral of compounding effects.²⁵

The ESA provides a crucial bulwark fighting against this tide. Passed in 1973,²⁶ the ESA seeks to "provide a means whereby the ecosystems upon which endangered species . . . depend may be conserved, to provide a program for the conservation of such endangered species,"²⁷ and to improve the status of an endangered species to recovery.²⁸ Importantly, in passing this law, Congress sought to imbue or institutionalize throughout the federal government a cautious approach to its interactions with the environment, reasoning that "[w]ho knows, or who can say, what potential cures for cancer or other scourges . . . may lie locked up in the structures of plants, which may yet be undiscovered, much less analyzed."²⁹

Despite lawmakers' resolve to meaningfully tackle the extinction crisis, in the half century since the law's passage troubling trends have

<https://perma.cc/B4SG-JEES>, and *All Things Considered*, Brinkley, Ark., Embraces 'The Lord God Bird', NAT'L PUB. RADIO at 04:11–04:25 (July 6, 2005), <https://perma.cc/45PY-2QFS>.

²² *Delisting*, *supra* note 20.

²³ BRUCE A. STEIN ET AL., REVERSING AMERICA'S WILDLIFE CRISIS: SECURING THE FUTURE OF OUR FISH AND WILDLIFE 2 (2018). See also Kenneth V. Rosenberg et al., *Decline of the North American Avifauna*, 366 SCIENCE 120, 120 (2019), <https://perma.cc/U8AR-ZVFR> (discussing the cumulative loss of nearly 3 billion birds in the United States and Canada since 1970).

²⁴ Paul Tolmé, *The U.S. Biodiversity Crisis*, NAT'L WILDLIFE FED'N (Jan. 30, 2017), <https://perma.cc/8U3W-T8E4>.

²⁵ David Biello, *How Biodiversity Keeps Earth Alive*, SCI. AM. (May 3, 2012), <https://perma.cc/44R6-E7VU>. Scientists characterize life forms that depend for part of their life cycle on species that are now extinct as "orphans of extinction." See *Save the Rhino, Save the Plant*, THE ECONOMIST (Jan. 29, 2022), <https://perma.cc/28E3-8X7B> (describing a situation where the extirpation of Sumatran rhinos has affected the propagation of 22 plant species who depend solely on the rhino for seed dispersal).

²⁶ *Endangered Species*, U.S. FISH & WILDLIFE SERV. (last visited Sep. 14, 2022), <https://perma.cc/FL87-DHS6>.

²⁷ ESA, 16 U.S.C. § 1531 (2018).

²⁸ See 50 C.F.R. § 402.02 (2020) ("Recovery means improvement in the status of listed species to the point at which listing is no longer appropriate under the criteria set out in section 4(a)(1) of the Act.") (emphasis in original).

²⁹ H.R. REP. NO. 93-412, at 5 (1973).

emerged. Relatively few species listed under the ESA are improving or reaching a recovered status.³⁰ Those species that the Services have declared recovered and delisted have often arguably attained that milestone due to low standards for recovery; many recovery plans set population and distribution goals lower than when species were initially listed.³¹ Opponents of strong protections for biodiversity cynically cite the ESA's limited track record for species recovery as a reason to weaken the statute.³² However, the lack of adequate progress in improving the state of biodiversity in the United States stems more from congressional antipathy toward funding conservation efforts, together with shortcomings in the Services' interpretation and implementation of what should be powerful statutory prohibitions in section 7(a)(2) designed to protect threatened and endangered species from harmful actions undertaken, financed, or approved by federal agencies.³³ While only better political choices can address the former, modest administrative reforms would go a long way toward remedying the latter.

³⁰ See Justin R. Pidot, *Contingent Delisting*, 91 U. COLO. L. REV. 649, 661 (2020) ("The status of more than 90 percent of listed species has remained unchanged since their listing."). As of September 2022, only 65 species have been delisted due to recovery. *Delisted Species*, U.S. FISH & WILDLIFE SERV., ENV'T CONSERVATION ONLINE SYS., <https://perma.cc/2GG6-EVLJ> (last visited Oct. 2, 2022) (spreadsheet filtered for "Species does not meet the definition of an endangered species or a threatened species—Recovered") (last visited Sept. 20, 2022). Note that nine species of Humpback whale are on this list. *Id.*

³¹ In a 2020 study, researchers identified 130 species for which FWS approved recovery plans that identified a recovery threshold with fewer populations or individuals than existed at the time the species were first listed as threatened or endangered. Ya-Wei Li et al., *Recovery Plans Need Better Science to Support Decisions that Allow Species to Decline in Abundance but Be Recovered* 2, 7, 10 (forthcoming paper, 2020), <https://perma.cc/9KLR-R8D3> (paper pending peer review). For almost all these species, FWS offered no scientific explanation for why it considered such declines to be consistent with a recovered population. *Id.* at 5, 9, 11. For additional information on the ambiguities inherent in FWS' definition of "recovered" species, see, for example, Maile C. Neel et al., *By the Numbers: How is Recovery Defined by the US Endangered Species Act?*, 62 BIOSCIENCE 646, 654 (2012) (finding that over a third of species had recovery thresholds below their population at the time of listing), and Gina K. Himes Boor, *A Framework for Developing Objective and Measurable Recovery Criteria for Threatened and Endangered Species*, 28 CONSERVATION BIOLOGY 33, 34 (2013).

³² See *infra* note 95 and accompanying text. Critics of the ESA's recovery track record invariably fail to explain how *reducing* protections for imperiled species and their habitat would improve the rate of species recovery.

³³ See *infra* notes 93–103 and accompanying text. Perhaps not surprisingly, researchers concluded that species that received more funding for recovery efforts and benefitted from legal limitations on threats to their wellbeing were more likely to be delisted due to recovery. See also Aaron M. Haines et al., *Benchmark for the ESA: Having a Backbone Is Good for Recovery*, 2 FRONTIERS IN CONSERVATION SCI. 1, 2 (Jan. 28, 2021), <https://perma.cc/5XAF-7U6T>; NOAH GREENWALD ET AL., *SHORTCHANGED: FUNDING NEEDED TO SAVE AMERICA'S MOST ENDANGERED SPECIES* 4 (2016), <https://perma.cc/UP66-SS9F>. A bipartisan bill titled "Recovering America's Wildlife Act of 2021," could go a long way to properly funding conservation efforts. For an account of the status of this bill, see S. 2372, 117th Cong. (2021); *S.2372- Recovering America's Wildlife Act of 2022*, CONGRESS.GOV, <https://perma.cc/KHD6-NG3C> (last visited Apr. 16, 2022). For a recent account of the "Senate[s] Environment and Public Works Committee [vote] to advance the legislation to the Senate for final passage," see Brandon Butler, *Driftwood Outdoors: Recovering America's Wildlife Act One Step Closer to Reality*, COLUMBIA DAILY TRIB. (Apr. 9, 2022), <https://perma.cc/4332-JP2X>.

B. Legal

On their face, the prohibitions in section 7(a)(2) appear to draw clear lines in the sand that prevent actions by federal agencies from driving threatened and endangered species closer to extinction and gradually diminishing habitat essential to these species' recovery. However, both regulators tasked with implementing the ESA have interpreted this part of the statute to allow for continued incremental declines of both listed species and their designated critical habitat.

1. *Twin Prohibitions & Procedures of Section 7(a)(2)*

In creating a program for conserving imperiled species through the ESA, Congress elected to hold the federal government itself to elevated standards for avoiding harms to listed species and the habitat necessary for their recovery.³⁴ The substantive and procedural provisions applicable to federal entities under section 7(a)(2) include some of the most far-reaching protections in any jurisdiction to prevent the extinction of identified species.³⁵ Substantively, this section requires all federal agencies to ensure that any discretionary action an agency authorizes, carries out, or funds is not likely to jeopardize the continued existence of a listed species or result in the destruction or adverse modification of the designated critical habitat of such species.³⁶ To assist agencies in complying with these restrictions, section 7(a)(2) prescribes a set of procedures requiring agencies proposing to undertake actions that may affect listed species or critical habitat to "consult" with FWS or NMFS.³⁷ Courts view compliance with section 7's procedural steps as a key element of ensuring against outcomes banned by the section,³⁸ and the Services'

³⁴ See *Tenn. Valley Auth. v. Hill*, 437 U.S. 153, 153–54 (1978) (citing the Sixth Circuit Court of Appeals' previous findings regarding legislative history and Congress' intent for the Endangered Species Act, specifically that Congress strengthened language in this act compared to prior endangered species legislation).

³⁵ See *id.* at 180 ("As it was finally passed, the Endangered Species Act of 1973 represented the most comprehensive legislation for the preservation of endangered species ever enacted by any nation.").

³⁶ ESA, 16 U.S.C. § 1536(a)(2) (2018); see also 50 C.F.R. § 402.03 (2020) ("Section 7 and the requirements of this part apply to all actions in which there is discretionary Federal involvement or control."). The FWS has responsibility for terrestrial and freshwater organisms, and the NMFS has responsibility for "marine wildlife such as whales and anadromous fish such as salmon." *About Us: Listing and Classification*, U.S. FISH & WILDLIFE SERV., <https://perma.cc/ZX2L-SGRW> (last visited Sept. 18, 2022).

³⁷ *Thomas v. Peterson*, 753 F.2d 754, 763 (9th Cir. 1985) (citing 16 U.S.C. § 1536(a)–(c)) (describing the procedural provisions of the ESA, including the requirement to "formally consult with" the FWS); see also *About Us: Listing and Classification*, *supra* note 36 (showing that the ESA requirements administers to "jointly" work with the Services when threatened or endangered species are possibly effected by a federal action).

³⁸ See, e.g., *Thomas*, 753 F.2d at 764 ("If a project is allowed to proceed without substantial compliance with those procedural requirements, there can be no assurance that a violation of the ESA's substantive provisions will not result.").

determinations in the consultation process are almost invariably determinative of a proposal's fate.³⁹

The section 7(a)(2) consultation process includes a set of increasingly thorough assessments depending on a project's likely impact on listed species or designated critical habitat.⁴⁰ If a federal agency determines that its proposed action has no effect on listed species or designated critical habitat, the agency may proceed without involving the Services.⁴¹ For an action that may affect these resources, the action agency must consult at least "informally" with the relevant Service; if the Service concurs in writing with the action agency's finding that the project is "not likely to adversely affect" (NLAA) species or critical habitat, the action may proceed.⁴² If informal consultation results in a consensus that a proposed action is likely to adversely affect listed species or critical habitat—or if the relevant Service refuses to concur with the action agency's NLAA finding—the agencies will proceed to so-called formal consultation.⁴³ Given this threshold, all proposed actions that go through the formal consultation process have at least some level of adverse impacts on listed species and/or designated critical habitat.⁴⁴

³⁹ The procedural process outlined in this Article is an overview; for a more detailed description of each step, see 50 C.F.R. §§ 402.10–402.17, and ERIN H. WARD ET AL., CONG. RSCH. SERV., R46867, ENDANGERED SPECIES ACT (ESA) SECTION 7 CONSULTATION AND INFRASTRUCTURE PROJECTS 1, 5–7 (2021). Describing the substantive weight of this consultation process, the U.S. Supreme Court noted that while a biological opinion issued by one of the Services at the end of the process "theoretically serves an 'advisory function,' . . . in reality it has a powerful coercive effect on the action agency." *Bennett v. Spear*, 520 U.S. 154, 169 (1997).

⁴⁰ WARD ET AL., *supra* note 39, at 5–7.

⁴¹ Fleshing out additional details of the initial process, in the first step, the so-called action agency—i.e., the federal agency planning a discretionary action—reaches out to the relevant Service (or sometimes both Services) requesting information about whether any listed species or critical habitat are present in the area where the proposed action will occur, or "action area." 50 C.F.R. § 402.11. If the action agency determines that either a listed species or critical habitat is present, the action agency will typically move into the second step and conduct a biological assessment to determine whether the proposed action may affect the listed species or critical habitat. *Id.* § 402.12. If the biological assessment concludes that the proposed action may affect the listed species or critical habitat, the agency must enter either formal or informal consultation with the Services. *See id.* §§ 402.13–.14 (showing requirements for "Informal Consultation" and "Formal Consultation," respectively).

⁴² 50 C.F.R. § 402.13. For a more detailed explanation of informal consultation, see U.S. FISH & WILDLIFE SERV. & NAT'L MARINE FISHERIES SERV., ENDANGERED SPECIES CONSULTATION HANDBOOK, xv (1988) [hereinafter CONSULTATION HANDBOOK].

⁴³ *See* CONSULTATION HANDBOOK, *supra* note 42, at 3-3 (flow chart depicting the informal consultation process).

⁴⁴ Adverse impacts on listed species include any level of incidental "take," i.e., harassment, death, or injury to individual members of a listed species that a proposed federal action is reasonably certain to cause. *See* 50 C.F.R. § 17.3(c) (2020) (setting out definitions of harass, harm, and incidental taking); CONSULTATION HANDBOOK, *supra* note 42, at xv (setting out definition of "is likely to adversely affect"). Consequently, even many actions that will ultimately benefit a species—stream restoration work to improve habitat for listed salmon, for example—must go through formal consultation since physical impacts during the restoration project may incidentally kill or injure individual salmon present at the site. *Id.* at 2-5.

At the close of formal consultation, the Service must produce a “biological opinion” (BiOp), using the “best science and commercial data available” to assess whether the proposed federal action is likely to jeopardize the continued existence of a listed species or destroy or adversely modify critical habitat.⁴⁵ If it finds a project is indeed likely to result in effects banned by section 7(a)(2), the Service must identify “reasonable and prudent alternatives” (RPA) to the proposed action that the action agency could implement and which would avoid the likelihood of jeopardy or adverse modification.⁴⁶ As noted, an adverse BiOp typically acts as the “kiss of death” for a project unless the BiOp also includes an RPA that the action agency chooses to implement.⁴⁷

While section 7(a)(2) is, of course, primarily regulatory, in at least a handful of instances the Services have employed market mechanisms to assist agencies in meeting their obligations under this provision.⁴⁸ Though only indirectly linked to section 7(a)(2),⁴⁹ FWS in particular has made extensive use of conservation banking mechanisms to mitigate impacts to listed species and their habitat in approving permits issued to non-federal entities that authorize incidental take of listed species.⁵⁰

The section 7(a)(2) process has additional features of note. If neither jeopardy nor adverse modification is likely, but the proposal will result in the unplanned “take” of listed species,⁵¹ the Services almost invariably issue an “incidental take statement” in the BiOp.⁵² This statement

⁴⁵ 50 C.F.R. § 402.14.

⁴⁶ *Id.* § 402.02.

⁴⁷ See *supra* note 39 and accompanying text. However, BiOps finding that a proposed project is likely to jeopardize a listed species or destroy or adversely modify critical habitat are vanishingly rare. See *infra* note 57 and accompanying text.

⁴⁸ For an examination of Obama era compensatory mitigation through the lens of a series of conservation agreements, see Justin R. Pidot, *Public-Private Conservation Agreements and the Greater Sage-Grouse*, 39 PUB. LAND & RES. L. REV. 165, 167–68. At the very end of the Obama Administration in 2017, the Department of Interior adopted a short-lived compensatory mitigation policy that encouraged—but did not require—federal agencies to avoid or mitigate harms to listed species and designated critical habitat as part of the section 7(a)(2) consultation process. See *infra* note 221.

⁴⁹ Since incidental take permits by their nature authorize actions that adversely affect listed species, the Services must go through the formal consultation process—with themselves—before issuing such permits. See U.S. FISH & WILDLIFE SERV. & NAT’L MARINE FISHERIES SERV., HABITAT CONSERVATION PLANNING AND INCIDENTAL TAKE PERMIT PROCESSING HANDBOOK 1-9, 14-24 (2016), <https://perma.cc/CT6H-2RHZ>.

⁵⁰ See, e.g., Amanda Zhang & Katie Allen, *Species and Habitat Conservation Banking*, CONSERVATION FIN. NETWORK (Sept. 30, 2020), <https://perma.cc/YJT3-W8RK> (discussing how conservation banking is similar to wetland mitigation banking); *Conservation Banking Incentives for Stewardship*, U.S. FISH & WILDLIFE SERV. (2019), <https://perma.cc/U9WU-253W> (discussing conservation banking and how “[l]andowners can profit from selling habitat or species credits” in order to “compensate for adverse impacts to [listed] species.”); David Takacs, *Are Koalas Fungible? Biodiversity Offsetting and the Law*, 26 N.Y.U. ENV’T L.J. 161, 171–75 (2018) (stating how the Services have implemented conservation banking to meet protection and funding goals).

⁵¹ ESA, 16 U.S.C. § 1532(19) (2018) (“The term ‘take’ means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct.”).

⁵² 50 C.F.R. § 402.14(i) (2020). Note that:

authorizes otherwise illegal death or injury of protected species, though the Services must include “reasonable and prudent measures” to be carried out by the action agency to minimize incidental take.⁵³ If the Service determines that a proposed federal action is likely to violate section 7(a)(2) and no alternatives are available, the action agency may apply to the Endangered Species Committee for an exemption.⁵⁴

Though resource user interests often portray section 7(a)(2) as imposing burdensome and costly restrictions on the activities of federal agencies and non-federal actions that they finance or permit,⁵⁵ empirical data suggest otherwise. Most section 7(a)(2) consultations—well over 90%—terminate after one of the Services concurs with an action agency’s NLAA determination to complete the informal consultation process.⁵⁶ Consultations concluding that a federal proposal is likely to jeopardize the continued existence of a listed species, or destroy or adversely modify critical habitat, are far rarer. An analysis covering more than seven years and ending in 2015 found that FWS issued only two biological opinions concluding that a federal project would jeopardize a listed species (out of over 88,000 formal and informal consultations); no opinion found destruction or adverse modification of critical habitat.⁵⁷ A study

The action agency is technically free to disregard the Biological Opinion and proceed with its proposed action, but it does so at its own peril (and that of its employees), for “any person” who knowingly “takes” an endangered or threatened species is subject to substantial civil and criminal penalties, including imprisonment.

Bennett, 520 U.S. 154, 170 (1997) (internal citations omitted).

⁵³ See 16 U.S.C. § 1536(b)(4); 50 C.F.R. § 402.14(i). Professor Owen described how these “reasonable and prudent measures” can protect listed species and critical habitat. See Dave Owen, *Critical Habitat and the Challenge of Regulating Small Harms*, 64 FLA. L. REV. 141, 187 (2012) (“Even as [the Services] have allowed the critical habitat protections to languish, they consistently have been finding that proposed projects will ‘take’ species and have been imposing ‘reasonable and prudent measures,’ many of which appear extensive and meaningful”). The section 7 regulations also allow the Services to impose “terms and conditions” that “must be complied with by the Federal agency or any applicant to implement the [reasonable and prudent] measures.” 50 C.F.R. § 402.14(i)(1)(iv). However, the regulations specify that reasonable and prudent measures, and terms and conditions imposed by the Services “cannot alter the basic design, location, scope, duration, or timing of the action and may involve only minor changes.” *Id.* § 402.14(i)(2).

⁵⁴ 16 U.S.C. § 1536(e)–(h). However, only a handful of exemptions have been granted over five decades, and the exemption process has not even been triggered for well over three decades. See M. LYNNE CORN ET AL., CONG. RSCH. SERV., R40787, ENDANGERED SPECIES ACT (ESA): THE EXEMPTION PROCESS 1, 13–20 (2017), <https://perma.cc/W5JW-Q8YJ> (describing specific projects that have previously sought exemptions under the Endangered Species Act).

⁵⁵ See Jacob W. Malcom & Ya-Wei Li, *Data Contradict Common Perceptions About a Controversial Provision of the U.S. Endangered Species Act*, 112 PROC. NAT’L ACAD. SCI. 15,844, 15,846 (Dec. 29, 2015), <https://perma.cc/GZ2Q-AYHS> (reporting data that “counter[s] many of the claims about the regulatory burdens and delays of complying with section 7.”).

⁵⁶ *Id.* at 15,844–45. A comprehensive 2015 study that analyzed FWS section 7 consultations from 2008 to 2015 cataloged 81,461 informal consultations and only 6,829 formal consultations. *Id.* at 15,845.

⁵⁷ *Id.* at 15,848, Table 2.

evaluating biological opinions issued between 2005–2009 found a slightly higher incidence of FWS biological opinions finding jeopardy and destruction or adverse modification of critical habitat—2.4% and 0.6% of BiOps respectively.⁵⁸

2. *Evolution of the Jeopardy & Adverse Regulatory Definitions*

Though regulatory modifications, policy adoptions, and court decisions have added wrinkles to the Services' implementation of section 7(a)(2)'s ban on federal actions that jeopardize the continued existence of listed species or destroy or adversely modify critical habitat, FWS and NMFS have consistently viewed these standards as providing them with broad discretion to allow incremental adverse impacts on listed species and designated critical habitat.⁵⁹ The Services have generally minimized the role of recovery and emphasized the wide scope of their section 7(a)(2) assessments in interpreting their responsibilities under this section. As a result, the “jeopardize” and destruction or adverse modification standards have almost been akin to the mathematical concept of an asymptote—a line that a curve comes infinitely close to but never intersects. Applied to endangered and threatened species, even as the “curve” of adverse impacts to species and critical habitat increasingly accumulate, the Services consistently find that the red lines theoretically imposed by section 7(a)(2) are rarely if ever crossed.⁶⁰

When it enacted the ESA in 1973, Congress did not define jeopardize or destruction or adverse modification of critical habitat; the statute also said nothing about how the Services should assess whether a federal action was likely to exceed these thresholds.⁶¹ In 1978, the Services enacted regulations defining “jeopardize the continued existence of” as an activity that would be expected to “appreciably reduce the likelihood of the survival and recovery” of a listed species.⁶² The new regulations defined “destruction or adverse modification” in nearly identical terms as an alteration that “appreciably diminishes the value of that habitat for the survival and recovery” of the species.⁶³ The Services declined requests

⁵⁸ Owen, *supra* note 53, at 164. Professor Owen calculated these figures after eliminating BiOps issued by a field office that he labeled anomalous. *Id.*

⁵⁹ Daniel J. Rohlf, *The Endangered Species Act at Forty: The Good, the Bad, and the Ugly*, 20 ANIMAL L. 251, 264–66, 268–69 (2014).

⁶⁰ *See id.* at 268–69 (“It is rare indeed that the relevant Service finds a project’s impact to be that final straw for a given species.”).

⁶¹ *See* ESA, 16 U.S.C. § 1532 (2018) (showing that the Act does not include definitions of jeopardize, destruction, or adverse modification of critical habitat); *see also* S. REP. NO. 93–307, at 19 (1973) (showing that Congress did not set an assessment standard, but rather generally authorizing the Secretary to “carry out such programs as are practicable for the protection of species listed . . . as endangered or threatened”).

⁶² Interagency Cooperation – Endangered Species Act of 1973, 43 Fed. Reg. 874, 875 (Jan. 4, 1978) (to be codified at 50 C.F.R. § 402.02).

⁶³ *Id.*

to make these definitions more specific, asserting that they preferred flexibility over specific and narrow definitions.⁶⁴

In the first overall effort to address the analytical methodology for assessing whether impacts caused by federal actions surpassed section 7(a)(2)'s thresholds, the Interior Solicitor's office in 1981 published an opinion that provided the basic foundation for later regulations that have guided implementation of this section for decades.⁶⁵ The Solicitor's memorandum addressed the question of how FWS should consider cumulative effects in assessing a proposed project's compliance with section 7(a)(2), and it described an overall process for determining whether a proposal jeopardizes a listed species or destroys or adversely modifies its critical habitat.⁶⁶ The memo focused on the area bounded by the effects of the federal proposal under consideration as setting the scope of a section 7(a)(2) analysis. It established the concept of an "environmental baseline" as the starting point for such an analysis, which the memo defined to include the past and present impacts of all federal, state, and private projects and human activities in the "affected area" of a proposed project.⁶⁷ The Solicitor specified that the Services should also consider the "anticipated impacts of all proposed federal projects in the affected area which have previously been the subject of sec. 7 consultation and received a favorable biological opinion[.]" since such projects have been found to comply with the ESA.⁶⁸ Finally, the Solicitor's opinion found that the Services should consider limited cumulative effects in their ESA analyses.⁶⁹ The opinion matter-of-factly noted that section 7(a)(2) would preclude further federal actions "in the area" when the "cushion" of remaining natural resources" above a minimum needed by the species was used up by other incremental impacts.⁷⁰

Five years later, the Services incorporated both the definitions and the analytical approach of the Solicitor's opinion into section 7

⁶⁴ *Id.* at 873 ("Definitions concerning jeopardy and the adverse modification or destruction of critical habitat must be flexible enough to deal with every possible consultation situation Overly specific and narrow definitions of these concepts would ultimately operate to the disadvantage of listed species by excluding them from coverage in unique situations.").

⁶⁵ U.S. Dep't of the Interior, Opinion by Office of the Solicitor on Cumulative Effects to be Considered Under Section 7 of the Endangered Species Act (Aug. 27, 1981) [hereinafter Solicitor's Opinion], *reprinted in* 88 Interior Dec. 903, 903–08 (1981).

⁶⁶ *Id.* at 906.

⁶⁷ *Id.* at 907.

⁶⁸ *Id.* (emphasis omitted).

⁶⁹ *Id.* at 906. The Solicitor's opinion limited the definition of cumulative effects in two significant ways compared to the expansive definition of cumulative effects under the National Environmental Policy Act (NEPA). *Id.* at 905. First, the Solicitor defined cumulative effects for purposes of assessing compliance with section 7(a)(2) as not including future federal actions that have not yet been the subject of a section 7(a)(2) consultation since those projects must undergo their own Section 7(a)(2) analysis in the future. *Id.* Second, the opinion specified that only those future state and private actions "reasonably certain to occur" constitute cumulative effects for purposes of section 7(a)(2) consultation. *Id.* at 208 (emphasis omitted).

⁷⁰ *Id.* at 907.

regulations.⁷¹ With one notable exception, the 1986 regulations largely retained the definitions of section 7(a)(2)'s key thresholds.⁷² However, in an apparent bow to the Reagan Administration's deregulatory agenda, the Services added the word "both" in front of the "phrase survival and recovery" within the definitions of "jeopardize the continued existence of" and "destroy or adversely modify" critical habitat.⁷³ Responding to comments that this change effectively rendered superfluous a consideration of impacts on recovery in assessing whether federal projects jeopardize listed species, the Services asserted that "[t]he 'continued existence' of the species is the key to the jeopardy standard, placing an emphasis on injury to a species' 'survival.'"⁷⁴ The Services nevertheless declined to include a regulatory definition of survival,⁷⁵ and brushed aside concerns about marginalizing recovery in the definition of "destruction or adverse modification" of critical habitat almost without explanation—an action that would later prove unwise.⁷⁶

The next significant interpretation event occurred in 1998 when the Services issued a joint Consultation Handbook that discussed in detail the agencies' interpretation of the substantive and procedural requirements of section 7 and its implementing regulations.⁷⁷ Apart from its wealth of explanation about the section 7(a)(2) consultation process, the Handbook added two important substantive elements.⁷⁸ First, the

⁷¹ See Interagency Cooperation-Endangered Species Act of 1973, as Amended; Final Rule, 51 Fed. Reg. 19,926, 19,932, 19,958 (June 3, 1986) (to be codified at 50 C.F.R. § 402) (explaining how the service should analyze impacts on species).

⁷² *Id.* at 19,933–34.

⁷³ *Id.* at 19,934, 19,958.

⁷⁴ *Id.* at 19,934.

⁷⁵ *Id.* Significantly, however, the Services noted that they "agree[d] with the criteria" set forth in a definition of survival proposed by a commenter. *Id.* That definition was as follows: "Survival for a species means retention of a sufficient number of individuals and/or populations with necessary habitat to insure [sic] that the species will keep its integrity in the face of genetic recombination and known environmental fluctuations." *Id.*

⁷⁶ See *id.* (explaining the Service's response to comments asking to change the 'and' to 'or'); see also *infra* note 87 and accompanying text.

⁷⁷ CONSULTATION HANDBOOK, *supra* note 42, at xx–xxii. For cases where courts have recognized the importance of the Handbook and discussed the level of deference owed to the Handbook, see *Miccosukee Tribe of Indians of Fla. v. United States*, 566 F.3d 1257, 1273 (11th Cir. 2009) ("Here there is no question that the Secretary of the Interior and the Fish & Wildlife Service are authorized by Congress to issue regulations that have the force of law in implementing the Endangered Species Act. The Handbook was created following the same administrative procedures that official regulations undergo. A preliminary Handbook was published in the Federal Register in 1994, and after a period for public comment was allowed and then extended, the Handbook was finally adopted in 1998. Under *Mead* and *Christensen*, the Service's Handbook is entitled to *Chevron* deference.") (citations omitted), and *In re Consol. Salmonid Cases*, 791 F. Supp. 2d 802, 898 n.26 (E.D. Cal. 2011) ("In fact, the Handbook requires an action-by-action analysis. NMFS must thoroughly explain how 'each' component of the RPA is 'essential.' While the Handbook is not deserving of *Chevron* deference as its purpose is to provide 'information and guidance,' its text is routinely cited as NMFS's and FWS's interpretation of the ESA, entitled to at least *Skidmore* deference. In at least one case, the Secretary of the Interior argued that the Handbook was not binding on the consulting agencies.") (emphasis and citations omitted).

⁷⁸ CONSULTATION HANDBOOK, *supra* note 42, at 4–33.

Handbook expanded the scope of a section 7(a)(2) analysis far beyond what the Solicitor's memo discussed. Though the Handbook continued to employ the environmental baseline concept, it also set out the Services' basic recipe for allowing incremental impacts on listed species and their critical habitat:

Adverse effects on individuals of a species or constituent elements or segments of critical habitat generally do not result in jeopardy or adverse modification determinations unless that loss, when added to the environmental baseline, is likely to result in significant adverse effects throughout the species' range, or appreciably diminish the capability of the critical habitat to satisfy essential requirements of the species.⁷⁹

In other words, until the Services find that a proposed federal action's adverse impacts act as the "last straw" which puts the entire species' existence at risk, the action does not violate section 7(a)(2).⁸⁰ Similarly, unless a federal action is likely to render an entire critical habitat designation incapable of providing for recovery of the species for which the habitat was designated, the individual action may proceed regardless of its site-specific impacts on the physical and biological features essential for the species' recovery.⁸¹ Together, therefore, section 7 regulations and the Handbook instruct the Services to assess a proposed federal action's compliance with section 7(a)(2) using oddly incongruent scopes of analysis—a detailed snapshot of a narrow "environmental baseline" that includes existing conditions, cumulative effects, and the direct and indirect effects of the federal action under consideration, and

⁷⁹ *Id.* at 4-36 (emphasis omitted).

⁸⁰ There is one exception to this focus on the entire listed species as for assessing jeopardy under section 7(a)(2). When a species has a final recovery plan (availability of which was published in the Federal Register) that delineates geographic "recovery units" of the species labeled as necessary for both the entire species' survival and recovery, the appropriate Service may assess whether a proposed federal action jeopardizes the continued existence of the species based solely on the project's impacts to one or more recovery units. CONSULTATION HANDBOOK, *supra* note 42, at 4-38. However, the Services rarely use this exception, and even when the agencies do employ it, they often implement it poorly. A 2022 study found that only 24 recovery plans have created recovery units defined as essential for species recovery and thus eligible for use in assessing jeopardy. See Michael J. Evans and Jacob W. Malcom, *Recovery Units under the Endangered Species Act Should be used More Widely*, FRONTIERS IN CONSERVATION SCI. (2022) at 5, <https://perma.cc/X83T-PNQ4>. However, even when a species had such delineated recovery units, researchers found that only 42% of the biological opinions that could have employed these units in assessing whether a proposed action jeopardized the continued existence of the relevant species explicitly did so; the chances a biological opinion would employ recovery units in its analysis also decreased with the age of the recovery plan at issue. *Id.* at 7. However, as Evans and Malcom concluded, greater use of the Services' authority to designate recovery units and employ them in assessing whether federal projects jeopardize the continued existence of listed species could allow the Services to avoid the "death by 1,000 cuts" problem in protecting listed species. *Id.* at 2.

⁸¹ CONSULTATION HANDBOOK, *supra* note 42, at 4-35.

the broad and undefined “current status” of an entire species and its entire critical habitat designation.⁸²

On the other hand, the Handbook took the step the Services had declined to carry out a dozen years earlier, adopting a broad and relatively biologically sophisticated definition of species’ “survival,” as the term is used by the section 7 regulations, to define both jeopardize and “destroy or adversely modify” critical habitat.⁸³ The Handbook explained that “survival is the condition in which a species continues to exist into the future while retaining the potential for recovery.”⁸⁴ It then listed factors for the Services to consider in assessing whether a specific species is capable of survival.⁸⁵

Vindicating commenters’ concerns years earlier, the Services’ 1986 efforts to deemphasize recovery in the definition of “destroy or adversely modify” critical habitat eventually met with disapproval in court.⁸⁶ Panels in both the Fifth and Ninth Circuits emphasized the crucial role of recovery in the statute’s definition of critical habitat to find unlawful the Services’ regulatory definition of “destroy or adversely modify” critical habitat.⁸⁷ In response, the Services eventually promulgated a new definition in 2016 that emphasized consideration of a proposed action’s effects on the value of critical habitat for species’ conservation.⁸⁸ The Trump Administration again revised the regulatory definition of section 7(a)(2)’s critical habitat standard in 2019, removing the 2016 definition’s recognition that alterations that appreciably diminish the value of critical habitat may include “those that alter the physical or biological features

⁸² See 50 C.F.R. § 402.02 (2020) (defining “environmental baseline,” “effects of the action,” and “cumulative effects”); see also *id.* § 402.14(g)(2) (defining the Services’ responsibilities to “[e]valuate the current status of the listed species or critical habitat.”).

⁸³ CONSULTATION HANDBOOK, *supra* note 42, at xviii–xix.

⁸⁴ *Id.* at xix.

⁸⁵ *Id.*

⁸⁶ See, e.g., *Sierra Club v. U.S. Fish & Wildlife Serv.*, 245 F.3d 434, 441–42 (5th Cir. 2001) (overturning the Services’ definition of “destroy or adversely modify”).

⁸⁷ *Id.* (“The ESA defines ‘critical habitat’ as areas which are ‘essential to the conservation’ of listed species. ‘Conservation’ is a much broader concept than mere survival. . . . Requiring consultation only where an action affects the value of critical habitat to both the recovery *and* survival of a species imposes a higher threshold than the statutory language permits.”) (emphasis in original) (internal citations omitted); *Gifford Pinchot Task Force v. U.S. Fish & Wildlife Serv.*, 378 F.3d 1059, 1070 (9th Cir. 2004) (“The agency’s interpretation would drastically narrow the scope of protection commanded by Congress under the ESA. To define ‘destruction or adverse modification’ of critical habitat to occur only when there is appreciable diminishment of the value of the critical habitat for both survival *and* conservation fails to provide protection of habitat when necessary only for species’ recovery. The narrowing construction implemented by the regulation is regrettably, but blatantly, contradictory to Congress’ express command.”).

⁸⁸ Interagency Cooperation-Endangered Species Act of 1973, as Amended; Definition of Destruction or Adverse Modification of Critical Habitat, 81 Fed. Reg. 7,214, 7,216 (Feb. 11, 2016) (codified at 50 C.F.R. § 402) (“Destruction or adverse modification means a direct or indirect alteration that appreciably diminishes the value of critical habitat for the conservation of a listed species. Such alterations may include, but are not limited to, those that alter the physical or biological features essential to the conservation of a species or that preclude or significantly delay development of such features.”) (emphasis omitted).

essential to the conservation of a species or that preclude or significantly delay development of such features.”⁸⁹ The 2019 definition also made it clear that a proposed agency action must appreciably diminish the value of a critical habitat designation “as a whole” to constitute a violation of section 7(a)(2).⁹⁰ While many commentators at the time criticized addition of the “as a whole” language as a change that would allow “more piecemeal, incremental losses that over time would add up cumulatively to significant losses . . . [or] ‘death by a thousand cuts,’”⁹¹ the Services accurately noted that the revised definition “reflect[ed] existing practice and the Services’ longstanding interpretation that the final destruction or adverse modification determination is made at the scale of the entire critical habitat designation.”⁹² The Services also indicated that impacts to relatively small areas of high biological significance—such as migration corridors or nesting grounds—could rise to a level of destruction or adverse modification “while impacts to a large geographic area [would] not always result in such a finding.”⁹³

3. Conservation Track Record of 7(a)(2) Protections

From a practical standpoint, a crucial question is of course whether section 7(a)(2)’s twin prohibitions, as interpreted and implemented by the Services for nearly 50 years, have provided listed species with significant protections. However, surprisingly little overall data exist to provide a clear answer—which itself indicates problems with the longstanding implementation of section 7(a)(2).

Political battles have helped to undermine objective assessments of the ESA’s efficacy.⁹⁴ Opponents of strong federal protections for

⁸⁹ Endangered and Threatened Wildlife and Plants; Regulations for Interagency Cooperation, 84 Fed. Reg. 44,976, 44,981 (Aug. 27, 2019) (“We revised the definition of ‘destruction or adverse modification’ by adding the phrase ‘as a whole’ to the first sentence and removing the second sentence of the prior definition.”).

⁹⁰ A coalition of states and environmental organizations challenged the 2019 revisions to section 7 regulations in federal district court. *See* Ctr. for Biological Diversity v. Haaland, 2022 WL 2444455 (N.D. Cal. July 5, 2022). The district court granted the plaintiffs’ motion to vacate the 2019 regulatory revisions without ruling on their legal merits, based on the Biden Administration’s announcement that the Services planned to revise the Trump-era changes. *See id.* at *5. However, the Ninth Circuit granted a petition for mandamus to reinstate the 2019 regulations, finding that the district court had “clearly erred” in vacating the 2019 rules changes without ruling on whether they were lawful. *See In re Wash. Cattlemen’s Ass’n*, 2022 WL 4393033 (9th Cir. Sept. 21, 2022).

⁹¹ 84 Fed. Reg. at 44,983.

⁹² *Id.* at 44,981. Indeed, the only reason that the Services declined some commenters’ request to add the “as a whole” phrase to the regulatory definition of “destruction or adverse modification” in 2016 was the Services’ observation that “a determination of destruction or adverse modification is made at the scale of the entire critical habitat designation.” 81 Fed. Reg. at 7,222.

⁹³ 84 Fed. Reg. at 44,983.

⁹⁴ *See* JIM LYONS, UNDER THREAT: THE ENDANGERED SPECIES ACT AND THE PLANTS AND WILDLIFE IT PROTECTS 2–3 (2017), <https://perma.cc/HX48-HH48> (describing two divergent views on whether the Act should be open to legislative change that “threatens the viability of the law itself”).

biodiversity commonly cite the relatively small number of species delisted as recovered as indicating the statute's inadequacies,⁹⁵ though most proposed reforms from conservative quarters would weaken the law's protections for listed species—hardly a logical recipe for advancing recovery of species threatened by human actions.⁹⁶ On the other hand, conservation advocates have extolled the statute's virtues for conserving threatened and endangered species while at the same time filing scores of lawsuits against the Services for failing to adequately interpret and implement its provisions.⁹⁷

A more dispassionate analysis of progress toward recovering listed species revealed several important but unsurprising factors influencing species recovery.⁹⁸ A study in the science journal *Frontiers in Conservation Science* found that species formerly protected under the ESA and were delisted as recovered tend to be charismatic species (mostly vertebrates) that were protected by the statute for decades, enjoyed relatively high levels of funding for recovery actions, were protected by other laws as well as the ESA, and had substantial habitat within relatively protected areas.⁹⁹ This suggests that the ESA has helped make progress toward recovery with what amounts to the “low hanging fruit”

⁹⁵ For example, in testimony from a 2011 hearing before the House of Representatives Resources Committee, a lawyer representing ranchers cited statistics on species delisted as recovered to assert that “since 1979, the ESA has worked as intended in 2 percent of the cases.” *The Endangered Species Act: How Litigation is Costing Jobs and Impeding True Recovery Efforts: Oversight Hearing Before the Comm. on Nat’l Res.*, 112th Cong. 7 (2011) (statement of Karen Budd-Falen, Owner/Partner, Budd-Falen Law Offices, L.L.C.).

⁹⁶ For example, in 2005 the House of Representatives passed HR 3824, a bill to “reform” the ESA; the bill’s provisions eliminated critical habitat designations altogether and required the federal government to compensate property owners for costs associated with protecting listed species. See Erik Stokstad, *House Revises Endangered Species Act*, SCIENCE (Sept. 30, 2005), <https://perma.cc/BAA7-8CT3>. The legislation eventually died in the Senate. See Threatened and Endangered Species Recovery Act of 2005, H.R. 3824, 109th Cong. (2005).

⁹⁷ Compare *The Endangered Species Act: A Wild Success*, CTR FOR BIOLOGICAL DIVERSITY, <https://perma.cc/89D9-SWJW> (last visited Oct. 26, 2022), with, e.g., Ctr. for Biological Diversity v. Haaland, 562 F. Supp. 3d 68, 74 (D. Ariz. 2021) (“[CBD] allege[s] that, in developing the [Mexican Wolf Recovery Plan First Revision] the [FWS] violated [the ESA] by failing to include (1) site-specific management actions necessary for conservation, and (2) objective, measurable criteria necessary for delisting the Mexican wolf.”) (citation omitted), and Ctr. for Biological Diversity v. Bernhardt, 480 F. Supp. 3d 69, 71 (D.D.C. 2020) (“[CBD] sues to prevent the [FWS] from leapfrogging the [ESA’s] current mandates in its efforts to protect the Houston toad.”), and Cook Inletkeeper v. Raimondo, 533 F. Supp. 3d 739, 762 (D. Alaska 2021) (“[Cook Inletkeeper & CBD] claim that NMFS violated the ESA in three ways: (1) NMFS’s BiOp failed to properly consider the full effects of the action on the survival and recovery of the Cook Inlet beluga whale; (2) NMFS failed to properly consider the cumulative effects on Cook Inlet belugas; and (3) NMFS failed to reinstate consultation despite new information triggering that requirement.”).

⁹⁸ See Haines et al., *supra* note 33, at 1–2 (providing analysis of patterns and history impacting species recovery).

⁹⁹ See *id.* at 4–7 (“Based on our review of delisting documents for recovered species, protected areas provide more opportunities for focused recovery efforts and implementation of recovery actions.”).

of biodiversity conservation challenges, though it has likely also at least reduced the declines of many less high-profile species.

However, other indicators point to signs of serious problems with the ESA's implementation, particularly that of section 7(a)(2). If the Services truly performed rational assessments of whether successive proposed federal actions are likely to jeopardize listed species or destroy or adversely modify critical habitat on a species-wide and critical habitat-wide bases, they would need a system for closely tracking the status of entire species and entire areas of designated critical habitat; and, that system would have to track in real time both the natural and human-caused adverse impacts as well as improvements in both. However, the Services lack the data, resources, personnel, and analytical capabilities to accomplish the gargantuan task of developing such tracking systems for almost all domestically-listed species; these agencies even have difficulty describing the current status of a species and critical habitat in the limited area affected by an individual agency action.¹⁰⁰ The Services do not have a means of tracking the adverse impacts the agencies themselves have previously authorized through the section 7(a)(2) consultation process for most species,¹⁰¹ and have even successfully argued in a district court that section 7(a)(2) does not obligate them to consider such information.¹⁰² As a result, aside from relatively rare

¹⁰⁰ The Fourth Circuit's decision in *Appalachian Voices v. U.S. Department of the Interior*, 25 F.4th 259 (4th Cir. 2022) provides a good example of this challenge. In *Appalachian Voices*, the court noted that section 7 regulations require FWS to develop a "snapshot" of an affected species' health in real time, at least within the area affected by the site-specific project at issue in each section 7(a)(2) consultation. *Id.* at 270. However, the court found that even though FWS acknowledged "numerous" state and private actions that affected the listed species at issue in the challenged project's action area, the agency made no effort to identify those activities or their impacts on the listed species; the court also found that FWS was "attempting to pass off its summary of range-wide conditions and threats as an action-area analysis." *Id.* at 272.

¹⁰¹ U.S. GOV'T ACCOUNTABILITY OFF., GAO-09-550, ENDANGERED SPECIES ACT: THE U.S. FISH AND WILDLIFE SERVICE HAS INCOMPLETE INFORMATION ABOUT EFFECTS ON LISTED SPECIES FROM SECTION 7 CONSULTATIONS 16 (2009) [hereinafter FWS HAS INCOMPLETE INFORMATION]. The Services also has no systemic method for tracking cumulative take of species "exposing itself to vulnerabilities, including the threat of litigation and the danger that it may have an inaccurate picture of the collective effects consulted-on actions have had on species." *Id.* at 23. Additionally, in status review of listed species, required by the ESA, the Services virtually never discuss or even refer to adverse impacts on these species or their designated critical habitats authorized by the Services over time in previous section 7(a)(2) consultations. See, e.g., U.S. FISH & WILDLIFE SERV., ATTWATER'S GREATER PRAIRIE-CHICKEN: 5-YEAR REVIEW: SUMMARY AND EVALUATION (2021), <https://perma.cc/UP9S-MLYS> (reviewing of the status of Attwater's prairie chicken and available scientific literature regarding the species and its habitat, but including no references to, or analysis of, previous biological opinions issued by the agency which effectively authorize adverse impacts to the species).

¹⁰² See, e.g., *Audubon Soc'y of Portland v. Nat'l Marine Fisheries Serv.*, 849 F. Supp. 2d 1017, 1046 (D. Or. 2011) ("[T]he court is not free to rewrite the statute to include additional requirements"). The plaintiffs argued that section 7 required NMFS to consider impacts that it had previously authorized in consulting on a new federal project that adversely affected the same species. *Id.* at 1035–36. The opinion agreed with NMFS that nothing in section 7 required it to consider this information,

federal actions that affect species' throughout their range, the Services' current approach of comparing site-specific adverse impacts to listed species and their critical habitat to the far-larger scales of entire species and entire critical habitat designations essentially guarantees that the agencies will consistently approve incremental harms to these resources.¹⁰³ This is of course inconsistent with the basic purposes of the ESA to promote recovery of listed species and the ecosystems upon which they depend.¹⁰⁴

III. THE FIX

Far from institutionalizing caution, decades of improperly implementing Section 7(a)(2) has allowed federal agency actions and authorizations to push threatened and endangered species incrementally closer to extinction.¹⁰⁵ Despite accelerating threats to biodiversity, including growing impacts of climate-driven threats, the Services continue to green-light, under the jeopardy standard, virtually every proposed federal action that goes through the formal section 7(a)(2) consultation process.¹⁰⁶ Further, with what amounts to a system of

The court recognizes that a different methodology is needed in order to allow NMFS and other federal agencies to provide more accurate opinions regarding the current status of threatened and endangered species and critical habitat. However, the court is not free to rewrite the statute to include additional requirements such as the development of new methodologies or new data.

Id. at 1046.

¹⁰³ Professor Owen examined this “death by a thousand cuts” issue in the context of regulating impacts to critical habitat and found that “the services do not construe the adverse modification prohibition as applying to minor alterations of habitat” even when those modifications resulted in adverse modification and even the take of the species. Owen, *supra* note 53, at 168. At the same time, Professor Owen concluded that despite the Services’ routine authorization of small harms to critical habitat, the Services “have used those tools [for protecting species and critical habitat provided by section 7(a)(2)] in creative, pragmatic, and often effective ways.” *Id.* at 188. At a broader level, the fact that the Services virtually never find jeopardy or destruction, or adverse modification caused by proposed federal actions that adversely affect listed species and/or their critical habitat, i.e., actions that must go through formal consultation, provides empirical confirmation that these agencies in fact authorize incremental harms to listed species and designated critical habitat as a matter of course. Malcom & Li, *supra* note 55, at 15847 (“The cumulative effect of hundreds of these small projects is reduced populations or habitat, an outcome that some people refer to as ‘death by a thousand cuts.’”).

¹⁰⁴ See ESA, 16 U.S.C. § 1531(b) (2018) (describing the ESA’s purposes to conserve listed species and the ecosystems upon which they depend); see also Owen, *supra* note 53, at 191 (“[I]f a species was listed primarily because of the threat of habitat degradation—and, with most species, that was a primary, if not the primary, threat—then allowing additional habitat degradation is fundamentally inconsistent with that goal [of recovering listed species].”) (internal citations omitted).

¹⁰⁵ Mary Christina Wood, *Protecting the Wildlife Trust: A Reinterpretation of Section 7 of the Endangered Species Act*, 34 ENV’T L. 605, 607 (2004).

¹⁰⁶ Katherine Renshaw, *Leaving the Fox to Guard the Henhouse: Bringing Accountability to Consultation Under the Endangered Species Act Reinterpretation of Section 7 of the Endangered Species Act*, 32 COLUM. J. ENV’T L. 161, 185 (2007).

perverse mathematical trickery, the Services have all but eliminated section 7's ban on federal actions that destroy or adversely modify critical habitat—in the process adding an ironic twist to the highly contentious process of drawing these lines in the first instance.¹⁰⁷

However, basic tenants of biology and a better legal understanding of section 7(a)(2)'s prohibitions themselves point the way to interpret and implement the law in a manner that can fulfill Congress's original vision of the ESA as a truly urgent emergency room for species facing extinction. This Part examines section 7(a)(2)'s twin prohibitions in turn, explaining how to make them a far more effective tool for biodiversity conservation with only modest revisions to existing regulations and Service policies.

A. What Actions May “Jeopardize” Listed Species?

1. Defining What “Jeopardize” Means

While it is surprising that the meaning of the ESA's most important substantive protection standard remains unclear nearly a half century after the statute's passage, debate over the exact dimensions of the so-called jeopardy standard—which has simmered for decades—heated up during the Trump Administration's revamp of regulations implementing section 7's interagency consultation process.¹⁰⁸ The jeopardy standard

¹⁰⁷ Under the Services' method of effectively comparing the size of critical habitat adversely affected by a proposed agency action with the entirety of the critical habitat for that species, it is easier for the Services to find that a project will not destroy or adversely modify critical habitat when the entire critical habitat designation for the species at issue is larger. For example, it is easier for the Services to find no section 7 violation for a hypothetical project that would eliminate 1,000 acres of designated critical habitat when the entire critical habitat designation for the species in question is 100,000 acres versus if the designated critical habitat area was only 10,000 acres. Observers sometimes refer to this application as the “denominator” approach to assessing impacts to critical habitat because the size of the entire area designated as critical habitat serves as the denominator of the fraction of all designated critical habitat a given project affects, i.e., the two fractions in this example would be 1,000 over 10,000 (i.e., adverse impacts to one tenth of all designated critical habitat) versus 1,000 over 100,000 (i.e., adverse impacts to one one-hundredth of all designated critical habitat). See 50 C.F.R. § 402.02 (2020) (“Destruction or adverse modification means a direct or indirect alteration that appreciably diminishes the *value of critical habitat as a whole* for the conservation of a listed species.”) (emphasis added). This means that the Services can provide fewer protections to designated critical habitat in site-specific consultations by simply increasing the size of the critical habitat area designated for protection. Ironically, therefore, the very interests that often vehemently oppose critical habitat designations out of fears of limitations on uses of the designated lands should in fact encourage the Services to make individual critical habitat designations as large as possible.

¹⁰⁸ Endangered and Threatened Wildlife and Plants; Regulations for Interagency Cooperation, 84 Fed. Reg. 44,976 (Aug. 27, 2019); see *Proposed Rule: Endangered and Threatened Species: Interagency Cooperation*, REGULATIONS.GOV, <https://perma.cc/5NQ4-X3JJ> (last visited Oct. 16, 2022) (showing over 64,000 public comments were received in response to the Trump Administration's proposed rulemaking); see also Lisa Friedman, *U.S. Significantly Weakens Endangered Species Act*, N.Y. TIMES (Aug. 12, 2019), <https://perma.cc/QBM2-VR5B> (discussing how Republican politicians sought to “narrow the scope of the” ESA and applauded the changes put forward by the Trump Administration).

presents a classic regulatory mixture of law and science. The terms employed by section 7—“jeopardize the continued existence of” or simply “jeopardy”—are not widely-used scientific terms, so one must employ traditional means of statutory construction to attempt to discern their meaning. At the same time, the ESA’s ban on federal actions that jeopardize listed species establishes a key level of protection for biological entities, and the law itself provides that federal agencies must employ the best science available in applying this standard.¹⁰⁹ Therefore, exactly what it means to jeopardize listed species also must make sense from a scientific standpoint. Both the law and basic biology strongly indicate that section 7’s ban on agency actions that jeopardize listed species does indeed incorporate a threshold which, if exceeded, can trigger a violation of this section. Regulations implementing section 7(a)(2) also indicate that a proposed action that pushes a listed species appreciably closer to this threshold is also a way a federal action can jeopardize a species’ continued existence.¹¹⁰

Though the Services, as well as virtually everyone else, commonly refers to section 7’s “jeopardy standard” and jeopardy or “no jeopardy” biological opinions, the precise language of section 7(a)(2) provides that federal agencies must ensure that their actions are not likely to “jeopardize the continued existence” of listed species.¹¹¹ The Services emphasize *jeopardize* as a verb to define the statutory phrase in section 7(a)(2), and have employed this grammatical construction to downplay the notion of a jeopardy biological threshold or “tipping point,” which if exceeded for a particular listed species would halt further actions that adversely affect that species.¹¹² Over decades of implementing section 7, the Services have never described what it means to “jeopardize” a species in specific biological terms, implicitly asserting that FWS or NMFS will know a situation that jeopardizes a given species when the agency encounters it. In their 2019 revisions to the consultation regulations, the Services vehemently disagreed with comments that they needed to identify a tipping point beyond which a species could not recover from additional adverse impacts in the course of assessing a proposed federal agency action’s compliance with section 7.¹¹³ The Services retorted that nothing in regulations implementing section 7(a)(2) requires identification of a tipping point in analyzing whether a proposal may jeopardize a listed species.¹¹⁴ They also argued at length that scientific

¹⁰⁹ See 50 C.F.R. § 402.14(d) (“The Federal agency requesting formal consultation shall provide the Service with the best scientific and commercial data available or which can be obtained during the consultation for an adequate review of the effects that an action may have upon listed species or critical habitat.”).

¹¹⁰ See 50 C.F.R. § 402.02 (setting out definition of “[j]eopardize the continued existence of”).

¹¹¹ ESA, 16 U.S.C. § 1536(a)(2) (2018).

¹¹² See 84 Fed. Reg. at 44,987 (describing such a “tipping point” as a point “beyond which the species cannot recover from any additional adverse effect”).

¹¹³ *Id.*

¹¹⁴ *Id.*

uncertainties often prevent identification of a biological point of no return for listed species, and observed that a myriad of factors influence a species' viability.¹¹⁵ The Services even threw cold water on concerns about small population size, noting that California condors have successfully rebounded from a very small population size.¹¹⁶ Overall, FWS and NMFS expressed concern that identifying a specific jeopardy threshold would "give a misleading sense of exactitude, and unduly limit the ability to exercise best professional judgment and factor in the actual scientific uncertainties."¹¹⁷

The Services' 2019 observations about section 7(a)(2)'s ban on federal actions that "jeopardize" listed species had additional noteworthy elements. These agencies took issue in particular with the idea that a listed species could already be in a state of "baseline jeopardy," which would preclude any additional adverse impacts from federal actions.¹¹⁸ The Services argued that section 7(a)(2) consultations "are not determinations made about the environmental baseline for the proposed action or about the pre-action condition of the species," and that even for highly imperiled species, section 7 requires that the Services determine whether adverse impacts of a proposed federal action "reduce appreciably" the likelihood of the species' survival and recovery.¹¹⁹ The agencies did concede, however, that "there could be a species that is so rare or imperiled that it reaches a point where there is little if any room left for it to tolerate additional adverse effects without being jeopardized by the action [under consideration in a section 7 consultation]."¹²⁰

Despite recognizing that circumstances may leave some species with little leeway to withstand additional adverse impacts, the Services have almost never found a proposed federal action likely to exceed section 7's "jeopardize" limitation.¹²¹ Rather than contemplating a threshold beyond which threats to a listed species are so great they do not allow additional adverse impacts, the Services commonly employ a comparative analysis to find that incremental adverse effects do not exceed the section 7 regulations' "reduce appreciably" limit.¹²² Thus, the Services often find that an action is not likely to jeopardize a listed species because the proposed federal action's negative impacts are not as great as they could

¹¹⁵ *Id.* at 44,988.

¹¹⁶ *Id.*

¹¹⁷ *Id.* Though the Services under the Biden Administration decided to rescind the Trump-era regulatory changes, it remains to be seen whether the Services under Biden or another chief executive will change their minds and become more supportive of the jeopardy standard as a "tipping point" or similar biological threshold.

¹¹⁸ *Id.* at 44,987.

¹¹⁹ *Id.* at 44,987–88 ("[E]ven in those cases [where an affected species is highly imperiled], the Services would apply the necessary 'reduce appreciably' standard to the 'jeopardize' determination.").

¹²⁰ *Id.* at 44,988.

¹²¹ See Malcom & Li, *supra* note 55, at 15845 (noting that only 2 out of 6,829 formal consultations found jeopardy).

¹²² See *id.* at 44,986, 44,988 (describing comparative analysis where adverse effects are compared to the environmental baseline and cumulative effects).

have been, or because such impacts are not as great as those from other sources.¹²³ For example, in *Turtle Island Restoration Network v. U.S. Department of Commerce*,¹²⁴ the court explained that NMFS’s “BiOp’s no jeopardy opinion is premised on *the proportionally low risk* that the shallow-set fishery poses to the loggerheads *relative to other threats*, such as international fishing and climate change.”¹²⁵ In a different 2020 BiOp finding that proposed operations of federal dams in the Columbia Basin would not jeopardize listed species of salmon and steelhead, NMFS reasoned that the affected species would decline less as a result of the proposed operations compared to other ways the agency could have operated the dams.¹²⁶

The Services’ reluctance to acknowledge the ban on federal actions that “jeopardize” listed species as establishing a biologically based threshold has generally not been met with a favorable reception in the courts.¹²⁷ The Ninth Circuit has embraced both the idea of a jeopardy threshold and the notion that existing conditions for a listed species may exceed such a threshold.¹²⁸ In one of the many legal battles dealing with imperiled salmonids in the Columbia River Basin, the court in *National Wildlife Federation v. National Marine Fisheries Service*¹²⁹ concluded that “an agency may not take action that will tip a species from a state of precarious survival into a state of likely extinction . . . [W]here baseline conditions already jeopardize a species, an agency may not take action that deepens the jeopardy by causing additional harm.”¹³⁰ The Ninth Circuit cited this “tipping point” holding to also reject NMFS’s comparative approach to analyzing whether a proposed fishery regime was likely to jeopardize sea turtles, rejecting the agency’s reasoning that the number of turtle deaths due to the fishing at issue in the case was likely to be small compared to mortality from other federally-approved and foreign fisheries.¹³¹ In yet another Ninth Circuit fish case, the court

¹²³ See, e.g., *Turtle Island Restoration Network v. U.S. Dep’t of Com.*, 878 F.3d 725, 737–38 (9th Cir. 2017) (describing one such case where the NMFS performed a comparative analysis and found no jeopardization to loggerhead turtles even with external threats such as climate change and citing to other examples of no jeopardization).

¹²⁴ *Id.*

¹²⁵ *Id.* at 738 (emphasis added). The court rejected NMFS’s biological opinion, which found a lack of jeopardy to loggerhead sea turtles. *Id.* at 741.

¹²⁶ See NAT’L MARINE FISHERIES SERV., ENDANGERED SPECIES ACT SECTION 7(A)(2) BIOLOGICAL OPINION AND MAGNUSON-STEVENSON FISHERY CONSERVATION AND MANAGEMENT ACT ESSENTIAL FISH HABITAT RESPONSE FOR THE CONTINUED OPERATION AND MAINTENANCE OF THE COLUMBIA RIVER SYSTEM 289 (2020), <https://perma.cc/8LKD-QS32> (opining that the proposed action would better combat climate change consequences to the jeopardized salmon and steelhead than other possible actions).

¹²⁷ See, e.g., *Nat’l Wildlife Fed’n v. Nat’l Marine Fisheries Serv.*, 524 F.3d 917, 929–30 (9th Cir. 2008) (holding that the NMFS’s biological opinion impermissibly failed to evaluate whether the effects of the proposed action would “tip the species . . . into a state of likely extinction.”).

¹²⁸ *Id.* at 930.

¹²⁹ *Id.*

¹³⁰ *Id.*

¹³¹ *Turtle Island Restoration Network*, 878 F.3d 725, 738 (9th Cir. 2017).

rejected FWS's finding that operations were not likely to jeopardize protected bull trout, faulting FWS for finding the proposed agency action did not jeopardize bull trout without first identifying "the tipping point precluding recovery" for a population of the species.¹³²

A historical perspective on section 7(a)(2)'s interpretation also supports the notion that this section contemplates a threshold beyond which adverse impacts would jeopardize the continued existence of a listed species. The 1981 Interior Solicitor's opinion on consideration of cumulative effects in the section 7 consultation process set out the section 7(a)(2) analytical process that the Services ultimately incorporated into their 1986 regulations, which have governed consultations for the vast majority of the ESA's existence.¹³³ The opinion envisioned a sequence of federal actions affecting a listed species, the adverse impacts from each one "consum[ing]" part of a resources "cushion" above the minimum requirements of the species.¹³⁴ When that cushion was gone, the opinion declared that "any additional federal activity in the area requiring a further consumption of resources would be precluded under sec. 7."¹³⁵ While the Services in 2019 specifically rejected this opinion as relevant to the question of whether section 7(a)(2)'s "jeopardize" standard incorporates a threshold, the agencies provided no explanation for dismissing this document other than the fact that it nominally focused on cumulative effects under section 7.¹³⁶ At the same time, the Services themselves appear to have viewed section 7(a)(2) as incorporating a threshold when they finalized section 7(a)(2) regulations in 1986; the Services at that point observed that "Congress intended that the 'jeopardy' standard be the ultimate barrier past which Federal actions may not proceed, absent the issuance of an exemption."¹³⁷

A closer look at both law and biology also supports section 7(a)(2) as incorporating a biologically-based threshold beyond which the law prohibits further adverse impacts on listed species. This provision of the ESA obligates federal agencies to ensure their actions do not "jeopardize the *continued existence*" of listed species, clearly incorporating a time

¹³² Wild Fish Conservancy v. Salazar, 628 F.3d 513, 527 (9th Cir. 2010).

¹³³ Solicitor's Opinion, *supra* note 65, at 906–08. The opinion's section discussing the consultation process contains a basic summary of the steps the Services wrote into the 1986 regulations. *Id.*

¹³⁴ *Id.* at 907.

¹³⁵ *Id.*

¹³⁶ See Endangered and Threatened Wildlife and Plants; Regulations for Interagency Cooperation, 84 Fed. Reg. 44,976, 44,988 (Aug. 27, 2019) ("The subject matter of the referenced memorandum was the treatment of cumulative effects. In any case, the guidance provided in that memorandum is not in conflict with the preamble discussion provided in the proposed rule on 'appreciably diminish,' 'tipping point,' and 'baseline jeopardy,' or in conflict with the Services' long-standing interpretations stated in the recent proposed rule's preamble. The position of the Services is that there is nothing in the Act or its regulations, or necessitated under the standards of the Administrative Procedure Act, requiring that a section 7(a)(2) analysis quantify or identify a 'tipping point.'").

¹³⁷ Interagency Cooperation-Endangered Species Act of 1973 as Amended; Final Rule, 51 Fed. Reg. 19,926, 19,934 (June 3, 1986) (codified at 50 C.F.R. § 402.02).

element.¹³⁸ In other words, to avoid “jeopardizing” a species, the adverse impacts from a proposed federal agency action at issue in a section 7 formal consultation must not preclude the species’ ability to exist into the future.¹³⁹ Section 7 regulations and Service policy further elaborate on this idea, as well as provide additional biological details.¹⁴⁰ As noted above, section 7 regulations define “jeopardize the continued existence of” as “to reduce appreciably the likelihood of both the survival and recovery of a listed species.”¹⁴¹ The Services’ Section 7 Handbook in turn defines “survival” as follows:

[Survival is] the condition in which a species continues to exist into the future while retaining the potential for recovery. This condition is characterized by a species with a sufficient population, represented by all necessary age classes, genetic heterogeneity, and number of sexually mature individuals producing viable offspring, which exists in an environment providing all requirements for completion of the species’ entire life cycle, including reproduction, sustenance, and shelter.¹⁴²

This definition describes a biological threshold directly linked to a determination of whether a proposed federal action is likely to “jeopardize” protected species.¹⁴³ Key elements of this threshold include both overall and effective population size, sufficient intraspecific genetic diversity, and minimally necessary habitat conditions needed for a species to exist into the future as the minimum foundation for recovery efforts.¹⁴⁴ The survival definition thus sets out a more biologically precise definition of the minimum “resources” required by a species referenced in the 1981 Solicitor’s opinion, as well as the “tipping point” described by the

¹³⁸ ESA, 16 U.S.C. § 1536(a)(2) (2018) (emphasis added).

¹³⁹ See CONSULTATION HANDBOOK, *supra* note 42, at 4-35–4-38 (showing that “jeopardize the continued existence of,” “survival,” and “jeopardy or adverse modification” definitions all require the Services to ensure the “continued existence of the *entire* species”) (emphasis in original).

¹⁴⁰ *Id.* at 4-34–4-38; 51 Fed. Reg. at 19,932–34.

¹⁴¹ 50 C.F.R. § 402.02 (2020).

¹⁴² CONSULTATION HANDBOOK, *supra* note 42, at xviii–xix.

¹⁴³ See *id.* at xvi (defining “[j]eopardize the continued existence of”).

¹⁴⁴ The “effective population” of a given overall population includes only those individuals that pass along their genes to the next generation. The overall population is considerably larger than the effective population for most species, though the relationship between the two varies considerably from species to species. For example, out of thousands of juvenile salmon, only a handful will survive to successfully reproduce and pass along their genes to the next generation. For elephants, on the other hand, a far higher percentage of individuals are likely to produce offspring. See, e.g., Adam J. Storch et al., *A Review of Potential Conservation and Fisheries Benefits of Breaching Four Dams in the Lower Snake River (Washington, USA)*, WATER BIOLOGY AND SEC., May 2022, at 2–4 (explaining how a one percent juvenile salmon return rate poses a high demographic and genetic risk to species abundance); see also George Wittemyer et al., *Differential Influence of Human Impacts on Age-Specific Demography Underpins Trends in an African Elephant Population*, ECOSPHERE, Aug. 2021, at 1–2 (describing how elephants have less variability in juvenile survivability relative to reproducing adults).

Ninth Circuit.¹⁴⁵ Far from supporting the Services' 2019 disavowal of its existence, the Services' own Section 7 Handbook provides a clear, and biology-based definition, of the threshold relevant to a proper analysis of whether a proposed federal action may "jeopardize the continued existence of" a listed species.¹⁴⁶

The Ninth Circuit's characterization of this threshold as a "tipping point" accurately describes the first element of a proper section 7(a)(2) "jeopardize" analysis. A proposed federal action with adverse impacts that would tip a listed species' condition to the point at which its population or habitat (or "environment" as the term is used in the Handbook's definition of survival) falls below the species' minimum survival characteristics would clearly jeopardize the species' continued existence. By pushing a species below the minimum conditions at which it could continue to exist into the future with a chance of recovery, the federal action would *preclude* the species' "survival" as the Handbook defines that term, which is a step beyond the regulations' interpretation of "jeopardize" as an action that would "reduce appreciably" the species' chances of survival.¹⁴⁷ Of course, to assess whether a proposed action would have such an effect, the relevant service would have to describe—in biologically meaningful terms—the minimum conditions associated with the survival of affected species. Only then could the Service rationally determine whether the proposed action at issue would push the species or its environment below this threshold. This is precisely the analysis the Ninth Circuit found lacking in multiple instances where the court rejected biological opinions that greenlit federal actions harmful to listed species.¹⁴⁸

¹⁴⁵ Solicitor's Opinion, *supra* note 65, at 6; *see, e.g., Turtle Island Restoration Network*, 878 F.3d 725, 738 (9th Cir. 2017) (explaining how the ESA requires agencies to ensure their actions will not "tip" species into a state of extinction); *Wild Fish Conservancy*, 628 F.3d 513, 527 (9th Cir. 2010) (describing how the Service has not determined when the tipping point precluding recovery for certain species will be reached, if at all).

¹⁴⁶ CONSULTATION HANDBOOK, *supra* note 42, at xvi. The Section 7 Handbook's definition of survival fits closely with the biological concept of "quasi-extinction." This term recognizes that extinction of a species is virtually inevitable or highly likely when a species' status falls below minimum population numbers and level of genetic diversity. Andrew Engelson, *What Does 'Quasi-Extinction' Actually Mean?*, COLUMBIA INSIGHT (Dec. 16, 2021), <https://perma.cc/LLC8-BPXX>. At such levels, demographic and genetic risks will likely result in extinction of a population over time, though the precise time period will vary depending on the species; longer lived species obviously may persist as essentially a "ghost population" over a longer period of time. The Services have occasionally employed a species' quasi-extinction level in biological opinions' jeopardy analyses. *See, e.g.,* NOAA FISHERIES, ENDANGERED SPECIES ACT SECTION 7(A)(2) SUPPLEMENTAL BIOLOGICAL OPINION: CONSULTATION ON REMAND FOR OPERATION OF THE FEDERAL COLUMBIA RIVER POWER SYSTEM 64 n.14, 65 (2014) (explaining how the 2008 BiOp used the quasi-extinction threshold rather than absolute extinction as a criterion because of the difficulty of predicting the dynamics of populations at extremely low abundance).

¹⁴⁷ CONSULTATION HANDBOOK, *supra* note 42, at xvi, xviii–xix; 50 C.F.R. § 402.02 (2020) (defining "[j]eopardize the continued existence of").

¹⁴⁸ *See, e.g., Nat'l Wildlife Fed'n*, 524 F.3d 917, 929 (9th Cir. 2008) (holding that the BiOp failed to focus its analysis on whether the action would jeopardize the survival of salmon and steelhead); *Turtle Island Restoration Network*, 878 F.3d at 737–38 (finding NMFS used

The key standard in the regulatory definition of “jeopardize the continued existence of” provides the second element of a proper “jeopardize” analysis: namely, whether the impacts of a proposed federal agency action would “reduce appreciably” the likelihood that a listed species and its environment will continue to meet the biological conditions associated with the species’ “survival.”¹⁴⁹ Again, to perform such an analysis, the Services would necessarily have to identify the conditions required by the species in terms of at least the specific elements identified in the Handbook’s definition of “survival,” that is, minimum overall population, effective population, genetic diversity, and environmental conditions that sustain those elements.¹⁵⁰ By identifying the extent of the deterioration in the species’ overall status due to the proposed action—the difference between the species’ current status across its range and its likely status after implementation of the proposed action—the Services could compare this drop to the gap between the species’ current status and its minimum survival requirements to determine whether the reduction in the species’ likelihood of remaining above its survival threshold caused by the proposed federal action would be appreciable.¹⁵¹

Current section 7 regulations already clearly require the Services to identify the first two factors listed above when conducting a “jeopardize” analysis in preparation for issuing a biological opinion on a proposed agency action.¹⁵² The regulations also imply the comparative analysis described above by requiring the Services to render an opinion on whether a proposed action jeopardizes a listed species “in light of” the status of the species and the proposed action’s adverse effects.¹⁵³ Since it is obviously impossible to assess the relative importance of a reduction in a species’ chances of survival, that is, whether it amounts to an “appreciable” reduction under the regulations’ definition of jeopardize, without also

the incorrect standard in assessing the prospective impact a proposed action would have on the survival of loggerhead turtles); *Wild Fish Conservancy*, 628 F.3d at 531–32 (determining FWS improperly monitored and reported the effects agency action had on bull trout).

¹⁴⁹ 50 C.F.R. § 402.02.

¹⁵⁰ CONSULTATION HANDBOOK, *supra* note 42, at xviii–xix, 4-21–4-22 (defining “Survival” and “Rangewide trend” respectively).

¹⁵¹ Neither the section 7 regulation nor the Handbook provide a definition of “reduce appreciably,” but the Handbook uses a similar phrase (“appreciably diminish”) within the regulations’ definition of “destroy or adversely modify” critical habitat. CONSULTATION HANDBOOK, *supra* note 42, at xviii. Building from that definition, the Services specify that “appreciably diminish the value” of critical habitat means “to considerably reduce” the capability of critical habitat to satisfy requirements for the species’ survival and recovery. *Id.* at x. Similarly, therefore, in a “jeopardize” analysis, the Services would have to determine whether the drop in a species’ chances of remaining above its minimum survival conditions caused by the proposed action under consideration would constitute a “considerable” reduction.

¹⁵² See 50 C.F.R. § 402.14(g)(2) (requiring identification of the current status of the affected species); See *id.* § 402.14(g)(3) (requiring identification of the effects of the action—plus cumulative effects—on listed species).

¹⁵³ See *id.* § 402.14(g)(4) (requiring the Service’s opinion to be formed with consideration of the effects and species’ status and habitat).

specifying a species' minimum survival conditions, a lawful biological opinion must identify these conditions as part of its analysis.¹⁵⁴

However, in conducting most formal consultations, the Services typically sidestep identification of specific parameters associated with the Handbook's definition of survival while nevertheless declaring that the proposed action will not reduce appreciably the species' likelihood of continuing to meet those minimum requirements.¹⁵⁵ Alternatively, the Services have simply compared adverse impacts to the species stemming from the proposed action not to the species' chances of survival but to other impacts.¹⁵⁶ While making what the section 7(a)(2) regulations clearly envision as comparative or threshold analyses without identifying the parameters biologically necessary—and legally required—to complete such assessments, the Services gain what they clearly see as two bureaucratic advantages from routinely conducting “jeopardize” assessments without identifying species' minimum survival conditions.

First, by failing to identify with any specificity these biological parameters, the Services gain almost unfettered discretion to determine whether the reduction in a species' status caused by a proposed action

¹⁵⁴ An analogy further illustrates the importance of knowing a species' minimum survival requirements to assess the significance of adverse impacts on the species. The loss of \$1,000 is likely relatively inconsequential to a millionaire. However, the same loss would probably be substantial if, instead of being wealthy, the person who lost the money is barely scraping by with a minimum-wage job. Similarly, a given adverse impact may not be consequential to a listed species whose current status is well above its minimum survival conditions, while an impact of similar magnitude may be far more consequential to a species at higher risk. Even the Services have implicitly acknowledged the need for such an analysis. In their 2019 rulemaking, the Services specified that they “do not dispute that, in some cases, there could be a species that is so rare or imperiled that it reaches a point where there is little if any room left for it to tolerate additional adverse effects without being jeopardized by the action.” Endangered and Threatened Wildlife and Plants; Regulations for Interagency Cooperation, 84 Fed. Reg. 44,976, 44,988 (Aug. 27, 2019) (codified at 50 C.F.R. § 402). In acknowledging that such a point exists, the Services necessarily must also acknowledge that the only way to rationally assess whether the adverse impacts of a proposed federal action reduce appreciably the likelihood that a species will remain above that point is to go through the comparative analysis described above.

¹⁵⁵ The section 7 regulations provide a good indication for why the Services' biological opinions typically avoid attempting to specify conditions associated with the “survival” of the species at issue in a given opinion. The regulations instruct the agencies to describe the current status of the species and its critical habitat, as well as specify the effects of the agency action that is the subject of the consultation and any cumulative effects. However, the regulations do not require the Services to describe conditions associated with survival of the species. See 50 C.F.R. § 402.14(g) (describing what must be considered in evaluations, and not mentioning conditions associated with survival of the species). While the Section 7 Handbook defines the term “survival,” its prescription for assessing whether a proposed action is likely to jeopardize a listed species largely tracks the section 7 regulations, and thus does not provide guidance to the Services on how to actually employ the Handbook's definition of survival in considering whether a proposed action reduces appreciably a species' chances of survival. See CONSULTATION HANDBOOK, *supra* note 42, at 4-37 (describing survival considerations).

¹⁵⁶ See *supra* note 131 and accompanying text; *Turtle Island Restoration Network*, 878 F.3d 725, 738 (9th Cir. 2017) (rejecting the agency's reasoning that the number of turtle deaths due to the fishing at issue in the case was likely to be small compared to mortality from other federally approved and foreign fisheries).

would result in an appreciable reduction in its chances of continuing to meet conditions necessary for its survival, or to even tip the species below its survival threshold. Without any context for assessing the significance of adverse impacts on an affected species, the relevant Service can simply assert that a given reduction in the species' chances for meeting survival parameters is not "appreciable." Also, by not specifying minimal survival conditions, the Services can ignore altogether the possibility that a species may not meet those parameters at all. Taken together, the Services can justify a conclusion that the action is not likely to jeopardize a listed species solely by emphasizing their scientific expertise, albeit unaccompanied by reference to key scientific factors the Services themselves have identified as important to their section 7(a)(2) assessments.¹⁵⁷ Such a reliance on bare expertise unaccompanied by relevant biological thresholds also serves to insulate the Services' "jeopardize" determinations from effective scientific or judicial review because outside reviewers have no specific criteria by which to evaluate the Services' conclusions.¹⁵⁸ While these analytical methods make section 7(a)(2) consultations relatively simple for the Services to complete—and hard for other entities to disagree with—they also of course raise the possibility that the Services are effectively giving the green light under the ESA to federal actions that reduce appreciably some listed species' chances of survival, or even push species to the point where they do not meet conditions that allow them to "survive" as the Handbook defines this term.

Second, by implementing the consultation process to avoid providing a clear description of minimum conditions associated with a species' survival threshold (as the Handbook defines that term) the Services also dodge having to deal with situations where a species' current status may not meet those conditions.¹⁵⁹ Acknowledging even the possibility of such circumstances occurring would raise the "baseline jeopardy" situation the Services forcefully disavowed in their 2019 rulemaking. However, if the current condition of a listed species' population or environment was in fact at or below minimum conditions meeting the Handbook's definition of "survival" for that species, specific consequences would necessarily follow. As the Interior Solicitor's office recognized over four decades ago—and the Ninth Circuit underlined in 2008—a proposed federal agency action having additional adverse impacts on a species at or below its survival conditions, which the Ninth Circuit labeled as an action that "deepens the jeopardy," would clearly jeopardize the species and thus be

¹⁵⁷ CONSULTATION HANDBOOK, *supra* note 42, at 4-23–4-24.

¹⁵⁸ For additional discussion on deferential judicial review of the Services' consultations, see Rohlf, *supra* note 59, at 258–62; Rohlf, *Jeopardy*, *supra* note 5, at 149–50.

¹⁵⁹ See CONSULTATION HANDBOOK, *supra* note 42, at xviii–xix (defining survival, in part, as "the condition in which a species continues to exist into the future while retaining the potential for recovery.").

precluded under section 7(a)(2).¹⁶⁰ These circumstances would also act as a biological limitation on the Services' discretion under section 7(a)(2), as well as potentially block a wide array of federal actions that would have adverse impacts on the species.

Unfortunately, the possibility that a listed species may face "baseline jeopardy" status is far from theoretical. For example, in 2021, Nez Perce tribal biologists concluded that over 40% of threatened Snake River spring and summer chinook salmon populations were at or below the quasi-extinction levels set by NMFS and predicted that over 75% of the populations would fall below this level by 2025.¹⁶¹ It is quite possible that other species on the endangered and threatened rolls face similar circumstances, but since the Services seldom provide biological criteria they equate with minimum survival levels for these species, it is not possible to identify them with any certainty. However, several additional listed species are likely at or below population or effective population levels consistent with the Handbook's definition of survival, as well as biological quasi-extinction levels. Red wolves, for instance, have only a handful of individuals remaining in the wild.¹⁶² Florida panthers likely have less than 200 individuals, which means that only a fraction of that number exists as an effective population (that is, the number of individuals that successfully reproduce and thus pass along their genes).¹⁶³ As noted above, proper application of section 7(a)(2)'s ban on federal actions that may "jeopardize" these species would preclude all federal actions that adversely affect these species—a course of action far removed from the overwhelming percentage of FWS's recent implementation decisions and one likely to generate considerable controversy and political pressure.¹⁶⁴

¹⁶⁰ Solicitor's Opinion, *supra* note 65, at 904–07; *Nat'l Wildlife Fed'n*, 524 F.3d 917, 930 (9th Cir. 2008).

¹⁶¹ Memorandum from Patty O'Toole, Fish and Wildlife Direction Director, to Northwest Power and Conservation Council Members, at 3 (Apr. 27, 2021), <https://perma.cc/KZU2-8CN4>.

¹⁶² See Jimmy Tobias, *The Collapse of Wild Red Wolves Is a Warning that Should Worry Us All*, THE NATION, (Aug. 2, 2021), <https://perma.cc/XH5X-GA46> (stating that there are between approximately nine and twenty red wolves still "rambling across the landscape").

¹⁶³ See Jimmy Tobias, *Defanged: Money and Politics Could Doom the Florida Panther—And the Endangered Species Act*, THE INTERCEPT (Jan. 24, 2021), <https://perma.cc/X39X-39K6> (noting that the current estimate of the Florida panther population is about 150 individuals, and that genetic challenges have affected Florida panthers because of their small population). Additional species at baseline jeopardy likely include Mount Graham red squirrels and pallid sturgeon. See, e.g., Press Release, Ctr. for Biological Diversity, U.S. Fish and Wildlife Service Delays Decision on Revising Critical Habitat for Mount Graham Red Squirrels (Aug. 3, 2021), <https://perma.cc/MST3-MDMV>; Press Release, U.S. Geological Survey, Culpit Identified in Decline of Endangered Missouri River Pallid Sturgeon (Jan. 23, 2015), <https://perma.cc/EJ34-KPP7>.

¹⁶⁴ In some instances, however, FWS may lack the power under section 7(a)(2) to halt an action even if it may jeopardize a listed species or destroy critical habitat. For example, under the Trump Administration, FWS appeared poised to issue an incidental take permit under the ESA—which also requires compliance with section 7(a)(2)—to allow a large development in Florida panther habitat that would add as many as 300,000 more people and 225,000 vehicles (a key source of panther mortality) within panther habitat. See Tobias,

The third element of a lawful section 7(a)(2) “jeopardize” analysis—which the Services have virtually never implemented—would also undoubtedly generate outcry along with additional protections for listed species. Returning to the regulatory definition of “jeopardize the continued existence of” listed species, the language refers to actions likely to reduce appreciably the likelihood “of both the survival and recovery” of a listed species in the wild.¹⁶⁵ Previous controversies and litigation over this phrasing centered on whether the regulations’ emphasis on the conjunctive wording of this phrase effectively rendered recovery superfluous.¹⁶⁶ However, in a 1999 paper examining application of section 7(a)(2) to listed salmonids, NMFS drew a crucial biological link between a species’ survival and recovery.¹⁶⁷ Highlighting section 7’s emphasis on the *continued* existence of listed species, the agency reached the following consequential conclusion: “Impeding a species’ progress toward recovery exposes it to additional risk, and so reduces its likelihood of survival. Therefore, in order for an action to not ‘appreciably reduce’ the likelihood of survival, it must not prevent or appreciably delay recovery.”¹⁶⁸ NMFS also noted that “no practical differences exist between the degree of [ecological] function essential for long-term survival and that necessary to achieve recovery.”¹⁶⁹

NMFS’s connection between a species’ long-term survival and progress toward recovery finds support in the biological literature. Time adds important risks to species facing extinction; stochastic and genetic factors in particular increase a species’ risk of extinction the longer the time a species exists at relatively low population levels and limited

supra note 163 (noting that FWS was preparing to issue a permit to a developer to convert panther habitat into residential areas which would bring with it an influx of residents and vehicles). A year later, however, the developer withdrew its permit request when FWS reversed course and was about to issue a biological opinion finding that permitting the development would jeopardize the panthers’ survival. See Lauren Leslie & Paul Dolan, *Developer Withdraws 100,000-Acre Florida Panther Habitat Conservation Plan*, WINK (Aug. 16, 2022), <https://perma.cc/2HFD-BY4V> (“The review of the [Habitat Conservation Plan] by the [FWS] revealed that the projects should not go forward because they would result in jeopardizing the future of the Florida panther”). Since section 7 does not apply to non-federal entities, developers could proceed without an incidental take permit unless FWS—or a third party using the ESA’s citizen suit provision—successfully argued in court that the development would be reasonably certain to result in a prohibited “take” of Florida panthers. See generally Steven P. Quarles et al., *Another Take on “Take”: The Section 9 Prohibitions*, in *THE ENDANGERED SPECIES ACT: LAW, POLICY, AND PERSPECTIVES* 143, 147 (Donald C. Baur & Ya-Wei Li, eds., 2021) (discussing how parties can bring suits against violators of the ESA’s section 9 “take” prohibition).

¹⁶⁵ 50 C.F.R. § 402.02 (2020).

¹⁶⁶ See *Gifford Pinchot Task Force*, 378 F.3d 1059, 1069–70 (9th Cir. 2004) (“Congress, by its own language, viewed conservation and survival as distinct, though complementary, goals, and the requirement to preserve critical habitat is designed to promote both conservation and survival.”).

¹⁶⁷ NAT’L MARINE FISHERIES SERV., *THE HABITAT APPROACH: IMPLEMENTATION OF SECTION 7 OF THE ENDANGERED SPECIES ACT FOR ACTIONS AFFECTING THE HABITAT OF PACIFIC ANADROMOUS SALMONIDS* 3 (1999).

¹⁶⁸ *Id.*

¹⁶⁹ *Id.* (internal citation omitted).

distribution.¹⁷⁰ Ironically, therefore, the Reagan-era addition of the word “both” in the regulatory definition of “jeopardize”—which at the time the Services apparently intended as a means to make the standard less restrictive—was actually a biologically forward-looking recognition of the important, time-based link between a species’ continued survival and its expeditious progress toward a more secure status.¹⁷¹ The third element of a “jeopardize” analysis, that is, whether a proposed federal action is likely to preclude or appreciably delay recovery of the species, thus finds support in both the “continued existence” language of section 7(a)(2) and the regulatory definition of “jeopardize.”

An important element of a “jeopardize” analysis should therefore be the impact of a proposed federal action on an affected species’ recovery, with a focus on whether the action would appreciably delay the species’ progress toward recovery. This underlines the importance of considering recovery plans in the Services’ formulation of biological opinions; plans must include site-specific measures needed for recovery, as well as a timeline for recovery efforts. This information is obviously directly relevant for the Services to assess whether a proposed action would preclude or appreciably delay a species’ recovery as part of a “jeopardize” analysis. For listed species without an approved recovery plan, the Services still must consider whether proposed federal actions preclude or appreciably delay recovery but must do so on the basis of reasonable projections of recovery goals, measures, and timelines.

Aside from NMFS biological opinions in the early 2000s dealing with salmonids, it is rare for the Services to consider proposed projects’ impacts on recovery—particularly temporal progress toward recovery—

¹⁷⁰ See Richard Kliman et al., *Genetic Drift and Effective Population Size*, NATURE EDUC. (2008), <https://perma.cc/E7XG-W2TR> (“Genetic drift is the reason why we worry about African cheetahs and other species that exist in small populations. Drift is more pronounced in such populations, because smaller populations have less variation and, therefore, a lower ability to respond favorably—that is, adapt—to changing conditions. Thus, it’s not just the number of cheetahs that worries us—it’s also the decreased variation in those cheetahs.”). See also Sean Hoban et al., *Genetic Diversity Targets and Indicators in the CBD Post-2020 Global Biodiversity Framework Must be Improved*, BIOLOGICAL CONSERVATION, July 2020, at 2–3, <https://perma.cc/96TF-AWFM> (arguing for the implementation of new and revised genetic indicators for maintaining genetic diversity to better serve global conservation efforts).

¹⁷¹ See Rohlf, *Jeopardy*, *supra* note 5, at 132. (“By proposing to place the word ‘both’ in front of the existing regulations’ phrase ‘survival and recovery’ within the definition of jeopardy, the agencies emphasized that an impact on recovery alone would be insufficient to justify a jeopardy finding.”) (internal citation omitted). The Ninth Circuit considered arguments that the inclusion of “both” intended to make the standard less restrictive and wrote:

To define ‘destruction or adverse modification’ of critical habitat to occur only when there is appreciable diminishment of the value of the critical habitat for both survival and conservation fails to provide protection of habitat when necessary only for species’ recovery. The narrowing construction implemented by the regulation is regrettably, but blatantly, contradictory to Congress’ express command.

Gifford Pinchot Task Force, 378 F.3d at 1069–70 (emphasis in original).

in “jeopardize” assessments.¹⁷² Objective evaluation of these factors would undoubtedly constrain the Services’ discretion to provide a section 7(a)(2) stamp of approval for many federal actions, and likely produce many conclusions that actions would likely jeopardize the continued existence of affected species. No doubt due to this fact, even NMFS—which drew the link between survival and recovery for purposes of “jeopardize” analyses for salmonids—abandoned this interpretation of section 7(a)(2) in the early 2000s in favor of a comparative analytical approach that federal courts have repeatedly struck down.¹⁷³

In sum, a significant step toward reinvigorating the Services’ section 7(a)(2) analyses and making the “jeopardize” standard a tool for helping to achieve 30x30 conservation goals—instead of its current role as largely a rubber stamp for federal projects that incrementally push listed species closer to extinction—is hiding in plain sight. Specifying the minimum conditions associated with the Handbook’s concept of “survival” for each listed species would allow the Services to assess whether proposed actions would be likely to appreciably reduce listed species’ likelihood of remaining above such conditions, or even drop species below this threshold. Specifically defining survival conditions would also indicate endangered and threatened species whose current conditions have fallen below their survival needs—a status which should both preclude further adverse effects due to federal actions and indicate a need for urgent recovery efforts. Additionally, recognizing the link between species’ survival and recovery by assessing whether proposed federal actions are likely to preclude or appreciably delay recovery would restore section 7(a)(2)’s role as an “emergency room” for stabilizing species’ condition and putting them on a path toward recovery, rather than rationalizing their continued decline.

¹⁷² NAT’L MARINE FISHERIES SERV., BIOLOGICAL OPINION: REINITIATION OF CONSULTATION ON OPERATIONS OF THE FEDERAL COLUMBIA RIVER POWER SYSTEM, INCLUDING THE JUVENILE FISH TRANSPORTATION PROGRAM AND 19 BUREAU OF RECLAMATION PROJECTS IN THE COLUMBIA BASIN (2000). For a discussion of the introduction of the “recovery prong” in jeopardy assessments, see Michael C. Blumm et al., *Still Crying Out for a “Major Overhaul” After All These Years—Salmon and Another Failed Biological Opinion on Columbia Basin Hydroelectric Operations*, 47 ENV’T L. 287, 296–98 (2017) (pointing out that NMFS BiOps did not consider recovery until 1995 and then in 2000 “interpreted the recovery prong of the jeopardy standard to require both quantitative abundance goals and a time frame for reaching recovery.”) (internal citation omitted).

¹⁷³ See, e.g., *Nat’l Wildlife Fed’n*, 524 F.3d 917, 927, 931 (9th Cir. 2008) (upholding the district court’s rejection of NMFS BiOp because its jeopardy analysis “contained structural flaws that rendered it incompatible with the ESA” including a failure to “adequately consider the proposed actions’ impacts on the listed species’ chances of recovery.”); *Turtle Island Restoration Network*, 878 F.3d 725, 738 (9th Cir. 2017) (rejecting use of comparative analysis in NMFS BiOp that found shallow-set fishery project posed “no jeopardy” to loggerhead turtles when compared to environmental and other non-project threats); *Nat’l Wildlife Fed’n v. Nat’l Marine Fisheries Serv.*, 184 F. Supp. 3d 861, 892–93 (D. Or. 2016), *appeal voluntarily dismissed*, 2016 WL 9631334 (Dec. 20, 2016) (rejecting the use of a “trending toward recovery” standard in NMFS jeopardy analysis and comparing that standard to the “recovery metric” standard used in a 2000 BiOp that sought to quantify the level recovery needed to escape the survival threat of low abundance).

2. Scope of a “Jeopardize” Analysis

The 2019 modifications to regulations implementing section 7(a)(2) raised concerns about the scope of the Services’ analyses for whether proposed federal actions jeopardize listed species and destroy or adversely modify designated critical habitat. While environmental advocates strongly objected to the addition of the phrase “as a whole” in the regulatory definition of the latter standard—to emphasize the Services’ species-wide focus in assessing whether proposed federal actions destroy or adversely modify critical habitat¹⁷⁴—this criticism mostly overlooked the fact that the Services have employed this broad focus for decades in both their section 7(a)(2) “jeopardize” and critical habitat analyses.¹⁷⁵ With at least one appellate court approving this methodology, it is very unlikely that the Services will reconsider their long-held view that they should look at impacts of a single project in terms of those impacts’ effects on the entire affected species or designated critical habitat.¹⁷⁶ Moreover, unlike the reforms discussed in the preceding Part, neither the ESA, its regulations, nor the Section 7 Handbook clearly demand a different approach. However, by taking the species-wide scope of analysis as a given for section 7(a)(2) assessments, the need for adjustment in one important aspect of species-wide “jeopardize” and destruction or adverse modification of critical habitat analyses becomes obvious. Regulations implementing section 7(a)(2) create a glaring mismatch between the Services’ species-wide approach to “jeopardize” and destruction or adverse modification analyses on the one hand, and the analytical limitations imposed by the regulations’ concept of “environmental baseline” and definition of cumulative effects on the other. Further, modifications to the section 7(a)(2) regulations in 2019 direct the Services to discount impacts; they instead must perform a rational analysis of a proposal’s impacts on a species across its range and its designated critical habitat.¹⁷⁷

¹⁷⁴ One environmental advocacy organization wrote:

Furthermore, the regulations reduce the value of critical habitat designations by only requiring federal agencies to consider the impacts of federally-permitted projects on the “value of the critical habitat as a whole.” This enshrines in regulation a practice that results in the piecemeal destruction of critical habitat – death by a thousand cuts for habitat-limited species.

Press Release, Defs. of Wildlife, Trump Administration Releases Regulations Endangering Imperiled Wildlife (Aug. 12, 2019), <https://perma.cc/VD79-ZGND>.

¹⁷⁵ See *supra* note 92 and accompanying text.

¹⁷⁶ See *Friends of Animals v. U.S. Fish & Wildlife Serv.*, 28 F.4th 19, 32 (9th Cir. 2022) (holding that FWS adequately analyzed the experiment’s potential effects on the spotted owl’s critical habitat by comparing the percent affected to the spotted owl’s total critical habitat); *Appalachian Voices*, 25 F.4th 259, 274 (4th Cir. 2022).

¹⁷⁷ See *Endangered and Threatened Wildlife and Plants; Regulations for Interagency Cooperation*, 84 Fed. Reg. 44,976, 44,981, 44,983 (Aug. 27, 2019) (to be codified at 50 C.F.R. § 402) (“[T]he Services must place impacts to critical habitat into the context of the overall designation to determine if the overall value of the critical habitat is likely to be appreciably reduced.”).

A rational assessment of whether a proposed federal action jeopardizes the continued existence of an entire listed species or destroys or adversely modifies its entire designated critical habitat necessarily requires essentially a “before and after” comparison of conditions across those broad scopes. The relevant Service should therefore harmonize the variables and compare (1) the species’ present condition across the species’ range and its critical habitat’s present condition across the entire critical habitat designation, with (2) the likely status of both the species and its critical habitat at the same scale after addition of the adverse impacts caused by the action under consideration. However, present section 7(a)(2) regulations effectively prevent such an analysis.

These regulations currently set out a geographically limited analysis of impacts to a listed species and its critical habitat.¹⁷⁸ At the project level, the Service must develop a comprehensive picture of an affected species and critical habitat.¹⁷⁹ To do so, it must add together the effects of the proposed project undergoing section 7(a)(2) consultation plus “cumulative effects” to the project’s “environmental baseline.”¹⁸⁰ The regulations define “environmental baseline” as the pre-project status of the species and its critical habitat’s current status in the “action area” of the proposed action under consideration, namely the area directly or indirectly affected by the action; the environmental baseline also includes the impacts of contemporaneous state and private activities in the action area, as well as federal actions in the action area that have already undergone section 7 consultation.¹⁸¹ “Cumulative effects” are similarly bounded by the proposed action’s “action area” and include *future non-federal* actions in the action area that are reasonably certain to occur.¹⁸²

In contrast, nothing requires the Service’s evaluation of a species’ status throughout its range, as well as the status of all designated critical habitat, to be nearly so comprehensive. The regulations neither describe nor define how the Service should assess the current status of a species across its range or the status of critical habitat across its designation. Only the Handbook addresses this issue. It notes that “the action [undergoing section 7(a)(2) consultation] is viewed against the aggregate effects of everything that has led to the species’ current status.”¹⁸³ However, the Handbook provides no guidance on how the Services should develop and update this aggregate view of a species’ status; it merely calls on the Service to outline broad attributes such as the species’ general

¹⁷⁸ See 50 C.F.R. § 402.02 (2020) (showing that the definitions of “cumulative effects” and “environmental baseline” are limited to the action area).

¹⁷⁹ See *id.* § 402.14(h)(1)(ii)–(iii) (showing that “detailed discussion” is required in biological opinions).

¹⁸⁰ *Id.* § 402.14(g)(4).

¹⁸¹ *Id.* § 402.02 (defining “action area” and “environmental baseline”).

¹⁸² *Id.* Significantly, the ESA’s definition of this term is substantially narrower than the definition of cumulative effects under NEPA, which includes all reasonably foreseeable future actions regardless of the entity likely to undertake the actions. Compare *id.*, with 32 C.F.R. § 651.16 (2020).

¹⁸³ CONSULTATION HANDBOOK, *supra* note 42, at 4-37.

overall status, distribution, population dynamics, and population trends.¹⁸⁴ As a result, it appears the Services often simply recycle the same discussion of the status of a species and the status of a designated critical habitat in successive biological opinions addressing the same species and critical habitat—making no effort to recognize that the status of a species and its critical habitat change over time, including due to the adverse impacts of successive federal actions undergoing formal section 7(a)(2) consultation.¹⁸⁵

For “jeopardize” and “destruction or adverse modification” analyses conducted at the scale of entire listed species and entire critical habitat designations, it makes no sense for the Services to perform detailed assessments of the status of listed species and designated critical habitats only at the project level.¹⁸⁶ As part of a formal consultation, section 7(a)(2) regulations require the Services to consider the impact on the affected species and critical habitat from cumulative effects, contemporaneous state and private activities, and future federal actions that have already undergone section 7(a)(2) consultation—but only in the “action area” of the project under consideration.¹⁸⁷ However, since the Services evaluate jeopardy and destruction or adverse modification at the species-wide and critical habitat designation-wide levels, *all impacts* to listed species and their critical habitat from these categories of actions that occur outside the action area are also directly relevant to a project-specific section 7(a)(2) analysis. Nevertheless, nothing specifically requires the Services

¹⁸⁴ *Id.* at 4-19–4-22.

¹⁸⁵ In its 2019 revisions to section 7(a)(2) regulations, the Services asserted that their “summary of the status of the affected species or critical habitat considers the *historical and past impacts* of activities across time and space.” Endangered and Threatened Wildlife and Plants; Regulations for Interagency Cooperation, 84 Fed. Reg. 44,976, 44,983 (Aug. 27, 2019) (to be codified at 50 C.F.R. § 402) (emphasis added). However, the agencies provided no support for this blanket assertion, which flies in the face of both third-party findings to the contrary and a cursory glance at representative biological opinions. For example, the GAO found that FWS lacks a clear methodology for tracking even monitoring reports that FWS requires other federal agencies to submit to the Service regarding actions those agencies took after a completed section 7(a)(2) consultation. *See* FWS HAS INCOMPLETE INFORMATION, *supra* note 101, at 11 (concluding that FWS’s failure to track the monitoring reports it requires “leaves the Service with incomplete knowledge of the extent of action agencies’ compliance with reporting requirements, as well as with incomplete information on species’ responses to the actions under consultation.”). Moreover, even the Services’ assertion that they take a broad look at the historical and past status of listed species and critical habitat in conducting section 7(a)(2) analyses fails to address broad-scale impacts to species and critical habitat stemming from contemporaneous state and private actions affecting these resources, federal agency actions that have already gone through section 7(a)(2) consultation but not yet been implemented, and cumulative effects outside a proposed federal project’s “action area,” all of which directly affect the status of a species across its range, as well as a critical habitat designation as a whole.

¹⁸⁶ This dichotomy in scope analysis was recently highlighted by the Fourth Circuit in *Appalachian Voices*, 25 F.4th 259 (4th Cir. 2022). In this case, the court held FWS’s utilization of population-level environmental baseline and cumulative effects assessments for analysis at a smaller action area were “serious errors.” *Id.* at 271, 279.

¹⁸⁷ 50 C.F.R. § 402.14(g) (2020).

to track or consider such impacts. Keeping track of such impacts across all listed species and designated critical habitat—which the Services would have to do in real time to allow them to consider up-to-date information in formal consultations through time—would of course present the Services with a task of enormous proportions. However, the Services’ decision to conduct individual section 7(a)(2) analyses on species-wide and critical habitat-wide bases—for example, assessing whether each site-specific project jeopardizes the continued existence of an entire affected species across its range—necessarily dictates precisely such tracking.¹⁸⁸

The Services’ species-wide and critical habitat-wide analyses thus underscore the shortcomings of the regulations’ present construct of a proposed federal agency action’s “environmental baseline,” as well as the present regulatory definition of cumulative effects. As now defined, a proposed project’s environmental baseline functions solely to limit (to the project area) the Services’ consideration of other relevant impacts on an affected species or critical habitat—that is, cumulative effects, contemporaneous state and private actions, and federal actions that have already undergone section 7(a)(2) consultation.¹⁸⁹ Such a limitation

¹⁸⁸ In the relatively rare instances where one of the Services do in fact consider a broader area of impacts to a species, this analytical approach can make a significant difference. In *Alaska v. Lubchenco*, 723 F.3d 1043, 1050–51 (9th Cir. 2013), the agency found that declines across the range of the species at issue justified a jeopardy finding for fishing authorizations. The court upheld a jeopardy biological opinion against an industry challenge, noting that:

The Recovery Plan additionally stressed the importance of monitoring on a sub-regional basis because a declining sub-population could indicate an unpredicted threat to the species that could spread to other sub-regions. The Recovery Plan therefore established a goal of no more than 50% decline in any single sub-region before the species could be delisted. The analysis of sub-regions in the BiOp yielded significant information that, in light of the Recovery Plan’s concerns, led to the conclusion that sub-regional declines indicated that the entire species was in jeopardy. . . . The Recovery Plan thus set a goal of a stable population to be accomplished through sub-regional monitoring. The BiOp furnished the supporting statistical analysis, thereby establishing a nexus between population trends in the sub-regions and the health of the species as a whole. Therefore the agency was not arbitrary or capricious in relying on sub-regional declines to determine whether continued fishing would jeopardize the species as a whole or adversely modify its critical habitat.

Id. at 1053.

¹⁸⁹ See 50 C.F.R. § 402.02 (2020) (limiting the environmental baseline to the action area). Those without substantial familiarity with the ESA often confuse the environmental baseline of a given section 7(a)(2) consultation with the status of an affected species or status of affected critical habitat. A project’s environmental baseline refers only to aggregated ongoing actions, federal actions already given a green light under section 7(a)(2), and reasonably certain future non-federal actions in the project’s action area; it does *not* refer to the overall status of a listed species across its range, or designated critical habitat as a whole, as the plain language of the term suggests. *Id.*; cf. 50 C.F.R. § 402.02 (defining “environmental baseline” and “cumulative effects”). As such, the term sometimes trips up even those with substantial experience with the ESA. See e.g., Rohlf, *Jeopardy*, *supra* note 5, at 142 (erroneously equating a project’s environmental baseline with the status of the species).

makes no sense for the species-wide and critical habitat-wide scales the Services employ for section 7(a)(2) consultation; to accurately perform a broad-scale assessment of whether the proposed federal action undergoing consultation may violate section 7(a)(2), the Services need to consider all contemporaneous and reasonably certain future impacts to the affected species and critical habitat throughout the species' entire range and across its entire designated critical habitat, rather than only in the project area.

In their 2019 modifications to the section 7(a)(2) regulations, the Services also attempted to employ the environmental baseline concept to make it easier for them to discount impacts to listed species and critical habitat resulting from ongoing agency actions. The Services changed the regulations' definition of environmental baseline to add the following requirement for calculating a project area's environmental baseline: "The consequences to listed species or designated critical habitat from ongoing agency activities or existing agency facilities that are not within the agency's discretion to modify are part of the environmental baseline."¹⁹⁰ This phrase harkens back to a failed strategy NMFS employed to find no section 7(a)(2) concerns for operations of federal dams in the Columbia Basin in 2004.¹⁹¹ In that matter, NMFS used this construction of the baseline concept to determine that both federal dams and non-discretionary elements of ongoing operation of those dams were part of the proposed operations' environmental baseline; then, by comparing with relatively smaller impacts of proposed dam operations with the significant impacts from the "baseline" existence and operation of the dams, NMFS concluded that proposed dam operations did not jeopardize listed salmon and steelhead runs or adversely modify their critical habitat.¹⁹² The Ninth Circuit rejected this approach to section 7(a)(2), which the court contrasted with "a more holistic, aggregate approach" that considered whether the sum of all impacts to the fish and their critical habitat across their range jeopardized the runs or destroyed or adversely modified their critical habitat.¹⁹³ The regulatory addition to the definition of environmental baseline described above indicates that the Services may once again use this term to unlawfully avoid aggregate section 7(a)(2) analyses in situations involving ongoing agency actions, such as dam operations and land management planning.

The fix for problems associated with the regulations' environmental baseline concept is relatively straightforward. The Services should simply redefine the definitions of environmental baseline and cumulative effects to eliminate the present limitation of these concepts to a proposed federal project's "action area." This change would align the Services' analyses of

¹⁹⁰ Endangered and Threatened Wildlife and Plants; Regulations for Interagency Cooperation, 84 Fed. Reg. 44,976, 44,978, 45,016 (Aug. 27, 2019) (codified at 50 C.F.R. § 402.02); 50 C.F.R. § 402.02 (defining "environmental baseline").

¹⁹¹ *Nat'l Wildlife Fed'n v. Nat'l Marine Fisheries Serv.*, 422 F.3d 782, 792 (9th Cir. 2005).

¹⁹² *Nat'l Wildlife Fed'n*, 524 F.3d 917, 926 (9th Cir. 2008).

¹⁹³ *Id.*

section 7(a)(2) compliance to the species-wide and critical habitat-wide scope of these analyses, requiring the Services to perform assessments that consider aggregations of all impacts on affected listed species and their critical habitat. While this change would require the Services to put in place systems to keep track of such aggregate impacts, such schemes are of course necessary for the Services to rationally conduct accurate, species-wide “jeopardize” assessments and critical habitat-wide destruction or adverse modification analyses in light of changes to species and critical habitat designations as a whole due to successive federal agency actions that adversely affect these resources, as well as other positive and negative impacts from all sources.¹⁹⁴ Additionally, the Services should eliminate the regulatory language added in 2019 to the definition of “environmental baseline” regarding ongoing agency actions; this language merely marks an ill-advised, Trump-era attempt by the Services to avoid properly aggregating impacts to listed species and critical habitat associated with ongoing agency actions—a practice courts have soundly rejected.¹⁹⁵

B. What Actions are Likely to Destroy or Adversely Modify Designated Critical Habitat?

On its face, section 7(a)(2)’s prohibition against destroying or adversely modifying critical habitat would seem to present a roadblock to far more proposed federal actions than its twin ban on jeopardizing listed species. The Services have designated millions of acres across the country as critical habitat for one or more species, and federal agencies routinely carry out or authorize activities with harmful effects on these areas.¹⁹⁶

¹⁹⁴ See FWS HAS INCOMPLETE INFORMATION, *supra* note 101, at 11 (“The Service lacks a systematic means of tracking the monitoring reports it requires in biological opinions for consulted-on species and does not know the extent of compliance with these requirements. Rather, the Service relies on its biologists to keep abreast of the pertinent biological opinions and to follow up on any associated required monitoring reports. This reliance on individual biologists, rather than on a systematic process, leaves the Service with incomplete knowledge of the extent of action agencies’ compliance with reporting requirements, as well as with incomplete information on species’ responses to the actions under consultation.”).

¹⁹⁵ See, e.g., *Appalachian Voices*, 25 F.4th 259, 278 (4th Cir. 2022) (explaining that cumulative effects analyses are “critical” to a jeopardy analysis and FWS’s no jeopardy conclusion was arbitrary and capricious for failing to comprehensively conduct a cumulative effects analysis); see also *Am. Rivers v. Fed. Energy Regul. Comm’n*, 895 F.3d 32, 47 (D.C. Cir. 2018) (holding that the FWS’s BiOp was insufficient for failing to analyze effects of continued operations in the habitat at issue); *Defs. of Wildlife v. Babbitt*, 130 F. Supp. 2d 121, 127–28 (D.C.C. 2001) (“Simply reciting the activities and impacts that constitute the baseline and then separately addressing only the impacts of the particular agency action in isolation is not sufficient” when analyzing an activity’s effects in light of the environmental baseline).

¹⁹⁶ For example, one study found that FWS alone had carried out almost 7,000 formal section 7(a)(2) consultations over a seven and one half year period. See Malcom & Li, *supra* note 55, at 15845. Since a finding that a proposed agency action is likely to adversely affect either a listed species or designated critical habitat is the trigger for formal consultation, it is not at all unusual for a proposed federal action to adversely affect critical habitat.

However, as noted above, biological opinions finding that a proposed action with a federal nexus is likely to destroy or adversely modify critical habitat are vanishingly rare; findings of destruction or adverse modification without an accompanying jeopardy determination are virtually non-existent.¹⁹⁷ The Services' long-time practice of comparing site-specific impacts to the entire critical habitat designation for an affected species has given the Services cover to sanction a nearly continuous stream of incremental harms to designated critical habitat. However, this practice contravenes both the plain language of the ESA as well as common sense—and a better application of both provides a simple and effective means of making critical habitat fulfill its statutory role in fostering listed species' recoveries.

The Ninth Circuit's decision in *Butte Environmental Council v. U.S. Army Corps of Engineers*¹⁹⁸ provides a quintessential fact pattern to assess the Services' approach to determinations of whether proposed federal actions destroy or adversely modify designated critical habitat. There, the federal action at issue included a permit to allow filling of approximately 242 acres of designated critical habitat of several wetland-dependent species, each with total critical habitat designations ranging from just over 94,000 acres to 597,000 acres.¹⁹⁹ Despite concluding that the loss of 242 acres would "contribute to a local and range-wide trend of habitat loss and degradation" as well as increasingly fragment remaining habitat, FWS employed its critical habitat-wide analytical approach to determine that federal authorization of the wetland fill would not violate section 7(a)(2).²⁰⁰ The Ninth Circuit concurred with this reasoning with only a very cursory discussion, simply declaring that "[a]fter all, the project would destroy only a very small percentage of each affected species' critical habitat."²⁰¹ The Services frequently cite this decision to justify their approach to assessing whether proposed federal actions destroy or adversely modify critical habitat, including in their vacated 2019 regulatory modifications that for three years added the phrase "as a whole" to the definition of this section 7(a)(2) standard.²⁰² Under this view of section 7(a)(2), the Services routinely sanction federal actions that eliminate or harm areas designated as critical habitat by rationalizing those impacts as relatively small or unimportant—almost the textbook example of the "death by a thousand cuts" slide toward species extinction.²⁰³

¹⁹⁷ See *supra* notes 57–58 and accompanying text.

¹⁹⁸ 620 F.3d 936, 944 (9th Cir. 2010).

¹⁹⁹ *Id.*

²⁰⁰ *Id.*

²⁰¹ *Id.* at 948.

²⁰² Endangered and Threatened Wildlife and Plants; Regulations for Interagency Cooperation, 84 Fed. Reg. 44,976, 44,981, 44,985–986 (Aug. 27, 2019) (to be codified at 50 C.F.R. § 402).

²⁰³ See Owen, *supra* note 53, at 168–69 ("[T]he services do not construe the adverse modification prohibition as applying to minor alterations to habitat. . . . Sometimes the biological opinions offered that rationale within a few paragraphs of a cumulative effects

However, several lines of reasoning contradict such an outcome. Perhaps most obviously, allowing unmitigated elimination or deterioration of critical habitat merely because it constitutes a relatively small percentage of designated critical habitat as a whole runs counter to the plain language of section 7(a)(2). This provision minces no words in instructing federal agencies to ensure that their actions do not destroy or adversely modify critical habitat.²⁰⁴ Since filling over 240 acres of wetlands completely eliminated their value to the species for the benefit of which those specific wetlands were designated as critical habitat, such action—absent any mitigation—plainly constitutes “destruction or adverse modification” of critical habitat.²⁰⁵ Similar scenarios play out repeatedly across the United States.²⁰⁶ By rationalizing loss of, or damage to, relatively small areas of critical habitat against much larger critical habitat designations as a whole, the Services have in effect created an unauthorized de minimis exception to section 7(a)(2)—an interpretation that finds no support in the statute’s plain language and one eerily reminiscent of the position the Supreme Court resoundingly rejected in *Tennessee Valley Authority v. Hill*.²⁰⁷

Additionally, the definition of critical habitat similarly cuts against the unmitigated elimination or harmful alteration of designated critical habitat. The ESA defines critical habitat as the area containing the physical and biological features that are “essential” to the conservation of listed species.²⁰⁸ In the *Butte Environmental Council* situation, FWS’s conclusion that filling the affected wetland would not destroy or adversely modify critical habitat necessarily represented the agency’s determination that features found on the 240 acres in question were in fact not “essential” and thus could be eliminated without consequence to the affected species’ conservation.²⁰⁹ Such a finding is directly at odds with the statutory definition of critical habitat and the Service’s finding

analysis acknowledging that the species’ habitat was being degraded, and that the degradation was occurring through the incremental effects of small habitat alterations, but this apparent tension was never acknowledged.”) (internal citation omitted).

²⁰⁴ ESA, 16 U.S.C. § 1536(a)(2) (2018).

²⁰⁵ *Id.*

²⁰⁶ See Owen, *supra* note 53, at 166–69, 167 tbl.2 (analyzing 138 biological opinions where the FWS found no adverse modification despite the occurrence of alternations that would adversely affect designated critical habitat of several species native to the Pacific Northwest and Southwestern United States). Generally, the biological opinions in each case asserted that the proposed project would only affect a relatively small portion of the critical habitat. *Id.*

²⁰⁷ 437 U.S. 153, 166, 173 (1978). In its opinion in this famous case, the Supreme Court soundly rejected efforts to interpret section 7(a)(2) through a lens of “reasonableness” that would allow for less potentially onerous limitations on proposed federal actions. *Id.* at 173. Noting that “[o]ne would be hard-pressed to find a statutory provision whose terms were any plainer than those in § 7,” the majority pointedly observed that this provision “admits of no exception.” *Id.* The Services’ present view of what it means to destroy or adversely modify critical habitat effectively once again attempts to create a broad exception to section 7(a)(2)’s plain language.

²⁰⁸ CONSULTATION HANDBOOK, *supra* note 42, at xii–xiii.

²⁰⁹ *Butte Env’t Council*, 620 F.3d 936, 948 (9th Cir. 2010).

at the time it designated the critical habitat in question that the features on the 240 acres at issue were among those essential for the conservation of the affected species.²¹⁰ While FWS clearly has the authority to modify critical habitat designations should it decide that its original designation is no longer accurate, the process to modify critical habitat requires amending the final designation rule through the Administrative Procedure Act's²¹¹ informal notice and comment process; FWS cannot determine that affected resources within a critical habitat designation are no longer essential to species' conservation merely by issuing a biological opinion.²¹²

Finally, the Services' view that they can routinely create what amounts to site-specific exceptions to section 7(a)(2)'s prohibition against destroying or adversely modifying critical habitat both makes little sense in light of the significant resources the Services expend to designate critical habitats, and runs counter to the focus many have attached to the critical habitat designation process. The Services spend an enormous amount of time and money on designating critical habitat; one FWS official estimated the agency spends between \$150,000 and \$300,000 per species to designate critical habitat.²¹³ The critical habitat designation process carries substantial additional costs as well. Despite little supportive evidence, property owners and others seeking to weaken protections for endangered species often point to critical habitat designations as creating unjustifiable restrictions on land uses.²¹⁴ The designation process also generates significant litigation—environmentalists suing the Services to force timely designations, and resource users and property owners often challenging completed designations.²¹⁵ Incongruously, after incurring considerable

²¹⁰ *Id.* at 944.

²¹¹ 5 U.S.C. §§ 551–559, 701–706, 1305, 3105, 3344, 4301, 5335, 5372, 7521 (2018) (rulemaking notice and comment procedure is codified at § 553).

²¹² *Butte Env't Council*, 620 F.3d at 944. Oddly, in its decision in *Butte Environmental Council*, the Ninth Circuit does not mention or consider how FWS could sanction elimination of features FWS had previously deemed “essential” to the affected species' conservation that are found on the 240 acres affected by the permit decision challenged in the case.

²¹³ YA-WEI (JAKE) LI, WHEN DOES CRITICAL HABITAT DESIGNATION BENEFIT SPECIES RECOVERY? 14 (2020), <https://perma.cc/N5GL-SCV5>.

²¹⁴ See, e.g., David Sunding, *The Economic Impacts of Critical Habitat Designation*, GIANNINI FOUND. AGRIC. & RES. ECON. UPDATE, July/Aug. 2003, at 7, <https://perma.cc/7B6N-L6MB> (criticizing the effects of critical habitat designation on landowners without citing evidence).

²¹⁵ See, e.g., *N.M. Farm & Livestock Bureau v. U.S. Dep't of the Interior*, No. CV 15-428 KG/CG, 2021 WL 275535, at *1 (D.N.M. Jan. 27, 2021) (concerning critical habitat designation for jaguars in portions of Arizona and New Mexico; litigation extended over five years, and involved an appeal to the Circuit Court which eventually resulted in a vacatur of the final rule); *N. N.M. Stockman's Ass'n v. U.S. Fish & Wildlife Serv.*, 30 F.4th 1210, 1210, 1217 (10th Cir. 2022) (concerning critical habitat designation for the New Mexico Meadow Jumping Mouse—this designation process cost FWS over \$20 million). The most recent ESA case to reach the U.S. Supreme Court involved a landowner's challenge to a critical habitat designation of their land for the dusky gopher frog. See *Weyerhaeuser Co. v. U.S. Fish & Wildlife Serv.*, 139 S. Ct. 361 (2018).

administrative and political costs, as well as devoting scarce personnel resources to designating critical habitat, the Services then interpret critical habitat as providing almost no discernable protections for listed species under section 7(a)(2).

Fortunately, the ESA itself provides a path toward revitalizing the role of critical habitat in fostering conservation of threatened and endangered species. It would not be difficult to transform the Services' focus on the entirety of a critical habitat designation as the means of assessing destruction or adverse modification from an instrument of species' incremental decline to a means of potentially allowing proposed actions to move forward—without compromising species' recoveries—even if they have harmful effects on a site-specific basis. A careful reading of the ESA's definition of critical habitat reveals the statute's focus on "physical or biological features essential to the conservation" of listed species; critical habitat is the "specific areas" within a species' current range that includes those resources.²¹⁶ Destroying physical or biological features essential to a species' recovery should, according to the ESA's plain language, constitute destruction or adverse modification of critical habitat.²¹⁷ However, the statute's focus on *features* essential for a species' recovery rather than the land itself, coupled with the Services' longstanding practice of evaluating site-specific impacts to critical habitat at the scale of an entire critical habitat designation, suggests an alternative.²¹⁸ If a proposed federal action that would eliminate or harm physical or biological features essential for a species' recovery at the site-specific level also included actions to *restore or secure* similar physical or biological features—within the geographic boundaries of the species' entire critical habitat designation—the relevant Service could justifiably conclude that, as a whole, the proposed action would not destroy or adversely modify features essential to the species' recovery. In other words, the Services should read section 7(a)(2)'s destruction or adverse modification standard as imposing a "no net loss" requirement, calculated within the boundaries of a given species' designated critical habitat, for physical and biological features essential for the species' recovery that are affected by a site-specific proposal.

In addition to its consistency with the ESA's plain language and the Services' policy on the scale of section 7(a)(2) analyses, this "no net loss" approach is also consistent with familiar approaches to resource protection. Both the U.S. Army Corps of Engineers and Environmental Protection Agency apply a no net loss policy to issuance of Clean Water

²¹⁶ ESA, 16 U.S.C. § 1532(5)(A)(i) (2018).

²¹⁷ See *id.* (including "specific areas . . . occupied by the species . . . on which are found those physical or biological features (I) essential to the conservation of the species" in the definition of critical habitat).

²¹⁸ *Id.*; see Owen, *supra* note 53, at 168 (noting that the Services "do not construe the adverse modification prohibition to apply to minor" habitat alterations).

Act²¹⁹ section 404 permits to fill wetlands—which ironically meant that the developers in the *Butte Environmental Council* case had an obligation to mitigate for their project’s impacts on wetlands, but no obligation to similarly make up for its reduction of features essential to the recovery of wetland-dependent endangered species.²²⁰ In the ESA context, at the end of the Obama Administration, FWS adopted a mitigation policy strongly encouraging—though stopping short of requiring—compensatory mitigation for adverse impacts on both listed species and designated critical habitat stemming from federal actions.²²¹

Of course, this “no net loss” interpretation of section 7(a)(2)’s critical habitat standard would have limitations. Some proposed federal actions may affect particularly important site-specific physical or biological features, such as a key breeding ground or migratory corridor,²²² rendering ineffective mitigation elsewhere within the boundaries of a critical habitat designation. However, this limit is not unique to this more protective approach to critical habitat; the Services have acknowledged this limit on their current approach to “as a whole” assessments of whether impacts from a proposed federal action destroy or adversely modify critical habitat.²²³ The Services would of course also have to develop systems to assess the adequacy of measures to mitigate impacts on specific features essential for conservation of a given species, but the agencies have considerable experience designing and evaluating such mitigation schemes for listed species.²²⁴ Importantly, the Services would

²¹⁹ Federal Water Pollution Control Act (CWA), 33 U.S.C. §§ 1251–1388 (2018). *See id.* § 1344 (containing the specific code section permitting wetlands to be filled).

²²⁰ *Butte Env’t Council*, 620 F.3d 936, 946–47 (9th Cir. 2010).

²²¹ Endangered and Threatened Wildlife and Plants; Endangered Species Act Compensatory Mitigation Policy, 81 Fed. Reg. 95,316 (Dec. 27, 2016). For an examination of Obama era compensatory mitigation through the lens of a series of conservation agreements, see Pidot, *supra* note 48, at 167. In 2018, the Trump Administration repealed this policy. Endangered and Threatened Wildlife and Plants; Endangered Species Act Compensatory Mitigation Policy, 83 Fed. Reg. 36,469 (July 30, 2018) (to be codified at 50 C.F.R. Ch. 1).

²²² Critically important within a migratory corridor are “stopover areas” and “bottlenecks.” Stopover areas or sites are “habitat patches along the migration route[s] where animals rest and forage to renew energy reserves.” Hall Sawyer & Matthew J. Kauffman, *Stopover Ecology of a Migratory Ungulate*, 80 J. ANIMAL ECOLOGY 1078, 1078 (2011). Bottlenecks are “areas where many animals must funnel through one confined or narrow landscape feature.” Temple Stoellinger et al., *Where the Deer and the Antelope Play: Conserving Big Game Migration as an Endangered Phenomena*, 31 DUKE ENV’T L. & POL’Y F. 81, 98 (2020) (internal citation omitted).

²²³ *See* Endangered and Threatened Wildlife and Plants; Regulations for Interagency Cooperation, 84 Fed. Reg. 44,976 44,983 (Aug. 27, 2019) (to be codified at 50 C.F.R. § 402) (defending the Services current “as a whole” approach to assessing impacts to critical habitat by explaining that “local impacts could be significant, for instance, where a smaller affected area of the overall habitat is important in its ability to support the conservation of a species (e.g., a primary breeding site).”).

²²⁴ *See e.g.*, Memorandum from Director, U.S. Fish and Wildlife Serv., U.S. Dep’t of the Interior, to Reg’l Dirs., Regions 1–7 and Manager, Cal. Nev. Operations, 1 (May 2, 2003), <https://perma.cc/Y77P-KFUB> (describing the purpose to mitigate species conservation through conservation banks and similar means); *Mitigation Banks, Conservation Banks*,

have to ensure that implementation of necessary measures to mitigate adverse impacts to physical or biological features essential for species' recovery is assured rather than merely promised. This too is an issue the Services—and reviewing courts—have faced fairly routinely in the section 7 context.²²⁵

The Biden Administration has signaled its intent to revisit changes to section 7(a)(2) regulations made under the preceding president, providing an excellent opportunity to codify a “no net loss” approach to biological and physical features essential for the recovery of species within critical habitat designations.²²⁶ Regulations the Services adopted in 2016 defined the critical habitat standard as follows:

Destruction or adverse modification means a direct or indirect alteration that appreciably diminishes the value of critical habitat for the conservation of a listed species. Such alterations may include, but are not limited to, those that alter the physical or biological features essential to the conservation of a species or that preclude or significantly delay development of such features.²²⁷

Modest alteration of this definition as follows would interpret section 7(a)(2) in a manner consistent with the ESA's plain language:

and In-Lieu Fee Programs in the West Coast Region, NOAA FISHERIES, <https://perma.cc/YW24-U2AN> (last updated July 29, 2022) (describing mitigation banks and in-lieu fee programs as tools to help with Endangered Species Act and Essential Fish Habitat regulatory processes); *Conservation Banking: Incentives for Stewardship*, *supra* note 50 (describing the FWS's role in incentivizing the use of mitigation banks to protect endangered species). For an account of the development of a public-private conservation agreement that incorporates mitigation, see Pidot, *supra* note 48, at 167 (examining two public-private agreements between mining companies and the federal government to mitigate negative impacts of mining activities on federal lands).

²²⁵ See *Ctr. for Biological Diversity v. Bernhardt*, 982 F.3d 723, 743 (9th Cir. 2020) (“Mitigation measures relied upon in a biological opinion must constitute a ‘clear, definite commitment of resources,’ and be ‘under agency control or otherwise reasonably certain to occur.’”) (internal citation omitted); see, e.g., *id.* at 742–43, 748 (finding that mitigation measures proposed in a FWS BiOp approving oil drilling in Alaska were indefinite and did not constitute a “clear, definite commitment of resources” and that any FWS reliance upon these measures to conclude that a polar bear's critical habitat would not be adversely modified by the oil project was arbitrary and capricious.); *Ctr. for Biological Diversity v. Rumsfeld*, 198 F. Supp. 2d 1139, 1153–54 (D. Ariz. 2002) (finding mitigation measures inadequate because the government's mitigation measures were indefinite, not subject to the government's authority, and unlikely to address the threat in a manner that avoids jeopardy).

²²⁶ See *NOAA Fisheries and U.S. Fish and Wildlife Service to Propose Regulatory Revisions to Endangered Species Act*, NOAA FISHERIES (June 4, 2021), <https://perma.cc/GT4S-J8B7> [Hereinafter *Regulatory Revisions*] (describing the Biden-Harris administration's Executive Order directing federal agencies to review and address agency actions for consistency with administration objectives like addressing climate change and stating that these agencies will “initiate rulemaking” to “revise, rescind, or reinstate five ESA regulations” including section 7 of the ESA).

²²⁷ See 50 C.F.R. § 402.02 (2016) (superseded) (defining “destruction or adverse modification”).

Destruction or adverse modification means a net reduction of the physical or biological features essential to the conservation of a species, or net impacts that preclude or significantly delay development of such features. For purposes of this definition, net reduction and net impacts refer to the designated critical habitat as a whole, except when a proposed federal action affects site-dependent physical or biological features essential to the conservation of a species such as an important breeding ground or migratory corridor.

This definition would put in place a “no net loss” approach to physical and biological features essential to species’ recovery. While it retains the “as a whole” language from the 2019 regulatory definition—criticized by many conservation advocates—it uses the Services’ long-time approach to analyzing site-specific impacts in the context of an entire critical habitat designation as a means to require mitigation of all impacts caused by a federal action to physical and biological features essential to an affected species’ recovery, rather than using a wide scale to minimize the significance of site-specific impacts to these features.²²⁸ This proposed definition also retains language from the 2016 regulation—removed in the 2019 revisions—recognizing that delaying or precluding development of features essential for recovery can also be a way proposed federal actions can adversely affect critical habitat.²²⁹ Finally, the proposed definition expressly recognizes that mitigation measures elsewhere within a designated critical habitat could not offset impacts to some essential features.

IV. FROM THE EMERGENCY ROOM TO RECOVERY

The interpretation of section 7(a)(2) outlined above, though consistent with Congress’ vision in 1973 and faithful to the language of the ESA itself, would fundamentally alter implementation of interagency consultation the Services have practiced for decades. Rather than slightly slowing the decline of listed species and loss of their critical habitat while awaiting uncertain future recovery efforts, applying the ESA’s “jeopardize” and critical habitat standards as lawmakers arguably intended would significantly improve section 7’s biodiversity protections and help put most species on a trajectory toward recovery. For many of the most imperiled species in the United States, applying section 7(a)(2) as a true emergency room conservation measure would represent the most significant legal step toward realizing the goals of the Convention on Biological Diversity’s post-2020 Global Biodiversity Framework, as expressed in the United States by the Biden Administration’s

²²⁸ 50 C.F.R. § 402.02 (2020).

²²⁹ See *Endangered and Threatened Wildlife and Plants; Regulations for Interagency Cooperation*, 84 Fed. Reg. 44,976, 44,985–86 (Aug. 27, 2019) (to be codified at 50 C.F.R. § 402) (discussing removal of the regulations’ inclusion of actions that preclude or appreciably diminish development of essential features as a means of adversely altering critical habitat).

commitment to increasing protections for biodiversity as part of the country's efforts to ameliorate climate change.²³⁰

At least from a legal standpoint, the changes in the application of section 7(a)(2) described in Part III would be relatively easy to accomplish. Indeed, most of the measures outlined rely on the ESA's plain language, as well as existing regulations and policies set forth in the Section 7 Handbook, effectively the implementation bible of section 7(a)(2). The Services would need to only adopt two modest regulatory changes. First, the Services should modify section 7(a)(2) regulations' definition of environmental baseline to a species-wide scope and eliminate analytical limitations imposed by confining—to only a proposed project's "action area"—consideration of modifications to contemporaneous state and private impacts, future federal actions that have already been through section 7(a)(2) consultation, and cumulative effects. Second, the Services should redefine "destruction or adverse modification" of critical habitat along the lines suggested above.²³¹ Given their intention to revisit changes made in 2019 to regulations implementing section 7(a)(2), the Services have an immediate opportunity to make these changes.²³²

At the same time, it would be naïve to assert that such modifications would also be easy from a political standpoint. Though relevant Biden appointees have uniformly emphasized that protecting biodiversity is crucial to the country's economy and well-being, increasing those protections will impact the bottom lines of some economically and politically powerful interests, which would no doubt oppose—and take steps to thwart—such reforms.²³³ Whether its actions regarding increasing protections for biodiversity in the face of such opposition will match its rhetoric remains a test for the Biden Administration and perhaps for future chief executives as well.

If the Services do find the political backbone to do so, rising to meet this challenge could mark an important turning point in U.S. efforts to conserve its most imperiled species. The remainder of this Part explores some of the practical, as well as far-reaching, implications of using section 7(a)(2) as a more powerful tool for protecting biodiversity.

A. Practical Effects of Improving the "Jeopardize" Standard

Despite the significant implications of reforming section 7(a)(2)'s "jeopardize" standard, empirical analyses of section 7 consultations reveal that the sky would not fall on most federal proposals and

²³⁰ See Tackling the Climate Crisis at Home and Abroad, Exec. Order No. 14,008, 86 Fed. Reg. 7,619, 7,622–23 (Feb. 1, 2021) (outlining the Biden Administration's commitment to protecting biodiversity as part of the administration's broader climate change policy).

²³¹ See discussion *supra* Part III.

²³² See *supra* note 226 and accompanying text.

²³³ See CONSERVING AND RESTORING AMERICA, *supra* note 15, 8–9 (affirming key Biden appointees' understanding that biodiversity and the country's well-being are interconnected).

stakeholders that have economic or other interests in such actions. Federal activities that may face increased constraints or even be barred altogether under a more rational interpretation of the jeopardy standard are likely to constitute a relatively small percentage of all federal agency proposals that affect listed species. Under the rules which have governed the section 7(a)(2) process for decades, actions a federal agency determines are not likely to adversely affect listed species—with written concurrence from the relevant Service—go forward with no further analysis. The vast majority of federal actions affecting listed species fall into this category; the broadest study of section 7(a)(2) consultations found that over a seven-year period ending in 2015, well over 90% of section 7(a)(2) consultations involving FWS ended with agencies' NLAA determinations and concurrences by FWS.²³⁴ This relatively large percentage of agency actions subject to informal consultation—which requires no analysis of jeopardy or destruction or adverse modification of critical habitat—would not change as a result of the proposed changes described in this Article.

Nonetheless, modifying the interpretation and implementation of section 7(a)(2) as outlined here would have important consequences for efforts to conserve threatened and endangered species. Perhaps most importantly, it would largely bring to a close the nonsensical idea that federal agencies can continuously authorize a wide array of incremental adverse impacts to listed species and their critical habitat—limited only by a theoretical barrier the Services never attempt to delineate and almost never determine has been exceeded—while supposedly at the same time working to stem these species' declines toward extinction and advancing their recoveries.²³⁵ Not only does such an approach make little sense from a biological standpoint, this mindset creates expectations that almost any federal action can proceed, even if it causes adverse impacts to listed species. This misguided idea also has two consequences that further reduce section 7(a)(2)'s protections for listed species. First, the Services have come to see a finding that a federal action is likely to jeopardize the continued existence of a listed species as a failure of the consultation process rather than a finding, both contemplated under section 7 and necessary in some cases, to ensure adequate protections for threatened and endangered species.²³⁶ The broad discretion the Services have created under their current interpretation of the “jeopardize”

²³⁴ Malcom & Li, *supra* note 55, at 15845.

²³⁵ Though the legal path advocated herein differs from the trust-based wildlife conservation arguments advanced by Professor Mary Wood, both arrive at the same destination: a halt to the idea that authorizing incremental harm to listed species is consistent with their recovery for the benefit of future generations. See Wood, *supra* note 105, at 643–44.

²³⁶ See Tobias, *supra* note 163 (citing an email exchange with FWS where they stated that “[t]he Service works diligently with federal agencies and applicants to help ensure their proposed actions are not likely to jeopardize listed species” and the government affairs director at the Center for Biological Diversity who asserts that “FWS believes calling jeopardy is a failure and should be avoided at all costs”).

standard allows them to rationalize almost any level of impact to listed species unchecked by any reference to the species' minimal survival needs or how a proposal affects species' progression toward recovery—ensuring that the section 7(a)(2) process almost never “fails” by halting a federal project. Second, federal agencies and resource-oriented stakeholders in such actions—for example, timber companies and grazers operating on federal land, entities seeking federal permits for actions that affect listed species, and those in similar positions—are well aware of the Services' wide latitude under the present jeopardy standard and are often willing and able to press the Services to employ their discretion to continue to approve activities of interest with few costly modifications to protect affected species.²³⁷ Tying assessments of whether a federal action jeopardizes listed species to the clear biological benchmarks of species' survival requirements and progress toward recovery would help alleviate this pressure.

Requiring the Services to make explicit these biological components of “jeopardize” analyses would have additional benefits. This practice would identify species now facing—or those on the brink of facing—so called “baseline jeopardy” status, that is, threatened and endangered species whose current status falls below the minimum population parameters, genetic diversity, or environmental conditions associated with the minimal “survival” needs of those species as defined in the Services' Section 7 Consultation Handbook.²³⁸ Identifying species at the greatest risk of spiraling toward extinction would make clear the cases where federal agencies would have to avoid adverse impacts. It would also help the Services, and others, prioritize recovery efforts by focusing on species in the most immediate need of conservation efforts, rather than allocating resources to popular or high-profile species on the protected lists.²³⁹ Taking these steps would also aid in fostering better

²³⁷ While it is obviously difficult to catalog behind-the-scenes political pressures influencing the Services' actions in section 7 consultations, examples are not difficult to find. *See, e.g., id.* (stating a belief that scientific decisions at FWS are influenced by political interests, based on an example, confirmed through a FOIA request, of a private party (Eastern Collier Property Owners) contributing significant funds to the agency for general operations while their permit application to build a development in critical Florida panther habitat was actively under review). In California's Central Valley, NMFS pulled a 1,123 page biological opinion concluding that a federal proposal to increase water deliveries to one of the state's largest and wealthiest irrigation districts would harm listed salmon; the agency replaced the scientists who wrote the opinion with a new team tasked with producing a revised version. *See Bettina Boxall, A Report Shows Trump's Water Plan Would Hurt California Salmon. The Government Hid It*, L.A. TIMES (Aug. 21, 2019), <https://perma.cc/G5JS-YMLT>. In a similar vein, a high-level Interior Department official eliminated a controversial biological opinion and formed a new team to write a revised plan to operate dams on the Missouri River that affect barge traffic. *See Amanda Little, The Bush Administration is Jettisoning Real Scientists in Favor of Yes-Men*, GRIST (Nov. 12, 2003), <https://perma.cc/6P3R-AYHC>.

²³⁸ CONSULTATION HANDBOOK, *supra* note 42, at 4-30–4-31, 4-35–4-37.

²³⁹ *See Haines et al., supra* note 33, at 4, 7–8 (showing that efficient allocation of funding can result in disparate results). According to a 2018 study examining FWS recovery plans, “[a]t an annual budget of \$150 million, inefficient allocation of resources would recover

communication with the public by providing notification of those species most imperiled, as well as aid in promoting fairness by providing a more methodical, analytical approach that would hopefully obviate concerns that powerful interests press the Services for discretionary calls. Lastly—but certainly not of least importance—requiring the Services to employ more explicit standards in conducting assessments of whether proposed federal actions jeopardize listed species would allow courts to provide more meaningful review of the agencies’ determinations. Under the status quo, the Services often prevail in suits challenging their section 7(a)(2) findings with what amounts to a “blinded by science” defense; citing their technical expertise and the ESA’s deferential standard of review, the Services routinely convince many courts to uphold their “no jeopardy” determinations without reference to any clear biological thresholds to justify their findings—the equivalent of the referee declaring the home team the winner of a game without bothering to keep score.²⁴⁰

The Services’ identification of minimal population, genetic, and environmental conditions needed for listed species’ survival also holds potential to integrate better protections for biodiversity into many facets of federal environmental regulation. For example, decisions by federal agencies on whether to approve influential benchmarks under other federal laws, such as water quality standards under the Clean Water Act, pesticide registrations under the Federal Insecticide, Fungicide, and Rodenticide Act,²⁴¹ and standards for protecting floodplains under the National Flood Insurance Program,²⁴² exert huge influence over a wide

about 104 species, whereas an optimal allocation is predicted to recover 1168 species.” Leah R. Gerber et al., *Endangered Species Recovery: A Resource Allocation Problem*, 362 SCIENCE 284, 286 (2018). See also U.S. GOV’T ACCOUNTABILITY OFF., GAO-05-211, ENDANGERED SPECIES ACT: FISH AND WILDLIFE SERVICE GENERALLY FOCUSES RECOVERY FUNDING ON HIGH PRIORITY SPECIES BUT NEEDS TO PERIODICALLY ASSESS ITS FUNDING DECISION 13, 19 13, 19 (2005) (finding that although FWS generally allocated recovery funds to higher priority species, factors other than species’ recovery priority ranking drove agency decisions about allocating recovery expenditures).

²⁴⁰ For example, in *Audubon Soc’y of Portland*, 849 F. Supp. 2d 1017 (D. Or. 2011), the court acknowledged that “a different methodology is needed in order to allow NMFS and other federal agencies to provide more accurate opinions regarding the current status of threatened and endangered species and critical habitat,” but refused to halt additional adverse impacts to fish populations already extremely depressed because “the court is not free to rewrite the statute to include additional requirements such as the development of new methodologies or new data. *Id.* at 1046. Further, the court stated that the “agency’s scientific methodology is owed substantial deference.” *Id.* (citations omitted); see also *Miccosukee Tribe of Indians of Fla.*, 566 F.3d 1257, 1267, 1271 (11th Cir. 2009) (citing *Balt. Gas & Elec. Co. v. Nat. Res. Def. Council*, 462 U.S. 87, 103 (1983)) (noting that courts should give a “high level of deference to the Service’s scientific determinations,” asserting that determining what constitutes the “best scientific and commercial data available” for purposes of assessing compliance with section 7(a)(2) is itself a scientific determination deserving deference, and explaining that when an agency “is making predictions, within its area of special expertise, at the frontiers of science . . . as opposed to simple findings of fact, a reviewing court must generally be at its most deferential”).

²⁴¹ 7 U.S.C. §§ 136–136y (2018).

²⁴² 42 U.S.C. §§ 4001–4131 (2018).

range of water pollution discharges, agricultural practices, and land use decisions across the country, respectively. Section 7(a)(2) consultation on these standard approval decisions that is based on a definition of “jeopardize” and that incorporates minimum survival characteristics for the wide variety of listed species such decisions affect would effectively “bake in” measures to ensure species’ survival within the fabric of other sweeping federal regulatory schemes.²⁴³

Finally, defining “jeopardize the continued existence of” listed species to include actions that preclude or appreciably delay recovery of listed species would itself lead to a number of positive steps for listed species. Such action would dispel another myth that has held back recovery efforts for decades: That species facing significant risk can persist for long periods of time until recovery efforts at an indefinite future date eventually improve their status. This biologically erroneous idea, effectively a corollary to the notion that species can suffer virtually limitless incremental adverse impacts before their eventual recovery at some future date, allows the Services to approve federal actions

²⁴³ As they discharge their duties to implement a wide variety of federal regulatory programs, federal agencies’ decisions on permits, standards, and registrations that may affect listed species or designated critical habitat are subject to the procedural and substantive requirements of section 7(a)(2). *See, e.g.*, *Ctr. for Biological Diversity v. U.S. Env’t Prot. Agency*, 847 F.3d 1075, 1091 (9th Cir. 2017) (holding that pesticide product re-registrations constitute “agency action,” within meaning of ESA provision requiring consultation regarding effects of agency action on endangered species and critical habitats). Courts have overturned such decisions as not consistent with section 7(a)(2). *See, e.g.*, *Nw. Env’t Advoc. v. U.S. Env’t Prot. Agency*, 268 F. Supp. 2d 1255, 1272–73 (D. Or. 2003) (finding that NMFS’s determination that revised Oregon water quality standards would not jeopardize listed species was arbitrary and capricious); *see also* *Fla. Key Deer v. Paulison*, 522 F.3d 1133, 1139 (11th Cir. 2008) (finding that the agencies’ implementation of the National Flood Insurance Program (NFIP) in Florida jeopardized Florida Key deer and other ESA-listed species). However, perhaps because of the potentially far-reaching consequences of doing so, applying section 7(a)(2) to federal requirements is not always straightforward. *See, e.g.*, Ani Esenyen, *The Clash of the Acts: FEMA’s Implementation of the National Flood Insurance Program and its Collision with the Endangered Species Act and National Environmental Policy Act*, 123 PENN. ST. L. REV. 499, 502, 533 (2019) (explaining the difficulty of implementing the NFIP without violating the ESA.) Taken to its logical conclusion, the consultation mechanism discussed in this article could also provide a direct basis for connecting biodiversity conservation with combating greenhouse gas emissions that contribute to climate change, the link President Biden made in calling for advancing 30x30 goals to protect species and habitat in his executive order on climate change. Climate change is now one of the leading reasons that the Services list species as threatened and endangered, as well as one of the principal threats to currently listed species. Arguably, therefore, a key aspect of the “environment providing all requirements for completion of the species’ entire life cycle”—an element of the Consultation Handbook’s definition of “survival”—are maximum levels of atmospheric greenhouse gases. CONSULTATION HANDBOOK, *supra* note 42, at xviii–xix. Thus, for example, a consultation on a federal agency’s proposal to issue oil and gas leases on federal land would have to assess whether producing—and burning—those fossil fuels would cause or contribute to atmospheric greenhouse gas concentrations exceeding species’ survival levels. Though this use of section 7 to regulate actions that result in greenhouse gas emissions is arguably required by the ESA, the likelihood that the Services—or reviewing courts—will go in such a direction may be low. *See* John Kostyack & Dan Rohlf, *Conserving Endangered Species in an Era of Global Warming*, 38 ENV’T L. REP. NEWS & ANALYSIS 10203, 10209 (2008).

inconsistent with both recovery measures and timelines based on the fiction that the “jeopardize” standard has little to do with recovery. By recognizing time as an important element of avoiding jeopardy—specifically timely progress toward recovery—the Services would safeguard the survival of species through time while furthering the ESA’s purpose of recovering listed species.²⁴⁴

Linking recovery with the “jeopardize” standard would also underline the importance of other ESA sections dealing with recovery. Agency policy and court opinions providing that recovery plan measures do not bind federal agencies have meant that agencies’ implementation of even explicit recovery plan measures has been spotty at best.²⁴⁵ However, since the site-specific measures and timelines set forth in recovery plans would obviously serve as a key gauge of whether a proposed federal action was likely to preclude or appreciably delay a species’ recovery, section 7(a)(2)’s “jeopardize” standard could provide an important boost for recovery by at least barring measures inconsistent with timely progress in that direction. This in turn would make recovery plans more consequential than current exercises that sometimes produce mainly paper.²⁴⁶ Similarly, incorporating considerations of timely recovery into section 7(a)(2) could re-energize the directives of section 7(a)(1). The latter instructs federal agencies, in consultation with the Services, to use their authorities to carry out programs to recover listed species.²⁴⁷ Often ignored by agencies, the Services, and courts alike, this section is consistent with an interpretation of the “jeopardize” standard that includes consideration of recovery.²⁴⁸

Working with the Services under section 7(a)(1) to develop and implement programs that further species’ recovery would help federal agencies avoid actions that may jeopardize listed species by impairing their timely recovery. Moreover, actions promoting recovery for more species would hopefully lead to more species delistings and

²⁴⁴ See ESA, 16 U.S.C. § 1531(b) (2018) (noting that the purposes of the ESA include providing “a program for the conservation” of listed species); see also 50 C.F.R. § 402.02 (2020) (defining “recovery” as essentially synonymous with conservation).

²⁴⁵ See Jamison E. Colburn, *The Indignity of Federal Wildlife Habitat Law*, 57 ALA. L. REV. 417, 444–45 (2005) (discussing problems resulting from the lack of enforceability of recovery plans).

²⁴⁶ See Jacob W. Malcom & Ya-Wei Li, *Missing, Delayed, and Old: The Status of ESA Recovery Plans*, 11 CONSERVATION LETTERS, July 2018, at 3, <https://perma.cc/9YTZ-4JBC> (finding that nearly one-fourth of listed species lack official recovery plans); *Defs. of Wildlife v. U.S. Dep’t of the Interior*, 931 F.3d 339, 358–60 (4th Cir. 2019) (holding FWS’s reliance on vague and outdated data in a recovery plan for a species of freshwater mussel, in “finding that the clubshell’s continued survival will not be jeopardized by [pipeline] construction is not in accordance with the law”). Cf., *Sw. Ctr. for Biological Diversity v. Bartel*, 470 F. Supp. 2d 1118, 1137 n.16 (S.D. Cal. 2006), *dismissed*, 409 Fed. App’x 143 (9th Cir. 2011) (“Congress expected FWS to engage in earnest and conscientious activity to use the recovery plans to try to remove the species from the protection of the ESA.”).

²⁴⁷ 16 U.S.C. § 1536(a)(1).

²⁴⁸ See *id.* (creating agencies’ statutory mandate to carry out programs for the conservation of endangered and threatened species).

correspondingly eliminate the need for section 7(a)(2) consultation on federal actions that affect those species.

B. Practical Effects of Improving the “Destruction or Adverse Modification Standard”

As it now stands, the Services’ view of section 7(a)(2)’s ban on destruction or adverse modification of critical habitat stands as one of the federal government’s most cynical and hollow interpretations of a natural resources law. After spending millions to designate critical habitats, FWS and NMFS agencies allow, as a matter of course, the literal destruction and adverse modification of physical and biological features essential for the recovery of listed species—in most cases without even a pretense of tracking such impacts as they accumulate and with no effort whatsoever to describe limitations that could eventually halt the incremental elimination and degradation of these designations as a whole.²⁴⁹ With cruel irony, extensive critical habitat designations—often won with citizen suits and celebrated by conservation advocates—simply make it easier for the Services to rationalize incremental federal harms as small compared to critical habitat designations “as a whole,” and thus inconsequential to species’ recoveries.²⁵⁰ In this context, any reform of implementation of section 7(a)(2) critical habitat standard clearly must not only count as a significant improvement in federal efforts to conserve biological diversity but also mark a crucial step in restoring this section as a means to vindicate lawmakers’ intent that section 7 stands as institutionalizing a cautionary approach to managing threatened and endangered species.

A “no net loss” approach to protecting the physical and biological features of critical habitat that are essential to species’ recoveries would restore critical habitat as a key tool for fostering listed species’ progress toward recovery while at the same time providing flexibility to complete at least some federal projects that have site-specific adverse impacts within critical habitat. Though the Services would have to carefully ensure that onsite or offsite mitigation efforts in fact make up for all impacts to features essential to affected species’ recoveries, this approach to section 7(a)(2) would obviate any need to keep track of the current

²⁴⁹ See *supra* notes 101–102 and accompanying text; see also Endangered and Threatened Wildlife and Plants; Review of Native Species That Are Candidates for Listing as Endangered or Threatened; Annual Notice of Findings on Resubmitted Petitions; Annual Description of Progress on Listing Actions, 79 Fed. Reg. 72,450, 72,456 (Dec. 5, 2014) (explaining that the median cost for the final listing with critical habitat designation of a single species is around \$305,000 and that over multiple species, this cost exceeds millions of dollars).

²⁵⁰ PERVAZE A. SHEIKH ET AL., CONG. RSCH. SERV., R46677, THE ENDANGERED SPECIES ACT: OVERVIEW AND IMPLEMENTATION 44 (2021) (explaining that citizen suits frequently result in critical habitat listings); see also Owen, *supra* note 53, at 168 (describing how harms to species are assessed in relation to the critical habitat as a whole, and therefore often allowed as “minor”).

status of these features across critical habitat designations as a whole—a vast task that the Services’ current approach to assessing impacts to critical habitat should obligate them to do.²⁵¹ The Services would similarly no longer have to identify a point at which the sum of all incremental harms to critical habitat designated for a particular species renders that entire designation unable to provide for the conservation needs of the species, again, a determination the agencies’ current approach requires (though the Services avoid it).²⁵²

Additionally, interpreting the critical habitat standard to truly prevent net loss of features essential to species’ recovery would finally differentiate the two prohibitions of section 7(a)(2). Though the Services usually wax creatively in attempting to explain that there is at least some difference between these standards, in practice, essentially none exists.²⁵³ However, the statute’s prohibition on destruction or adverse modification obviously focuses on adverse impacts to important habitat itself, independent of their immediate effects on listed species. A “no net loss” approach to section 7(a)(2)’s critical habitat standard would restore this separation; the Services would not need to consider effects on a species in assessing whether a proposed federal action was likely to destroy or adversely modify physical or biological features essential for the species’ recovery. This view of section 7(a)(2) is also consistent with a key purpose of the ESA that aims beyond just the species level of biodiversity protection, namely Congress’s emphasis on conserving “the ecosystems upon which endangered species and threatened species depend.”²⁵⁴

While some conservation advocates may balk at interpreting section 7(a)(2) to permit onsite or offsite (though within a given critical habitat designation) mitigation, this approach arguably has important positive

²⁵¹ See discussion *supra* Part III.A.2.

²⁵² See discussion *supra* Part II.B.2.

²⁵³ For example, in FWS’s final designation of critical habitat for black pinesnakes, the agency’s efforts to explain the benefits of the designation could muster only an assertion that “the benefits of critical habitat include public awareness of the presence of black pinesnake and the importance of habitat protection.” Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for Black Pinesnake, 85 Fed. Reg. 11,238, 11,256 (Feb. 26, 2020) (to be codified at 50 C.F.R. pt. 17). The Services commonly cite critical habitat as providing other federal agencies and the public with notice of the presence of listed species’ habitat as a key benefit of critical habitat designation. In his empirical study of section 7(a)(2) consultations, Professor Owen could not identify a single biological opinion which concluded that a federal proposal would destroy or adversely modify critical habitat without also finding the project was likely to jeopardize the affected species (though opinions finding a likely 7(a)(2) violation were themselves rare). See Owen, *supra* note 53, at 166 (“But my data set did not include a single opinion in which [the Services] found jeopardy without finding adverse modification.”). The Services themselves routinely acknowledge that they see virtually no substantive protections for listed species added by designation of critical habitat. In a typical example, FWS, in its designation of critical habitat for black pinesnakes, explained that “it is unlikely that any additional conservation efforts would be recommended to address the adverse modification standard over and above those recommended as necessary to avoid jeopardizing the continued existence of the [snakes].” 85 Fed. Reg. at 11,257.

²⁵⁴ ESA, 16 U.S.C. § 1531(b) (2018).

elements. First, it is clearly far more protective of listed species than the status quo, which inexplicably posits that many of the physical and biological features the Services deem to be “essential” to recovery of a given species are in fact expendable, allowing the Services to incrementally permit their literal destruction or adverse modification until some theoretical point beyond which the entire critical habitat designation (which often cover millions of acres) is rendered incapable of supporting a recovered population.²⁵⁵ Simply describing in writing the Services’ long-time implementation of one of section 7(a)(2)’s two key provisions demonstrates its absurdity, as well as the relative benefits of a “no net loss” approach. This view of section 7(a)(2)’s critical habitat standard would also create a potentially profitable market for innovative approaches to protecting and restoring features essential for species recoveries. There are many examples of market approaches providing not only compensatory mitigation for adverse impacts but also “uplift” in the form of net benefits to conservation. However, markets for such benefits require “buyers,” that is, those willing to pay for conservation benefits.²⁵⁶ A “no net loss” approach to the ESA’s ban on destruction or adverse modification of critical habitat would create ample buyers among both federal agencies and permittees and others with financial interests in federal or federally permitted actions likely to adversely affect critical habitat. As such, this approach would help internalize the costs of impacts to biodiversity that these actions impose on society.

At the same time, making clear that critical habitat designations come with important protections for the physical and biological features essential to species’ recovery in their boundaries would make the designation process itself much more consequential than it is currently. Even though its present effects are minimal, the Services’ process of drawing lines on maps to delineate critical habitat has always created controversy and litigation.²⁵⁷ Accordingly, attaching real protections to critical habitat would likely increase strife over designation decisions even over present controversies, as well as ramp up political pressure on the Services to employ their discretion to exempt certain areas from inclusion in designation. Presently, critical habitat designations provide listed species with little additional de jure protection apart from the

²⁵⁵ See discussion *supra* Part II.B.2.

²⁵⁶ For example, since irrigation in the arid western United States is often very inefficient, investments in more efficient technology and changing points of water diversion for irrigation can benefit both farmers and improve instream flows. The funding for such transactions comes from “buyers” such as conservation-oriented foundations or donors, as well as entities fulfilling mandatory or voluntary conservation obligations. See Alex H. Johnson & Joe S. Whitworth, *Enabling Ecological Restoration Through Quantification, in* BROKEN PUMPS AND PROMISES: INCENTIVIZING IMPACT IN ENVIRONMENTAL HEALTH 77, 78, 84, 90, 94 (E.A. Thomas eds., 2016) (arguing that a market-based approach to watershed management will lead to a more efficient allocation of conservation resources).

²⁵⁷ See, e.g., Damien M. Schiff, *The Endangered Species Act at 40: A Tale of Radicalization, Politicization, Bureaucratization, and Senescence*, 37 ENVIRONS ENV’T L. & POL’Y J. 105, 106, 124 n.116 (2014) (discussing the controversies surrounding the ESA and the Services line drawing of critical habitats).

“jeopardize” standard, other than clearly notifying federal agencies and others of the probable location of features essential to species’ recovery.²⁵⁸ In contrast, a “no net loss” approach would of course apply substantive protections to all physical and biological features essential to a species’ recovery within critical habitat boundaries, albeit solely with respect to federal proposals or non-federal projects requiring a federal permit or having some other federal nexus. Without the broad discretion to effectively exempt almost any site-specific impact to critical habitat from a literal ban on destroying or adversely modifying essential features, the Services would no doubt look at the designation process with a more critical eye. Their resulting critical habitat designations would set the boundaries for meaningful habitat protections under the critical habitat standard; as such, these decisions would become important to establish the parameters of listed species’ future recoveries.²⁵⁹

C. Toward 30x30 and Beyond

In 2022, parties to the Convention on Biological Diversity adopted a Global Biodiversity Framework (Framework) outlining goals and associated “action targets” to guide “urgent action across society . . . to put biodiversity on a path to recovery by 2030 for the benefit of planet and people.”²⁶⁰ While the target of conserving 30% of land and marine areas worldwide captured the most attention, the Framework also set additional biological goals aimed at the species level of biodiversity.²⁶¹ These included halving the risk of extinction faced by all taxonomic groups, retaining 90% of the genetic diversity within all individual species, and of course fostering species recovery.²⁶²

President Biden’s “Executive Order on Tackling the Climate Crisis at Home and Abroad” specifically called for meeting the Framework’s

²⁵⁸ Echoing anecdotal reports, Professor Owen found some the Services may be able to effectively exact additional conservation measures from action agencies when a federal proposal will affect designated critical habitat, or even prompt the Services themselves to look more carefully at a project’s effects on habitat. *See* Owen, *supra* note 53, at 173.

²⁵⁹ The Services have taken the position that they do not need to identify the ultimate conservation needs of a species at the time they designate critical habitat, an argument the Ninth Circuit Court of Appeals has validated. *See* Home Builders Ass’n of N. Cal. v. U.S. Fish & Wildlife Serv., 616 F.3d 983, 989–90 (9th Cir. 2010). However, it is actually quite logical that the Services should understand the habitat requirements for a species’ ultimate recovery at the time it designates the area with features essential for that recovery. Indeed, a group convened by several senators in 2006 made up of ESA experts and representatives from a broad spectrum of interests addressed this precise issue in its report. *See* THE KEYSTONE CENTER, THE KEYSTONE WORKING GROUP ON ENDANGERED SPECIES ACT HABITAT ISSUES 5 (2006), <https://perma.cc/ALA5-FUDN>. Included among the group’s few consensus recommendations to Congress for ESA reform was changing the timing of critical habitat designation from concurrent with a species’ listing to instead coincide with approval of a recovery plan (which the group also recommended be completed within a required time period). *Id.* at 6.

²⁶⁰ U.N. Framework, *supra* note 8, at 4–6.

²⁶¹ *Id.* at 5–6.

²⁶² *Id.* at 5.

30x30 conservation goal in the United States as an important part of the country's efforts to reduce carbon emissions and to adapt to climate change.²⁶³ Reforming implementation of section 7(a)(2)'s protections as discussed here would represent a significant U.S. step toward meeting this 30x30 benchmark. A "no net loss" approach to protecting the features of critical habitat essential for species' recoveries would make entire critical habitat designations meaningful conservation tools, rather than merely convenient ways to rationalize incremental habitat loss. Such designations—which often cover extensive areas—could thus contribute toward 30% conservation goals for both land and marine areas.²⁶⁴ Since there are relatively few other means for the federal government to protect habitat on non-federal lands in particular, critical habitat designations could play an especially significant role in ensuring that 30x30 conservation efforts include at least some degree of habitat protections for the many threatened and endangered species that depend on those lands.²⁶⁵ Further, since the ESA expressly allows the Services to designate as critical habitat areas not presently occupied by a listed species but still deemed essential for the species' recovery, the Services could use this authority to protect areas species need into the future as they adapt to climate change by adjusting their ranges.²⁶⁶ Such designations would help foster recovery of listed species even in the face

²⁶³ Tackling the Climate Crisis at Home and Abroad, Exec. Order. No. 14008, 86 Fed. Reg. 7,619, 7,627 (Feb. 1, 2021).

²⁶⁴ See, e.g., *USFWS Threatened & Endangered Species Active Critical Habitat Report*, U.S. FISH & WILDLIFE SERV., <https://perma.cc/BU8X-5ML4> (July 12, 2022) (mapping the current critical habitats in the United States and the extensive areas they cover). The total amount of acres currently protected as Critical Habitats totals 114,087,751.41, all of which can be contributed towards reaching the 30% conversation goals. *Id.*

²⁶⁵ Two thirds of all listed species have at least some of their habitat on private land, and about one third depend exclusively on private land. Daniel M. Evans et al., *Species Recovery in the United States: Increasing the Effectiveness of the Endangered Species Act*, ISSUES IN ECOLOGY, Winter 2016, at 14. Section 7(a)(2)'s ban on actions that destroy or adversely modify critical habitat applies only to actions undertaken, permitted, or financed by a federal agency, so this limitation would provide only partial protection for listed species on non-federal lands. However, given important federally linked and broadly applicable programs such as protections for wetlands under section 404 of the Clean Water Act and federally subsidized flood insurance under the National Flood Insurance Program, section 7(a)(2)'s habitat protections on federal land would still be considerable. See CWA, 33 U.S.C. § 1344 (2018) (requiring dredge and fill permits linked to federal waters of the United States); National Flood Insurance Act, 42 U.S.C. § 4001 (2018) (establishing the necessity of a federally linked flood insurance program).

²⁶⁶ The ESA allows the Services to designate critical habitat for a listed species beyond its current range so long as the Services determine that the area designated is essential for the species' conservation. ESA, 16 U.S.C. § 1532(5)(A)(ii) (2018). Trump-era Amendments to regulations governing critical habitat designation made it more difficult to designate critical habitat outside of species' present range, but the Biden Administration has moved to reverse these changes. *Regulatory Revisions*, *supra* note 226. Authors have pointed to the ESA's flexibility to designate critical habitat beyond species' present range as a key means of using the ESA to facilitate species' adaptation to climate change. Kostyack & Rohlf, *supra* note 243, at 10208–09; ALEJANDRO E. CAMACHO ET AL., THE SIX PRIORITY RECOMMENDATIONS FOR IMPROVING CONSERVATION UNDER THE FEDERAL ENDANGERED SPECIES ACT 7 (2021), <https://perma.cc/L2ZW-B796>.

of climate change and represent a direct manifestation of the Executive Order's link between ameliorating climate change and protecting biodiversity.²⁶⁷ Lastly, protecting essential features for species' recoveries across entire critical habitat designations—as opposed to allowing piecemeal harm to these features until some theoretical limit is reached—would help preserve species' genetic diversity by fostering broad geographic distribution throughout species' designated critical habitats.²⁶⁸

Though the United States technically has no obligation under the Convention on Biological Diversity to advance other action targets set forth in the Framework, reforming the Services' interpretation of section 7(a)(2)'s “jeopardize” standard would assist the country in acting along with its global counterparts to improve the state of the planet's crucial biological resources.²⁶⁹ Assessing whether federal projects jeopardize the continued existence of listed species by establishing and considering minimum survival standards for listed species, as well as ensuring that such projects do not appreciably delay species' recoveries, would reduce the overall risk of extinction faced by listed species across all taxonomies, as well as foster their recoveries—both key biological goals and targets of the Framework.²⁷⁰ Going further, the Services could advance the Executive Order's link between fighting climate change and protecting biodiversity by developing survival criteria for listed species that specifically deal with causes of climate change and climate adaptation. For example, the survival criteria for species dependent on Arctic sea ice should incorporate a maximum level of atmospheric carbon consistent with maintaining at least minimal levels of pack ice.²⁷¹ While section

²⁶⁷ At the same time, the Services have long worked to avoid adequately considering climate change in the context of section 7. *See* Kostyack & Rohlf, *supra* note 243, at 10210 (detailing how federal agencies have historically ignored the section 7(a)(1) mandate to conserve threatened species). The Trump administration even went so far as to propose to entirely exempt from section 7(a)(2) federal actions that “have effects that are manifested through global processes,” an obvious reference to climate change. Endangered and Threatened Wildlife and Plants; Regulations for Interagency Cooperation, 82 Fed. Reg. 44,976, 45,011 (Aug. 27, 2019) (to be codified at 50 C.F.R. § 402). However, the Services ultimately decided against adding this broad climate loophole to their section 7(a)(2) regulations. *Id.* The courts have played an important role in ensuring the Services adequately consider climate change in the consultation process. *See, e.g., Appalachian Voices*, 25 F.4th 259, 270–71 (4th Cir. 2022); *Nat'l Wildlife Fed'n*, 184 F. Supp. 3d 861, 949 (D. Or. 2016) (both holding that climate change must form part of the biological opinion analysis).

²⁶⁸ Species with broad distributions typically maintain greater intraspecies genetic diversity since individuals inhabiting diverse habitats often develop genetic adaptations to their unique environments. *See, e.g.,* Carlos Carroll et al., *Wolf Delisting Challenges Demonstrate Need for an Improved Framework for Conserving Intraspecific Variation Under the Endangered Species Act.*, 71 BIOSCIENCE 73, 74 (2021).

²⁶⁹ *See supra* note 12 and accompanying text (noting that the United States has not ratified the convention's framework).

²⁷⁰ U.N. Framework, *supra* note 8, at 5–6.

²⁷¹ *See, e.g.,* Dirk Notz & Julianne Stroeve, *Observed Arctic Sea-Ice Loss Directly Follows Anthropogenic CO₂ Emission*, 354 SCIENCE 747, 747–48 (2016) (discussing the linear relationship between atmospheric carbon and Arctic sea-ice loss and its impacts).

7(a)(2)’s “jeopardize” standard and associated species survival criteria would obviously have no impact on greenhouse gas emissions resulting from actions in other countries or even those of non-federal entities, such criteria could be determinative for federal decisions such as whether to continue to issue oil and gas leases on federal lands and federal waters offshore.

However, implementing section 7(a)(2) as set forth here would present technical challenges. The Services would have to go through the scientifically demanding process of setting survival standards for all listed species, as well as tracking the status of entire species over time, relative to both these standards and timely progress toward recovery—and provide warnings of species that fall below their survival threshold or fall behind on their recovery trajectory.²⁷² The Services would also have to ensure the validity of measures to offset any adverse impacts to physical and biological features essential for species’ recoveries within designated critical habitats.

Strategic deployment of twenty-first century tools could assist the Services in carrying out such tasks. For example, developing and deploying machine learning to analyze and classify the massive amounts of acoustic, spatial, and visual data produced by various sensors would free conservation researchers from the inefficient and time-consuming task of manual analysis and perhaps improve data reliability.²⁷³ Deep learning, a subset of machine learning that uses data structures called “deep artificial neural networks,” can also assist in the development of ecological models that conceivably would allow for more accurate estimates of the effects of proposed federal projects on listed species and critical habitat as a whole.²⁷⁴ Automated models could also assist the Services in determining whether or not a recovery plan is working and would allow the Services the flexibility to set conditions-based triggers. Outside of the machine learning context, nearly ubiquitous satellite imagery can help monitor alterations to, and assist in managing, critical habitat.²⁷⁵ Moreover, better modeling and imagery will assist in

²⁷² These standards could also need revision. See Hoban et al., *supra* note 170, at 3 (discussing the need for improved monitoring standards).

²⁷³ See Aakash Lamba et al., *Deep Learning for Environmental Conservation*, 29 CURRENT BIOLOGY R977, R979 (2019) (discussing various applications of camera systems to environmental conservation initiatives); Walter Jetz et al., *Biological Earth Observation with Animal Sensors*, 37 TRENDS IN ECOLOGY & EVOLUTION 293, 295–96 (2022) (discussing the potential for GPS applications to aid in biological understanding and Earth observation).

²⁷⁴ Lamba et al., *supra* note 273, at R977; see also Devis Tuia et al., *Perspectives in Machine Learning for Wildlife Conservation*, NATURE COMM’NS, 2022, at 1, <https://perma.cc/JL2G-38PR> (arguing that machine learning can be integrated into modern animal ecology to improve ecological modeling).

²⁷⁵ See *Technology Can Help Conserve Biodiversity*, THE ECONOMIST (Jun. 15, 2021), <https://perma.cc/228V-53KV> (explaining how despite an “explosion of technology,” scientists are still struggling to reverse the decline in biodiversity. The article puts forward three factors that are needed to combine technology and policy to address climate change and achieve conservation goals.).

identifying the features of habitat essential for species recovery.²⁷⁶ Taken together, the Services can use this modeling as a tool to communicate and explain their decision-making process to the public and advocacy groups—two essential partners in the effort to preserve endangered species.²⁷⁷ Finally, the Services can use data science to self-audit their progress in meeting the goals of the ESA.²⁷⁸

As monitoring and modeling improve, the Services should employ these technical tools as part of their obligation to use best scientific and commercial data available in performing assessments of whether federal actions jeopardize listed species or destroy or adversely modify critical habitat.²⁷⁹ While the Services need to be prepared to incorporate new technological developments into their section 7 processes, technology is of course only a tool and not a panacea; on-the-ground biological monitoring and assessments will always play an important role.

V. CONCLUSION

The jeopardy and destruction and adverse modification standards of section 7 are critical tools for biodiversity conservation; however, decades of improper implementation of section 7(a)(2) have allowed federal agency actions and authorizations to push listed species incrementally closer to extinction. As the approaching fiftieth anniversary of the passage of the ESA coincides with both unprecedented threats to biodiversity and global efforts to conserve this precious resource, it is high time to interpret and implement the law in a manner that can fulfill Congress' original vision

²⁷⁶ See *Conservation in a Heating World*, THE ECONOMIST (Feb. 22, 2019), <https://perma.cc/FH4V-SCJF> (discussing different conservation methods promoted by scientists such as “biodiversity hotspots,” and arguing that conservationists should use the return on investment of methods of conservation). For examples of modeling used to identify biodiversity hotspots, see Evans et al., *supra* note 265, at 7–8; Catrin Einhorn & Nadja Popovich, *This Map Shows Where Biodiversity Is Most at Risk in America*, N.Y. TIMES (Mar. 3, 2022), <https://perma.cc/4QFD-CXYC>. For an example of modeling used to identify migratory stopover sites, see Sawyer & Kauffman, *supra* note 222, at 1078.

²⁷⁷ For a 2022 study of FWS communication practices, see Patrice A. Kohl & Sarah E. Warner, *Public Communication Practices and Beliefs Among Conservation Scientists and Practitioners*, 13 J. FISH & WILDLIFE MGMT. 262, 264, 267 (2022) (A survey of 75 FWS Ecological Services employees in the Midwest region revealing that they believed conveying information to be the most important goal and that “a lack of knowledge explains negative attitudes about efforts to protect species and that with enough knowledge people would be supportive of [their] work.”).

²⁷⁸ Michael J. Evans et al., *Novel Data Show Expert Wildlife Agencies are Important to Endangered Species Protection*, NATURE COMM'NS, 2019, at 6, <https://perma.cc/6WRN-YG2E> (“Using data to critically evaluate the efficacy and efficiency of laws and regulations can help clarify contentious topics and guide the development of future policy. The U.S. Congress recently passed the Foundations for Evidence-Based Policymaking Act specifically to help ensure that federal decisions are based on data rather than conjecture.”) (internal citation omitted).

²⁷⁹ See ESA, 16 U.S.C. § 1536(a)(2) (2018) (requiring the Services to use the “best scientific and commercial data available” in carrying out their responsibilities under this section).

of the ESA as both protecting imperiled species and promoting their timely recovery.

Anniversaries aside, it is critical that the Services embrace a biologically and legally accurate interpretation of section 7(a)(2) because many of the conditions that led to the listing of so many species are not improving, and unfortunately will only get worse in the coming decades unless countries around the globe take drastic actions. Concerns about the pervasive impacts of climate change helped give rise to the 30x30 habitat conservation goal, and President Biden's embrace of this benchmark provides reason enough for the Services to finally abandon the biologically dangerous and legally defective idea that things can get worse for endangered and threatened species before they get better. To meet this moment of conservation opportunity, the Services should incorporate a new approach to species protection and recovery into their efforts to revise the section 7 regulations in order to reverse the Trump Administration's previous, ill-advised regulatory modifications.²⁸⁰ Doing so would add teeth to section 7(a)(2)'s prohibitions and consultation process.

The needed fixes are straightforward. The Services should vindicate their own past policy and biological pronouncements by specifying minimum conditions associated with species' survival—a concept whose importance the Services themselves have underlined—and use these conditions as benchmarks in assessing whether proposed projects are likely to “jeopardize” listed species. Additionally, the Services must recognize the link between survival and recovery in assessing whether a proposed action is likely to appreciably delay recovery. Concerning critical habitat, the Services should stop allowing incremental destruction of critical habitat and impose a “no net loss” requirement of a species' critical habitat. For both prohibitions, the Services must align the scope of their analysis towards assessing impacts “as a whole.”

The ESA has previously been celebrated for its innovation and success, and the law is frequently cited as one of the world's most effective in protecting biodiversity.²⁸¹ As existing threats to biodiversity mount in both the United States and around the world, both of these laudatory claims will be tested. The Services must meet this challenge by not only improving section 7(a)(2)'s function as an effective conservation

²⁸⁰ See e.g., Endangered and Threatened Wildlife and Plants; Regulations for Interagency Cooperation, 84 Fed. Reg. 44,976, 44,983 (Aug. 27, 2019) (showing some comments that expressed concerns that the changes to regulatory language would “undermine[] conservation because it would allow more piecemeal, incremental losses that over time would add up cumulatively to significant losses or fragmentation”).

²⁸¹ See, e.g., Bruce Babbitt, *The Endangered Species Act and “Takings”: A Call for Innovation within the Terms of the Act*, 24 ENV'T L. 355, 356 (1994) (“The ESA is undeniably the most innovative, wide-reaching, and successful environmental law which has been enacted in the last quarter century.”); *The U.S. Endangered Species Act*, WORLD WILDLIFE FUND, <https://perma.cc/2XFW-XGXF> (last visited Oct. 16, 2022) (“Viewed as the gold standard for conservation legislation, the ESA is one of the world's most effective laws for preventing and reversing the decline of endangered and threatened wildlife.”).

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emergency room, but also by recognizing that patients' longer-term survival depends on a recovery room as well.