

No. 16-35866

**UNITED STATES COURT OF APPEALS
FOR THE NINTH CIRCUIT**

CENTER FOR BIOLOGICAL DIVERSITY, et al.,
Plaintiffs-Appellants,

v.

RYAN ZINKE, et al.,
Defendants-Appellees,

and

STATE OF MONTANA et al.,
Defendant-Intervenor-Appellees

On Appeal from United States District Court for the District of Montana
Case No. 2:15-CV-0004-SEH

**BRIEF OF AMICI CURIAE LAW PROFESSORS AND SCIENTISTS
IN SUPPORT OF PLAINTIFFS-APPELLANTS**

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STATEMENT OF INTEREST OF AMICI CURIAE¹

Amici Curiae submitting this brief are law professors who teach about environmental law and scientists who research and teach in the fields of ecology and biology. As academics, policy researchers, and teachers of future practitioners, *Amici* have an interest in promoting a better understanding of the Endangered Species Act (“ESA”). This case presents a fundamental question about how the ESA protects species, specifically how Defendant United States Fish and Wildlife Service (“Service”) should consider a species’ lost historic range – where a species once existed but is no longer present – in making a listing decision.

Amici are concerned that the Service’s existing policy will constrain it to consider the threats and viability of a species only within the context of its depleted current condition. This concern is illustrated by the Service’s decision not to list the Upper Missouri River distinct population segment of the Arctic grayling as a protected species. In its decision, the Service mentioned, but failed to consider, suitable but unoccupied habitat in the Arctic grayling’s historic range, ignoring an opportunity to reinstall a species even in a fragment of the territory in which it once thrived. This approach undermines the ESA’s stated purpose, which is to

¹ Pursuant to Federal Rule of Appellate Procedure 29(a)(4)(E), *Amici* state that no party or counsel in this case and no person except counsel of record for *Amici* authored or contributed money to fund the preparation of this brief.

recover species and the ecosystems upon which they depend, and overlooks the most recent understanding of how a species' broad geographic representation is essential to its own viability and the health of the ecosystems it inhabits. *Amici* present this brief to assist the Court in its consideration of the purpose and intent of the ESA and the scientific basis for consideration of historic range in ESA listing decisions.

The brief of amici curiae is submitted on behalf of the following environmental law professors and scientists (affiliations herein are for identification purposes only):

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INTRODUCTION

“The Supreme Court has called the Endangered Species Act ‘the most comprehensive legislation for the preservation of endangered species ever enacted by any nation.’” California ex rel. Lockyer v. U.S. Dep’t of Agriculture, 575 F.3d 999, 1018 (9th Cir. 2009) (citing Tenn. Valley Auth. v. Hill, 437 U.S. 153, 153 (1978)). The ESA protects not only imperiled species but also the ecosystems on which they depend, with the goal of safeguarding our nation’s natural heritage. See 16 U.S.C. § 1531(b). To achieve these conservation objectives, the ESA authorizes the Fish and Wildlife Service and the National Marine Fisheries Service (collectively “Services”) to list imperiled species, which then receive substantial special protections. See Tenn. Valley Auth. v. Hill, 437 U.S. at 174 (it is “beyond doubt that Congress intended endangered species to be afforded the highest of priorities”).

To enjoy the protections of the ESA, a species must first be listed as “endangered” or “threatened.” Under the ESA, an endangered species is “any species which is in danger of extinction in all or a significant of portion of its range.” 16 U.S.C. § 1532(6). Similarly, a species qualifies as threatened when it “is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.” 16 U.S.C. § 1532(20). In

practice, the Services have long considered a species' historic range in a listing determination.

That practice has changed. In 2014, the Services enacted a policy re-interpreting the phrase "significant portion of its range" in a way that severely limits when a species qualifies for listing under the ESA ("SPR Policy"). The SPR Policy interprets "range" in this phrase to mean only the species' range at the time of the agency's determination and rejects any consideration of lost historic range – no matter how extensive – as an independent factor for determining if a species is imperiled. 79 Fed. Reg. 37,578, 37,609 (July 1, 2014) ("Lost historic range is relevant to the analysis of the status of the species, but it cannot constitute a significant portion of a species' range."). The SPR Policy pushes the Services toward protecting zoo-like populations that exist as mere relics rather than as integral parts of functional ecosystems.

Such is the case in the Service's decision not to list the upper Missouri River distinct population segment of the Arctic grayling as endangered or threatened. The Arctic grayling has existed in the conterminous United States in two isolated populations for thousands of years, formerly occupying the waterbasins of Lakes Superior, Michigan, and Huron in Michigan and the upper Missouri River and its tributaries in Montana. Today, the Arctic grayling has disappeared from Michigan, and the Montana population occupies only ten percent of its former territory in the

upper Missouri River basin and its tributaries. Where the Arctic grayling once swam in over 1,250 miles of waters in the Sun, Jefferson, Madison, Gallatin, Big Hole, Beaverhead, and Red Rock Rivers, as well as the Missouri River itself, degradation and diversion have reduced the main fluvial (river-based) population of Arctic grayling to a stretch of the Big Hole River. Yet the Service in its decision failed to consider the significance of these lost habitats and the benefits of reintroducing the grayling to suitable habitats where it once lived.

The Service contends that its “current range” interpretation does consider historical range by evaluating the effect of a species’ lost range on the remaining population’s biological status. 79 Fed. Reg. 37, 578, 37,584. Yet the effect of any such evaluation still focuses entirely on the species’ currently-occupied range. This interpretation effectively excises the phrase “significant portion of its range” from the definitions of “threatened” and “endangered” by dismissing all losses of range except for those that go so far as to threaten the remaining pocket of habitat. Conservation scientists further agree that the distinction between current and historic range can be fleeting – species migrate, and temporarily-unoccupied portions of historic range can become significant parts of a species’ range over time through repopulation and recovery.

This focus only on a species’ viability in its current range reflects a misunderstanding of Congress’ intentions for the fate of at-risk species in the

United States. The ESA was not intended to ensure mere survival of a species within small quarantined habitats. Instead, the ESA includes specific provisions that require broader conservation efforts, reflecting a desire by Congress to preserve robust populations of species within their historic ranges that contribute to species viability and the stability and function of their ecosystems. These provisions enable protection of regionally-significant population segments, rehabilitation of species within historic ranges, transplantation of populations back within the territory they once lived, and a recognition that the protection of any single species can be beneficial for the broader ecosystem in which it plays a part. The Service's interpretation ignores all such measures.

The Service also ignores recent developments in the fields of biology and ecology, including deeper scientific understanding that ecological systems work dynamically. The "current range" interpretation misses the importance of populating a species throughout significant portions of its historic range. By surviving across various ecosystems, the species preserves different morphologies, life histories, and ways of interacting with its environment. This variation is a foundation of a species' continued viability – which is measured qualitatively, not just by population numbers. The Service's interpretation also fails to value the intertwined viability of species and the health of the ecosystems they live in. Certain species are integral to the ecosystems that, in turn, they depend upon for

viability. Lack of representation by one species in an area can erode support for other supporting species and ecosystems, and in a feedback loop, affect the species' overall viability. Moreover, species' presence within a significant portion of their historic range also provides substantial historical, educational, recreational, and scientific benefits to all Americans – exactly as Congress envisioned in enacting the ESA.

ARGUMENT

I. The ESA's Text and Legislative History Support a Broad Reading of "Range."

In response to rapid declines in species biodiversity, Congress passed the ESA to protect individual species and the ecosystems that sustain them. The ESA was a major shift from the preceding endangered species laws and for the first time, provided protections for significant portions of a species' range. Other of the ESA's provisions promote recovery to former ranges for protected species and the preservation of regional species subpopulations. The text and history of the ESA supports use of significant historic range as a crucial tool to achieve the biodiversity goals envisioned by Congress.

A. Congress Intended the ESA and Its Amendments To Protect Species Populations Throughout Their Range.

The ESA's protections of not just the existence of at-risk species, but also the significant populations and ecosystems within which they reside, represent a

shift by Congress to extend protections to biological diversity. The ESA was the third in a series of laws in the late 1960s and early 1970s intended to protect endangered species. However, its two predecessors adopted the more limited view that only species facing total extinction warranted protection. Neither afforded protection to a species at risk in a “significant portion of its range.” See Endangered Species Conservation Act, Pub. L. 91-135 § 3(a), 83 Stat. 275 (Dec. 5, 1969) (defining an endangered species as one whose “existence is endangered . . . and that its survival requires assistance”).

The ESA of 1973 adds protections for imperiled species in a “significant portion of its range.” The House Report accompanying the bill affirmed that this expansion of protections to species imperiled in a portion of its range was a departure from prior laws, calling it a “significant shift in the definition in existing law which considers a species to be endangered only when it is threatened with worldwide extinction.” H.R. Rep. No. 412, 93rd Cong., 1 Sess. (1973).

As a successor to laws focused solely on preventing total extinction, the ESA was intended to broadly protect and restore the species and ecosystems of our nation, in recognition that a species’ presence across a significant portion of its geographic range is important to its ability to provide “esthetic, ecological, educational, historical, recreational, and scientific” benefits. 16 U.S.C. § 1531(a)(3). Indeed, the Service has applied this understanding of the ESA and

listed species based on reductions of their historic range in the past. Such was the case with the coastal California Gnatcatcher, a small insectivorous songbird. The songbird was listed as threatened in 1993 “throughout its historic range in southern California and northwestern Baja California.” 58 Fed. Reg. 16,742 (March 30, 1993). In its summary of factors affecting the species, the Service pointed to the fact that “[t]he habitat and range of the coastal California gnatcatcher have been significantly reduced,” noting that the species historically occurred in six counties in southern California but had been extirpated from two counties with further risks in another county by 1960. *Id.* at 16,751. The Service also pointed to the fact that nearly 60 percent of the gnatcatcher’s range had been destroyed or reduced between 1980 and 1990, *id.*, and cited to studies that estimated 90 percent reduction in historic sage brush habitat as justification for the listing decision. *Id.*

Further support for the ESA’s mandate to consider the broader ecological significance of species’ range can be found in the 1978 statutory amendment of the term “species” to include subpopulations. Endangered Species Act Amendments of 1978, Pub.L. No. 95-632, 92 Stat. 3751 (1978) (defining “species” as “any subspecies of fish or wildlife or plants, and any distinct population segment of any species of vertebrate fish or wildlife which interbreeds when mature”). Thus, the ESA now allows protection for “any distinct population segment of any species” (“DPS”) – an ecologically discrete sub-unit of a taxonomic species. *Id.* The

Service can thus list a DPS even if the overall taxonomic species is healthy and viable. While the DPS provision is distinctly different from the “significant portion of its range” provision, both flow from Congress’ recognition that regional populations, not just the species as a whole, may warrant protection. Each provision is a mechanism for the Service to preserve important regional ecosystems and habitats without a determination that the broader species as a whole is threatened or endangered.

This expansion in scope of the ESA demonstrates Congress’ intent to protect species on a geographic basis rather than merely ensure the survival of a particular organism. These DPSs can be protected before large-scale declines occur that would necessitate listing a species throughout its entire range, again in contrast to an interpretation of the ESA that permits only the protection of stable, but much depleted and isolated, populations. See, e.g., Determination of Threatened Status for the Contiguous U.S. Distinct Population Segment of the Canada Lynx and Related Rule, 65 Fed. Reg. 16,052, 16,060-61 (Mar. 25, 2000) (determining that the Canada lynx population in the contiguous United States warrants protection as a DPS based on examinations of the current status of lynx compared to historic populations). Taken together, the 1973 ESA and 1978 amendment demonstrate Congress’ intent to protect species on a smaller unit basis as opposed to a

worldwide assessment. As demonstrated by the Service’s own listing practices, these more tailored assessments require a consideration of historic range.

B. The ESA’s Expansive Recovery and Listing Provisions Demand Consideration of Habitats Beyond a Species’ Current Range.

Two aspects of the listing process indicate that the Service must consider historic habitat. First, the initial factor in the five-factor analysis for listing decisions expressly recognizes that the habitat or range of an endangered or threatened species is likely to have been much greater in the past than in its current state. This factor requires the Service to consider “(a) the present or threatened destruction, modification, or curtailment of its habitat or range.” 16 U.S.C. § 1533(a)(1)(A). This requirement to consider former habitat of a species that has been or is being destroyed should support a species listing, but the Service’s cramped interpretation of “range” in the SPR Policy constrains the temporal and geographic scope of its analysis and militates against listing. The “curtailment” language indicates that Congress intended that the Service, when interpreting “the habitat or range,” incorporate its historical dimensions.²

² The Service has argued that it considers historical range but it does so solely with regards to the “status of the species in its current range” – it admits that it does “not explicitly consider whether lost historical range is itself an SPR.” 79 Fed. Reg. 37,578, 37,584.

Second, “critical habitat,” which the Services must define for each endangered and threatened species in a periodic endangered species list, is defined by the statute to include “specific areas outside the geographical area occupied by the species at the time it is listed.” 16 U.S.C. § 1532(5)(A)(ii). As with the “curtailment” factor, the definition of “critical habitat” specifically contemplates that the Service consider areas outside of the species’ current range and assess its importance to the species’ continued viability.

The ESA also includes measures to restore a species to parts of its historic range after listing, which reflects Congress’ overarching aim and purposes in enacting the ESA. It makes little sense for Congress to account for significant historic range in protecting and recovering a species, but not to consider the same factor in a listing determination. One example of the ESA’s focus on habitat restoration is its definition of “conservation.” The ESA specifies that conservation includes “all methods and procedures which are necessary to bring any endangered species or threatened species to the point at which the measures provided pursuant to this chapter are no longer necessary. Such methods and procedures include, but are not limited to, habitat acquisition and maintenance . . . and transplantation.” 16 U.S.C. § 1532(3). The statutorily-permitted use of transplantation as a conservation tool necessitates recognition of historic range, as a species must be transplanted from its “current range” into another habitat that it previously

occupied. Despite having no “current range” at all outside of captivity, several species that have been almost completely extirpated from their former territories have been reintroduced into their historic range, including the Mexican wolf, red wolf, California condor, and black-footed ferret. See Carroll et al., *Geography and Recovery under the U.S. Endangered Species Act*, 24 CONSERVATION BIOLOGY 395, 403 (2010).

In addition to transplantation, the Services may also reestablish self-sustaining populations in regions that are outside the species’ current range when doing so fosters its conservation and recovery. 16 U.S.C. § 1539(j)(2)(A).

“Reintroducing a species into its historical range often is critical for its recovery.”

National Oceanic and Atmospheric Administration, *An Introduction to Section 10(j) of the Endangered Species Act: Reintroducing At-Risk Species to Foster Long-Term Recovery*, http://www.westcoast.fisheries.noaa.gov/protected_species/salmon_steelhead/esa_10j_designations.html (last visited Mar. 6, 2017).

These experimental populations may be isolated from other existing populations of the species, and the program is intended to “reestablish self-sustaining populations in regions that are outside the species’ current range.” Id. Because the ESA explicitly endorses geographical range as a vital component of conservation policies, the SPR Policy approach of restricting initial listing determinations to a

species' "current range" is nonsensical and cannot be reconciled with these conservation tools.

II. Ecological Principles Animate the ESA and Support Consideration of Historic Range in Species Listing

The dual purpose of the ESA, as envisioned by Congress, is to protect species from extinction and to provide "a means whereby the ecosystems upon which threatened and endangered species depend may be conserved." 16 U.S.C. § 1531(b). The two purposes are linked. This articulation conveys an unambiguous understanding that species and their ecosystems are necessarily interdependent and that conservation of at-risk species must include protections beyond only preventing the total extinction of a species. See Gifford Pinchot Task Force et al. v. U.S. Fish and Wildlife Serv., 378 F.3d 1059, 1069 (9th Cir. 2004) ("the ESA was enacted not merely to forestall the extinction of species (i.e., promote a species survival), but to allow a species to recover to the point where it may be delisted"); Sierra Club v. U.S. Fish and Wildlife Serv., 245 F.3d 434, 441-42 (5th Cir. 2001) ("'Conservation' is a much broader concept than mere survival. The ESA's definition of 'conservation' speaks to the recovery of a threatened or endangered species.").

A. The Health of a Species Depends on Representation Throughout Significant Portions of Its Native Range.

Congress recognized that the United States has an interest in preserving the ecological diversity in the flora and fauna within its territory. Among the ESA's purposes, Congress declared that "species of fish, wildlife, and plants are of esthetic, ecological, educational, recreational, and scientific value to the Nation and its people." 16 U.S.C. § 1531(a)(3). Congress found ecological and scientific value in organisms and intended the ESA to protect both the species themselves and the ecosystems upon which they depend. This comprehensive protection is the only way that "the Nation's heritage in fish, wildlife, and plants" can be safeguarded "for the benefit of all citizens." 16 U.S.C. § 1531(a)(5).

Just as listing decisions under the ESA rely upon the best available science, new ecological science and modeling are crucial tools for understanding how a species' range should be considered. Ecologists have begun to understand the factors that contribute to a species' viability and health: representation, resiliency, and redundancy. This "3R" framework requires that a species be represented and participate in a diversity of ecosystems, attain population numbers large enough to remain resilient to losses, and have redundant genetic reserves such that some species could be lost without a loss of the species. See Mark Shaffer and Bruce Stein, *PRECIOUS HERITAGE: THE STATUS OF BIODIVERSITY IN THE UNITED STATES*, 301-322 (Oxford University Press, 2000). This model has been relied upon and

frequently cited by the Service for listing decisions. See Final Rule To Identify the Northern Rocky Mountain Population of Gray Wolf as a Distinct Population Segment and To Revise the List of Endangered and Threatened Wildlife, 74 Fed. Reg. 15,123 (April 2, 2009) (“each of the States and each of the recovery areas meaningfully contributes to its resiliency, redundancy, and representation”); Revised Designation of Critical Habitat for the Contiguous United States Distinct Population Segment of the Canada Lynx, 74 Fed. Reg. 8,616 (February 25, 2009) (“the inclusion of the Minnesota unit is important in applying the conservation principles of representation, resiliency, and redundancy to the critical habitat designation for lynx”); Determination of Threatened Status for the Polar Bear (*Ursus maritimus*) Throughout Its Range, 73 Fed. Reg. 28,212 (May 15, 2008) (“The terms ‘resiliency,’ ‘redundancy,’ and ‘representation’ are intended to be indicators of the conservation value of portions of the range.”).

Considering a species’ historical range is an integral part of this model. The 3R framework recognizes the importance to species’ overall persistence of conserving genetic diversity, facilitating a species’ ability to withstand significant demographic and environmental variation, and protecting sufficient populations to provide a margin of safety. Such goals require careful analysis of a species within its historic habitat and the ecotypes represented in this area. Indeed, some scientific studies suggest a numeric threshold for representation, e.g. to be

considered sufficiently secure from a biological perspective, a species may lose no more than a third of its historic range. See John Vucetich et al., The Normative Dimension and Legal Meaning of Endangered and Recovery in the U.S. Endangered Species Act, 20 CONSERVATION BIOLOGY 1383 (2006). This threshold further depends on a species' interactions with its various ecosystems. See Carlos Carroll et al., Geography and Recovery under the U.S. Endangered Species Act, 24 CONSERVATION BIOLOGY 395 (2010) (explaining that adequate representation must be analyzed in regards to the types of habitat the species occupies and its ecological role in those areas). As Shaffer and Stein note, “[t]he principle of representation – saving some of everything – will require identifying conservation targets not simply as species and communities but as the complexes of populations, communities, and environmental settings that are the true weave of biodiversity.”

Id.

It is not only possible but likely that consideration of unoccupied portions of a species' historic range, using the 3R framework, would find portions of the range suitable for recovery and potentially biologically significant that would be missed in a review of only of the species' current range. This is not just a theoretical or abstract concept – species move and shift and thus the boundaries of a species' range are dynamic. Species can either naturally repopulate suitable segments of

their former territories. In other words, species do not become “extinct” from a habitat until the species itself is extinct.

This approach requires an analysis of historic range that is absent from the Service’s grayling finding and proscribed by the SPR Policy. The simultaneous acceptance of the 3R framework by the Service and the subsequent absence of its application in the grayling listing analysis ignores these ecological realities.

B. Broad Geographic Representation of Species Is Essential in Conserving Ecosystem Health.

As expressed above, Congress has made it clear that it intended the ESA to be a tool for broad conservation purposes. The text and the statute support an interpretation of the ESA as a law that recognizes that the importance of species’ broad distribution, and the role that protecting ecosystems plays in efforts to conserve threatened and endangered species. Like many of the laws governing environmental conservation and management, the ESA requires that decisions on listing a species as threatened or endangered be made on the basis of the “best scientific and commercial data available.” 16 U.S.C. § 1533(b)(1)(A). The science shows that effective conservation includes considering a species’ occurrence in the broader ecosystems that comprise its historic range.

A historical-range approach to defining a species’ listing eligibility, rather than the current-range approach which examines a species without consideration of the broader ecological setting, would better incorporate contemporary conservation

science. Biologists have long recognized the essential role that species can play in maintaining the health of the overall biodiversity and stability of the surrounding ecosystem. See 16 U.S.C. § 1531(a)(3) (recognizing “ecological” values of endangered and threatened species). While ecosystems are maintained by a fine balance of organisms, many of which are indispensable “keystone” species whose absence necessarily results in cascading losses of other species, conservation scientists have also recognized that “interactivity of species is a multidimensional continuum” when it comes to the health and stability of an ecosystem. Michael E. Soule et al., Strongly Interacting Species: Conservation Policy, Management, and Ethics, 55 BIOSCIENCE 168, 171 (2005). A policy that restricts protection to the remaining reduced population of a species without examining that species’ role within the broader ecology across its historical range fails to recognize important ecosystem interactions that are essential to proper conservation.

This “multidimensional continuum” highlights the importance of focusing on the interactions between species, not only on the species themselves. Accordingly, “any definition of biodiversity should emphasize protection of the many ecological processes that involve a multiplicity of species.” Fred P. Bosselman, A Dozen Biodiversity Puzzles, 12 N.Y.U. ENVTL. L.J. 364, 435 (2004). Indeed, courts have cited the importance of listed species’ contributions to their broader ecosystems as a basis for upholding the constitutionality of the ESA itself.

Nat'l Ass'n of Home Builders v. Babbitt et al., 130 F.3d 1041, 1054 n. 11 (D.C. Cir. 1997) (“To remove [a wild species] is to entrain changes in other species, raising the populations of some, reducing or even extinguishing others, risking a downward spiral of the larger assemblage.”) (quoting E.O. Wilson, The Diversity of Life 308 (1992)); GDF Realty Investments, Ltd. et al. v. Norton et al., 326 F.3d 622 (5th Cir. 2003) (finding that interdependence of species compels the conclusion that regulated takes under ESA affect interstate commerce).

The possible effects of the withdrawal of a native species from an ecosystem can be enormously harmful. The phenomenon of species coextinction, in which species that are connected to one another without necessarily being keystones of the ecosystem as a whole, demonstrates “the interconnectedness of organisms in complex ecosystems.” Lian Pin Koh et al., Species Coextinctions and the Biodiversity Crisis, 305 SCIENCE 1632, 1634 (2004). Coextinction events can include the loss of predators with their prey and specialist herbivores with their host plants. A recent example of the loss of an “affiliate species” is that of a tropical butterfly species from Singapore that was attributed to the loss of their specific larval host plants. Lian Pin Koh et al., Co-extinctions of Tropical Butterflies and Their Hostplants, 36 BIOTROPICA 272 (2004). The scientists examining that close relationship between tropical butterflies and their specific hostplants due to massive, long-term habitat disturbance found that “the

preservation of whole habitats is urgently needed if we are to avoid the possible cascading effects of species (co-) extinctions.” Id. This emphasis on relationships that species have with one another, rather than a singular focus on the dangers that one species faces alone, recognizes the complexity and spatial variability of ecosystem interaction. Such studies are on the “cutting edge of conservation biology,” making it the “best available science.” Kalyani Robbins, The Importance of Keeping Ecosystems Intact, 37 ENVTL. L. 573, 585 (2007).

The Service finds that the Arctic grayling has evolved with other native species in its historical habitat and that the grayling is linked in predation relationships with numerous animals, including osprey, minks, belted kingfisher, great blue heron, and possibly black bear and river otter. 79 Fed. Reg. 49,384, 49,414. And yet, the Service has not assessed the relationship between the Arctic grayling and its ecosystem, or the consequences of its removal from its historic habitat, in order to decide whether the lost habitat is a “significant portion of its range.”

The Service’s focus on a single species within its current range ignores the reality that species play a complex, interconnected role in the ecosystem around them and fails to recognize that proper conservation of biodiversity must preserve “whole habitats,” not only the range in which a species can be found at the time of the listing determination. The grayling occupies an important niche in the local

ecology, whose balance may be disrupted in a cascading manner after the grayling's removal from the ecosystem.

Additionally, a listing determination that fails to include an ecosystem-based analysis may overlook significant biological interactions that will impact the long-term viability of the grayling. For example, under the Service's definition of range, it may be possible for grayling to disappear in one type of ecosystem (fluvial or adfluvial) altogether without triggering a listing, thus overlooking the fact that the species' occurrence in both types of ecosystem may be important to the overall viability of the species itself. This oversight would be ameliorated by an approach that includes examination of a species' historical range, which would necessarily include historical habitats where a particular species interacted with the broader ecosystem of that area.

III. The Service's "Current Range" Interpretation Gives Rise to Practical Problems and Inconsistencies.

The Service's narrow interpretation of "range" as limited to the current range at the time of the final decision also amplifies the negative effects of delays in the listing process. The Service itself recognizes that its resources are limited and that delay is not uncommon. In many cases, the Service may find a species warrants listing, but that listing is precluded by higher priority species. See 16 U.S.C. § 1533(b)(3)(B)(iii)(I) (allowing agency to make a "warranted but precluded" finding based on lack of agency resources). If, at a certain time, nine

out of ten populations are on the verge of extinction while a single separate population is more robust, the species as a whole may qualify as threatened or endangered even under the Service's notion of "range" because the species would be at risk of extinction throughout a significant portion of its range. However, once the nine populations have disappeared, the Service could deny protection to the species as a whole based on the robustness of the one remaining population unit. Such a time-dependent and ever-changing definition of "range" means that listing determinations turn on the particular date of the decision and not "solely on the basis of the best scientific and commercial data available" as required by the ESA. 16 U.S.C. § 1533(b)(1)(A).

Using only a species' diminished range at the time of a listing determination also creates several policy dilemmas. In this case, for instance, rather than considering a more holistic analysis of the Arctic grayling's historical regional and ecological importance in a large territory of the United States, the Service's listing determination focuses only on whether the few remaining populations will continue to survive in their current state. By limiting its examination to the species' viability within its present range, the Service's approach actually fosters a perverse incentive for industry or private parties who may profit from encroachment onto a species' historic range to accelerate the destruction of habitat to ensure that a species "current range" is reduced.

For the Arctic grayling, this perverse incentive is particularly problematic. The Arctic grayling were once abundant in all of the major rivers of the upper Missouri basin. Since the last ice age, the grayling has formed a part of the ecosystems in the Sun, Smith, Gallatin, Big Hole, Red Rock, Ruby and Madison Rivers. Now only six precariously small populations remain, of which only two are of the fluvial (river-dwelling) variety. 79 Fed. Reg. 49,384, 49,387-88. These fluvial populations are not interchangeable with adfluvial (lake-dwelling) grayling, which are unable to hold their position in flowing water. *Id.* at 49,392. Of the remaining fluvial populations, the only sizable native population remains in the Big Hole River in southwest Montana. As an aside, the other fluvial population, reintroduced to the Ruby River, contains under 100 individuals. *Id.* at 49,398. In 2010, the Service identified several threats to the grayling, including overall low abundance, inadequate regulatory mechanisms, and stream dewatering. Any continued delay in protections for the remaining grayling populations runs the risk that the Ruby River and other smaller populations will disappear, leaving the single fluvial Big Hole population as the “new normal” under a shifting baseline.

The irony is that the Service itself has relied upon reintroduction of the Arctic grayling into habitats outside its existing range to support a finding that the population overall is stable and does not warrant listing. The Ruby River fluvial grayling population is entirely reintroduced (as are many of the lake-dwelling

grayling populations) a tacit acknowledgment of the necessity of looking outside a species' current range for conservation solutions and that "range" should include historic range. Due to reintroduction and stocking of grayling into its historic range and other suitable habitats, the Service reversed its prior decision in 2010 that the grayling deserved listing and, on that basis, dismissed the very threats that had led to the initial listing decision. 79 Fed. Reg. 49,384, 49,407. The Service's fundamental internal inconsistencies regarding the importance of a species' historic range to listing decisions make one thing clear: The Service needs to consider a more comprehensive conservation analysis – one that includes species' historic ranges – in making listing decisions under the ESA.

CONCLUSION

The Service has developed a SPR Policy – and applied it to the Arctic grayling in this instance – that contradicts both the intent of Congress in crafting the ESA and the best available conservation science. By reading "significant portion of its range" as only applicable to a species' current range, the Service undermines the broader recovery goals of the ESA and threatens to leave us with nothing more than small museum-like populations with limited ecosystem functions. The Service's interpretation should be reevaluated and the Service should adopt a policy that more accurately reflects Congress' intent to protect the ecosystems and historical habitats in which endangered species reside.

For the foregoing reasons, *Amici* respectfully urge the Court to reverse the district court decision below.

Dated: March 8, 2017

Respectfully submitted,

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CERTIFICATE OF COMPLIANCE

Pursuant to Federal Rules of Appellate Procedure 29(a)(4)(G) and 32(g)(1), I certify that the foregoing Brief of *Amici Curiae* complies with the type volume limitation and typeface requirements contained in Federal Rules of Appellate Procedure 29(a)(4) and (5), because it is proportionally spaced, has a typeface of 14 points, and contains 5,931 words, excluding tables and cover page.

Dated: March 8, 2017

By: /s/ Deborah A. Sivas
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CERTIFICATE OF SERVICE

I hereby certify that I electronically filed the foregoing **Brief of *Amici Curiae* Law Professors and Scientists in Support of Plaintiffs-Appellants** with the Clerk of the United States Court of Appeals for the Ninth Circuit by using the appellate CM/ECF system on March 8, 2017.

I certify that all participants in the case are registered CM/ECF users and that service will be accomplished by the appellate CM/ECF system.

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Dated: March 8, 2017