

ARTICLES

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“Experimental Populations” Outside Historical Range Proposal: Will It Get the Frog Out of Hot Water?

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ABSTRACT

To address the impact of climate change on habitats of endangered and threatened species, the U.S. Fish and Wildlife Service is proposing a 2022 rule change to allow “experimental populations” to be introduced into habitat outside the species’ historical range. For essential experimental populations, habitat could be designated beyond current or historical range where “little to no habitat remains within the historical range of a species or where formerly suitable habitat . . . is undergoing, irreversible decline or change, rendering it unable to support one or more life history stages for the species.”¹ A statutory prerequisite (under Endangered Species Act (ESA) section 10(j)) to designation of critical habitat for an experimental population is that “such population is essential to the continued existence of an endangered species or a threatened species.” The ESA defines “critical habitat” but does not separately define “habitat.”² Designation of “critical habitat” has been complicated by the Weyerhaeuser v. FWS decision, in which the Supreme Court concluded that “critical habitat” must first be “habitat.”³

INTRODUCTION

What if an endangered species’ current habitat is no longer suitable for the conservation of that species? Under the 2022 Fish and Wildlife Service’s (FWS) proposed regulatory changes for “Essential Experimental Populations,” additional habitat could be designated outside the current or historical range for an endangered or threatened

¹ Proposed Experimental Populations Rule, 87 Fed. Reg. 34,625 (June 7, 2022).
² 16 U.S.C. § 1532(5)(A).
³ Weyerhaeuser Co. v. U.S. Fish & Wildlife Serv., 139 S. Ct. 361, 368 (2018).

species.⁴ These regulatory changes could take effect when “little or no habitat remains within the historical range of a species or where formerly suitable habitat . . . is undergoing, irreversible decline or change, rendering it unable to support one or more life history stages for the species.”⁵ Such conservation measures may be necessary when climate change or invasive species cause current habitat to be unsuitable and where the suitable habitat for endangered or threatened species shifts outside its historical range.⁶

Figure 1 shows a little endangered dusky gopher frog, who covers its eyes when it is scared. You’d be scared too if you realized how difficult it has become to preserve habitat for you.⁷

Figure 1. *Frightened Dusky Gopher Frog*



Source: Jeff Humphries⁸

⁴ Endangered and Threatened Wildlife and Plants; Designation of Experimental Populations, 87 Fed. Reg. 34,625 (proposed June 7, 2022) (to be codified at 50 C.F.R. pt. 17) [hereinafter Proposed Experimental Populations Rule] (Summary and Background) (comment period ended Aug. 8, 2022).

⁵ *Id.*

⁶ See Jessica Aldred, *More Than 1,000 Species Have Been Moved Due to Human Impact*, THE GUARDIAN (Apr. 20, 2016), <https://www.theguardian.com/environment/2016/apr/20/more-than-1000-species-have-been-moved-due-to-human-impact> [<https://perma.cc/BK4M-XB2T>].

⁷ See Appendix 1 for discussion of habitat issues associated with the dusky gopher frog and the longleaf pine ecosystem.

⁸ See Jeff Humphries, Photograph in *Gopher Frog Conservation Plan for North Carolina*,

The Endangered Species Act (ESA) defines “critical habitat,”⁹ but does not separately define “habitat.” In its 2018 *Weyerhaeuser v. FWS* decision involving the dusky gopher frog, the Supreme Court concluded that “critical habitat must first be habitat” [emphasis added].¹⁰ In response, the Trump administration finalized the definition of current “habitat,”¹¹ which the Biden administration rescinded without replacing it.¹² Criteria for “exclusions to critical habitat” imposed by the Trump administration have also been rescinded.¹³ Instead, the FWS shifted its focus to revision of the experimental populations rule.

The rule change would authorize the Secretary of the Interior to designate an endangered or threatened species as an “experimental population” to “be released into habitat that is necessary to support one or more life history stages outside the species’ current range.”¹⁴ A statutory prerequisite (under ESA section 10(j)) to designation of critical habitat for an experimental population is that “such population

N.C. WILDLIFE RES. COMM’N at 1 (Dec. 10, 2020), <https://www.ncwildlife.org/Portals/0/Learning/documents/Profiles/Amphibians/Gopher-Frog-Conservation-Plan-2020-FINAL.pdf> [<https://perma.cc/YK8G-ZWVK>] (This defensive behavior assumed by several amphibian species is called the “unken reflex.” For the dusky gopher frog, it involves curling inward and covering its eyes with its forefeet when it feels threatened, peeking out periodically until danger passes, usually after a predator comes into contact with the bitter secretion on the frog’s skin.) See also *Natural History: Mississippi Gopher Frog*, CTR. FOR BIOLOGICAL DIVERSITY, https://www.biologicialdiversity.org/species/amphibians/Mississippi_gopher_frog/natural_history.html [<https://perma.cc/63ZJ-7QQQ>]; see also Rebecca Means, *Management Strategies for Florida’s Ephemeral Ponds and Pond-Breeding Amphibians: Final Report* 14, FLA. FISH & WILDLIFE CONSERVATION COMM’N (2008), <https://www.coastalplains.org/wp-content/uploads/2018/09/Management-Strategies-for-Floridas-Ephemeral-Ponds-and-Pond-Breeding-Amphibians.pdf> [<https://perma.cc/Z5ND-NYAH>].

⁹ 16 U.S.C. § 1532(5)(A).

¹⁰ *Weyerhaeuser Co. v. U.S. Fish & Wildlife Serv.*, 139 S. Ct. 361, 368 (2018).

¹¹ 50 C.F.R. § 424.02 (2021) (updated by Trump Administration in final rule Listing Endangered and Threatened Species and Designating Critical Habitat, 85 Fed. Reg. 81,411 (Dec. 16, 2020)).

¹² Endangered and Threatened Wildlife and Plants; Regulations for Listing Endangered and Threatened Species and Designating Critical Habitat, 87 Fed. Reg. 37,757 (June 24, 2022) (rescinding Trump Administration definition of “habitat”).

¹³ Endangered and Threatened Wildlife and Plants; Regulations for Designating Critical Habitat, 87 Fed. Reg. 43,433 (July 21, 2022) (rescinding final rule of the same name 85 Fed. Reg. 82,376 (Dec. 18, 2020) which outlined how and when the FWS would apply exclusion analysis). For discussion of the Trump administration critical habitat regulations, see Isabella Kendrick, *Critical Habitat Designations Under the Endangered Species Act in an Era of Climate Crisis*, 121 COLUM. L. REV. 81 (2021).

¹⁴ Proposed Experimental Populations Rule, 87 Fed. Reg. 34,625 at 34,628 (June 7, 2022) (proposed amendment to 50 C.F.R. § 17.81(a)).

is essential to the continued existence of an endangered species or a threatened species.”¹⁵ This Article discusses the proposed changes to the “experimental populations rule,”¹⁶ which would allow the introduction of endangered or threatened species and the designation of critical habitat outside the species’ historical range to facilitate adaptation to changes induced by climate change or invasive species.

I

CLIMATE CHANGE—IMPACT ON HABITAT AND SPECIES

The Intergovernmental Panel on Climate Change (IPCC), formed by the United Nations and World Metrological Organization, reported that the period of 1995–2006 included eleven of the twelve warmest years since 1850, when instrumental records of the global surface temperatures began being kept.¹⁷ The World Metrological Organization predicted in 2022 that the “past eight years are on track to be the eight warmest on record, fueled by ever-rising greenhouse gas concentrations and accumulated heat. Extreme heatwaves, drought and devastating flooding have affected millions and cost billions this year.”¹⁸ The IPCC Climate Change 2022: Impacts, Adaption and Vulnerability report concluded:

Climate change has altered marine, terrestrial and freshwater ecosystems all around the world (*very high confidence*). Effects were experienced earlier and are more widespread with more far-reaching consequences than anticipated (*medium confidence*). Biological responses, including changes in physiology, growth, abundance, geographic placement and shifting seasonal timing, are often not sufficient to cope with recent climate change (*very high confidence*). Climate change has caused local species losses, increases in disease (*high confidence*) and mass mortality events of plants and animals (*very high confidence*), resulting in the first climate-driven

¹⁵ 16 U.S.C. § 1539(j)(B); *see also* 16 U.S.C. § 1539(j)(C)(ii) (corresponds to ESA section 10).

¹⁶ Proposed Experimental Populations Rule, 87 Fed. Reg. 34,625 (June 7, 2022).

¹⁷ Yuwei Zhang, ‘Warming of the Climate System Is Unequivocal’: Highlights of the Fourth IPPCC Assessment Report, United Nations UN Chronicle (June 2007), <https://www.un.org/en/chronicle/article/warming-climate-system-unequivocal-highlights-fourth-ippcc-assessment-report> [<https://perma.cc/ZE23-2E7Y>]; *see also* NAT’L RSCH. COUNCIL, ADVANCING THE SCIENCE OF CLIMATE CHANGE, at 286 (Nat’l. Acad. Press 2010), <https://doi.org/10.17226/12782> [<https://perma.cc/BM8A-25C5>].

¹⁸ Press Release, World Meteorological Organization, Eight Warmest Years on Record Witness Upsurge in Climate Change Impacts (Nov. 6, 2022), <https://public.wmo.int/en/media/press-release/eight-warmest-years-record-witness-upsurge-climate-change-impacts> [<https://perma.cc/QTd6-C4GQ>].

extinctions (*medium confidence*), ecosystem restructuring, increases in areas burned by wildfire (*high confidence*) and declines in key ecosystem services (*high confidence*).¹⁹

International agreements, such as the Paris Climate Change Accord, recognize the risks posed by climate change and set targets for reduction in carbon generation and other greenhouse gases.²⁰ These measures hope to mitigate increases in global temperatures and the consequences they pose.²¹ A 2017 study published by the Yale Program on Climate Change Communication found that 70% of Americans believe that global warming is occurring and 58% of Americans believe it is mostly caused by human activity.²²

The FWS identifies climate change as a key reason for the proposed regulatory change to justify creation of “experimental populations” of endangered and threatened species outside their historical range.²³ In the press release announcing the publication of the proposed changes to experimental population regulations, the FWS provided examples of the impact of climate change (despite not including them in the Federal Register summary itself):

Scientists have already observed wildlife responding to the effects of climate change, with some species and ecosystems losing habitat due to increased temperatures, altered rain and snow patterns, sea level

¹⁹ Hans Pörtner et al., *Technical Summary*, in CLIMATE CHANGE 2022: IMPACTS, ADAPTION AND VULNERABILITY, at 45 (2022), https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_TechnicalSummary.pdf [<https://perma.cc/GPV4-VHCN>] (contribution of Working Group II to Sixth Assessment Report of the Intergovernmental Panel on Climate Change).

²⁰ U.N. Climate Change, *Paris Agreement – Status of Ratification*, *United Nations Climate Change*, <https://unfccc.int/process/the-paris-agreement/status-of-ratification> [<https://perma.cc/S6CB-9GFB>] (last visited Mar. 21, 2023) (indicating that 194 of 197 participating parties (countries) have ratified the convention); see also Statement by Simon Stiell, *UN Climate Change Executive Secretary, on the IPCC's Synthesis Report of the Sixth Assessment Report* (March 20, 2023) <https://unfccc.int/news/statement-by-simon-stiell-un-climate-change-executive-secretary-on-the-ipcc-s-synthesis-report-of> (last visited Apr. 6, 2023) [hereinafter “Stiell Statement on IPCC Report”].

²¹ See U.N. Climate Change, *supra* note 20 (indicating that 194 of 197 participating parties (countries) have ratified the convention); see also Stiell Statement on IPCC Report, *supra* note 20.

²² A. LEISEROWITZ ET AL., YALE UNIV. & GEORGE MASON UNIV., CLIMATE CHANGE IN THE AMERICAN MIND (Yale Program on Climate Change Communication, May 2017). *But see* Coal. of Ariz./N.M. Cntys. for Stable Econ. Growth, Comment Letter on Proposed Experimental Populations Rule at 2 (Aug. 4, 2022), https://downloads.regulations.gov/FWS-HQ-ES-2021-0033-0263/attachment_1.pdf [<https://perma.cc/5MFD-S2Z8>] (“Climate change impacts are currently based on generalized computer modeling that are not scientifically suited for determination of specific threats to species habitat.”).

²³ Proposed Experimental Populations Rule, 87 Fed. Reg. 34,625 (June 7, 2022) (Summary and Background).

rise, and greater frequency and intensity of drought and wildfires. These species include the Mt. Rainier ptarmigan in Washington state, Montana stoneflies and the emperor penguin, found in the Antarctic. Climate change has also exacerbated existing threats to plants and wildlife, such as greater threats from disease and invasive species. In Hawaii, increased temperatures are driving the spread of avian malaria among some of the world’s most endangered birds, as mosquitoes move upslope. At Blackwater National Wildlife Refuge in Maryland, coastal wetlands are being overtaken by the invasive grass phragmites—a problem made worse by sea level rise—causing the loss of habitat for imperiled species such as the saltmarsh sparrow.²⁴

Climate change is increasing the frequency and severity of droughts and wildfires, significantly altering the habitat and its suitability for various species.²⁵ Wildfires can alter or impair streams and bodies of water.²⁶ Wildfire behavior has become more intense and widespread

²⁴ Press Release, U.S. Fish & Wildlife Serv., Dep’t. of the Interior Proposes Expanding Conservation Technique as Climate Change Threatens Greater Species Extinction (June 6, 2022), <https://www.fws.gov/press-release/2022-06/department-interior-proposes-proposes-expanding-conservation-technique> [<https://perma.cc/CFN6-T5LM>] (also indicating comments were open until Aug. 8, 2022); see Michael Osland et al., *Tropicalization of Temperate Ecosystems in North America: The Northward Range Expansion of Tropical Organisms in Response to Warming Winter Temperatures*, 27 GLOB. CHANGE BIOLOGY 3009 (2021).

²⁵ Hans Pörtner et al., *supra* note 19, at 48.

²⁶ See National Geographic Staff, *What Do Wild Animals Do in Wildfires?*, NAT’L GEOGRAPHIC (Sept. 7, 2020), <https://www.nationalgeographic.com/environment/article/150914-animals-wildlife-wildfires-nation-california-science> [<https://perma.cc/SY9F-FG7U>].

but does not affect all species equally.²⁷ For the natural cycle to occur, wildfires need to be shorter in duration and less intense.²⁸

Since the 1980s, the size and intensity of wildfires in California have notably increased. Fifteen of the 20 largest wildfires in California history have occurred since 2000, . . . Due to increasing fire size, frequency, . . . beetle outbreaks and drought driven mortality, forest biodiversity and composition is changing rapidly. . . . Atypically large patches of high-severity fire can hinder the ability of an ecosystem to recover, potentially undermining conservation of native biodiversity by long-term or permanent loss of native vegetation, expansion of non-native, invasive species, and long-term or permanent loss of essential habitat for native fauna.²⁹

Major environmental studies emphasize that climate change poses new and growing threats to a myriad of species.³⁰ In its 2019 report, the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) estimated that over one million species are at risk of extinction because of climate change, direct exploitation, land use changes, widespread contamination with pesticides and other

²⁷ See National Geographic staff, *supra* note 26 (noting that many species run from the fire or burrow beneath the ground during it, but not all of them can escape the blazes. Fires can benefit predator species that prey on smaller animals that are fleeing the fire. Other species, such as fungi and morel mushrooms, need fire to release spores and some regenerate through underground rhizomes, bulbs, or roots. Some plants emerge only as a result of the fire, as the landscape changes with new growth.); see also National Geographic Society, *The Ecological Benefits of Fire*, NAT'L GEOGRAPHIC, <https://education.nationalgeographic.org/resource/ecological-benefits-fire> [<https://perma.cc/YN85-JKG2>] (last visited Mar. 21, 2023) (Lupine emerge and thrive after a fire and are the sole food source for the endangered Karner blue butterfly caterpillar.); see also Melissa Petruzzello, *Playing with Wildfire: 5 Amazing Adaptations of Pyrophytic Plants*, BRITANNICA, <https://www.britannica.com/list/5-amazing-adaptations-of-pyrophytic-plants#:~:text=Some%20plants%2C%20such%20as%20the,has%20physically%20melted%20the%20resin> [<https://perma.cc/9ZGA-9JQX>] (last visited Mar. 21, 2023) (noting that the lodgepole pine, Eucalyptus, and Banksia need fire to open the pinecones and reseed the forest).

²⁸ CAL. FISH & WILDLIFE DEP'T, SCIENCE: WILDFIRE IMPACTS, <https://wildlife.ca.gov/Science-Institute/Wildfire-Impacts> [<https://perma.cc/8MFA-8XKN>] (last visited Mar. 21, 2023) (the removal of natural fire from an ecosystem can lead to excess fuel buildup and changes in vegetation composition, which can increase the risk of uncharacteristically large high-severity fires, which is opposite to the natural cycle); see Interview with Jim Lee, biologist for The Nature Conservancy at Camp Shelby, MS (May 25, 2022) [hereinafter Jim Lee Interview] (on file with author) (noting that, to mirror a natural cycle, low intensity controlled burns are being used to restore the longleaf pine forest, the habitat necessary for the dusky gopher frog and gopher tortoise).

²⁹ CAL. FISH & WILDLIFE DEP'T, *supra* note 28.

³⁰ See U.S. ENV'T PROT. AGENCY, CLIMATE CHANGE IMPACTS ON ECOSYSTEMS (Jan. 19, 2017), <https://19january2017snapshot.epa.gov/climate-impacts/climate-impacts-ecosystems.html> [<https://perma.cc/Z9ME-QSTN>].

pollutants, and invasive species.³¹ The International Union for Conservation of Nature (IUCN) lists nearly seven hundred mammals and birds on the “red list” of endangered species, including 27% of mammals.³² The Natural Resources Defense Council (NRDC) emphasizes that section 10(j) of the ESA is an important tool to help species adapt as habitats and ecosystems change, especially where the species is “unable to shift [its range] at a rate needed to survive climate change . . . transportation and introduction of populations in newly habitable areas might be crucial to those species’ survival.”³³ The IPCC’s 2022 report also concluded that

Approximately half of the species assessed globally have shifted polewards or, on land, also to higher elevations (very high confidence). Hundreds of local losses of species have been driven by increases in the magnitude of heat extremes (high confidence), as well as mass mortality events on land and in the ocean (very high confidence) and loss of kelp forests (high confidence). Some losses are already irreversible, such as the first species extinctions driven by climate change (medium confidence). Other impacts are approaching irreversibility such as the impacts of hydrological changes resulting from the retreat of glaciers, or the changes in some mountain (medium confidence) and Arctic ecosystems driven by permafrost thaw (high confidence).³⁴

³¹ Nat. Resources Def. Council (NRDC), Comment Letter on Proposed Experimental Population Rule at FN 1 and 2 (Aug. 8, 2022), https://downloads.regulations.gov/FWS-HQ-ES-2021-0033-0411/attachment_1.pdf [<https://perma.cc/TR5D-53BQ>] [hereinafter NRDC] (citing S. Díaz et al., *Summary for Policymakers of the Global Assessment Report on Biodiversity and Ecosystem Services*, INTERGOVERNMENTAL SCIENCE-POLICY PLATFORM ON BIODIVERSITY AND ECOSYSTEM SERV., IPBES Plenary at its seventh session at 12 (IPBES 7, Paris, 2019), <https://doi.org/10.5281/zenodo.3553579> [<https://perma.cc/F23G-DKSE>]).

³² *Redlist*, INT’L UNION FOR CONSERVATION OF NATURE, <https://www.iucnredlist.org/about/background-history> [<https://perma.cc/7VN6-HWXJ>]; Michela Pacifici, *Species’ Traits Influenced Their Response to Recent Climate Change*, 7 NATURE CLIMATE CHANGE 205 (2017); see also Press Release, Wildlife Conservation Society Zoos, Aquariums and Conservation Programs, Climate Change Impacts on Endangered and Threatened Wildlife Is Massively Underreported, Scientists Say (Feb. 13, 2017), <https://newsroom.wcs.org/News-Releases/articleType/ArticleView/articleId/9848/Climate-Change-Impacts-on-Threatened-and-Endangered-Wildlife-is-Massively-Underreported-Scientists-Say.aspx> [<https://perma.cc/52WH-XCYX>].

³³ NRDC, *supra* note 31, at 3.

³⁴ Hans-O. Pörtner et al., *Summary for Policymakers*, in CLIMATE CHANGE 2022: IMPACTS, ADAPTATION AND VULNERABILITY, at 9 (2022), https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_SummaryForPolicymakers.pdf [<https://perma.cc/3TQA-FE9J>] (contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change).

By the 2080s, more than 58% of plants and 35% of animals will be lost if climate change and current emission levels are left unchecked.³⁵ The Audubon Society estimates that over three hundred North American birds will lose half of their historical range this century due to climate change.³⁶ “In the West alone, habitat is being lost and degraded at an alarming rate due to wildfire, invasive species, altered temperatures and precipitation patterns, and other climate-driven forces.”³⁷ The Center for Biological Diversity reports that one in six ESA-listed species in coastal states will be threatened by rises in sea levels, which will result in demise of coastal forests, salt marshes, and submersion of their habitat areas.³⁸ These changes may have altered the habitat to the point that it is no longer suitable for the survival of the species in one of its life historical stages, and suitable habitat may exist only outside its historical range.³⁹

Even twenty-five years ago, the destruction of habitat and degradation contributed to the endangerment of 85% of ESA-listed species.⁴⁰ A 2019 study concluded that over 99% of animals in the United States listed as ESA endangered species were sensitive to climate change.⁴¹ Nearly three-quarters of known species are insects, and because of

their climate sensitivity and large ecological footprint, insects collectively serve as ‘canaries’ in vast numbers of coal mines, providing advance notice of the forthcoming impacts of climate

³⁵ Ctr. for Biological Diversity, Comment Letter on Proposed Experimental Populations Rule at 3 (Aug. 8, 2022), https://downloads.regulations.gov/FWS-HQ-ES-2021-0033-0499/attachment_1.pdf [<https://perma.cc/CB79-WQ4Q>] (citing Rachel Warren, *Quantifying the Benefit of Early Climate Change Mitigation in Avoiding Biodiversity Loss*, 3 *Nature Climate Change* 678 (2013)).

³⁶ See *Survival by Degrees: 389 Bird Species on the Brink*, NAT'L AUDUBON SOC'Y (2019), <https://www.audubon.org/climate/survivalbydegrees> [<https://perma.cc/WZ2Y-MDGU>].

³⁷ Paulina Mastryukov, Comment Letter on Proposed Experimental Populations Rule (Aug. 1, 2022), <https://www.regulations.gov/comment/FWS-HQ-ES-2021-0033-0213> [<https://perma.cc/HG7V-SESJ>].

³⁸ Ctr. for Biological Diversity, *supra* note 35, at 3 (noting that the loggerhead sea turtle and western snowy plover are among those affected species).

³⁹ Although the FWS proposes deletion of the phrase “suitable natural habitat,” many environmental groups support retention of this description. See, e.g., Defs. of Wildlife, Comment Letter on Proposed Experimental Populations Rule (Aug. 8, 2022), https://downloads.regulations.gov/FWS-HQ-ES-2021-0033-0482/attachment_1.pdf [<https://perma.cc/TVB3-JGVL>].

⁴⁰ See Ctr. for Biological Diversity, *supra* note 35, at 4 (citing David Wilcove et al., *Quantifying Threats to Imperiled Species in the United States*, 48 *BIOSCIENCE* 607 (1998)).

⁴¹ Defs. of Wildlife, *supra* note 39, at 2; see also Osland et al., *supra* note 24.

change on other organisms such as the plants that depend on them for pollination and the larger animals that depend on them for food.⁴²

The development of insects and their host plants can also get out of sync because of climate changes.⁴³ As caterpillars emerge from their cocoons, they need young, tender leaves to eat.⁴⁴ If there is a mismatch and plants start growing earlier in the year because of warming temperatures, the more mature plants may be toxic for the caterpillars to eat, so fewer survive.⁴⁵ Similarly, if insects emerge before the young foliage, the insects will starve.⁴⁶ Conversely, if insects adapt by speeding up their life cycle, the insect population may become too plentiful and deforestation can become a problem.⁴⁷ When insect populations migrate northward, it puts Northern forests more at risk for defoliation.⁴⁸

The Nevada Division of Natural Heritage (NDNH) is particularly concerned with the impact of climate change on rare plants.⁴⁹ The NDNH offers cautionary support for the use of experimental populations, stating that only when threats “are impossible to abate through protection of originally designated critical habitat, like climate change, should . . . experimental populations of rare plants outside of their historical range” be considered.⁵⁰ The 2022 IPCC report recognizes with “very high confidence” that many of the losses of local plant and animal populations are “associated with large increases in hottest yearly temperatures and heatwave events.”⁵¹ In light of the

⁴² See *ESA Position Statement on Climate Change*, ENTOMOLOGICAL SOC’Y OF AM. (Jan. 25, 2019), <https://www.entsoc.org/sites/default/files/files/Science-Policy/2019/ESA-Position-Statement-Climate-Change.pdf> [<https://perma.cc/P9KF-DNH4>].

⁴³ *Id.*

⁴⁴ See Columbian Coll. of Arts & Sci., *Caterpillars Provide New Clues on Impact of Warmer Weather*, GEORGE WASH. UNIV. (Nov. 1, 2012), <https://columbian.gwu.edu/caterpillars-provide-new-clues-impact-warmer-temperatures> [<https://perma.cc/8YZH-P8KH>].

⁴⁵ *Id.*

⁴⁶ *Id.*

⁴⁷ *Id.*

⁴⁸ Press Release, Univ. of Cambridge, *Hungry Caterpillars an Underappreciated Driver of Carbon Emissions* (Nov. 3, 2021), <https://www.eurekalert.org/news-releases/933222> [<https://perma.cc/3RZZ-28W7>].

⁴⁹ Nev. Div. of Nat. Heritage, *Comment Letter on Proposed Experimental Populations Rule at 2* (Aug. 1, 2022), https://downloads.regulations.gov/FWS-HQ-ES-2021-0033-0199/attachment_1.pdf [<https://perma.cc/VDJ7-MA66>].

⁵⁰ *Id.*

⁵¹ Hans-O. Pörtner et al., *supra* note 34, at 9; *see also* Hans Pörtner et al., *supra* note 19, at 47.

growing awareness of the effect of climate change on species, the analysis section of ESA biological opinions (BiOp) should include analysis of climate change impacts.⁵²

The Environmental Protection Agency (EPA) previously attempted to address the impact of greenhouse gases on climate change through the controversial Obama Clean Power Plan (CPP)⁵³ and the divisive Trump Affordable Clean Energy Rule (ACE),⁵⁴ as well as through motor vehicle Corporate Average Fuel Economy (CAFE) regulations.⁵⁵ In the 2022 case of *West Virginia v. EPA*,⁵⁶ the Supreme Court struck down the EPA's attempt to use Clean Air Act (CAA) section 111(d)⁵⁷ to force existing power plants to shift from coal to natural gas as an intermediate step, and then shift to renewable energy sources to reduce greenhouse gases, the major contributor to climate change.⁵⁸ Using the "major questions doctrine,"⁵⁹ the Court concluded that emission caps

⁵² See *Wild Fish Conservancy v. Irving*, 221 F. Supp. 3d 1224, 1233–34 (E.D. Wash. 2016) (holding that National Marine Fisheries Service's biological opinion (BiOp) for Leavenworth National Fish Hatchery was "arbitrary and capricious" for failing to adequately consider effects of climate change, because there was "no discussion whatsoever of the potential effects of climate change in the BiOp's analysis of the Hatchery's future operations and water use.").

⁵³ Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units, 80 Fed. Reg. 64,661 (Oct. 23, 2015) (codified in 40 C.F.R. pt. 60).

⁵⁴ Repeal of the Clean Power Plan; Emission Guidelines for Greenhouse Gas Emissions from Existing Electric Utility Generating Units; Revisions to Emission Guidelines Implementing Regulations, 84 Fed. Reg. 32,520 (July 8, 2019), *vacated* in *Am. Lung Ass'n v. EPA*, 985 F.3d 914 (D.C. Cir. 2021).

⁵⁵ *Corporate Average Fuel Economy* (CAFE), NAT'L. HIGHWAY TRANSP. SAFETY ADMIN, <https://www.nhtsa.gov/laws-regulations/corporate-average-fuel-economy> [<https://perma.cc/UJ9Y-2GQV>] (last visited Mar. 21, 2023) (CAFE refers to the corporate average fuel economy standards that regulate mileage requirements for motor vehicles and trucks, implemented under the Clean Air Act).

⁵⁶ *West Virginia v. EPA*, 142 S. Ct. 2587 (2022).

⁵⁷ 42 U.S.C. § 7411(d).

⁵⁸ See *Sources of Greenhouse Gas Emission*, EPA, <https://www.epa.gov/ghgemissions/sources-greenhouse-gas-emissions> [<https://perma.cc/6RAA-TL66>] (last visited Mar. 21, 2023). Greenhouse gas emissions have been a major contributor to climate change. In 2019, electric generation was the second largest source of greenhouse gases (25%), and 60% of electricity generation is from fossil fuels. Burning coal was nearly two-thirds of the carbon dioxide emissions (while generating only 28.4% of the electricity). INT'L ENERGY AGENCY, CO₂ EMISSIONS FROM FUEL COMBUSTION 11 (2019), https://iea.blob.core.windows.net/assets/eb3b2e8d-28e0-47fd-a8ba-160f7ed42bc3/CO2_Emissions_from_Fuel_Combustion_2019_Highlights.pdf [<https://perma.cc/8AW9-GKQG>] (noting that around one half of the global increase in emissions between 2000 and 2017 came from power generation in Asia).

⁵⁹ See *West Virginia*, 142 S. Ct. at 2587 (referencing the "Major Questions Doctrine," which is a Supreme Court-created concept that fails to give deference to an agency's regulation, based on the assumption that clearer specific delegation from Congress is necessary for action with significant economic and political consequences).

with energy generation-shifting measures of such great political and economic consequence belong to Congress, and that the EPA lacks authority to require this as a best system of emission reduction (BSER) without clear, unambiguous delegation of authority.⁶⁰ This *West Virginia v. EPA* decision interpreted EPA authority only under the CAA, and the case did not address the authority of the FWS to address climate change issues through the ESA.⁶¹

President Biden has directed all government agencies to prioritize climate change mitigation.⁶² The 2022 Inflation Reduction Act amends the Clean Air Act to define greenhouse gasses as pollutants and allow for regulation of their emissions through the grant programs.⁶³ Because it is a reconciliation funding bill, however, broader authority could not be granted to the EPA through this mechanism, but it will provide funding for numerous clean energy projects and programs affecting climate change.⁶⁴

⁶⁰ *Id.* (In 2015, the EPA finalized the Obama Clean Power Plan (“CPP”) rule, requiring existing power plants to achieve a 30% reduction in carbon dioxide emissions by 2030 (below 2005 emissions)). Using Clean Air Act (CAA) section 111(d), the EPA created regulations under the CPP to shift the production of electricity from coal to natural gas to renewable energy sources. In the 2022 case of *West Virginia v. EPA*, the Supreme Court struck down that regulation, narrowly interpreting the EPA’s delegated authority under that CAA section to setting performance standards and traditional reductions in pollution. Under CAA section 111(1)(a), “standard of performance” means a standard for emissions of air pollutants that reflects the degree of emission limitation achievable through the application of the best system of emission reduction (BSER). While the EPA had authority to regulate technologies inside-the-fence-line in existing power plants under this section, the Supreme Court concluded that the EPA lacked delegated CAA authority to define BSER based on generation-shifting measures. Such authority would necessitate clear, unambiguous delegation of such significant power to the agency by Congress.

⁶¹ *Id.* (specifically addressing EPA authority to address climate change under specific CAA § 111(d), but not addressing the authority of the FWS to regulate climate change). Even though *West Virginia v. EPA* is not direct precedent for the FWS authority, it may have implications beyond the scope of this Article regarding climate change solutions generally.

⁶² Exec. Order No. 13,990, 86 Fed. Reg. 7037 (Jan. 25, 2021) (President Biden’s executive order dated Jan. 20, 2021, on Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis).

⁶³ Inflation Reduction Act of 2022, Pub. L. No. 117-169, amending CAA §§ 132–138.

⁶⁴ See Mack McGuffey & Melissa Horne, *Clean Air Act Amendments Minimally Impact EPA’s Authority to Pass Climate Change Regulation*, ENV’T L. AND POLICY MONITOR (Aug. 31, 2022), <https://www.environmentallawandpolicy.com/2022/08/clean-air-act-amendments-minimally-impact-epas-authority-to-pass-climate-change-regulation/> [<https://perma.cc/6DQS-ZCRB>]; *A User Guide to the Inflation Reduction Act: How New Investments Will Deliver Good Jobs, Climate Action, and Health Benefits*, BLUEGREEN ALLIANCE (2022), <https://www.bluegreenalliance.org/wp-content/uploads/2022/10/BGA-IRA-User-GuideFINAL-1.pdf> [<https://perma.cc/A369-UFC2>].

In delegating ESA authority to the FWS, Congress specifically empowered the Secretary of the Interior to “determine whether any species is endangered or threatened because of . . . the present or threatened destruction, modification, or curtailment of its habitat or range”; therefore, threatened destruction of habitat is clearly contemplated and climate change clearly poses threats to destruction of habitat for endangered species.⁶⁵ The regulatory proposal of the FWS to define the scope of “experimental populations” under the ESA is an effort to achieve the substantive intent of Congress.⁶⁶ Congress does not exempt climate change as a trigger for conservation programs when delegating authority to the Secretaries of the Interior and Commerce to implement the ESA’s broad conservation purpose.⁶⁷ Absent a finding of clear congressional intent, the Court should be reluctant to limit the implementing agency from interpreting the statute and fulfilling its responsibility to administer the ESA.⁶⁸

The FWS is now attempting to address impacts of climate change on destruction of habitats through its proposed modifications to the ESA’s experimental populations rule.⁶⁹ In the summary to the proposal and press release, the FWS specified climate change factors as a justification for modifying 50 C.F.R. § 17.81 which currently allows introduction of experimental populations only within the species’ “probable historic (sic) range.”⁷⁰ The climate change justification, however, does not appear in the proposed wording changes applied to experimental population regulations.⁷¹ If climate change is the primary justification for designating habitat outside the species’ historical range, it should be specified in the regulation itself or be included in a

⁶⁵ 16 U.S.C. § 1533(a)(1)(A).

⁶⁶ See Proposed Experimental Populations Rule, 87 Fed. Reg. 34,625, at 34,628 (June 7, 2022) (to be codified at 50 C.F.R. § 17.81(a)).

⁶⁷ 16 U.S.C. § 1531(b), as implemented through 50 C.F.R. §§ 424.01–.21 (2020); see also *infra* Part II of this Article (discussing purpose of ESA); see also 16 U.S.C. § 1539(j) (to emphasize the importance of species preservation, Congress amended the ESA in 1978 to enhance the FWS’ conservation ability by adding the experimental population option).

⁶⁸ See generally LARRY M. EIG, CONG. RSCH. SERV., R41730, STATUTORY INTERPRETATION: GENERAL PRINCIPLES AND RECENT TRENDS (Sept. 24, 2014).

⁶⁹ Proposed Experimental Population Rule, 87 Fed. Reg. 34,625 (June 7, 2022) (to be codified at 50 C.F.R. § 17).

⁷⁰ *Id.* at 34,626; see also Press Release, U.S. Fish & Wildlife Serv., Department of the Interior Proposes Expanding Conservation Technique as Climate Change Threatens Greater Species Extinction (June 6, 2022), <https://www.fws.gov/press-release/2022-06/department-interior-proposes-proposes-expanding-conservation-technique> [<https://perma.cc/6KJN-K7TD>].

⁷¹ See Endangered and Threatened Wildlife and Plants, Experimental Populations, 50 C.F.R. § 17(H).

nonexclusive list of circumstances in which habitat outside the historical range could be designated for the experimental population.⁷² In addition, it is important to specify that cumulative effects of climate change must be considered.⁷³ The proposed rule also faces other challenges and objections, as discussed in the following Sections of this Article.

II

ESA AND CRITICAL HABITAT BACKGROUND

A. Endangered Species Act Background

The Endangered Species Act passed in 1973 with strong bipartisan support.⁷⁴ The purpose of the ESA is

- (1) to provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved;
- (2) to provide a program for the conservation for such endangered species and threatened species; and
- (3) to take steps to achieve the purposes of treaties and conventions related to conservation of species.⁷⁵

The ESA encourages cooperative efforts with state and local agencies⁷⁶ as well as other interested parties to better safeguard “the Nation’s heritage in fish, wildlife and plants” through conservation programs.⁷⁷ The breadth and importance of this purpose is emphasized by the congressional command that it is “declared to be the policy of Congress that all Federal departments and agencies shall seek to conserve endangered and threatened species . . . in furtherance of the purposes.”⁷⁸

⁷² Authors’ interpretation.

⁷³ Authors’ recommendation; Jessica Wentz, *Climate Change Attribution Science and the Endangered Species Act*, 39 YALE J. REGUL. 1043, 1090–91 (2022); Am. Fisheries Soc’y, Comment Letter on Proposed Experimental Populations Rule at 3–5 (Aug. 8, 2022), https://downloads.regulations.gov/FWS-HQ-ES-2021-0033-0543/attachment_1.pdf [<https://perma.cc/XYA8-ZXNE>].

⁷⁴ Endangered Species Act of 1973, Pub. L. No. 93-205, 87 Stat. 884 (Dec. 28, 1973); see Jeffrey Knighton, Jr., *Critical Decisions: The Challenge of Defining Critical Habitat Under the Endangered Species Act*, 9 LSU J. ENV. L. REV. 562, 567 (2021); Shannon Peterson, *Congress and Charismatic Megafauna: A Legislative History of the Endangered Species Act*, 29 ENV’T L. 463, 473–76 (1999) (discussing ESA).

⁷⁵ 16 U.S.C. § 1531(b), as implemented through 50 C.F.R. §§ 424.01–.21 (2020).

⁷⁶ See 16 U.S.C. § 1531(c)(2).

⁷⁷ 16 U.S.C. § 1531(a)(5).

⁷⁸ 16 U.S.C. § 1531(c)(1).

The Secretary of the Interior and Secretary of Commerce share responsibility for designating species as endangered or threatened.⁷⁹ The FWS in the Department of the Interior coordinates application of the ESA to land and fresh water species, while the National Marine Fisheries Service (NMFS) within the National Oceanic and Atmospheric Association (NOAA) in the Department of Commerce administers the ESA for the protection of marine animals.⁸⁰ These agencies (collectively referred to as “the Services”) are tasked with “the use of all methods and procedures which are necessary” in conserving endangered and threatened species.⁸¹ If an interested person or nongovernmental organization (“NGO”) petitions the FWS or NMFS to list a species, the agency has ninety days to determine whether a status review is warranted and then twelve months to decide whether to publish a proposed listing in the Federal Register for comment or decide that the petition is not warranted at this time.⁸² For the endangered species that get listed, the Services are required to monitor the species and to conduct a status assessment review every five years.⁸³

A species is eligible to be considered for listing as “endangered” if the species “is in danger of extinction throughout all or a significant portion of its range”⁸⁴ or listed as “threatened” if the species “is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.”⁸⁵ The review process can also result in a species being placed on a “candidate list,” where listing the species is “warranted, but precluded” by higher priority listings.⁸⁶

⁷⁹ 16 U.S.C. § 1532(15).

⁸⁰ *Endangered Species Act Implementation*, U.S. FISH & WILDLIFE SERV., <https://www.fws.gov/initiative/protecting-wildlife/endangered-species-act-implementation> [<https://perma.cc/J3J2-3LGD>] (last visited Mar. 21, 2023).

⁸¹ 16 U.S.C. § 1532(3).

⁸² 16 U.S.C. § 1533(b)(3) (corresponding with ESA § 4).

⁸³ 16 U.S.C. § 1533(c)(2)(A)–(g); *see also Listing Species Under the Endangered Species Act*, U.S. NAT’L OCEANIC & ATMOS. ADMIN., <https://www.fisheries.noaa.gov/national/endangered-species-conservation/listing-species-under-endangered-species-act> [<https://perma.cc/P34T-WCUD>] (last visited Mar. 21, 2023); *see also, e.g.*, MISS. FIELD OFF. OF U.S. FISH & WILDLIFE SERV., DUSKY GOPHER FROG (*RANA SEVOSA*) 5-YEAR REVIEW: SUMMARY AND EVALUATION (May 2021), https://ecos.fws.gov/docs/tess/species_nonpublish/3504.pdf.

⁸⁴ 16 U.S.C. § 1532(6).

⁸⁵ 16 U.S.C. § 1532(20).

⁸⁶ *See* PERVAZE A. SHEIKH & ERIN H. WARD, CONG. RSCH. SERV., R46677, ENDANGERED SPECIES ACT: OVERVIEW AND IMPLEMENTATION 13 (Mar. 2021) (showing

ESA requirements specify that a species must be listed if it is threatened or endangered because of any of the following five factors:

1. present or threatened destruction, modification, or curtailment of its habitat or range;
2. over-utilization of the species for commercial, recreational, scientific, or educational purposes;
3. disease or predation;
4. inadequacy of existing regulatory mechanisms; and
5. other natural or manmade factors affecting its continued existence.⁸⁷

The ESA requires that listing determinations be made “solely on the basis of the best scientific and commercial data available.”⁸⁸ Economic impacts are not considered in making species listing determinations and are prohibited under the ESA.⁸⁹ The Northern District of California vacated a Trump administration regulatory change that facilitated consideration of economic factors in listing determinations.⁹⁰ The court held that eliminating the language “without reference to possible economic or other impacts of such determination,” previously contained in 50 C.F.R. § 424.11(b), would “create a risk that economic information may influence the listing determination, which would run afoul of the statutory language.”⁹¹

listing process chart), <https://crsreports.congress.gov/product/pdf/R/R46677> [<https://perma.cc/33EF-F8FA>].

⁸⁷ 16 U.S.C. § 1533(a)(1)(A)–(E); accord 50 C.F.R. § 424.11(c)(1)–(5) (2021); see also *Listing Species Under the Endangered Species Act*, U.S. NAT’L OCEANIC & ATMOS. ADMIN., <https://www.fisheries.noaa.gov/national/endangered-species-conservation/listing-species-under-endangered-species-act> [<https://perma.cc/V42D-EWK2>] (last visited Mar. 21, 2023).

⁸⁸ 16 U.S.C. § 1533(b)(1)(A); accord 50 C.F.R. § 424.11(b) (2021).

⁸⁹ *Listing Species Under the Endangered Species Act*, U.S. NAT’L OCEANIC & ATMOSPHERE ADMIN., <https://www.fisheries.noaa.gov/national/endangered-species-conservation/listing-species-under-endangered-species-act> [<https://perma.cc/V42D-EWK2>] (last visited Mar. 21, 2023).

⁹⁰ *Center for Biological Diversity v. Deb Haaland*, Case 4:19-cv-06812-JST at 8 (N. Dist. CA, July 5, 2022).

⁹¹ *Id.* Vacating the removal of “without reference to possible economic or other impacts of such determination.” Endangered and Threatened Wildlife and Plants; Regulations for Listing Species and Designating Critical Habitat, 84 Fed. Reg. 45,020 (Aug. 27, 2019). The court’s vacatur orders also reinstated the “blanket rule” in accord with ESA § 4(d), protecting habitat for threatened species, and restored the ESA § 7 required consultation with the FWS and the NOAA.

Economic impacts, however, can be considered in designating “critical habitat” for the species and in excluding particular areas from critical habitat designation.⁹² In *Weyerhaeuser*, the Supreme Court emphasized that the ESA requires the Secretary to consider the economic impact before designating or excluding an area from critical habitat.⁹³

B. Designating Critical Habitat

The 1978 ESA amendments define “critical habitat,” but do not separately define “habitat.”⁹⁴ Under the ESA, “critical habitat” is defined as

- (i) the specific areas within the geographical area occupied by the species, at the time it is listed in accordance with the provisions of section 1533 of this title, on which are found those physical or biological features (I) essential to the conservation of the species and (II) which may require special management considerations or protection; and
- (ii) specific areas outside the geographical area occupied by the species, at the time it is listed in accordance with the provisions of section 1533 of this title, upon a determination by the Secretary [of the Interior] that such areas are essential for the conservation of the species.⁹⁵

It is important to recognize that this definition contemplates designation of “areas outside the geographical area occupied by the species” when it was listed, enabling the Secretary to make adjustments when it becomes necessary to include other habitat that is “essential for the conservation of the species.”⁹⁶

The FWS website explains the process for determining critical habitat, which initially examines areas that are “currently occupied” by the species:

[W]e first evaluate areas currently occupied by the species and consider what physical and biological features a species needs for life processes and successful reproduction. These features include:

- Space for individual and overall population growth, and for normal behavior
- Cover or shelter

⁹² 50 C.F.R. § 17.90(a) (2021).

⁹³ *Weyerhaeuser Co. v. U.S. Fish & Wildlife Serv.*, 139 S. Ct. 361, 371 (2018).

⁹⁴ See Endangered Species Act Amendments, Pub. L. No. 95-632, 92 Stat. 3751 (1978).

⁹⁵ 16 U.S.C. § 1532(5)(A) (corresponding to ESA § 3).

⁹⁶ See *id.*; 16 U.S.C. § 1533(a)(3)(A)(ii).

- Food, water, air, light, minerals, or other nutritional or physiological requirements
- Sites for breeding and rearing offspring, germination, or seed dispersal
- Habitats that are protected from disturbances or are representative of the historical geographical and ecological distributions of the species.⁹⁷

If the FWS concludes that the “occupied areas” would not be adequate to ensure the conservation of the species, the FWS considers “unoccupied areas” for designation as critical habitat.

For an unoccupied area to be designated as critical habitat, we must determine that there is a reasonable certainty that the area will contribute to the conservation of the species and that the area contains one or more of the physical or biological features essential to the conservation of the species.⁹⁸

The ESA statute clearly authorizes designation of such habitat upon the determination that it is “essential to the conservation of the species” which *may* (not “must”) require “special management considerations or protection.”⁹⁹ The ESA specifies in 16 U.S.C. § 1533(a)(3)(A)(i) that the Secretary “shall, concurrently with making a determination under paragraph (1) that a species is an endangered species or a threatened species, designate any habitat of such species which is then considered to be critical habitat.”¹⁰⁰ The Secretary also has statutory authority to revise the designation as appropriate.¹⁰¹

While critical habitat is supposed to be designated contemporaneously with the listing of an endangered species, the habitat designation often lags by several years.¹⁰² The Services have designated critical habitat for only about 60% of listed species (or 1,000 listed domestic species).¹⁰³ For example, the dusky gopher frog was added to the

⁹⁷ U.S. FISH & WILDLIFE SERV., CRITICAL HABITAT, <https://www.fws.gov/project/critical-habitat> [<https://perma.cc/YDZ5-G942>] (last updated Mar. 21, 2023).

⁹⁸ *Id.*

⁹⁹ 16 U.S.C. §§ 1532(5)(A)(i–ii).

¹⁰⁰ 16 U.S.C. § 1533(a)(3)(A)(i) (referencing the Secretary of the Interior and the Secretary of Commerce).

¹⁰¹ 16 U.S.C. § 1533(a)(3)(A)(ii).

¹⁰² See, e.g., David Anthony Kirk et al., *Our Use, Misuse, and Abandonment of a Concept: Whither Habitat?* 8 *ECOL. & EVOL.* 4197 (2018), <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5916312/pdf/ECE3-8-4197.pdf> [<https://perma.cc/7CW9-V4NN>] (discussing delays with respect to habitat designation for killer whales (*Orcinus orca*)).

¹⁰³ SHEIKH & WARD, *supra* 86, at 21.

Endangered Species List in 2001,¹⁰⁴ but the FWS did not designate critical habitat until 2010.¹⁰⁵ Suitable habitat for the frog (longleaf pine forest ecosystem) had been reduced by 98% due primarily to logging and urbanization,¹⁰⁶ so that the frog's current habitat is limited to only three counties in southern Mississippi.¹⁰⁷ The initial FWS plan proposed adding an unoccupied area on private land in Louisiana (Unit I) where the species once lived, but which it no longer occupied.¹⁰⁸ Unit I contains ephemeral ponds, but it would require modifications to reintroduce the longleaf pine and open the canopy necessary habitat for the survival of the endangered frog.¹⁰⁹ The affected private landowners successfully challenged the inclusion of Unit I as critical habitat in *Weyerhaeuser*.¹¹⁰ Federal lands are prioritized as sources of support for the recovery of listed species in accord with the 2016 FWS/NOAA policy regarding the implementation of ESA § 4(b)(2),¹¹¹ and use of federal lands for the frog and other species becomes even more important in light of the *Weyerhaeuser* ruling.

The quest to designate additional critical habitat for the endangered dusky gopher frog was stymied by the Supreme Court's declaration in *Weyerhaeuser* that an area is eligible for designation as critical habitat under ESA § 4(a)(3)(A)(i) only if it is habitat for the species.¹¹² The

¹⁰⁴ Endangered and Threatened Wildlife and Plants; Final Rule to List the Dusky Gopher Frog as Endangered, 66 Fed. Reg. 62,993 (Dec. 4, 2001).

¹⁰⁵ Designation of Critical Habitat for Mississippi Gopher Frog, 75 Fed. Reg. 31,387, 31,395 (Fish & Wildlife Serv. June 3, 2010).

¹⁰⁶ *Weyerhaeuser Co. v. U.S. Fish & Wildlife Serv.*, 139 S. Ct. 361, 365 (2018); *see also* Endangered and Threatened Wildlife and Plants; Final Rule to List the Mississippi Gopher Frog Distinct Population Segment of Dusky Gopher Frog as Endangered, 66 Fed. Reg. 62,993 (Dec. 4, 2001) (noting that the dusky gopher frog once inhabited the lower coastal plain ranging from the Mississippi River in Louisiana to the Mobile River delta of Alabama and into southern North Carolina).

¹⁰⁷ *See* Jim Lee Interview, *supra* note 28 (noting that by 2001 the known wild population of the dusky gopher frog had dwindled to a group of one hundred at a single pond in southern Mississippi. It has now expanded to three Mississippi counties); *see also* *Weyerhaeuser Co.*, 139 S. Ct. 361, 365 (2018) (discussing the same general area in Mississippi).

¹⁰⁸ *Weyerhaeuser Co.*, 139 S. Ct. at 366.

¹⁰⁹ *See* Appendix I for details about the dusky gopher frog and conservation efforts to save it, as well as a more in-depth discussion of the longleaf pine ecosystem as necessary habitat for the endangered dusky gopher frog and dusky tortoise (the keystone species in the ecosystem) and the author's visit to The Nature Conservancy's conservation efforts in southern Mississippi.

¹¹⁰ *See* *Weyerhaeuser Co.*, 139 S. Ct. at 361 (discussing dusky gopher frog habitat).

¹¹¹ Policy Regarding Implementation of the Section(b)(2) of the Endangered Species Act, 81 Fed. Reg. 7226, Fish & Wildlife Serv., Nat'l Oceanic & Atmospheric Admin. (Mar. 14, 2016) [hereinafter 2016 Policy]; *see generally* 50 C.F.R. pt. 424 (2021).

¹¹² *Weyerhaeuser Co.*, 139 S. Ct. at 368.

Supreme Court then remanded the case to the Fifth Circuit Court of Appeals to determine if the FWS’ decision not to “exclude” the Louisiana land from critical habitat was arbitrary and capricious.¹¹³ The Fifth Circuit remanded the case to the Eastern District of Louisiana.¹¹⁴ However, the FWS and the landowners entered into a settlement, removing the critical habitat designation from that Unit I Louisiana private land, so the District Court issued a consent decree on July 3, 2019, rather than ruling on the remanded issues.¹¹⁵

The Supreme Court interpreted 16 U.S.C. § 1533(a)(3)(A)(i) as meaning that “[o]nly the ‘habitat’ of the endangered species is eligible for designation as critical habitat”¹¹⁶ and that “[e]ven if an area otherwise meets the statutory definition of unoccupied critical habitat because the Secretary finds the area essential for the conservation of the species, Section 4(a)(3)(A)(i) does not authorize the Secretary to designate the area as *critical* habitat unless it is also *habitat* for the species.”¹¹⁷ If Congress had intended that interpretation, it would have defined “habitat” separately in the definition section of 16 U.S.C. § 1532—instead, that statute defined only “critical habitat” as the guiding authority for the Secretary’s designation.¹¹⁸ The FWS had not previously deemed it necessary to define “habitat” separately since the 1978 ESA amendments.¹¹⁹ By making this strained interpretation, however, the Court laid the foundation for the Trump administration to create a new definition of “habitat” that did not include habitat within the species’ historical range or the new potential range necessitated by climate change.¹²⁰ In response, the Trump administration issued a definition of “habitat” that focused on current habitat:

¹¹³ *Id.* at 369.

¹¹⁴ Consent Decree at 964, *Markle Interests, LLC v. U.S. Fish & Wildlife Serv.*, 919 F.3d 963 (5th Cir. 2019) (No. 13-cv-234).

¹¹⁵ *Id.*; see also David Miller, *Endangered Species Law & Policy: Settlement Eliminates 1,500 Acres of Designated Dusky Gopher Frog Critical Habitat*, NOSSAMAN, LLP (July 18, 2019), <https://www.endangeredspecieslawandpolicy.com/settlement-eliminates-1500-acres-of-designated-dusky-gopher-frog-critical-habitat> [https://perma.cc/9XFA-BMST] (summarizing consent decree).

¹¹⁶ *Weyerhaeuser Co.*, 139 S. Ct. at 368.

¹¹⁷ *Id.*

¹¹⁸ Authors’ interpretation. See generally EIG, *supra* note 68.

¹¹⁹ Endangered Species Act Amendments of 1978, Pub. L. No. 95-63216, 92 Stat. 3751 (1978) (codified at 16 U.S.C. § 1531); see generally EIG, *supra* note 68.

¹²⁰ Endangered and Threatened Wildlife and Plants; Regulations for Listing Endangered and Threatened Species and Designating Critical Habitat, 85 Fed. Reg. 81,411 (Dec. 16, 2020).

For the purposes of designating critical habitat only, habitat is the abiotic and biotic setting that currently or periodically contains the resources and conditions necessary to support one or more life processes of a species.¹²¹

The regulation became final shortly before President Biden took office.¹²² Areas not currently inhabited by the species (“unoccupied areas”) could be considered critical habitat under this rule only if the Services determine that the occupied areas alone are inadequate to conserve the species.¹²³

The Biden administration’s FWS and NOAA rescinded that the Trump Administration’s definition of “habitat” without replacing it.¹²⁴ The argument was that a “one-size-fits-all” definition of habitat limits the Services’ ability to designate habitat that satisfies the statutory definition of critical habitat.¹²⁵ Instead, the Services will assess whether an area is habitat on a case-by-case basis using the best scientific data available.¹²⁶ Congress clearly delegated authority to the Secretary to designate “critical habitat” for endangered and threatened species,¹²⁷ so the Services decided to return to the direct statutory language to guide their decisions regarding critical habitat. The Services conceded that critical habitat must be habitat, taking into consideration the *Weyerhaeuser* decision,¹²⁸ but chose not to define “habitat.” Authors of this Article, however, believe that if Congress had intended to conclude that critical habitat had to first be habitat, it would have defined “habitat” separately in the definition section of 16 U.S.C. § 1532.

¹²¹ 50 C.F.R. § 424.02 (2020), updated in Regulations for Listing Endangered and Threatened Species and Designating Critical Habitat, 85 Fed. Reg. 81,411 (Dec. 16, 2020).

¹²² *Id.*

¹²³ 50 C.F.R. § 424.12 (2020); *see also* Endangered and Threatened Wildlife and Plants; Regulations for Listing Species and Designating Critical Habitat, 84 Fed. Reg. 45,021 (Aug. 27, 2019) (the FWS and the NOAA clarifying, interpreting, and implementing procedures and criteria for listing and removing species from endangered list).

¹²⁴ Endangered and Threatened Wildlife and Plants; Regulations for Listing Endangered and Threatened Species and Designating Critical Habitat, 87 Fed. Reg. 37,757 (June 24, 2022).

¹²⁵ *Id.* at 37,758–59.

¹²⁶ *Id.*

¹²⁷ 16 U.S.C. §§ 1533(a)(3)(A), 1533(b)(2). Clear declaration of authority takes on additional importance since the Supreme Court decision of *West Virginia v. EPA*, 142 S. Ct. 2587 (2022). In that decision interpreting the Clean Air Act of 2022, the Supreme Court required the EPA to have clearly delegated authority before it could require caps and compel major shifts in energy sources to address climate change, pursuant to the major questions doctrine.

¹²⁸ Endangered and Threatened Wildlife and Plants; Regulations for Listing Endangered and Threatened Species and Designating Critical Habitat, 87 Fed. Reg. 37,757 (June 24, 2022).

C. Exclusions to Critical Habitat

In determining what constitutes “critical habitat” and whether an exclusion is warranted, the Secretary is required to consider economic impacts, national security, impact on permittees and lessees, nonbiological impacts on local, state, and tribal governments, in addition to conservation plans and other relevant impacts, which are to be published in the Federal Register.¹²⁹ In the *Weyerhaeuser* decision, the Supreme Court emphasized that section 4(b)(2) “requires the Secretary to consider economic impact and relative benefits before deciding whether to exclude an area from critical habitat or to proceed with designation.”¹³⁰ The Court seemed most concerned with the economic impact of designating habitat, so it should have stopped with requiring an economic assessment, rather than offering a strained construction of the ESA statute.¹³¹ The methodology for measuring the negative economic impact of designating critical habitat and for quantifying the benefits is controversial and complex.¹³²

The ESA statute provides that the Secretary *may* exclude an area from “critical habitat” if “the benefits of such exclusion outweigh the benefits of specifying such area as part of the critical habitat, unless he determines, based on the best scientific and commercial data available, that the failure to designate such area as critical habitat will result in the extinction of the species concerned.”¹³³ Exclusion from critical habitat is not mandated under the ESA section 4(b)(2).¹³⁴ Contrary to the statutory flexibility granted to the Secretary, the Trump administration added regulatory restrictions that compelled exclusion of habitat if the benefits of exclusion outweighed the benefits of

¹²⁹ 16 U.S.C. § 1533(b)(2).

¹³⁰ *Weyerhaeuser Co. v. U.S. Fish & Wildlife Serv.*, 139 S. Ct. 361, 371 (2018).

¹³¹ Authors’ interpretation.

¹³² See Amy Sinden, *The Economics of Endangered Species: Why Less Is More in the Economic Analysis of Critical Habitat Designations*, 28 HARV. ENV’T L. REV. 129, 129 (2004) (arguing that cost-benefit analysis “forces incommensurable values into a common metric; it produces hopelessly indeterminate results; it clouds transparency and undermines public participation . . . and it delivers all this regulatory imperfection” for an unreasonably high price, and criticizing the decision in *N.M. Cattle Growers Ass’n v. U.S. Fish & Wildlife Serv.*, 248 F.3d 1271 (10th Cir. 2001)); see also Timm Kroeger and Frank Casey, *Economic Impacts of Designating Critical Habitat Under the U.S. Endangered Species Act: Case Study of the Canada Lynx (Lynx Canadensis)*, 11 HUMAN DIMENSIONS OF WILDLIFE 437–53 (2006); see also Wentz, *supra* note 73, at 1043 (discussing qualitative and quantitative methods for determining how climate change should factor into decisions).

¹³³ 16 U.S.C. § 1533(b)(2).

¹³⁴ See 2016 Policy at 81 Fed. Reg. 7226, 7229.

designating the area as critical habitat.¹³⁵ The regulatory language added by the Trump administration sought to deprive the Secretary of the discretion afforded by Congress.¹³⁶ Specifically,

if the Secretary determines that the benefits of excluding a particular area from critical habitat outweigh the benefits of specifying that area as part of the critical habitat, then the Secretary *shall* exclude (emphasis added) that area, unless the Secretary determines, based on the best scientific and commercial data available, that the failure to designate that area as critical habitat will result in the extinction of the species concerned.¹³⁷

This change is quite controversial; it provides more protection for businesses and landowners who do not want use of their land restricted or modified.¹³⁸ This change, however, makes it increasingly difficult to help already endangered or threatened species survive when part of the reason they are now endangered is that they have been pushed out of their historical range as a consequence of human activities.¹³⁹ The Supreme Court even acknowledged that the primary reasons that the dusky gopher frog's habitat was reduced by 98% was due to urbanization and the logging industry's preference for a faster growing, densely packed loblolly species that is incompatible with the open-canopy habitat needs of the frog.¹⁴⁰

On his first day in office, President Biden issued Executive Order 13,990, which directed agencies to review actions and regulations created during the Trump administration which were inconsistent with the goal to “promote and protect our public health and the

¹³⁵ 16 U.S.C. § 1533(b)(2); *see also* 50 C.F.R. § 17.90 (2020).

¹³⁶ 50 C.F.R. § 17.90 (2020).

¹³⁷ Endangered and Threatened Wildlife and Plants; Regulations for Designating Critical Habitat, 85 Fed. Reg. 82,376, 82,377 (Dec. 18, 2020), codified at 50 C.F.R. § 17.90 (2020).

¹³⁸ Endangered and Threatened Wildlife and Plants; Regulations for Designating Critical Habitat, 87 Fed. Reg. 43,333 (July 21, 2022), *rescinding* 85 Fed. Reg. 82,376 (rule of the same name). The background section of 87 Fed. Reg. 43,333 indicated that the Trump administration critical habitat rule was challenged by seven environmental groups and nineteen states.

¹³⁹ *See* Aldred, *supra* note 6; *see also* Brad Plumer, *Humans Are Speeding Extinction and Altering the Natural World at an 'Unprecedented' Pace*, N.Y. TIMES (May 6, 2019), <https://www.nytimes.com/2019/05/06/climate/humans-are-speeding-extinction-and-altering-the-natural-world-at-an-unprecedented-pace.html> [<https://perma.cc/6B2G-HCR3>].

¹⁴⁰ *See* Weyerhaeuser Co. v. U.S. Fish & Wildlife Serv., 139 S. Ct. 361, 365 (2018) (a loblolly pine is a fast-growing tree that creates a dense forest that is desirable to the logging industry).

environment.”¹⁴¹ On July 21, 2022, the Biden administration rescinded the Trump administration’s regulations mandating exclusion of areas from critical habitat.¹⁴² This rescission restores discretion to the Services while recognizing agency expertise and denouncing outside influences.¹⁴³ Thus, it revives the 2016 Policy Regarding the Implementation of section 4(b)(2) of the Endangered Species Act, which recognizes that the Secretary may (instead of “shall”) exclude certain lands from designation as critical habitat.¹⁴⁴ The 2022 final regulation does acknowledge, however, that the Supreme Court in *Weyerhaeuser* declared its authority to review those decisions for abuse of discretion.¹⁴⁵

Reasons for excluding some land from being designated as critical habitat can include the fact that the species is already being protected under habitat conservation plans (HCP), safe harbor agreements (SHA), candidate conservation agreements with assurances (CCAA), or integrated natural resources management plans (INRMP).¹⁴⁶ The 2016 FWS/NOAA policy regarding the implementation of ESA section 4(b)(2) emphasizes that certain areas may be excluded from critical habitat designations if “critical habitat designation would impair the realization of benefits expected from the plan, agreement, or partnership.”¹⁴⁷ Where private landowners have agreed to provide certain protections or habitat under one of these agreements, little

¹⁴¹ Exec. Order No. 13,990, 86 Fed. Reg. 7037 (Jan. 25, 2021) (President Biden’s executive order dated January 20, 2021, on Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis).

¹⁴² Endangered and Threatened Wildlife and Plants; Regulations for Designating Critical Habitat, 87 Fed. Reg. 43,433 (July 21, 2022), *rescinding* 85 Fed. Reg. 82,376 (rule of the same name).

¹⁴³ *See id.*

¹⁴⁴ *Id.* at 43,435.

¹⁴⁵ Endangered and Threatened Wildlife and Plants; Regulations for Designating Critical Habitat, 87 Fed. Reg. 43,433 (July 21, 2022), *rescinding* 86 Fed. Reg. 59,346 and revising the preamble to 2013 Policy Rule to recognize judicial review of decisions; *see also* Endangered and Threatened Wildlife and Plants; Regulations for Listing Endangered and Threatened Species and Designating Critical Habitat, 87 Fed. Reg. 37,757 (June 24, 2022).

¹⁴⁶ *See* SHEIKH & WARD, *supra* note 86; *see generally* U.S. FISH & WILDLIFE SERV., SAFE HARBOR AGREEMENTS, <https://www.fws.gov/service/safe-harbor-agreements> [<https://perma.cc/LE9K-LQJC>] (last visited Apr. 9, 2023); *see generally* U.S. FISH & WILDLIFE SERV., INTEGRATED NATURAL RESOURCES MANAGEMENT PLANS (INRMPs), <https://www.fws.gov/service/integrated-natural-resources-management-plans-inrmps> [<https://perma.cc/JY9Q-XDY8>] (last visited Mar. 2, 2023).

¹⁴⁷ *See* Policy Regarding Implementation of the Section(b)(2) of the Endangered Species Act, 81 Fed. Reg. 7226, 7229 (Mar. 14, 2016).

additional conservation benefit may be obtained by declaring the same land “critical habitat,” and the trust and cooperation of the landowner may be compromised by such designation.¹⁴⁸ Collaborative management is often a more effective mechanism for incentivizing private landowners to take steps that assist in protecting endangered species.¹⁴⁹ An empirical analysis of FWS practices concludes that “collaborative governance transforms the ESA from a statute prohibiting certain outcomes (such as harm or jeopardy to a species) to a regulatory program implementing collaboratively crafted best practices.”¹⁵⁰

Sometimes there is sufficient supporting information to justify listing a species as endangered or threatened, but the species receives “candidate species” status where the listing is “warranted but precluded” by higher priority listings.¹⁵¹ Candidate species lack statutory protections, causing occasional voluntary efforts to be made with private landowners and businesses to help conservation efforts and to reduce the likelihood that more restrictive land use measures will be necessary in the future.¹⁵² Nonfederal landowners may enter into CCAA, in which they “agree to carry out certain actions intended to conserve the species, with the assurance that, as long as the agreed actions are carried out, the landowner will not be required to change those activities if any candidate species covered by the CCAA is

¹⁴⁸ Policy Regarding Implementation of the Section(b)(2) of the Endangered Species Act, 81 Fed. Reg. 7226 (Mar. 14, 2016) (setting forth nonbinding policy on how the Services consider partnerships, conservation plans, and economic impacts in the exclusion process).

¹⁴⁹ See Ashley Graves, *Comment: Collaborative Management as a Mechanism for Incentivizing Private Landowners and Protecting Endangered Species*, 6 TEX. A&M L. REV. 297 (2018).

¹⁵⁰ Robert Fischman et al., *Collaborative Governance Under the Endangered Species Act: An Empirical Analysis of Protective Regulations*, 38 YALE J. REG. 976, 976 (2021).

¹⁵¹ Parker Moore & Katrina Krebs, *Complying with the Endangered Species Act*, LEXIS PRACTICE ADVISOR at 7 (Jan. 2020), <https://www.bdlaw.com/content/uploads/2020/01/2019-12-31-Lexis-Practice-Note-Complying-with-the-ESA-P-Moore-and-K-Krebs.pdf> [<https://perma.cc/J5FL-PLFF>]; see, e.g., Cardno, Inc., *Nationwide Candidate Conservation Agreement for Monarch Butterfly on Energy and Transportation Lands* (Mar. 2020), https://www.fws.gov/sites/default/files/documents/Final_CCAA_040720_Fully%20Executed.pdf [<https://perma.cc/6BEN-84HE>].

¹⁵² See Graves, *supra* note 149; see also, e.g., Cardno Inc., *supra* note 151; see also *Endangered and Threatened Wildlife and Plants; Enhancement of Survival and Incidental Take Permits*, 88 Fed. Reg. 8380 (Feb. 9, 2023). The Department of Interior is proposing to strengthen voluntary conservation opportunities for both listed and non-listed species by simplifying the “the requirements for enhancement of survival permits by combining safe harbor agreements and candidate conservation agreements with assurances into one agreement type” (to be called conservation benefit agreements).

subsequently listed as threatened or endangered.”¹⁵³ This allows for cooperative management options and flexibility that enables the creation of measures to help the species sooner, and, if successful, may avoid or delay listing the species.¹⁵⁴ Once a species is listed, a designation of “critical habitat” could impose more onerous restrictions on land use, so the CCAA land will usually receive an exclusion for those landowners who agreed to the CCAA prior to the listing.¹⁵⁵

One of the largest CCAAs is for the protection of the monarch butterfly.¹⁵⁶ The Eastern monarch butterfly population has decreased by 85% since the mid-1990s and the monarch butterfly population west of the Rocky Mountains has declined by 95% to 99% since the 1980s.¹⁵⁷ After numerous attempts to get the monarch butterfly listed as an endangered species, it was designated as a candidate species in December 2020.¹⁵⁸ Key threats to the monarch butterfly include habitat loss due to land conversion and mowing, as well as threats due to herbicide and pesticide use.¹⁵⁹ Use of neonicotinoid insecticides are threatening many pollinators, including monarch butterflies, and inadequate restrictions on the use of this group of insecticides is endangering both the survival of these pollinators and crop production.¹⁶⁰ The presence of milkweed plants is essential for

¹⁵³ SHEIKH & WARD, *supra* note 86, at 16.

¹⁵⁴ See Graves, *supra* note 149.

¹⁵⁵ SHEIKH & WARD, *supra* note 86, at 16.

¹⁵⁶ Cardno Inc., *supra* note 151. The CCAA covers private land and there is a corresponding CAA to cover federal land.

¹⁵⁷ *Id.* at 5–6, 17, 19. The conservation potential of the Agreement anticipates the enrollment of up to 26 million acres of energy and transportation lands, which could contribute over 300 million stems of milkweed, and 2.3 million acres of monarch foraging habitat, over the coming decades. There are two migratory species of monarch butterflies and one that stays in Florida, where temperatures and host milkweed plants do not necessitate migration; see also Press Release, Ctr. for Biological Diversity, Eastern Monarch Butterfly Population Up Slightly, Still Below Extinction Threshold (May 24, 2022) <https://biologicaldiversity.org/w/news/press-releases/eastern-monarch-butterfly-population-up-slightly-still-below-extinction-threshold-2022-05-24/>.

¹⁵⁸ See *Monarchs*, U.S. FISH & WILDLIFE SERV., <https://www.fws.gov/initiative/pollinators/monarchs> [<https://perma.cc/6UVD-QVGY>] (last visited Mar. 4, 2023).

¹⁵⁹ Cardno Inc., *supra* note 151, at 21.

¹⁶⁰ *Schedule for Review of Neonicotinoid Pesticides*, U.S. ENV'T PROT. AGENCY, <https://www.epa.gov/pollinator-protection/schedule-review-neonicotinoid-pesticides> [<https://perma.cc/M3KP-NYYZ>] (last visited Feb. 6, 2022); Pesticide Registration Review; Proposed Interim Decisions for Several Neonicotinoid Pesticides; Notice of Availability, 85 Fed. Reg. 5953 (Feb. 3, 2020).

breeding because it is the plant on which the monarch lays its eggs.¹⁶¹ Additionally, blooming nectar from cone flowers is necessary for nutrition for the adult monarch butterfly.¹⁶² In the 139-page voluntary CCAA between the FWS and over thirty energy and transportation sector entities, the entities agreed to provide landscape conservation measures to restore conditions more favorable to the butterfly's breeding and foraging on land and right-of-way easements. Utility and energy right-of-way easements include over twelve million acres nationally.¹⁶³ In the summer of 2022, the IUCN "red-listed" the monarch butterfly as endangered,¹⁶⁴ but it is still a candidate species with respect to the ESA in the United States.¹⁶⁵

A letter from the Forest Landowners Association requested similar safe harbor agreements with landowners who implement voluntary practices to benefit at-risk and listed species on their property if the proposed experimental populations rule changes go into effect.¹⁶⁶ This association notes that "[r]ecent species proposals have recognized the conservation benefits of forestry best management practices (BMPs) and provided exceptions in [ESA] Section 4(d) rules for activities on private lands that implement these practices."¹⁶⁷

¹⁶¹ See Life Cycle, MONARCH JOINT VENTURE, <https://monarchjointventure.org/monarch-biology/life-cycle#:~:text=Monarchs%2C%20like%20other%20butterflies%20and,a%20variety%20of%20flowering%20plants> [<https://perma.cc/6KK4-YLWU>] (last visited Nov. 11, 2022).

¹⁶² See Cardno Inc., *supra* note 151, at 7.

¹⁶³ *Id.* at 16.

¹⁶⁴ Press Release, *Migratory Monarch Butterfly Now Endangered – IUCN Red List*, IUCN (July 21, 2022), <https://www.iucn.org/press-release/202207/migratory-monarch-butterfly-now-endangered-iucn-red-list> [<https://perma.cc/U8TN-CDR2>] (The IUCN Red List includes 147,517 species (of which 41,459 are threatened with extinction.).

¹⁶⁵ See Life Cycle, *supra* note 161.

¹⁶⁶ Forest Landowners, Comment Letter on Proposed Experimental Populations Rule 4 (Aug. 8, 2022), https://downloads.regulations.gov/FWS-HQ-ES-2021-0033-0534/attachment_1.pdf [<https://perma.cc/CPS7-X6FP>] The Forest Landowners' Association members are private forest land stakeholders who own and manage over 55 million acres nationwide with a sustainable forest management approach to ensure prosperity of their forest for future generations. Sixty percent of the habitat for listed or at-risk species is on privately owned forest land.

¹⁶⁷ *Id.*

III

PROPOSAL FOR INTRODUCTION OF EXPERIMENTAL POPULATIONS OUTSIDE THEIR HISTORICAL RANGE

A. Experimental Populations Background

ESA section 10(j) authorizes the establishment of “experimental populations.”¹⁶⁸ Since this 1982 amendment to the ESA, the Services have created ESA section 10(j) rules for eighty-one experimental populations that include fifty-two ESA species.¹⁶⁹ Since 2010, fewer than twenty experimental populations have been designated.¹⁷⁰ ESA section 10(j) specifically delegates authority to the Secretary of the Interior to “release . . . any population (including eggs, propagules, or individuals) of an endangered species or a threatened species outside the current range of such species if the Secretary determines that such release will *further the conservation of such species* (emphasis added).”¹⁷¹ Designation of experimental populations has been critical to the recovery of species, such as the grizzly bear, whooping crane, Oregon silverspot butterfly, Rio Grande silvery minnow, black-footed ferret, and the gray wolf.¹⁷²

Although nearly half of the designated experimental populations have not been introduced into new habitat, the distinction is important to ensure that the already designated population can be rescued promptly and introduced more quickly into a specified area when climate-induced emergencies occur, such as extreme flooding, fire, or drought.¹⁷³ The ability of the FWS to designate or preserve this habitat

¹⁶⁸ 16 U.S.C. § 1539(j).

¹⁶⁹ HUNTER SAPIENZA & YA-WEI LI, ENV’T POL’Y INNOVATION CTR., REINTRODUCTION: AN ASSESSMENT OF ENDANGERED SPECIES ACT EXPERIMENTAL POPULATIONS 3 (2021). These include well-known species such as the California condor, black-footed ferret, and whooping crane, and many lesser-known species such as Anthony’s riversnail (snail), orangefoot pimpleback (freshwater clam), and spotfin chub (fish).

¹⁷⁰ Env’t Pol’y Innovation Ctr., Comment Letter on Proposed Experimental Populations Rule (Aug. 1, 2022), https://downloads.regulations.gov/FWS-HQ-ES-2021-0033-0252/attachment_2.pdf & https://downloads.regulations.gov/FWS-HQ-ES-2021-0033-0252/attachment_1.pdf [<https://perma.cc/4UTG-4KTR>].

¹⁷¹ 16 U.S.C. § 1539 (j)(2)(A).

¹⁷² Animal Legal Def. Fund, Comment Letter on Proposed Experimental Populations Rule (Aug. 8, 2022), https://downloads.regulations.gov/FWS-HQ-ES-2021-0033-0431/attachment_1.pdf [<https://perma.cc/MQE5-GKAA>] (citing U.S. FISH & WILDLIFE SERV., FACT SHEET, WHAT IS A 10(j) RULE? (Oct. 2018)).

¹⁷³ Env’t Pol’y Innovation Ctr., *supra* note 170, at 1–2.

for an experimental population, however, is dependent on how that experimental population is classified.¹⁷⁴

ESA section 10(j) specifies two types of experimental populations: “essential” and “nonessential.”¹⁷⁵ To be classified as an “essential experimental population,” the population must be one “whose loss would be likely to appreciably reduce the likelihood of the survival of the species in the wild.”¹⁷⁶ The distinction is important because “critical habitat shall not be designated . . . for any experimental population determined . . . to be not essential to the continued existence of a species.”¹⁷⁷ Nonessential populations do not receive critical habitat designations and are treated as candidate species proposed for listing with regard to ESA section 7 interagency consultation (unless the population is located within a National Wildlife Refuge or National Park System).¹⁷⁸ For a nonessential experimental population, an agency must confer with the Services regarding whether its activities will jeopardize the species, but it is not required to refrain from the activity.¹⁷⁹ In contrast, with an essential experimental population, it is treated as a “threatened species” and provided jeopardy protection,¹⁸⁰ prohibiting federal agency actions that destroy or adversely modify that habitat.¹⁸¹ So far, the FWS has not designated any experimental population as “essential.”¹⁸² Also no plant species has ever been reintroduced as either type of experimental population using 10(j).¹⁸³ The Center for Biological Diversity emphasizes the urgency for designating some experimental populations “as essential.”¹⁸⁴

¹⁷⁴ See 50 C.F.R. §§ 17.80(a), 222.501(a) (2021).

¹⁷⁵ 50 C.F.R. § 17.80(b).

¹⁷⁶ 50 C.F.R. §§ 17.80(b), 222.501(a) (2021).

¹⁷⁷ 16 U.S.C. § 1539(j)(C)(ii).

¹⁷⁸ 16 U.S.C. § 1539(j)(C)(i)–(ii); see also 50 C.F.R. § 17.83(b) (distinguishing the National Wildlife Refuge and the National Park System from other locations where experimental populations are established).

¹⁷⁹ See generally SAPIENZA & LI, *supra* note 169; see also 50 C.F.R. § 17.81(f) (2021) (stating that the Services may (but are not required to) designate critical habitat for essential experimental populations); see also 87 Fed. Reg. 34,625 at 34,626 (June 7, 2022) (FWS proposal deleting the sentence stating, “No designation of critical habitat will be made for nonessential populations,” as it redesignated § 17.81(f) as § 17.81(g)).

¹⁸⁰ See generally SAPIENZA & LI, *supra* note 169, at 6.

¹⁸¹ SHEIKH & WARD, *supra* note 86, at 19.

¹⁸² *Id.*; see also SAPIENZA & LI, *supra* note 169, at 8; see also Ctr. for Biological Diversity, *supra* note 35, at 5.

¹⁸³ See SAPIENZA & LI, *supra* note 169, at 10.

¹⁸⁴ See also Ctr. for Biological Diversity, *supra* note 35, at 5 (Center for Biological Diversity finds failure to designate “essential” experimental populations as unacceptable given the extreme urgency of the extinction crisis).

Other proposed changes related to experimental populations include replacing the phrase “natural populations” with “nonexperimental populations.”¹⁸⁵ The North Carolina Wildlife Resources Commission supports this change because it “better clarifies the distinction between extant portions of the listed species and those considered as the experimental portion of the population.”¹⁸⁶ In contrast, the Oregon Department of Fish and Wildlife (ODFW) opposes replacing “natural populations” with “nonexperimental populations” in § 17.80 because such a change “does not differentiate when experimental and nonexperimental populations are within or outside of the historic species range.”¹⁸⁷

B. Controversy Surrounding Introduction of Experimental Populations Outside Historical Range

The most controversial aspect of the proposed regulatory changes relates to the introduction of experimental populations outside their historical range.¹⁸⁸ Comments on the proposed removal of the “historic (sic) range” restriction fell into four categories: (1) support from NGO environmental members for striking the “historic range” requirement, (2) opposition from Western states’ ranchers and farmers groups, energy groups, especially from groups opposing wolves or coyotes, (3) qualified support with suggestions for clarifying language and consultation from fish and wildlife agencies and some environmental groups, and (4) assertions that the development of these proposed changes fails to comply with other governmental requirements or the

¹⁸⁵ Proposed Experimental Populations Rule, 87 Fed. Reg. 34,625 (June 7, 2022).

¹⁸⁶ N.C. Wildlife Res. Comm’n, Comment Letter on Proposed Experimental Populations Rule at 2 (Aug. 8, 2022), https://downloads.regulations.gov/FWS-HQ-ES-2021-0033-0426/attachment_1.pdf [<https://perma.cc/7TPR-9V9W>].

¹⁸⁷ Or. Dep’t of Fish & Wildlife, Comment Letter on Proposed Experimental Populations Rule (Aug. 2, 2022), https://downloads.regulations.gov/FWS-HQ-ES-2021-0033-0231/attachment_1.pdf [<https://perma.cc/M2VR-G8GW>].

¹⁸⁸ See N.C. Wildlife Res. Comm’n, *supra* note 186; see also N.M. Dep’t of Game & Fish, Comment Letter on Proposed Experimental Populations Rule (Aug. 5, 2022), https://downloads.regulations.gov/FWS-HQ-ES-2021-0033-0292/attachment_1.pdf [<https://perma.cc/9S9A-6QQ5>]; see also Elizabeth McCormick & Andrea Wortzel, *FWS Proposes to Account for Climate Change When Designating Experimental Populations*, ENVIRONMENTAL LAW AND POLICY MONITOR (June 14, 2022), <https://www.environmentalawandpolicy.com/2022/06/fws-proposes-to-account-for-climate-change-when-designating-experimental-populations/> [<https://perma.cc/NBY3-NV39>].

Weyerhaeuser case.¹⁸⁹ While most entities agree that climate change has altered the suitability of some current habitat for species, the entities disagree extensively on an appropriate solution that will benefit the endangered species without harming other local species or business and economic interests in a newly designated recipient area.¹⁹⁰ Risk assessment needs to be done in advance so that the introduced experimental population does not pose significant adverse impact on the recipient ecosystem.¹⁹¹ Concerns regarding the ambiguities in designation criteria, lack of required environmental impact statements, ecological effects on the receiving ecosystem (unintended consequences), as well as the need for greater consultation with local affected entities, will be discussed in this Section.

The ESA statute authorizes designation of critical habitat upon the determination that it is “essential to the conservation of the species.”¹⁹² Nothing in the statutory language of the ESA mandates that critical habitat must be current habitat.¹⁹³ The conundrum is that the Supreme Court in *Weyerhaeuser* went beyond the literal text and held that “[e]ven if an area otherwise meets the statutory definition of unoccupied critical habitat because the Secretary finds the area essential for the conservation of the species, [ESA] Section 4(a)(3)(A)(i) does not authorize the Secretary to designate the area as *critical* habitat unless it is also *habitat* for the species.”¹⁹⁴ There is not clear statutory language that mandates the conclusion that the Court reached.¹⁹⁵

¹⁸⁹ See generally Comment Letters on Proposed Experimental Populations Rule (2022), <https://www.regulations.gov/document/FWS-HQ-ES-2021-0033-0001/comment> [<https://perma.cc/Z7EP-FSAA>] (588 comments submitted).

¹⁹⁰ See Am. Fisheries Soc’y, *supra* note 73, at 2–3. Risk assessments need to be done on the recipient ecosystem to avoid harm to native/local species. When the FWS translocated about 200 endangered watercress darters to Tapawingo Spring outside the taxon’s native range, it resulted in the extermination of the local Tapawingo darter. Cross-fertilization of two endangered tree species in Hawaii created a more sustainable hybrid that threatened the survival of the two originally endangered species.

¹⁹¹ See Appendix of Alaska Dep’t of Fish & Game, Comment Letter on Proposed Experimental Populations Rule (Aug. 1, 2022), https://downloads.regulations.gov/FWS-HQ-ES-2021-0033-0216/attachment_1.pdf [<https://perma.cc/BF2E-7ACN>].

¹⁹² 16 U.S.C. § 1532(5)(A)(ii).

¹⁹³ 16 U.S.C. § 1532.

¹⁹⁴ *Weyerhaeuser Co. v. U.S. Fish & Wildlife Serv.*, 139 S. Ct. 361, 368 (2018).

¹⁹⁵ Authors’ interpretation. See *id.* at 371 (2018). The *Weyerhaeuser* Court is very concerned with requiring a clear delegation of authority to the EPA to act in broad ways to fight climate change, but it misconstrues what seems to be clear broad intent by Congress for the Departments of Interior and Commerce to take broad steps that are necessary or

Is there more latitude to expand critical habitat for “experimental populations”? ESA 16 U.S.C. § 1539(j) does not specifically limit “experimental populations” to their historical range, but existing regulation 50 C.F.R. § 17.81(a) requires that the release be “within its probable historic range, absent a finding by the Director in the extreme case that the primary habitat of the species has been unsuitably and irreversibly altered or destroyed.”¹⁹⁶ The changes to the experimental populations rule proposed by the FWS in 2022 would delete the language related to “historic range.”¹⁹⁷ This deletion would make the FWS definition of “experimental population” more consistent with the NMFS definition, which does not limit experimental populations to their probable historical range.¹⁹⁸ According to the Proposed Regulatory Revisions Preamble, new habitat outside the historical range of the species could be designated for experimental populations “where little to no habitat remains within the historical range of a species or where formerly suitable habitat...is undergoing[] irreversible decline or change, rendering it unable to support one or more life history stages for the species.”¹⁹⁹ However, these limitations do not appear in the text of any of the regulatory changes. As proposed, section 17.81(a) would read as follows if the proposed change is adopted:

The Secretary may designate as an experimental population a population of endangered or threatened species that has been or will be released into habitat that is necessary to support one or more life history stages outside the species’ current range, subject to the further conditions specified in this section.²⁰⁰

Advocates for this change recognize that the Services need the flexibility to introduce species outside their historical range.²⁰¹ The Defenders of Wildlife support this change, stating that the current regulatory restriction to historical range “unduly restricts the Service’s ability to conserve threatened and endangered species, the primary goal

essential to the preservation of species when the Court conflates two sections to come up with a meaning that is doubtful Congress intended.

¹⁹⁶ Compare 50 C.F.R. § 17.81(a) (2021), with Proposed Experimental Populations Rule, 87 Fed. Reg. 34,625 (June 7, 2022).

¹⁹⁷ Proposed Experimental Populations Rule, 87 Fed. Reg. 34,625 (June 7, 2022) (to be codified at 50 C.F.R. § 17.81(a)).

¹⁹⁸ See 50 C.F.R. § 222.501(a) (2021) (NOAA Rule).

¹⁹⁹ Proposed Experimental Populations Rule, 87 Fed. Reg. 34,625 (June 7, 2022).

²⁰⁰ *Id.*

²⁰¹ Defs. of Wildlife, *supra* note 39, at 1.

of the [ESA] Act.”²⁰² Some species, such as the little Key deer and Key woodrat, need to be introduced to new habitat before their existing habitat on the Florida Keys is destroyed by hurricanes or submerged with rising sea levels.²⁰³ The habitat for the Key deer has become small and fragmented due to “residential, commercial, infrastructure development” and increased vehicle collisions.²⁰⁴ Their only chance of survival may be for some Key deer to be relocated outside their historical range as an experimental population before a natural disaster wipes out the existing population.²⁰⁵

The reintroduction of the Western gray wolf (*Canis lupus*), Mexican wolf (*Canis lupus baileyi*) and Red wolf (*Canis rufus*) in North Carolina as experimental populations are particular points of controversy, especially since more farmers and ranchers may have to deal with the consequences of the presence of these wolves if the “historical range” prerequisite is eliminated.²⁰⁶ Northern Rocky Mountain gray wolves were listed as endangered in 1974 and were reintroduced into their historical range in central Idaho and Yellowstone National Park using ESA 10(j) experimental population designations in 1995.²⁰⁷ Environmentalists cite this reintroduction as an important step toward the wolves’ recovery.²⁰⁸ In the northern Rockies, the reintroduction of Rocky Mountain gray wolves has improved the riparian vegetation along streams since deer and elk fled to higher ground and no longer

²⁰² *Id.*

²⁰³ See Ctr. for Biological Diversity, *supra* note 35; Animal Legal Def. Fund, *supra* note 172, at 3; Defs. of Wildlife, *supra* note 39, at 3.

²⁰⁴ See Defs. of Wildlife, *supra* note 39, at 3.

²⁰⁵ Authors’ viewpoint.

²⁰⁶ See Ctr. for Biological Diversity, *supra* note 35; see also American Farm Bureau Federation, Comment Letter on Proposed Experimental Populations Rule (Aug. 8, 2022), https://downloads.regulations.gov/FWS-HQ-ES-2021-0033-0412/attachment_1.pdf; see also N.M. Farm & Livestock Bureau, Comment Letter on Proposed Experimental Populations Rule (Aug. 3, 2022), https://downloads.regulations.gov/FWS-HQ-ES-2021-0033-0251/attachment_1.pdf; see also Colo. Wool Growers Assoc., Comment Letter on Proposed Experimental Populations Rule (Aug. 8, 2022), https://downloads.regulations.gov/FWS-HQ-ES-2021-0033-0262/attachment_1.pdf; see also Nat’l Cattlemen’s Beef Assoc., Comment Letter on Proposed Experimental Populations Rule (Aug. 8, 2022), https://downloads.regulations.gov/FWS-HQ-ES-2021-0033-0526/attachment_1.pdf [<https://perma.cc/94LT-5DBE>].

²⁰⁷ The Northern Rocky Mountain Gray Wolves, Dep’t of Justice (updated June 27, 2018), <https://www.justice.gov/enrd/northern-rocky-mountain-gray-wolves> [<https://perma.cc/2EBE-8U32>].

²⁰⁸ Ctr. for Biological Diversity, *supra* note 35, at 4.

overgraze trees and shrubs in valley bottoms.²⁰⁹ As the top predator in this ecosystem, the Rocky Mountain gray wolf is the keystone species—as it expands southward, cattle and sheep growers feel threatened.²¹⁰ In 2008, the endangered gray wolf was delisted, relisted by court order, and delisted again in 2009.²¹¹ The federal district court in Montana approved a settlement in 2011, in which the Rocky Mountain gray wolf would retain its listing in Washington, Oregon, and Utah, but lose protection in Idaho and Montana.²¹² Wyoming allowed the wolves to be shot on sight, prompting a relisting in 2012.²¹³ The back-and-forth saga has continued, with numerous courts vacating attempted delistings.²¹⁴ The Trump administration delisted the Rocky Mountain gray wolf in 2020,²¹⁵ a decision that the Biden administration is currently reviewing.²¹⁶ The Defenders of Wildlife and five other

²⁰⁹ George Monbiot, *How Wolves Change Rivers*, YOUTUBE (Feb. 13, 2014), <http://www.youtube.com/watch?v=ysa5OBhXz-Q> [<https://perma.cc/8YAR-QSS4>].

²¹⁰ See N.M. Farm & Livestock Bureau, *supra* note 206; see also Colo. Wool Growers Assoc., *supra* note 206; see also Nat’l Cattlemen’s Beef Assoc., *supra* note 206.

²¹¹ See Endangered and Threatened Wildlife and Plants; Removal of the Gray Wolf (*Canis lupus*) From the List of Endangered and Threatened Wildlife, 85 Fed. Reg. 69,778 (Nov. 3, 2020) (“Delisting Rule” which reviews the relevant history and includes additional information about the listing status of various populations of the gray wolf).

²¹² Defs. of Wildlife v. Salazar, 09-cv-77-DWM (D. Mont. Apr. 9, 2011); see also KRISTINA ALEXANDER, CONG. RSCH. SERV., R41730, THE GRAY WOLF AND THE ENDANGERED SPECIES ACT (ESA): A BRIEF LEGAL HISTORY (Jan. 9, 2012) (describing the history of the gray wolf including the listing, de-listing, and relisting as endangered species), <https://www.everycrsreport.com/reports/R41730.html>.

²¹³ Press Release, Ctr. for Biological Diversity, Wyoming Wolves Lose Federal Protection, Will Be Shot on Sight Across Most of State: Lawsuit Launched Challenging Wyoming’s Kill-at-Will Policy (Aug. 31, 2012), https://www.biologicaldiversity.org/news/press_releases/2012/wolves-08-31-2012.html [<https://perma.cc/BY6P-X3UE>] (last visited Nov. 12, 2022).

²¹⁴ See Humane Soc’y of the U.S. v. Kempthorne, 579 F. Supp. 2d (D.D.C. 2008) (vacating rule); Defs. of Wildlife v. Hall, 565 F. Supp. 2d 1160 (D. Mont. 2008) (enjoining rule); Humane Soc’y of the U.S. v. Salazar, No. 09-1092-PLF (D.D.C. 2009) (settlement vacating rule); Defs. of Wildlife v. Salazar, 729 F. Supp. 2d 1207 (D. Mont. 2010) (vacating rule); Humane Soc’y of the U.S. v. Jewell, 76 F. Supp. 3d 69 (D.D.C. 2014) (vacating rule), *aff’d* 865 F.3d 585 (D.C. Cir. 2017).

²¹⁵ See Endangered and Threatened Wildlife and Plants; Removal of the Gray Wolf (*Canis lupus*) from the List of Endangered and Threatened Wildlife, 85 Fed. Reg. 69,778 (Nov. 3, 2020) (“Delisting Rule” which reviews the relevant history).

²¹⁶ Troutman Pepper, *Trump ESA Rules Vacated*, JD SUPRA (July 7, 2022), <https://www.jdsupra.com/legalnews/trump-esa-rules-vacated-4436176/> [<https://perma.cc/5N2B-GZZT>] (discussing Biden administration reviewing revising ESA rules concerning listing).

NGOs also sued the FWS for injunctive relief to prevent the delisting of the gray wolf.²¹⁷

Arizona and New Mexico ranchers have criticized the reintroduction of the Mexican gray wolf, claiming that it has “cost our livestock industry millions while decimating the associated rural economies.”²¹⁸ They believe that the proposed removal of the “historic range” requirement would further threaten rural economies.²¹⁹ The Colorado Wool Growers Association offers two examples of these dangers, such as when wolves killed 176 head of sheep in 2013 and 143 head of sheep in 2022 despite the presences of herders and guardian dogs.²²⁰ In contrast, the Animal Legal Defense Fund maintains that livestock depredation by the Mexican gray wolf is rare and the “historical range’s ability to support the species has been . . . significantly diminished by threats such as climate change and other human-caused stressors.”²²¹ The Office of Advocacy for the U.S. Small Business Administration counters that the “presence of these wolves had many more effects on livestock, including loss of body condition, birthing weak calves, premature calf births, immune suppression, decreased pregnancy rates, increased susceptibility to disease, and more aggressive demeanor.”²²² The FWS is working on an Environmental Impact Statement related to the reintroduction and management of the gray wolf in Colorado as an experimental population, assessing the potential impacts to stakeholders.²²³

Should experimental populations that exist prior to the adoption of the proposed rule be allowed to expand outside their historical range? The preamble to the Proposed Regulatory Revisions provides that “[i]f

²¹⁷ See *Defs. of Wildlife v. U.S. Fish & Wildlife Serv.*, Case 3:21-cv-00344 (N.D. CA), filed Jan. 14, 2021.

²¹⁸ See Benjamin Segovia, Comment Letter on Proposed Experimental Populations Rule (July 21, 2022), <https://www.regulations.gov/comment/FWS-HQ-ES-2021-0033-0045> [<https://perma.cc/D6E8-HBB6>].

²¹⁹ *Id.*

²²⁰ Colo. Wool Growers Ass’n., *supra* note 206 at 4.

²²¹ Animal Legal Def. Fund, *supra* note 172 at 4 (citing Fourth Nat’l Climate Assessment, U.S. Global Change Research Program (Nov. 23, 2018)); U.S. NAT’L PARK SERV., CLIMATE CHANGE IN THE SOUTHWEST – POTENTIAL IMPACTS, <https://www.nps.gov/articles/climate-change-in-the-southwest-potential-impacts.htm> [<https://perma.cc/PH3D-FBVJ>].

²²² U.S. Small Bus. Admin. Off. of Advoc., Comment Letter on Proposed Experimental Populations Rule at 7 (Aug. 8, 2022), https://downloads.regulations.gov/FWS-HQ-ES-2021-0033-0460/attachment_1.pdf [<https://perma.cc/9NZD-LC2M>].

²²³ Endangered and Threatened Wildlife and Plants; Establishment of a Nonessential Experimental Population of the Gray Wolf in the State of Colorado; Environmental Impact Statement, 87 Fed. Reg. 43,489 (July 21, 2022) (to be codified at 50 C.F.R. pt. 17).

this proposal is finalized, it will be applied to future designations and will not require the reevaluation of any prior designation of an experimental population.”²²⁴ The Rewilding Institute and Project Coyote argue that prior designations of experimental populations also should benefit from the change and that protection of coyotes should expand beyond their historical range.²²⁵ The experimental population of the Mexican gray wolf is an example of a species whose 2015 revised plan should be revisited to support recovery of the wolf north of the Interstate Highway 40 boundary.²²⁶ The Mexican gray wolf’s historical range supports only a small number of wolves, but debate continues regarding how much of the Rocky Mountain region is part of the wolf’s historical range.²²⁷ With the proposed rule change deleting the prerequisite of historical range, it should be easier for the FWS to introduce an experimental population of Mexican gray wolves in the southern Rocky Mountain region.²²⁸

The implementing agency for release of a species in a new habitat is sometimes a state wildlife agency or NGO, rather than the FWS.²²⁹ Some populations of species are already being introduced to new habitats by state wildlife agencies before federal listing of the species.²³⁰ The proposed rule would not be retroactive and therefore might not apply to species released before ESA designation as threatened or endangered.²³¹ Groups assisting in the release of species

²²⁴ Proposed Experimental Populations Rule, 87 Fed. Reg. 34,625, 34,625 (June 7, 2022) (to be codified at 50 C.F.R. pt. 17).

²²⁵ Rewilding Inst. & Project Coyote, Comment Letter on Proposed Experimental Populations Rule at 4 (Aug. 8, 2022), https://downloads.regulations.gov/FWS-HQ-ES-2021-0033-0489/attachment_1.pdf [<https://perma.cc/S6Q4-RH38>].

²²⁶ *Id.*

²²⁷ *Id.*

²²⁸ See Ctr. for Biological Diversity, *supra* note 35, at 4.

²²⁹ See e.g., Alaska Dep’t of Fish & Game, *supra* note 191; Nev. Div. of Nat. Heritage, *supra* note 49; N.C. Wildlife Res. Comm’n, *supra* note 186; Or. Dep’t. of Fish & Wildlife, *supra* note 187; Mo. Dept. of Conservation, Comment Letter on Proposed Experimental Populations Rule (Aug. 8, 2022), https://downloads.regulations.gov/FWS-HQ-ES-2021-0033-0454/attachment_1.pdf [<https://perma.cc/6UF7-9NVY>]; 50 C.F.R. § 17.81(a) (2023) (requiring the FWS to consult state fish and wildlife agencies, affected tribal governments, and local agencies).

²³⁰ See generally Turner Endangered Species Fund, Comment Letter on Proposed Experimental Populations Rule (Aug. 8, 2022), <https://www.regulations.gov/comment/FWS-HQ-ES-2021-0033-0494> [<https://perma.cc/GY8X-4W6D>].

²³¹ See Proposed Experimental Populations Rule, 87 Fed. Reg. 34,625, 34,625 (June 7, 2022) (to be codified at 50 C.F.R. pt. 17) (stating that the proposed rule “will be applied to future designations and will not require the reevaluation of any prior designation of an experimental population”).

want the proposed rule clarified “to ensure that an experimental population designation can be applied even when releases have already been conducted, regardless of the date of such releases.”²³² If such releases are accomplishing the conservation goals of the ESA, it would be appropriate to assess whether these populations are also worthy of protection as essential experimental populations under the ESA.

C. Impact of Introducing Experimental Population Outside Its Historical Range

The comments by the State of Alaska Department of Fish and Game (ADF&G) emphasize that “any decision to establish an experimental population must be based on a thorough, scientifically defensible assessment of the benefits and risks, including the likelihood of success, bounded by rigorous sidebars and guidelines for analyses to avoid any foreseeable and unforeseen consequences, ecological and otherwise.”²³³ Steps must be taken to protect ecosystems from the introduction of diseases or parasites and other risks to indigenous species and habitat. The ADF&G includes a list of factors to be considered, ranging from impacts of predation, disease, or other adverse biological impacts, ecological risks, management costs, socioeconomic effects, and compatibility with “goals of adjacent land managers.”²³⁴ Alaska generally opposes the introduction of nonindigenous species, in part because of those factors.²³⁵ The Animal Legal Defense Fund recognizes that the introduction of an experimental population “could have long-reaching consequences for the native ecosystem and its residents.”²³⁶ Similarly, the Guidelines of the International Union for Conservation of Nature’s (IUCN) recognize that the “management of disease and known pathogen transfer is important, both to maximise the health of translocated organisms and

²³² Turner Endangered Species Fund, *supra* note 230 (“Clarity is needed to ensure that an experimental population designation can be applied even when releases have already been conducted, regardless of the date of such releases. . . . Such reintroduction efforts are more likely to be initiated if the implementing entity (e.g., state wildlife agency) has assurance that if listing eventually occurs, the management latitude provided by ESA subsection 10(j) can be expected due to application of an experimental population designation immediately following the initial ESA listing action.”) *see also* Rewilding Inst. & Project Coyote, *supra* note 225, at 4.

²³³ Alaska Dep’t of Fish & Game, *supra* note 191.

²³⁴ *Id.*

²³⁵ *Id.*

²³⁶ Animal Legal Def. Fund, *supra* note 172, at 6.

to minimise the risk of introducing a new pathogen to the destination area.”²³⁷

The comments by Irrigation and Electrical Districts Association of Arizona recognize that ecological destruction and harm to native species can occur by introducing a non-native species outside its historical range.²³⁸ As an example, it notes that “[m]illions of dollars are spent . . . with the Adaptive Management Work Group to protect four species of fish,” whose survival is impacted by the introduction of non-native trout into the Colorado River.²³⁹ However, “what species is ‘native’ versus ‘invasive’ may not be so clear—especially as climate change continues to transform environments.”²⁴⁰ Similarly, the North Carolina Wildlife Resources Commission is concerned that there may be “serious repercussions on other species by increasing competition for resources, . . . altering habitats, and ultimately harming native, state trust species.”²⁴¹

The Oregon Department of Fish and Wildlife (ODFW) is especially concerned about the impact of non-native species on native non-focal species and habitat.²⁴² The ODFW maintains that the burden of proof should be on the FWS to show the lack of impact and argues that approval by state, local, and tribal entities should be required.²⁴³ The current language of 50 C.F.R. § 17.81(b)(1)–(4) requires consideration of (1) the effects on extant populations; (2) the likelihood of survival of the experimental population; (3) the effects on recovery of the species; and (4) the potential effects on the population from existing or anticipated Federal, State, or private actions “within or adjacent to the population area.”²⁴⁴ Furthermore, ESA section 10(j) “does not allow for designation of critical habitat for nonessential experimental populations,” thereby minimizing regulatory burdens.²⁴⁵

²³⁷ INT’L UNION FOR CONSERVATION OF NATURE, GUIDELINES FOR REINTRODUCTIONS AND OTHER CONSERVATION TRANSLOCATIONS § 5.1.6 (2013), <https://portals.iucn.org/library/efiles/documents/2013-009.pdf> [<https://perma.cc/PQX3-CU2V>] [hereinafter IUCN Guidelines].

²³⁸ Irrigation & Electrical Dists. Ass’n of Ariz., Comment Letter on Proposed Experimental Populations Rule (Aug. 8, 2022), https://downloads.regulations.gov/FWS-HQ-ES-2021-0033-0044/attachment_1.pdf [<https://perma.cc/F275-CEC5>].

²³⁹ *Id.*

²⁴⁰ Animal Legal Def. Fund, *supra* note 172, at 6.

²⁴¹ N.C. Wildlife Res. Comm’n, *supra* note 186, at 1.

²⁴² Or. Dep’t of Fish & Wildlife, *supra* note 187.

²⁴³ *Id.*

²⁴⁴ See 50 C.F.R. § 17.81(b)(1)–(4) (2021).

²⁴⁵ Alaska Dep’t. of Fish & Game, *supra* note 191.

This limitation, however, is deleted from 50 C.F.R. § 17.81(g) in the proposed revisions.²⁴⁶

Currently, 50 C.F.R. § 17.81(b) provides the mandate that the Secretary “shall utilize the best scientific and commercial data available” to consider the effects on the recovery of the species and on the populations from which the experimental population was derived.²⁴⁷ The FWS replaced the compulsory language “shall utilize” with “will use,” without offering a reason for that change.²⁴⁸ Although the FWS characterizes its word changes as “minor,” the term “shall consider” carries more mandatory weight than “will consider,” so the Sierra Club considers such change without explanation as arbitrary and capricious.²⁴⁹ The original clause stipulating that the FWS “shall utilize” best scientific data should be restored or should be changed to “must utilize.” If an experimental population is introduced outside its historical range, the Wildlife Society recommends that the Service “clearly describe how this population contributes to reaching recovery targets and how these introduced populations will be included in the delisting process.”²⁵⁰

D. Suitable Habitat Versus Habitat Necessary to Support One or More Life History Stages

In the proposed rule change for experimental populations, “suitable natural habitat” would be replaced with “habitat that is necessary to

²⁴⁶ See Proposed Experimental Populations Rule, 87 Fed. Reg. 34,625, 34,628 (June 7, 2022) (to be codified at 50 C.F.R. pt. 17).

²⁴⁷ 50 C.F.R. § 17.81(b) (2021).

²⁴⁸ Proposed Experimental Populations Rule, 87 Fed. Reg. at 34,628.

²⁴⁹ Sierra Club, Comment Letter on Proposed Experimental Populations Rule at 3 (Aug. 8, 2022), https://downloads.regulations.gov/FWS-HQ-ES-2021-0033-0490/attachment_1.pdf [<https://perma.cc/2KBF-UDTZ>] (noting that the term “will” is commonly used in contracts to refer to a future event or action and may result in ambiguity about whether an obligation or duty has been imposed. If the proposed change seeks to avoid the obsolete term “shall” while making clear that the provision is mandatory, a less ambiguous term would be “must.”); see also *Gutierrez de Martinez v. Lamagno*, 515 U.S. 417, 432 n.9 (1995) (adding to the ambiguity, the Supreme Court asserted in a footnote, “Though ‘shall’ generally means ‘must,’ legal writers sometimes use, or misuse, ‘shall’ to mean ‘should,’ ‘will,’ or even ‘may.’ See D. Mellinkoff, *Mellinkoff’s Dictionary of American Legal Usage* 402-403 (1992) (‘shall’ and ‘may’ are ‘frequently treated as synonyms’ and their meaning depends on context . . .”).

²⁵⁰ The Wildlife Soc’y, Comment Letter on Proposed Experimental Populations Rule at 2 (Aug. 8, 2022), https://downloads.regulations.gov/FWS-HQ-ES-2021-0033-0511/attachment_1.pdf.

support one or more life history stages” in the listing criteria.²⁵¹ The Natural Resources Defense Council (NRDC) recognizes that “[s]pecies often use different habitats for breeding, foraging, nesting, overwintering, or other life stages;” the NRDC therefore supports a rule change that reinforces the breadth of the FWS’s authority to designate a habitat that may be suitable for one, but not all, of the life history stages of a species.²⁵² The Northwest Indian Fisheries Commission, however, maintains that migratory and nonmigratory species should be differentiated regarding this standard, and the proposed habitat should be suitable to support all life stages for nonmigratory species as a prerequisite to introducing an experimental population.²⁵³

Several environmental groups prefer retaining the phrase “suitable natural habitat” or “suitable habitat.”²⁵⁴ The NRDC and Defenders of Wildlife prefer retaining the word “suitable” rather than “necessary,” as the former word is less limiting in scope and would help the FWS fulfill the broad conservation purpose compelled in the ESA.²⁵⁵ There is no evidence that Service biologists or policy-makers have had difficulty interpreting “suitable natural habitat,” and substituting it with “necessary to support one or more life history stages” introduces uncertainty.²⁵⁶ The Sierra Club believes that the FWS should keep the phrase “suitable . . . habitat” rather than replacing it with the requirement that the areas be “necessary to support” a life history stage,²⁵⁷ because they are concerned that a court could narrowly interpret the change as prohibiting the introduction of an experimental population until all areas in its current range are no longer able to support that life history stage or stages.²⁵⁸ The phrase “suitable habitat” may better comport with the Supreme Court’s requirement in *Weyerhaeuser* that critical habitat first must be “habitat”²⁵⁹ that is suitable without substantial modification, so perhaps the terms suitable

²⁵¹ Proposed Experimental Populations Rule, 87 Fed. Reg. 34,625, 34,626 (June 7, 2022) (to be codified 50 at C.F.R. § 17.81).

²⁵² NRDC, *supra* note 31, at 5.

²⁵³ Nw. Indian Fisheries Comm’n, Comment Letter on Proposed Experimental Populations Rule at 3 (Aug. 8, 2022), https://downloads.regulations.gov/FWS-HQ-ES-2021-0033-0529/attachment_1.pdf [<https://perma.cc/938E-8P5W>].

²⁵⁴ *See* Defs. Of Wildlife, *supra* note 39, at 4; *see also* NRDC, *supra* note 31, at 5.

²⁵⁵ *See* 50 C.F.R. § 17.81(a); *see also* NRDC, *supra* note 31, at 3, 5.

²⁵⁶ Defs. of Wildlife, *supra* note 39, at 4.

²⁵⁷ Sierra Club, *supra* note 249, at 2.

²⁵⁸ *Id.*

²⁵⁹ *See* *Weyerhaeuser Co. v. U.S. Fish & Wildlife Serv.*, 139 S. Ct. 361, 368 (2018).

and necessary should both be contained in any revision of the regulation, so it could read: habitat that is necessary to support one or more life history stages and is suitable for the conservation of the species.²⁶⁰

The U.S. Small Business Administration Office of Advocacy criticizes the proposed rule changes in part because it does not specify the circumstances in which species could be introduced outside their historical range, creating regulatory uncertainty for small businesses.²⁶¹ According to the comment by the Industrial Minerals Association–North America, the requirement that “little to no habitat remains within the historical range” is ambiguous, and the lack of context regarding the degree to which habitat needs to suffer damage is problematic.²⁶²

When the Biden administration rescinded the Trump administration’s definition of “habitat,” it justified this action, in part, by arguing that “it remains unclear how an area would be judged as containing or not containing all of the ‘resources and conditions’ that are ‘necessary to support’ a life process of the species.”²⁶³ The current proposal, nevertheless, includes very similar ambiguous language: “necessary to support one or more life history stages.”²⁶⁴ The Industrial Association of North America argues that this proposed criterion is also vague and in need of further clarity.²⁶⁵

To clarify that rules are developed for specific species, the experimental population proposal replaces “special” rules with “species-specific” rules in 50 C.F.R. §§ 17.82, 17.84, and 17.85.²⁶⁶ Since an experimental population shall be treated as a threatened species for purposes of establishing this experimental population, the Sierra Club is concerned that there will be fewer protections for experimental populations.²⁶⁷ It argues that clarification is needed to

²⁶⁰ Authors’ interpretation.

²⁶¹ U.S. Small Bus. Admin. Off. of Advoc., *supra* note 222, at 4.

²⁶² Indus. Mins. Ass’n – N. Am., Comment Letter on Proposed Experimental Populations Rule at 3 (Aug. 5, 2022), https://downloads.regulations.gov/FWS-HQ-ES-2021-0033-0291/attachment_1.pdf [<https://perma.cc/7G7B-DJUE>].

²⁶³ Endangered and Threatened Wildlife and Plants; Regulations for Listing Endangered and Threatened Species and Designating Critical Habitat, 87 Fed. Reg. 37,757, 37,759 (June 24, 2022).

²⁶⁴ *See* Proposed Experimental Populations Rule, 87 Fed. Reg. 34,625, 34,626 (June 7, 2022) (to be codified at 50 C.F.R. pt. 17).

²⁶⁵ Indus. Mins. Ass’n – N. Am., *supra* note 262, at 4.

²⁶⁶ Proposed Experimental Populations Rule, 87 Fed. Reg. at 34,626 (specifically changing 50 C.F.R. §§ 17.82, 17.84, 17.85).

²⁶⁷ *See* Sierra Club, *supra* note 249, at 4.

ensure that natural populations of endangered species and their offspring are not subject to relaxed ESA protections if they overlap experimental populations.²⁶⁸ The Center for Biological Diversity stresses “the importance of connectivity of populations to ensure their persistence” in recommending a change to section 17.81(c)(3) and urges deletion of the requirement that experimental populations be isolated from natural populations.²⁶⁹

E. Experimental Population Proposal Compliance with Other Regulatory Requirements

The FWS anticipates that a categorical exclusion from the National Environmental Policy Act (NEPA) analysis (43 C.F.R. § 46.210(i)) is likely to apply to the proposed changes, such that designation of experimental populations would not have to complete environmental assessments or environmental impact statements.²⁷⁰ In its proposal, the FWS maintains that the rule “will not have a significant economic impact on a substantial number of small entities” and that it “would not impose a cost of \$100 million or more in any given year on local or State governments or private entities.”²⁷¹ Determining the economic impact, however, is difficult, and the methodology is controversial.²⁷²

Several groups contend that a NEPA environmental review, including an Environmental Impact Statement, is necessary to ensure there is not unforeseen degradation of the habitat and there are not adverse consequences to native species and local landowners.²⁷³ The Catron County Board recommends that the Services examine both the context and intensity of the impact of the proposed action on the human environment, citing the significant impact of experimental populations of Mexican Grey wolves.²⁷⁴ The Catron County Board maintains that the FWS has failed to minimize the significant economic impact on

²⁶⁸ *Id.*

²⁶⁹ See Ctr. for Biological Diversity, *supra* note 35, at 5.

²⁷⁰ Proposed Experimental Populations Rule, 87 Fed. Reg. at 34,627.

²⁷¹ *Id.*

²⁷² See Sinden, *supra* note 132, at 129.

²⁷³ See, e.g., The Wildlife Soc’y, *supra* note 250, at 2; Catron Cnty., N.M. Bd. of Cnty. Comm’rs, Comment Letter on Proposed Experimental Populations Rule (June 7, 2022), https://downloads.regulations.gov/FWS-HQ-ES-2021-0033-0009/attachment_1.pdf [<https://perma.cc/RQ3V-P6UA>] (providing comments from a county directly impacted by the reintroduction of the Mexican gray wolf).

²⁷⁴ Catron Cnty., N.M. Bd. of Cnty. Comm’rs, *supra* note 273 (citing 40 C.F.R. § 1508.27).

small entities and that the FWS has violated Executive Order 12,630 (Government Actions Affecting Private Property), the Regulatory Flexibility Act (as amended by the Small Business Regulatory Enforcement and Fairness Act), the Unfunded Mandates Reform Act, and NEPA.²⁷⁵

Local organizations such as Catron County argue that the Unfunded Mandates Reform Act is violated because the FWS proposal fails to include local government input in the development of the regulatory changes.²⁷⁶ The Montana Natural Resource Coalition (MtNRC) also asserts that “novel” legal and policy issues are raised by the proposed rule, even if the economic threshold is not met, and that the proposed changes disproportionately affect small businesses.²⁷⁷ The MtNRC criticizes the FWS’s proposed changes to experimental populations rules because they lack specific examples of climate change or invasive species, and the MtNRC maintains that these rules should include an “administrative record for the peer reviewed scientific information, data, articles, and/or other substantive, high integrity, reproducible scientific information . . . and foreseeable impacts of the proposed Rule.”²⁷⁸ This lack of information makes it difficult for county governments to “understand the need, purpose, and foreseeable impacts of the proposed Rule.”²⁷⁹

Under the proposed rule, “local government entities” would be referred to as “local government agencies,” and Tribal governments would be included as affected governments with whom consultation would be required.²⁸⁰ The proposed rule adds the requirement that the FWS consult with persons holding an interest in water rights in addition to the current requirement that the FWS consult with persons holding interests in land; many comments support this change.²⁸¹ The

²⁷⁵ *Id.* See generally 5 U.S.C. §§ 601–612.

²⁷⁶ Catron Cnty., N.M. Bd. of Cnty. Comm’rs, *supra* note 273.

²⁷⁷ J.R. CARLSON, MONT. NAT. RES. COAL. SURVEY OF THE PROPOSED FISH AND WILDLIFE SERVICE ESA SECTION 10(J) HISTORICAL RANGE RULE 11, https://downloads.regulations.gov/FWS-HQ-ES-2021-0033-0517/attachment_1.pdf [<https://perma.cc/8HFW-D2Q8>].

²⁷⁸ *Id.* at 7.

²⁷⁹ *Id.* at 2 (criticizing the failure of the FWS to document economic and ecological impacts of the Proposed Rule on local and county entities).

²⁸⁰ Proposed Experimental Populations Rule, 87 Fed. Reg. 34,625, 34,626 (June 7, 2022) (to be codified at 50 C.F.R. pt. 17).

²⁸¹ See, e.g., Coal. of Ariz./N.M. Cntys. for Stable Econ. Growth, *supra* note 22, at 3; Defs. of Wildlife, *supra* note 39 at 1; The Wildlife Soc’y, *supra* note 250, at 4 (supporting the new requirement in 50 C.F.R. § 17.81(e) that the FWS consult with both “persons

Northwest Indian Fisheries Commission raises concerns regarding the potential impact on treaty-reserved resources and other listed species, given the lack of adequate resources of the FWS to meet the legal requirements for currently listed species.²⁸² The ODFW recommends that 50 C.F.R. section 17.81 include considerations about staff or financial resources and the ability “to predict likely ecological interactions . . . with other listed species or treaty-reserved resources.”²⁸³

State fish and wildlife agencies are often at the forefront of conservation measures and can request small federal grants to assist in implementing their wildlife action plans.²⁸⁴ Some local governmental agencies, such as the North Carolina Wildlife Resource Commission (NCWRC), request that “concurrence” from the state fish and wildlife agency be added before a species is introduced outside its historical range.²⁸⁵ The NCWRC asserts that “consultation” alone is insufficient to protect local interests and local species, and notes the potential serious repercussions on other species, including native state trust species.²⁸⁶ Comments from state fish and wildlife services emphasize the value of local expertise and necessity of timely input and cooperative agreement between the FWS and the state agencies.²⁸⁷ An Indiana University study recommends that governments implement an approach of “collaboratively crafted, practice-based conservation requirements [that] may improve the prospect for recovery [of the species], even if they are less stringent than the standard statutory prohibitions.”²⁸⁸ These steps need to be taken to avoid triggering resentment and economic hardship for private landowners, businesses, and local agencies.²⁸⁹

holding any interest in land or water that may be affected by the establishment of an experimental population” and Tribal governments).

²⁸² Nw. Indian Fisheries Comm’n, *supra* note 253.

²⁸³ *Id.*

²⁸⁴ Fischman et al., *supra* note 150, at 1040–41.

²⁸⁵ N.C. Wildlife Res. Comm’n, *supra* note 186.

²⁸⁶ *Id.* (recommending that regulatory language be added to the section 17.81 listing and recognizing the effect on species “that exist solely as a captive population”).

²⁸⁷ See, e.g., N.C. Wildlife Res. Comm’n, *supra* note 186; Alaska Dep’t of Fish & Game, *supra* note 191; Or. Dep’t of Fish & Wildlife, *supra* note 187.

²⁸⁸ Fischman et al., *supra* note 150, at 1055.

²⁸⁹ *Id.*

IV RECOMMENDATIONS

Climate change, invasive species, and alteration of habitat by human activity are making it difficult for many species to survive. It is essential that the FWS has the flexibility to introduce species or populations outside their historical range when all or most of that historical range is no longer “suitable” to support the species in one or more of its life historical stages.²⁹⁰ It also is essential, however, that the FWS consider the risks and impact of translocation of the species itself and its impact on plants and animal species endemic to the chosen site of relocation.²⁹¹ The FWS needs to monitor and assess such impacts and minimize parasites and diseases that could adversely affect either the translocated species or the species that are endemic to the newly designated area.²⁹² Because of immunosuppression from the stress of translocation, members of the experimental population may be more vulnerable to diseases.²⁹³ The introduction of the new species should not have substantial adverse impact on the balance between predators and prey in the designated land.²⁹⁴ The new location should be one that is not likely to soon experience similar climatic impacts or alterations that could make it unsuitable for the translocated species.

The proposed change to rule 50 C.F.R. § 17.81(a) for experimental populations would replace “suitable natural habitat” with “habitat that is necessary to support one or more life history stages” in the listing criteria.²⁹⁵ To make the distinction clearer, rule 17.81(a) should specify that an experimental population can be released into a habitat outside its current natural range if the habitat is “suitable to support one or more life history stages.”²⁹⁶ If the word “necessary” is used, it should be defined in the context being necessary for the conservation of the species, and the translocation should occur before the old habitat is

²⁹⁰ Proposed Experimental Populations Rule, 87 Fed. Reg. 34,625 (June 7, 2022) (to be codified at 50 C.F.R. § 17.81).

²⁹¹ IUCN Guidelines, *supra* note 237, at § 5.2, Annex 5.

²⁹² *Id.* at § 5.1.5.

²⁹³ See discussion in Am. Fisheries Soc’y, *supra* note 73, at 2–4.

²⁹⁴ *Id.* at 3–4; see generally Liz Fuller-Wright, *How Do New Predators Change an Ecosystem? Watch the Prey, Say Princeton Researchers*, PRINCETON UNIV. (June 10, 2019), <https://www.princeton.edu/news/2019/06/10/how-do-new-predators-change-ecosystem-watch-prey-say-princeton-researchers> [<https://perma.cc/LCY6-7L5Z>] (research supported by U.S. National Science Foundation grant).

²⁹⁵ Proposed Experimental Populations Rule, 87 Fed. Reg. 34,625 (June 7, 2022) (to be codified at 50 C.F.R. § 17.81).

²⁹⁶ Authors’ recommendation.

totally unsuitable for the species.²⁹⁷ Because the Supreme Court ruled in the *Weyerhaeuser* case that “critical habitat must first be habitat,”²⁹⁸ the word “suitable” better reflects that the habitat to which the FWS would move the experimental population qualifies as “habitat” because it is already “suitable” and would not require significant modification.²⁹⁹ This might allow an “experimental population” designation to be used to expand available habitat in the context of the *Weyerhaeuser* case.³⁰⁰

The FWS and the NMFS have good processes for assessing “critical habitat” and evaluating and implementing recovery plans for species³⁰¹ that should be incorporated in the development of guidelines for designating an “experimental population.”³⁰² The processes for translocation of listed species that “ensure ecological impacts on receiving ecosystems do not hinder conservation goals of both the species at issue and the other species in those ecosystems” are also beneficial.³⁰³ The IUCN Guidelines for Reintroductions and Other Conservation Translocations also should be examined in developing those systematic guidelines.³⁰⁴ Measures for designating and implementing translocation of an experimental population of an ESA listed species or population should consider the following variables.³⁰⁵

- (1) Consider climate change impact as the focal determinant for designating an endangered or threatened species as an “essential” experimental population,³⁰⁶ and establish procedures for evaluating the impact of climate change.³⁰⁷ Since climate change

²⁹⁷ Authors’ recommendation.

²⁹⁸ *Weyerhaeuser Co. v. U.S. Fish & Wildlife Serv.*, 139 S. Ct. 361, 368 (2018).

²⁹⁹ Authors’ recommendation.

³⁰⁰ Authors’ recommendation.

³⁰¹ See MISS. FIELD OFF. OF U.S. FISH & WILDLIFE SERV., *supra* note 83; see also MISS. FIELD OFF. OF U.S. FISH & WILDLIFE SERV., DUSKY GOPHER FROG RECOVERY PLAN (2015), [https://ecos.fws.gov/docs/recovery_plan/2015_07_16_Final%20RP_R_sevosa_08212015%20\(1\).pdf](https://ecos.fws.gov/docs/recovery_plan/2015_07_16_Final%20RP_R_sevosa_08212015%20(1).pdf) [<https://perma.cc/ULG4-6C5R>].

³⁰² Authors’ recommendation.

³⁰³ *Defs. of Wildlife*, *supra* note 39, at 4.

³⁰⁴ See IUCN Guidelines, *supra* note 237.

³⁰⁵ See *Defs. of Wildlife*, *supra* note 39, at 5; see also Am. Fisheries Soc’y, *supra* note 73.

³⁰⁶ Authors’ recommendation for revising 50 C.F.R. § 17.80(b); accord SAPIENZA & LI, *supra* note 169.

³⁰⁷ Accord with *Wentz*, *supra* note 73, at 1089 (recommending that “FWS and NMFS should introduce procedures whereby listing decisions, habitat designations, and recovery plans are periodically reviewed and revised in light of new scientific data on climate

is the primary justification for designating habitat outside the species' historical range, it should be specified in the regulation itself.

- (2) Specify that an experimental population can be released into a habitat outside its current natural range if the habitat is "suitable to support one or more life history stages" and "necessary" for the conservation of the species in one or more of its life stages.³⁰⁸ Under this rationale, the FWS would first determine whether the habitat is "necessary" for the survival or conservation of the species in one of its life stages.³⁰⁹ The FWS then can assess whether modifications are needed to make the habitat "suitable" for the species, with or without modification.³¹⁰
- (3) Consider the cumulative effects of multiple stressors to justify the introduction of experimental populations beyond their historical range.³¹¹ The cumulative effects should be specified as a justification for the proposed regulation, included in the regulatory language, and considered with the translocation proposal.³¹²
- (4) Establish risk assessment tools to maximize conservation success and minimize undesired impacts on species and ecosystems to which they are translocated.³¹³ Establish mechanisms for monitoring the translocated populations and the impact on the recipient ecosystem. The impact of removing those individuals from that population should also be assessed, especially if the population from which the experimental population was derived was small.³¹⁴

change."); see J.R. CARLSON, MONT. NAT. RES. COAL. SURVEY OF THE PROPOSED FISH AND WILDLIFE SERVICE ESA SECTION 10(J) HISTORICAL RANGE RULE 11, *attached to* Mont. Nat. Res. Coal., Comment Letter on Proposed Experimental Populations Rule (Aug. 5, 2022), https://downloads.regulations.gov/FWS-HQ-ES-2021-0033-0517/attachment_1.pdf [<https://perma.cc/TD3J-WUDU>].

³⁰⁸ See Proposed Experimental Populations Rule, 87 Fed. Reg. 34,625 (June 7, 2022) (to be codified at 50 C.F.R. § 17.81). Authors' recommendation is that the term "suitable" (used in the current regulation) be retained and paired with the proposed language "to support one or more life history stages."

³⁰⁹ Authors' recommendation.

³¹⁰ Authors' recommendation.

³¹¹ See Am. Fisheries Soc'y, *supra* note 73 at 3–5.

³¹² See generally Ben J. Novak et al., *U.S. Conservation Translocations: Over a Century of Intended Consequences*, 3 CONSERVATION SCI. & PRAC. 4 (Apr. 2021); see also Wentz, *supra* note 73, at 1090–91.

³¹³ See generally IUCN Guidelines, *supra* note 237.

³¹⁴ *Id.* See also Am. Fisheries Soc'y, *supra* note 73 at 3–5.

- (5) Determine how species should be prioritized for translocation, given that there are resource limitations of the Services.³¹⁵ Establish translocation mechanisms for release and implementation, determining if they should differ for experimental populations and nonexperimental populations.³¹⁶
- (6) Reevaluate the requirement that experimental populations remain wholly separate from other natural populations to facilitate more genetic interchange and to reflect the practical reality that animals move in ways that do not reflect the legal distinctions.³¹⁷ An experimental population is generally treated as a threatened species on private land.³¹⁸ If an experimental population becomes commingled with native populations, however, it should be protected by the set of rules that provide greater protection.³¹⁹ In other words, if the native population is listed as endangered and the populations interbreed, the offspring should be treated as “endangered” rather than merely “threatened.”³²⁰
- (7) Improve the process for consultation with state and local agencies and Tribes and for receiving input early in the planning process from affected federal programs and businesses and landowners impacted by the translocation.³²¹

A collaborative approach toward conservation best practices may benefit a species that is introduced into a new habitat as an experimental population. Therefore, the FWS should encourage conservation benefit agreements such as Safe Harbor Agreements, CCAAs, or HCPs with landowners who implement voluntary practices to benefit at-risk and newly introduced listed species on their property.³²² Such agreements should be allowed and encouraged when

³¹⁵ Authors’ recommendation; *see generally* Novak et al., *supra* note 312.

³¹⁶ *See generally* IUCN Guidelines, *supra* note 237, Annex 6.

³¹⁷ SAPIENZA & LI, *supra* note 169.

³¹⁸ 50 C.F.R. § 17.82 (2021).

³¹⁹ Authors’ recommendation. *Accord* Ctr. for Biological Diversity, *supra* note 35, at 5.

³²⁰ Authors’ recommendation.

³²¹ *See* Proposed Experimental Populations Rule, 87 Fed. Reg. 34,625 (June 7, 2022) (to be codified at 50 C.F.R. § 17.81(d)).

³²² *See generally* U.S. FISH & WILDLIFE SERV., SAFE HARBOR AGREEMENTS, <https://www.fws.gov/service/safe-harbor-agreements> [<https://perma.cc/YMM5-22AK>] (last visited Mar. 4, 2023) (recognizing that Safe Harbor Agreements are traditionally created prior to the listing of a species). *See also* Endangered and Threatened Wildlife and Plants; Enhancement of Survival and Incidental Take Permits, 88 Fed. Reg. 8380 (Feb. 9, 2023).

a listed species is translocated as an experimental population. The process of introducing an experimental population should involve consultation, but not veto power, by local agencies and parties whose interests and economies are potentially affected by the introduction of the experimental population.³²³ As species and their habitats face increasing risks associated with climate change impacts or invasive species, the success of the translocation of a species would be better facilitated through cooperative efforts.³²⁴

The Department of Interior is proposing to strengthen voluntary conservation opportunities for both listed and non-listed species by simplifying the “the requirements for enhancement of survival permits by combining safe harbor agreements and candidate conservation agreements with assurances into one agreement type” (to be called conservation benefit agreements).

³²³ Authors’ recommendation.

³²⁴ Authors’ recommendation.

APPENDIX I
ADAPTING HABITAT FOR THE
DUSKY GOPHER FROG AND GOPHER TORTOISE

When longleaf pine forests were prevalent in the southeastern United States in the early 1900s, the dusky gopher frog lived throughout Mississippi, coastal Alabama and Louisiana, and southern North Carolina.³²⁵ More than 98% of these forests have been logged or removed to facilitate urban development or timber plantations that consist of faster-growing loblolly pines that are planted closer together.³²⁶ This resulting closed-canopy forest is not suitable for the vegetation or dynamics needed for the survival of the dusky gopher frog and gopher tortoise.³²⁷ To restore the habitat, low-intensity “controlled” or “prescribed” burns are necessary every two to three years to burn off the shrubs and allow emergence of herbaceous vegetation.³²⁸ The burns scorch the lower trunks of the longleaf pine trees,³²⁹ but do not kill mature trees, while opening the soil for additional pine trees seedlings and savannah grass to grow.³³⁰ Oaks and other shade trees may have to be removed, as well as invasive species such as Cogongrass, Chinese privet, and Chinese tallow tree.³³¹ These invasive species “disrupt[] the natural balance of an ecosystem by shading native vegetation and releasing toxins into the soil, making it difficult for native plants to grow.”³³² Prescribed fires typically are conducted after the breeding season for dusky gopher frogs, when the ponds have dried up and the burns help lower the pH in the breeding

³²⁵ *Gopher Frog Conservation Plan for North Carolina*, N.C. WILDLIFE RES. COMM’N 1, 5 (2020), <https://www.ncwildlife.org/Portals/0/Learning/documents/Profiles/Amphibians/Gopher-Frog-Conservation-Plan-2020-FINAL.pdf> [https://perma.cc/B9QU-ASGR] [hereinafter N.C. Conservation Plan].

³²⁶ *Id.*

³²⁷ *Weyerhaeuser*, 139 S. Ct. at 368; *see also* Jim Lee Interview, *supra* note 28.

³²⁸ Jim Lee Interview, *supra* note 28.

³²⁹ *Id.* In Florida, the native longleaf pine is one of the most successful trees in withstanding the hurricanes.

³³⁰ Jim Lee Interview, *supra* note 28. The roots of the berry bushes usually survive the fire and so those bushes reemerge after the fire. At Camp Shelby, herbicides have also been applied directly on the undesired shrubs that The Nature Conservancy is trying to eliminate from the ecosystem.

³³¹ *Pascagoula River Watershed*, THE NATURE CONSERVANCY, <https://www.nature.org/en-us/get-involved/how-to-help/places-we-protect/pascagoula-river-watershed-conservation-profile/> [https://perma.cc/7WAD-MYMR].

³³² *Id.*

ponds.³³³ The savannah grass that emerges in this open canopy is the staple diet for the gopher tortoise; the dusky gopher frog attaches its eggs to the savannah grass in the ephemeral ponds.³³⁴

Figure 2. *Longleaf Pine Forest – Controlled Burn*



Source: Carol Miller³³⁵

The gopher tortoise is the keystone animal in the longleaf pine forest ecosystem with a historical range in Mississippi, Louisiana, Alabama,

³³³ See N.C. Conservation Plan, *supra* note 325, at 9.

³³⁴ Jim Lee Interview, *supra* note 28.

³³⁵ Carol Miller, Photograph of longleaf pine forest after controlled burn at Camp Shelby, Mississippi (2022).

Florida, Georgia, and South Carolina.³³⁶ It is the only one of the five North American tortoise species that lives east of the Mississippi River.³³⁷ The gopher tortoise has experienced an 80% decline in its population over the past one hundred years due to habitat loss, habitat fragmentation, construction of dams, agriculture, urbanization, and road kill.³³⁸ Within its range, the western gopher tortoise population is listed as a threatened species under the ESA, but the eastern populations are candidate species, whose listing is warranted, but precluded by higher priority listings.³³⁹ In Florida, the gopher tortoise is a state-designated threatened species, and in Mississippi, it is a state-designated endangered species.³⁴⁰ Consequently, in 2006, the Mississippi Military Department (implemented through The Nature Conservancy facility at Camp Shelby) established the Gopher Tortoise Head Start Program in collaboration with the United States FWS, United States Forest Service, Mississippi Natural Heritage Program and the Mississippi Department of Wildlife, Fisheries and Parks.³⁴¹

Tortoises are herbivorous, so they also eat legumes, gopher apples, and other broadleaf grasses.³⁴² Tender savannah grass is the staple diet

³³⁶ See *Gopher Tortoise* (*Gopherus polyphemus*), U.S. FISH & WILDLIFE SERV. ECOS ENV'T CONSERVATION ONLINE SYS., <https://ecos.fws.gov/ecp/species/6994> [<https://perma.cc/ZU6M-LVN6>] (last visited Sept. 15, 2022); see also Eddie Robertson, *Endangered Gopher Tortoises Released into the Wild at Camp Shelby*, WLOX (Sept. 9, 2020), <https://www.wlox.com/2020/09/10/endangered-gopher-tortoises-released-into-wild-camp-shelby/> [<https://perma.cc/PF5Y-WYHP>].

The gopher tortoise (*Gopherus polyphemus*) species is in the *Testudinidae* family and can live 40 to 70 years in the wild and 86 to 100 years in captivity. See *Gopherus polyphemus (Florida) Gopher Tortoise*, UNIV. OF MICH. MUSEUM OF ZOOLOGY ANIMAL DIVERSITY WEB, https://animaldiversity.org/accounts/Gopherus_polyphemus/ [<https://perma.cc/95X3-ZEMA>].

³³⁷ *Gopher Tortoise*, FLA. FISH & WILDLIFE CONSERVATION COMM'N, [https://myfwc.com/wildlifehabitats/profiles/reptiles/gopher-tortoise/#:~:text=Gopher%20tortoises%20can%20live%2040,and%20latitude%20\(Ernst%20et%20al](https://myfwc.com/wildlifehabitats/profiles/reptiles/gopher-tortoise/#:~:text=Gopher%20tortoises%20can%20live%2040,and%20latitude%20(Ernst%20et%20al) [<https://perma.cc/86AN-NM27>] (last visited Mar. 4, 2023).

³³⁸ *Gopher Tortoise*, THE NATURE CONSERVANCY (June 30, 2022), <https://www.nature.org/en-us/get-involved/how-to-help/animals-we-protect/gopher-tortoise/> [<https://perma.cc/3B3H-26N5>].

³³⁹ Endangered and Threatened Wildlife and Plants; 12-Month Finding on a Petition to List the Gopher Tortoise as Threatened in the Eastern Portion of Its Range, 76 Fed. Reg. 45,129 (July 27, 2011); see also U.S. FISH & WILDLIFE SERV. ECOS ENV'T CONSERVATION ONLINE SYS., *supra* note 336.

³⁴⁰ FLA. FISH & WILDLIFE CONSERVATION COMM'N, *supra* note 337.

³⁴¹ Robertson, *supra* note 336.

³⁴² *Gopher Tortoise* (*Gopherus polyphemus*), FLA. FISH & WILDLIFE CONSERVATION COMM'N 1, 2, <https://myfwc.com/media/19512/gt-specprofile.pdf> [<https://perma.cc/E3ZS-6L6Y>] (last visited Mar. 4, 2023).

of the gopher tortoises, but they also enjoy fruits (such as blueberries).³⁴³

The gopher tortoise is the keystone species in the longleaf pine forest because as many as 350 species, including the gopher frog, share the burrow with the tortoise or occupy abandoned burrows.³⁴⁴ Burrows provide these species with shelter from fire, storms, and predators.³⁴⁵ The gopher tortoise digs long branching burrows which can be six to ten feet deep and fifteen to forty feet long; the front feet of the tortoise are uniquely designed for shoveling out a burrow.³⁴⁶ Most of the burrows are in upland habitat, making them less prone to flooding and contain air pockets, according to Jim Lee, biologist for The Nature Conservancy at Camp Shelby, Mississippi.³⁴⁷ Tortoises prefer well-drained, sandy soils and they spend a lot of time in the burrows that maintain more constant temperatures, which is important because tortoises are ectotherms who depend on the environment to regulate their body temperature.³⁴⁸

The gopher tortoise digs a hole in front of its burrow (called a burrow apron), in which she lays her eggs, and covers the eggs with the sandy soil. Typically, a tortoise deposits the eggs between May through July, and the eggs hatch approximately one hundred days after they are

³⁴³ Jim Lee Interview, *supra* note 28. Blueberries were fed to young tortoises while we observed them at the Camp Shelby facility.

³⁴⁴ Elizabeth Roznik & Steve Johnson, *Gopher Frogs, Burrows, and Fire: Interactions in the Longleaf Pine Ecosystem*, UNIV. OF FLA. IFAS EXTENSION, <https://edis.ifas.ufl.edu/publication/UW295> [<https://perma.cc/69Q7-BN37>].

³⁴⁵ *Id.*; see also *Wildlife Conservation: Basic Facts About Gopher Tortoises*, GOPHER TORTOISE SERVS., INC., <https://www.gophertortoise.org/tortoise/facts.htm> [<https://perma.cc/2XUG-P8B7>] (last visited Sept. 16, 2022). Species that use the gopher tortoise burrows for shelter include the dusky gopher frog, other toads, snakes, mice, rabbits, lizards, burrowing owls, and even opossums, skunks, armadillos, and quail. The black pine snake (ESA threatened candidate) also lives in the longleaf pine forest. Jim Lee Interview, *supra* note 28.

³⁴⁶ Jim Lee Interview, *supra* note 28. In the Florida longleaf pine forests, the Carolina gopher tortoises' burrows can be forty to eighty feet, due to the softer terrain. The dusky gopher frog, however, is not inhabiting the Florida terrain; see also Jim Lee Video, *Our Gopher Tortoise Head Start Program at Camp Shelby*, FACEBOOK: THE NATURE CONSERVANCY IN MISS. (Dec. 2, 2021, 1:00 PM), <https://m.facebook.com/MississippiTNC/videos/our-gopher-tortoise-head-start-program-at-camp-shelby-allows-the-gopher-tortoise/232604542311711/> [<https://perma.cc/NBV9-BFUY>] [hereinafter Jim Lee Video].

³⁴⁷ E-mail from Jim Lee, Biologist, The Nature Conservancy, to Carol Miller (Aug. 31, 2022) (on file with author). Jim Lee is the lead biologist at Camp Shelby for The Nature Conservancy in charge of the "head start" program for the gopher tortoise and dusky gopher frog.

³⁴⁸ FLA. FISH & WILDLIFE CONSERVATION COMM'N, *supra* note 337.

deposited.³⁴⁹ A female lays one clutch of five to nine ping pong ball-sized eggs per year in the burrow apron at the entrance of her burrow.³⁵⁰ The surrounding temperature of the soil influences the distribution of males and females rather than the sex being predetermined at the time the eggs are laid.³⁵¹ Rainfall just prior to hatching may increase the survival of the hatchlings, as it is easier for the hatchlings to push through wet soil.³⁵² Otherwise, only about 25% to 30% of the eggs hatch and the tortoise hatchlings have only a 10% chance of survival within its first year.³⁵³ To address this conundrum, The Nature Conservancy is raising gopher tortoise hatchlings in its lab to increase the tortoises’ chance of survival.³⁵⁴ The Nature Conservancy’s primary Head Start Program of raising and then releasing two-year-old gopher tortoises has had a 70% survival rate among more than four hundred tortoises they have released.³⁵⁵ Importantly, the two-year-olds are the size of the wild six to eight-year-olds, so they will be able to reproduce sooner and are large enough that they will not be predated by snakes.³⁵⁶

As a juvenile (2.5 to 5 inches), the gopher tortoise has yellow bony plates (scutes) encircled by black markings, but as the tortoise matures, its shell and skin become darker.³⁵⁷ If it reaches adulthood (9 to 11 inches), the gopher tortoise may live for forty to seventy years in the wild.³⁵⁸ It generally takes eighteen years for a male and twenty-five

³⁴⁹ Jim Lee Interview, *supra* note 28 (noting the range is 80 to 110 days).

³⁵⁰ FLA. FISH & WILDLIFE CONSERVATION COMM’N, *supra* note 337.

³⁵¹ Jim Lee Interview, *supra* note 28.

³⁵² Jim Lee Interview, *supra* note 28; *see also* e-mail from Jim Lee, *supra* note 347.

³⁵³ THE NATURE CONSERVANCY, *supra* note 338; *see also* Jim Lee Video, *supra* note 346.

³⁵⁴ Jim Lee Interview, *supra* note 28; *see* FACEBOOK: THE NATURE CONSERVANCY IN MISS., *supra* note 346; *see also* *Gopher Tortoises Released at Camp Shelby*, YOUTUBE: MISS. DEP’T OF WILDLIFE, FISHERIES, & PARKS (Oct. 16, 2017), <https://www.youtube.com/watch?v=LbDCPH3zVSs> [<https://perma.cc/975Q-JLVF>].

³⁵⁵ Jim Lee Interview, *supra* note 28; *see* FACEBOOK: THE NATURE CONSERVANCY IN MISS., *supra* note 346; *see also* YOUTUBE: MISS. DEP’T OF WILDLIFE, FISHERIES, & PARKS, *supra* note 354.

³⁵⁶ *Id.*

³⁵⁷ *How to Identify a Gopher Tortoise*, FLA. FISH & WILDLIFE CONSERVATION COMM’N, <https://myfwc.com/education/wildlife/gopher-tortoise/tortoise-id/> [<https://perma.cc/EHD9-65VS>].

³⁵⁸ *Gopher Tortoise*, NAT’L GEOGRAPHIC (last visited Mar. 4, 2023), <https://www.nationalgeographic.com/animals/reptiles/facts/gopher-tortoise?loggedin=true&rnd=1668131277485> [<https://perma.cc/29Z5-A4CS>]; *see also* *Wildlife Conservation: Basic Facts About Gopher Tortoises*, *supra* note 345 (recognizing that some gopher tortoises can live one hundred years in captivity).

years for a female tortoise to reach sexual maturity. The Nature Conservancy at Camp Shelby, however, is studying whether sexual maturity is more a matter of size than years, as a five-year-old tortoise raised in captivity (with a steady food source) is much larger than its wild counterpart.³⁵⁹ In 2020, through its Head Start Program, The Nature Conservancy released five six-year-old tortoises that it had hatched and raised in the lab, at which time they showed secondary characteristics of being sexually mature.³⁶⁰ These tortoises quickly found abandoned burrows and adapted to living in the wild.³⁶¹ If these tortoises can survive and reproduce at a younger age, it will help restore the population more quickly.³⁶²

³⁵⁹ Jim Lee Interview, *supra* note 28.

³⁶⁰ *Jim Lee Talks About Gopher Tortoises*, FACEBOOK: THE NATURE CONSERVANCY IN MISS. (Sept. 11, 2020), <https://sw-ke.facebook.com/MississippiTNC/videos/jim-lee-talks-about-gopher-tortoises/413227662995766/>.

³⁶¹ *Id.*

³⁶² *Id.*

Figure 3. 5-Year-Old Gopher Tortoises – Head Start Versus Wild



Source: Carol Miller³⁶³

³⁶³ Carol Miller, Photograph of three gopher tortoises at Camp Shelby, Mississippi, comparing size of lab-raised tortoises and wild tortoises, all of which were four to five-years-old. Jim Lee Interview, *supra* note 28. They were all the same age, but the larger one was raised at Camp Shelby and the two smaller ones were brought in from the forest; those in the wild had to expend more energy to survive, and thus grew less quickly.

Figure 4. *Gopher Tortoise Near Its Burrow*



Source: Carol Miller³⁶⁴

³⁶⁴ Carol Miller, Photograph of adult gopher tortoise raised in the Nature Conservancy lab, now living in the wild, at Camp Shelby, Mississippi.

Figure 5. *Juvenile Gopher Tortoise*



Source: Carol Miller³⁶⁵

³⁶⁵ Carol Miller, Photograph of young lab-raised gopher tortoise at Camp Shelby, Mississippi.

Figure 6. *Gopher Tortoise Burrow*



Source: Carol Miller³⁶⁶

³⁶⁶ Carol Miller, Photograph of gopher tortoise burrow in longleaf forest at Camp Shelby, Mississippi.

The dusky gopher frog³⁶⁷ is listed as endangered under the ESA,³⁶⁸ as “near threatened” by IUCN, and G3-Vulnerable by NatureServe.³⁶⁹ The dusky gopher frog has a particular habitat preference for stump holes, burned out stumps, or small mammal burrows, with the holes being not much larger than the frog.³⁷⁰ Dusky gopher frogs also inhabit burrows and prefer cohabiting with the gopher tortoise.³⁷¹ The burrows provide some protection from predators such as snakes, racoons, and owls, as well as helping them stay moist, which is essential to their survival. At night, they may temporarily leave the burrow to search for their prey—crickets, beetles, flies, and pink mice.³⁷²

In the mid-1990s, the longest known distance between breeding ponds used by dusky gopher frogs and burrows they inhabited was 299 meters, but after United States Forest Service habitat restorations, distances of up to two thousand meters have been observed.³⁷³ The Florida gopher frog subspecies may travel from one to three miles from a breeding pond to a burrow.³⁷⁴

The dusky gopher frog “is noted for covering its eyes with its front legs when it feels threatened, peeking out periodically until danger

³⁶⁷ See, e.g., Final Rule to List the Mississippi Gopher Frog Distinct Population Segment of Dusky Gopher Frog as Endangered, 66 Fed. Reg. 62,993 (Dec. 4, 2001) (scientific name *Lithabardia sabosis* but more commonly referred to in concept reference as the *Rana capito* (for small populations in Alabama, Florida, or North Carolina) or *Rana sevosa* (for the Mississippi population)).

³⁶⁸ *Id.*

³⁶⁹ See U.S. Dept. of Defense, Legacy Resource Management Program Recommended Best Management Practices for the Gopher Frog on Department of Defense Installations (Dec. 17, 2018) at 5 https://www.denix.osd.mil/dodparc/denix-files/sites/36/2018/12/Recommended-BMPs_Gopher-Frog_Final2_Dec_2018_cleared_508-1.pdf [<https://perma.cc/KDW7-Z5RY>] [hereinafter Dept. of Defense Mgmt. Practices].

³⁷⁰ See Endangered and Threatened Wildlife and Plants; Final Rule to List the Mississippi Gopher Frog Distinct Population Segment of Dusky Gopher Frog as Endangered, 66 Fed. Reg. 62,993–94 (Dec. 4, 2001); accord telephone interview with John Tuby, Biologist, U.S. Fish & Wildlife Serv. Ecological Serv.’s (Sept. 30, 2022). See also *Dusky Gopher Frog* (*Rana sevosa*) *Recovery Plan*, U.S. FISH & WILDLIFE SERV.; MISS. FIELD OFF. 1, 21 (2015), [https://ecos.fws.gov/docs/recovery_plan/2015_07_16_Final%20RP_R_sevosa_08212015%20\(1\).pdf](https://ecos.fws.gov/docs/recovery_plan/2015_07_16_Final%20RP_R_sevosa_08212015%20(1).pdf) [<https://perma.cc/ETS2-2B7Z>]; see also Laurie Walden, *Carolina Gopher Frog*, S.C. WILDLIFE FED’N (Apr. 1, 2017), <https://www.scwf.org/carolina-gopher-frog> [<https://perma.cc/TTM5-A4T3>] (clearing the landscape of stump holes hinders the ability of the frog to find suitable habitat).

³⁷¹ Jim Lee Interview, *supra* note 28.

³⁷² *Id.*

³⁷³ *Id.*

³⁷⁴ *Id.*

passes.”³⁷⁵ This defensive behavior is called the unken reflex, which involves curling inward and covering its eyes with its forefeet when it feels threatened and peeking out periodically until danger passes, usually after a predator comes into contact with the bitter secretion on the frog’s skin.³⁷⁶

Figure 7. *Unken Reflex of Dusky Gopher Frog*



Source: Jeff Humphries³⁷⁷

Dusky gopher frogs breed in ephemeral ponds that are dry part of the year, keeping the eggs safe from fish predators.³⁷⁸ The male frog makes a “snoring” sound to attract the female and sits on her to push out the eggs, which he then fertilizes.³⁷⁹ Females try to hold on to savannah grass or other emergent herbaceous vegetation to keep from

³⁷⁵ *Weyerhaeuser*, 139 S. Ct. at 365.

³⁷⁶ N.C. Conservation Plan, *supra* note 325.

³⁷⁷ See Humphries, *supra* note 8.

³⁷⁸ See Designation of Critical Habitat for Dusky Gopher Frog, 77 Fed. Reg. 35,117, 35,129–31 (June 12, 2012). Therefore, conversion of wetland with ephemeral ponds to regular ponds with fish (that would eat the frog eggs and tadpoles) is also a habitat destruction problem. See also MISS. FIELD OFF. OF U.S. FISH & WILDLIFE SERV., *supra* note 301, at 1.

³⁷⁹ Jim Lee Interview, *supra* note 28.

drowning and to ensure the eggs will attach to the vegetation.³⁸⁰ The egg mass contains 500 to 2,800 eggs, which hatch in nine to twenty-one days.³⁸¹ Dusky gopher frogs normally breed once a year in Mississippi during the rainy season, typically in late winter or spring.³⁸² Rainy conditions at different times of the year can facilitate additional breeding cycles for the frogs, as occurred in August of 2022.³⁸³ From May through July, tadpoles mature to the metamorphose stage, leaving the ponds as young juvenile frogs.³⁸⁴ Newly metamorphosed frogs also face difficulty in finding bugs that are small enough to eat.³⁸⁵ At this stage, the animals commonly eat adult common fruit flies and cricket larvae.³⁸⁶ This is a critical period for the young frogs when mortality is the highest—one study found that only 12.5% of metamorphosed dusky gopher frogs survived their first month as they searched for a burrow, with snakes as their primary predator.³⁸⁷ A 76% survival rate can be achieved if the frog’s eggs are taken to the lab, raised through the tadpole stage, and juveniles then are released near burrows, instead of near ponds.³⁸⁸ If burrows are near the breeding pond, survival rates increase substantially for frogs that make it to a burrow, with those frogs experiencing only a 4% mortality rate in the first month.³⁸⁹

³⁸⁰ *Id.*

³⁸¹ See MISS. FIELD OFFICE OF U.S. FISH & WILDLIFE SERV., *supra* note 301, at 8.

³⁸² Jim Lee Interview, *supra* note 28.

³⁸³ E-mail from Jim Lee, *supra* note 347. This also makes the soil softer, so it is easier for the tortoise hatchlings to break through the soil.

³⁸⁴ Jim Lee Interview, *supra* note 28. When the Nature Conservancy takes a portion of the eggs to raise in captivity at Camp Shelby to give the frogs a “head start,” the metamorphosed frog is reintroduced to the longleaf pine forest ecosystem shortly after losing its tadpole tail.

³⁸⁵ *Id.*

³⁸⁶ See Means, *supra* note 8 (studying fifty ephemeral ponds in Florida). The Florida gopher frog is more common than the Mississippi dusky gopher frog, but is a Florida state-listed Species of Special Concern. *Id.* at 19. It inhabits the Western part of the Florida panhandle. Ephemeral ponds are essential to the survival of fourteen amphibian species in Florida, including a gopher frog. Due to the cyclic nature of drying and filling, ephemeral ponds are unable to support populations of predatory fish.

³⁸⁷ Elizabeth Roznik & Steve A. Johnson, *Burrow Use and Survival of Newly Metamorphosed Gopher Frogs* (*Rana capito*), 43 JHERPETOLOGY 431–37 (2009).

³⁸⁸ See Elizabeth Roznik & S.B. Reichling, *Survival, Movements and Habitat Use of Captive-Bred and Reintroduced Dusky Gopher Frogs*, 24 ANIMAL CONSERVATION 51, 55 (2021), https://www.researchgate.net/publication/341435805_Survival_movements_and_habitat_use_of_captive-bred_and_reintroduced_dusky_gopher_frogs [<https://perma.cc/UUV4L-9JMG>].

³⁸⁹ Roznik & Johnson, *supra* note 387.

It takes twelve months for dusky gopher frog males to reach sexual maturity and eighteen to twenty-four months for females.³⁹⁰ If they survive predation, disease, and weather, dusky gopher frogs typically live for five to eight years in Mississippi,³⁹¹ and the Carolina gopher frog can live as long as nine to fifteen years.³⁹² Other studies indicate that the Mississippi adult frogs can live nine to twelve years, but that only one-fourth of the males live longer than three years, and only one-third of the females live longer than five years, minimizing their opportunities to breed multiple times.³⁹³

Figure 8. *Juvenile Dusky Gopher Frog*



Source: Carol Miller³⁹⁴

³⁹⁰ Jim Lee Interview, *supra* note 28.

³⁹¹ *Id.*

³⁹² N.C. Conservation Plan, *supra* note 325, at 6.

³⁹³ See MISS. FIELD OFF. OF U.S. FISH & WILDLIFE SERV., *supra* note 301, at 10.

³⁹⁴ Photograph of dusky gopher frog taken by author Carol Miller at Camp Shelby, Mississippi (May 25, 2022).

Figure 9. *Metamorphosing Dusky Gopher Frog*



Source: Carol Miller³⁹⁵

The dusky gopher frog once inhabited the lower coastal plain ranging from the Mississippi River in Louisiana to the Mobile River delta of Alabama and into southern North Carolina.³⁹⁶ From 1987–1988, forty-two ponds in six Mississippi counties were identified.³⁹⁷ When the dusky gopher frog was designated as an ESA federally

³⁹⁵ *Id.* (showing metamorphosis from tadpole to frog).

³⁹⁶ *See, e.g.*, Endangered and Threatened Wildlife and Plants; Final Rule to List the Mississippi Gopher Frog Distinct Population Segment of Dusky Gopher Frog as Endangered, 66 Fed. Reg. 62,993 (Dec. 4, 2001) (scientific name *Lithabadia sabosis* but more commonly referred to in concept reference as the *Rana capito* (for small populations in Alabama, Florida, or North Carolina) or *Rana sevosa* (for the Mississippi population)).

³⁹⁷ *Id.* at 62,995.

endangered species in 2001,³⁹⁸ Glen's Pond³⁹⁹ and Old Fort Bayou Pond in southern Mississippi were the only remaining habitats and may have contained as few as one hundred adult frogs.⁴⁰⁰ In 2010, the FWS proposed designation of four sites as occupied critical habitat that had ephemeral ponds, open-canopy longleaf pine forests, and burrows needed as habitat for the frog.⁴⁰¹ By 2018, the one breeding population was expanded to six, according to The Nature Conservancy biologists.⁴⁰² In 2022, biologist Jim Lee explained that during the past eighteen years, habitat has been adapted in four southern Mississippi counties, primarily in the De Soto National Forest, where fourteen additional ephemeral ponds have been developed.⁴⁰³ Special use permits for Camp Shelby and United States Forest Service land are facilitating habitat adaptation.⁴⁰⁴ Ideally, a habitat will include a pond that is 60 feet and a nearby pond of 110 feet, in case the first pond dries up.⁴⁰⁵

The proximity of these ponds, however, makes the frogs vulnerable to common weather events or diseases and may not be sufficient for their survival, prompting the FWS to propose designating private land

³⁹⁸ *Id.* at 62,993.

³⁹⁹ Dusky gopher frog breeding at Glen's Pond has been studied since 1988. Nicole Thurgate, *The Ecology of the Endangered Dusky Gopher Frog (Rana Sevosa), and a Common Congener, the Southern Leopard Frog (Rana Sphenoccephala)* 51 (2006) (Ph.D. Dissertation, Univ. New Orleans), <https://scholarworks.uno.edu/td/433/> [<https://perma.cc/G77X-F6HW>].

⁴⁰⁰ Tate Watkins, *If a Frog Had Wings, Would It Fly to Louisiana?*, 37 PERC REPORTS, Summer 2018, at 30, <https://www.perc.org/wp-content/uploads/2018/07/perc-reports-summer-2018.pdf> [<https://perma.cc/748D-GUF2>].

⁴⁰¹ *Weyerhaeuser Co. v. U.S. Fish & Wildlife Serv.*, 139 S. Ct. at 366.

⁴⁰² Watkins, *supra* note 400.

⁴⁰³ Jim Lee Interview, *supra* note 28. Harrison County, MS: Pony Ranch Pond, New Pond, and Glen's Pond (which formed a metapopulation by 2021), and Reserve Pond; Jackson County, MS: Justin's Pond in Sandhill Crane National Wildlife Refuge and Old Fort Bayou Mitigation Bank (owned by The Nature Conservancy) (the two of which form a metapopulation), Mike's Pond and adjacent Powerline Pond, TNC1, and Gill's Pond and McCoy's Pond (for which the Memphis Zoo is doing captive breeding); Perry County, MS: Leaf River Wildlife Management Area – Mars Hill Upper Pond, Steve's Pond, Schaphiopus Pond, and Dogwood Pond. *See* MISS. FIELD OFF. OF U.S. FISH & WILDLIFE SERV., *supra* note 83; *see also* MISS. FIELD OFF. OF U.S. FISH & WILDLIFE SERV., *supra* note 301, at 1 (specifying that at least twelve viable metapopulations were needed that have two or more proximate breeding ponds. At the time the Recovery Plan was adopted at 11: "In Mississippi, seven critical habitat units are protected on the De Soto National Forest; one is protected on property owned by the U.S. Army Corps of Engineers; one on property owned by the state of Mississippi; and two are on private property owned by The Nature Conservancy (TNC), a nongovernmental, nonprofit organization dedicated to land and water conservation").

⁴⁰⁴ Jim Lee Interview, *supra* note 28.

⁴⁰⁵ *Id.*

in St. Tammany Parish, Louisiana, where the frog resided in 1965.⁴⁰⁶ Unfortunately, this effort was thwarted by the 2018 *Weyerhaeuser* Supreme Court ruling,⁴⁰⁷ so current efforts are focused on federal land in the De Soto National Forest and aided by efforts by environmental organizations and zoos that assist with breeding and reintroducing the frogs to these environs.⁴⁰⁸

Figure 10. *De Soto National Forest*



Source: U.S. Fish & Wildlife Service⁴⁰⁹

Active management is sometimes necessary. In 2010, one or two male frogs were heard “snoring” (calling for a mate) for three months at Mike’s Pond, so The Nature Conservancy (which owns Mike’s Pond) introduced two females in March of that same year.⁴¹⁰ Fertilized eggs appeared the next day, the egg mass was hatched in captivity, and

⁴⁰⁶ See Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for Mississippi Gopher Frog, 75 Fed. Reg. 31,387, 31,394 (proposed June 3, 2010) (to be codified at 50 C.F.R. Pt. 17).

⁴⁰⁷ See *Weyerhaeuser Co. v. U.S. Fish & Wildlife Serv.*, 139 S. Ct. at 361.

⁴⁰⁸ Jim Lee Interview, *supra* note 28.

⁴⁰⁹ FWS, ECOS ENVIRONMENTAL CONSERVATION ONLINE SYSTEM, DUSKY GOPHER FROG ENDANGERED, <https://ecos.fws.gov/ecp/species/5600> [<https://perma.cc/58W8-EXEQ>] (last visited Sept. 30, 2022) (map showing the current habitat range for the dusky gopher frog).

⁴¹⁰ Jim Lee Interview, *supra* note 28.

some of the offspring were released to Glen's Pond to help with the diversity of the gene pool.⁴¹¹ Eventually 299 tadpoles and 165 baby frogs were released to Mike's Pond.⁴¹² Once Mike's Pond dried up, the mature females were returned to the Glen's Pond area.⁴¹³ A grant from the FWS is also facilitating a research project by the University of Southern Mississippi's Gulf Coast Research Lab to study the protozoan parasite *Dermomycooides* (sp.) that is responsible for many deaths of frogs in the breeding ponds.⁴¹⁴ Dusky gopher frogs are also particularly susceptible to Ranaviruses.⁴¹⁵ If a tadpole is not exposed to the parasite during the two weeks after hatching, mortality is less likely from the exposure,⁴¹⁶ so the Head Start programs help reduce mortality by bringing the eggs to labs, raising the tadpoles in the lab before releasing the juvenile frogs back to their habitat.

A number of zoos belonging to the Association of Zoos and Aquariums (AZA) are involved in the dusky gopher frog conservation process, including zoos in Memphis, Omaha, Detroit, Dallas, and Como.⁴¹⁷ The Omaha Henry Doorly Zoo has assisted with the reproduction and reintroduction of dusky gopher frogs as part of its Aquarium's Amphibian Conservation Area since 2007.⁴¹⁸ The Memphis Zoo began its conservation efforts in 2001 when the species was placed on the ESA endangered species list.⁴¹⁹ Since 2017, the Memphis Zoo has released over four thousand tadpoles and four

⁴¹¹ *Id.*

⁴¹² *Id.*

⁴¹³ *Id.* Fifty metamorphosed frogs were being added to Mars Hill Upper Pond the day Author Miller visited Camp Shelby in 2022.

⁴¹⁴ W. CAROLINA UNIV., *Saving the Dusky Gopher Frog* (Oct. 4, 2019), <https://www.wcu.edu/stories/posts/dusky-gopher-frog-research.aspx> [<https://perma.cc/B4UB-YU56>] (Robin Overstreet of the University of Southern Mississippi and Joe Pechmann, Associate Professor at West Carolina University, are coordinating the project.).

⁴¹⁵ MISS. FIELD OFF. OF U.S. FISH & WILDLIFE SERV., *supra* note 301, at 19.

⁴¹⁶ Jamie Smith, *Effects of Infection of the Protist Parasite, Dermomycooides sp., in Dusky Gopher Frog Tadpoles* (2020) (M.A. thesis, Univ. S. Miss.), https://aquila.usm.edu/cgi/viewcontent.cgi?article=1827&context=masters_theses [<https://perma.cc/3VJU-C4PN>].

⁴¹⁷ Press Release, Omaha's Henry Doorly Zoo and Aquarium, *Zoo Grows Critically Endangered Dusky Gopher Frog Population by 622* (July 23, 2019), <https://www.omahazoo.com/inthenews/posts/zoo-grows-critically-endangered-dusky-gopher-frog-population-by-622> [<https://perma.cc/A9KK-EYTT>].

⁴¹⁸ *Id.*

⁴¹⁹ See MEMPHIS ZOO, *Saving a Species: Dusky Gopher Frog*, YOUTUBE (Mar. 23, 2022), <https://www.youtube.com/watch?v=41FfpnD2VvU> [<https://perma.cc/J7FU-7MV6>]; see also *Endangered and Threatened Wildlife and Plants; Final Rule to List the Mississippi Gopher Frog Distinct Population Segment of Dusky Gopher Frog as Endangered*, 66 Fed. Reg. 62,993 (Dec. 4, 2001).

thousand juvenile frogs in new Ward Bayou Mississippi ponds.⁴²⁰ The zoo is now studying how successful its efforts have been, using funding provided by an AZA grant.⁴²¹ In vitro fertilization efforts involved collaboration with the Memphis Zoo and the FWS.⁴²² With the assistance of the FWS, United States Forest Service, Sandhill Crane National Wildlife Refuge, the AZA, and The Nature Conservancy, eighty-two frogs were released in a new pond in southern Mississippi in 2017 as part of the effort to establish a new self-sustaining population of dusky gopher frogs.⁴²³

There are separate gopher frog subspecies known as Carolina gopher frogs and Florida gopher frogs.⁴²⁴ The Mobile Bay is a barrier between the Mississippi dusky gopher frogs and the Carolina/Florida gopher frogs.⁴²⁵ While the latter is not currently an ESA listed species, it is scheduled for review in fiscal year 2025.⁴²⁶ The North Carolina Wildlife Commission Gopher Frog Project began in 2007. The Commission is working with the North Carolina Zoo and North Carolina Aquarium at Fort Fisher to “head start” and conserve the small

⁴²⁰ *Id.*

⁴²¹ See WORLD ASSOC. OF ZOOS & AQUARIUMS, *Memphis Zoo Dusky Gopher Frog Release*, FACEBOOK (Sept. 23, 2021), <https://m.facebook.com/officialWAZA/videos/memphis-zoo-dusky-gopher-frog-release/831007304239535/> [<https://perma.cc/5R99-HBMU>]; see also MEMPHIS ZOO, *supra* note 419.

⁴²² Memphis Zoo, *Memphis Zoo Helps to Release Hundreds of Endangered Frogs into the Wild*, ABC 24+ (July 12, 2019), <https://www.localmemphis.com/article/news/memphis-zoo-helps-to-release-hundreds-of-endangered-frogs-into-the-wild/522-e89614a1-84d4-4ce7-be88-7f9803398b60#:~:text=Unfortunately%2C%20after%20years%20of%20effort,the%20breeding%20method%20used%20today> [<https://perma.cc/Y4EG-X47M>].

⁴²³ Press Release, Omaha Henry Doorly Zoo Releases 82 Critically Endangered Frogs in Mississippi, WOWT (Sept. 29, 2017), <https://www.wowt.com/content/news/Omaha-Henry-Doorly-Zoo-releases-82-critically-endangered-frogs-into-wild-448721783.html> [<https://perma.cc/4QMD-4348>].

⁴²⁴ Walden, *supra* note 370 (scientific name *Lithabardia sabosis* but more commonly referred to in concept reference as the *Rana capito* (for small populations in Alabama, Florida, or North Carolina) or *Rana sevosa* (for the Mississippi population)).

⁴²⁵ Endangered and Threatened Wildlife and Plants; Final Rule to List the Mississippi Gopher Frog Distinct Population Segment of Dusky Gopher Frog as Endangered, 66 Fed. Reg. 62,993 (Dec. 4, 2001), <https://www.federalregister.gov/documents/2001/12/04/01-29923/endangered-and-threatened-wildlife-and-plants-final-rule-to-list-the-mississippi-gopher-frog>.

⁴²⁶ See Dep’t of Defense Mgmt. Practices, *supra* note 369 at 5. It is listed as State Protected in Alabama (also a species of Highest Conservation Concern), a Species of Concern in Florida, State-rare in Georgia, State-endangered in South Carolina, and State-endangered in North Carolina, has a NatureServe Raking of G3-Vulnerable, and is listed as Near Threatened by the IUCN Red list.

Carolina gopher frog population in southeastern North Carolina.⁴²⁷ There were once fifty-three ponds, but now only seven distinct populations remain.⁴²⁸ Development of land, fragmented landscape, and impoundments have isolated the remaining frog populations and hindered the frogs' ability to develop greater genetic diversity.⁴²⁹ The Commission is working on wetland restoration through prescribed burns, tree harvesting, shrub removal, and stump hole management.⁴³⁰ Droughts, pathogens (such as chytrid fungus and *Ranavirus*) and degraded habitat factors are making the restoration and conservation efforts more problematic.⁴³¹ Climate change factors of more frequent extreme weather events, such as floods, droughts, changes in seasonal rainfall, and rising temperatures also can adversely affect the gopher frogs.⁴³²

⁴²⁷ N.C. Conservation Plan, *supra* note 325 at 8–9.

⁴²⁸ *Id.* at 7 (listing Croatan National Forest, Camp Lejeune, Holly Shelter Game Land, Military Ocean Terminal at Sunny Point (MOTSU), Boiling Spring Lakes, Sandhills GL, and Fort Bragg).

⁴²⁹ *Id.* at 12.

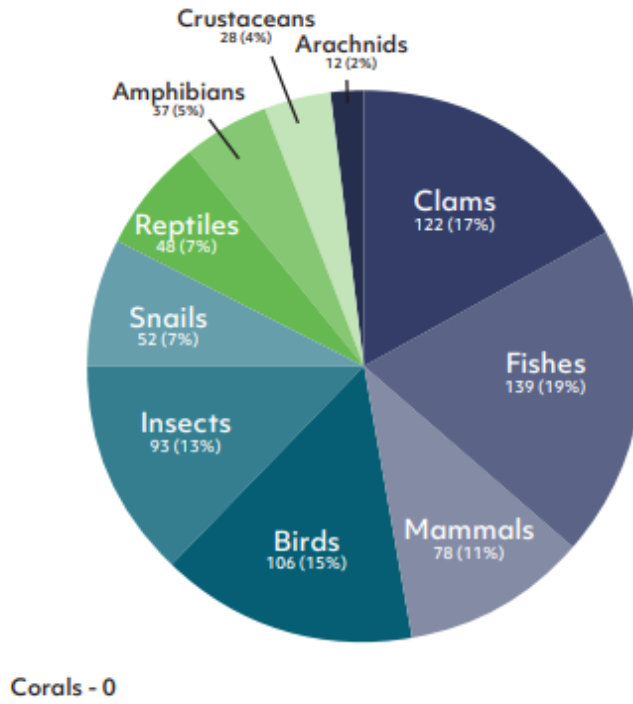
⁴³⁰ *Id.* at 10, 12–13 (noting that, in this region, the frogs often seek shelter in stump holes, the availability of which has been compromised by uneven management of the trees).

⁴³¹ *Id.* at 11.

⁴³² *Id.* at 12.

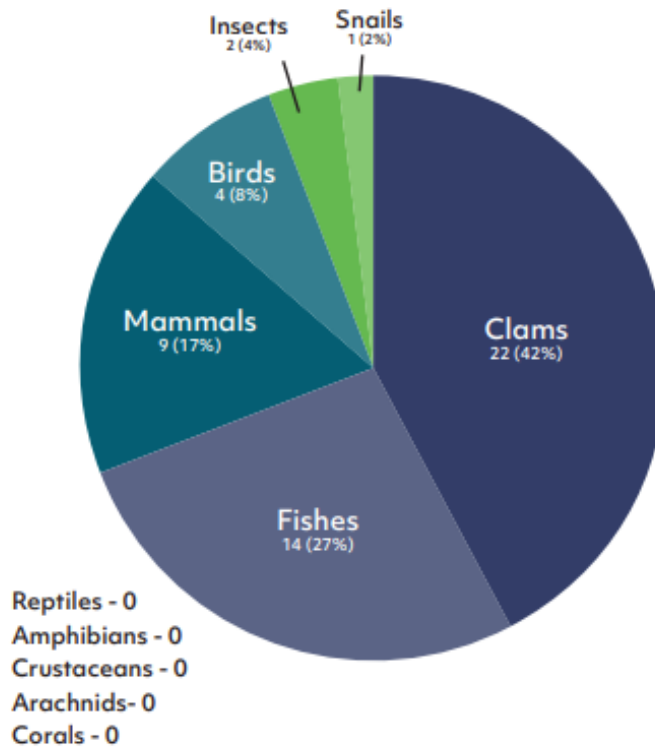
**APPENDIX II
REINTRODUCTION:
AN ASSESSMENT OF ENDANGERED SPECIES ACT
EXPERIMENTAL POPULATIONS (JUNE 2021)**

U.S. ESA Species



(cont'd on next page)

Species with Section 10(j) Rule(s)



Source: Environmental Policy Innovation Center⁴³³

⁴³³ SAPIENZA & LI, *supra* note 169 (noting that no plant species has ever been reintroduced as either type of experimental population using 10(j)).