SIX PRIORITY RECOMMENDATIONS FOR IMPROVING CONSERVATION UNDER THE ESA

by Alejandro E. Camacho, Melissa L. Kelly, and Ya-Wei Li

Alejandro E. Camacho is a Chancellor's Professor of Law at the University of California, Irvine; Faculty Director of the Center for Land, Environment, and Natural Resources (CLEANR); and a Member Scholar at the Center for Progressive Reform. Melissa L. Kelly is Staff Director and Attorney at CLEANR. At the time of this writing, Ya-Wei Li was Director for Biodiversity at the Environmental Policy Innovation Center.

SUMMARY

Because of persistent legislative attacks on the Endangered Species Act (ESA), some conservationists have made a strategic choice not to propose substantial adjustments to it. But conservation recommendations are long overdue, and improvements to the ESA and its implementing regulations and policies seem more possible in the current political climate. The University of California, Irvine School of Law and the Environmental Policy Innovation Center convened a broad dialogue within the conservation community seeking perspectives on those improvements. This Article summarizes their findings, and recommends both legislative and administrative actions to update the Act and fulfill its conservation goals.

In the 47 years since its enactment, the Endangered Species Act (ESA)[1] has achieved much success in conserving certain species and their ecosystems. The ESA currently protects more than 1,600 plant and animal species in the United States,[2] and has been effective at recovering approximately 65 species.[3] Further, at least 227 species were likely to have gone extinct if not for the ESA.[4] These successes, in part, have resulted in strong public support for the Act.[5]

Yet, despite the Act's success and public support, legislative and regulatory attempts to weaken its protections have been unceasing since 2011.[6] In recent years, for example, congressional Republicans have introduced bills to remove protections for specific species[7] and to weaken the Act's protections more broadly.[8] The regulatory revisions finalized by the U.S. Fish and Wildlife Service (FWS) and National Oceanic and Atmospheric Administration (NOAA) Fisheries (collectively the Services) in August 2019 allow publication of projected economic effects of listing decisions, restrict designation of unoccupied critical habitat, and eliminate default §9 protections for newly listed, threatened species.[9] Over the past decade, a consis-

Authors' Note: This Article is adapted from a May 2021 report by CLEANR, available on its website at http://www.law.uci.edu/academics/centers/cleanr/publications.html.

1. 16 U.S.C. §§1531-1544, ELR Stat. ESA §§2-18.
2. U.S. Fish and Wildlife Service (FWS), *Listed Species Summary (Boxscore)*, https://ecos.fws.gov/ecp/report/boxscore (last visited July 7, 2021).
3. FWS, *Delisted Species*, https://ecos.fws.gov/ecp/report/species-delisted (last visited July 7, 2021).
4. J. Michael Scott et al., *By the Numbers*, *in* 1 The Endangered Species Act at Thirty 16, 31 (Dale D. Goble et al. eds., Island Press 2006).
5. *See* Letter from Ben Tulchin et al., Tulchin Research, to Interested Parties, Re: Poll Finds Overwhelming, Broad-Based Support for the Endangered Species Act Among Voters Nationwide (July 6, 2015), https://www.biologicaldiversity.org/campaigns/esa/pdfs/2015_Poll_on_Endangered_Species_Act.pdf; Center for Biological Diversity, *The Endangered Species Act: A Wild Success*, https://www.biologicaldiversity.org/campaigns/esa_wild_success/index.html (last visited July 7, 2021).
6. Jamie Pang & Noah Greenwald, Center for Biological Diversity, Politics of Extinction 1 (2015), https://www.biologicaldiversity.org/campaigns/esa_attacks/pdfs/Politics_of_Extinction.pdf.
7. *E.g.*, Madilyn Jarman, *Riders Remain in 2019 National Defense Authorization Act*, Wildlife Soc'y, May 22, 2018, https://wildlife.org/riders-remain-in-2019-national-defense-authorization-act/ (discussing U.S. House of Representatives amendment to defense appropriations act that prohibits the listing of the greater sage-grouse and lesser prairie-chicken under the ESA for 10 years following passage of the legislation).
8. Michael Doyle, *Barrasso Introduces Legislation to Reform ESA*, E&E News, Sept. 16, 2020, https://www.eenews.net/eenewspm/stories/1063713905 (proposing legislation to "elevate the role of states, increase transparency in implementation of the law and provide regulatory certainty to promote recovery activities").
9. Regulations for Listing Species and Designating Critical Habitat, 84 Fed. Reg. 45020 (Aug. 27, 2019) (to be codified at 50 C.F.R. pt. 424).

tent theme of many of these legislative and regulatory provisions is providing greater opportunities for the regulated community and states to influence conservation decisions or reduce protections.

Because of these persistent legislative attacks on the ESA, some conservationists have made a strategic choice not to consider or propose any substantial adjustments to the ESA, taking the position that it is better left untouched. But as a result, the dominant narrative on changes to the ESA has focused on how to make the law friendlier to the regulated community. Recommendations for improving the ESA from a conservation perspective are long overdue, despite the political risks of amending the law. Conservationists should be prepared with these recommendations if the political opportunity arises to legitimately improve the ESA.

The election of President Joseph Biden, along with the current Democratic-controlled U.S. House of Representatives and U.S. Senate, has created a rare moment in which legislative rollbacks to the ESA are virtually impossible. In this favorable political climate, improvements to the ESA and its implementing regulations and policies seem more possible than at any other time during the past decade. During this same period, the case for more effective approaches to conserving biodiversity has only become stronger. Every year, scientists publish accounts of ongoing extinctions, extirpations of populations, and habitat loss.[10]

To begin a broad dialogue within the conservation community on legislative and administrative improvements to the ESA, the University of California, Irvine School of Law Center for Land, Environment, and Natural Resources (UCI Law CLEANR), in partnership with the Environmental Policy Innovation Center (EPIC), convened two workshops to seek perspectives on those improvements. We started with a scoping session in April 2019, titled Advocating for Improvements in Species Conservation.[11]

Based on the discussion at the scoping session, UCI Law CLEANR and EPIC identified key recommendations that offered the best trade off among these factors: (1) most likely to enhance conservation; (2) sufficiently pragmatic that they present a meaningful chance to be adopted in a favorable political climate; and (3) reflecting the most interest and enthusiasm from participants at the scoping session. CLEANR and EPIC then surveyed scoping session participants and other species conservation experts to rank the recommendations according to the priority of each for enhancing conservation.

In October 2020, UCI Law CLEANR and EPIC convened a two-day, virtual workshop roundtable titled A Conservation Vision for the Federal Endangered Species Act.[12] This roundtable continued the meaningful dialogue from the 2019 scoping session and focused on six of the highest priority recommendations identified through the survey described above.[13]

Based on the April 2019 and October 2020 dialogues, this report offers six priority recommendations for improving the ESA and its implementing regulations and policies, with an emphasis on enhancing species and habitat conservation[14]:

(1) tailoring protections for endangered, threatened, and recovered species and their habitats;

(2) revising incidental take authorization standards;

(3) improving recovery planning and implementation;

(4) providing incentives for species conservation on private, state, and federal lands;

(5) accounting and preparing for ecological change; and

(6) improving generation, quality, and public dissemination of ESA data.

These recommendations seek to advance the conservation objectives of the ESA in this century and to inform future public dialogue on imperiled species conservation. Although

10. *E.g.*, Center for Biological Diversity, *Halting the Extinction Crisis*, https://www.biologicaldiversity.org/programs/biodiversity/elements_of_biodiversity/extinction_crisis/index.html (last visited July 7, 2021).

11. The goal of that session was to bring together a small number of leading ESA scholars, advocates, and policymakers to begin scoping a vision for improving the ESA and its regulations. The scoping session did not try to seek consensus on specific challenges to, or recommendations for, improving conservation under the ESA, but rather tried to capture a diversity of perspectives within the conservation community. The discussion was not limited to ideas that could only be implemented through legislation; it included administrative changes that may prove easier to adopt.

    Participants included Justin Berchiolli (UCI Law), Alejandro Camacho (UCI Law), Holly Doremus (University of California, Berkeley School of Law), Bob Dreher (Defenders of Wildlife), Rebecca Epanchin-Niell (Resources for the Future), Tomer Hasson (The Nature Conservancy), Melissa Kelly (UCI Law), Ya-Wei (Jake) Li (EPIC), Jacob Malcom (Defenders of Wildlife), Daniel Rohlf (Lewis & Clark Law School), Mark Rupp (Environmental Defense Fund), and Mark Schwartz (University of California, Davis).

12. Participants included Daniel Ashe (Association of Zoos and Aquariums), Zach Bodane (Western Landowners Alliance), Kristin Butler (U.S. Senate Committee on Environment and Public Works), Alejandro Camacho (UCI Law), Holly Doremus (University of California, Berkeley), Bob Dreher (Defenders of Wildlife), Rebecca Epanchin-Niell (Resources for the Future), Tomer Hasson (The Nature Conservancy), Melissa Kelly (UCI Law), Mike Leahy (National Wildlife Federation), Ya-Wei (Jake) Li (EPIC), Elizabeth Mabry (U.S. Senate Committee on Environment and Public Works), Jacob Malcom (Defenders of Wildlife), Tim Male (EPIC), Bart Melton (National Parks Conservation Association), Caroline Murphy (The Wildlife Society), Keith Norris (The Wildlife Society), Ryan Richards (Center for American Progress), Daniel Rohlf (Lewis & Clark Law School), Joseph Roman (University of Vermont), J.B. Ruhl (Vanderbilt University Law School), Michael Runge (U.S. Geological Survey), Mark Rupp (Environmental Defense Fund), Jason Rylander (Defenders of Wildlife), and Mark Schwartz (University of California, Davis).

13. Additional recommendations supported by a literature review, many of which were discussed at but not the focus of the scoping session and October 2020 roundtable, are more fully included at Alejandro E. Camacho et al., UCI Law CLEANR, The Six Priority Recommendations for Improving Conservation Under the Federal Endangered Species Act (2021), https://www.law.uci.edu/centers/cleanr/news-pdfs/cleanr-epic-esa-report.pdf.

14. Although this Article focuses on the ESA, the statute should not be viewed in isolation. To properly protect biodiversity, other federal conservation programs, state conservation laws, private-sector conservation efforts, and other initiatives are needed to complement the ESA's conservation measures. In fact, in many situations, those non-ESA tools may play a larger role than the ESA at conserving listed and at-risk species. Thus, readers should consider the recommendations in this Article as a starting point for developing a broader suite of tools to conserve biodiversity in the United States and abroad.

many of these recommendations can be accomplished administratively, some might be easier to adopt through a legislative amendment in a favorable political environment.

Part I of this Article describes cross-cutting challenges to implementation of the ESA. These challenges inform the six priority recommendations described in Part II. These are not the only recommendations identified at the two workshops, but are the ones regarded as the most important to include in this report. Part III concludes.

I. Cross-Cutting Implementation Challenges

There are overarching challenges to implementation of the ESA that impact its ability to effectively conserve species and their habitats. This section discusses these cross-cutting issues to provide context for the specific recommendations that follow in Part II.

A. Need for Greater Clarity and Consistency at All Key Decision Points

Since the beginning of the ESA, key decisions about species listing, permitting, recovery, and other protections have lacked clear, objective standards. Often the decisions appear ad hoc and subjective, and thus are vulnerable to political considerations. For example, the Services have never adopted a more objective definition of "threatened" or "endangered," despite recommendations in the scientific literature for how to do so. Core terms like "foreseeable future" and "likely" remain subject to wide interpretation within the agencies. Likewise, the definitions of "jeopardy" and "adverse modification" of critical habitat remain highly subjective. When confronted with criticism about the lack of transparency and clarity, the agencies have often explained that ESA decisions must be made on a case-by-case basis using the best available science (BAS).

This response, however, overlooks the potential for the Services to adopt clearer, more objective standards for key decision points that still provide the agencies with enough discretion to account for the unique circumstances of every decision. Importantly, the agencies have rarely clarified the *policy* thresholds associated with listing and permitting decisions (e.g., in interpreting the jeopardy standard, when is an impact to a species "appreciable"?). In the listing context, career scientists within the agencies have tested more objective standards for listing decisions, but the Services have never tried to adopt those standards in policy or regulation. This problem is not unique to a presidential administration—no Democratic or Republican administration has made it a priority to address the problem.

As a result, conservationists often distrust ESA decisions on controversial matters, like listing decisions for the polar bear, lesser prairie-chicken, and Northern Rockies wolverine. At the same time, the regulated community and states often express a similar criticism, sometimes framed as a "bring me a different rock" problem in which they claim that FWS staff will continue asking for a different set of conservation measures as part of an ESA permitting action until the staff appears satisfied. Creating clearer, more objective decision standards should resonate with conservationists and the regulated community.

B. Need for Transparency and Greater Access to Documents Used in Decisions

Many documents related to ESA decisions are not readily available to the public, or sometimes even within the Services. For example, §7 biological assessments make up more than 90% of all §7(a)(2) consultations, but they are generally not posted online. Often, documents are not well organized even within FWS' internal information management system.

The overall result is the appearance of ad hoc permitting decisions, the inability of the public to fully understand and track implementation of those decisions, and the inability of the Services to adequately track and enforce ESA permit terms. Judicial review is also impeded without access to the documents. Further, without monitoring and other implementation documents, it becomes impossible to evaluate the effectiveness of ESA programs.

For example, the effectiveness of safe-harbor agreements depends primarily on the voluntary willingness of participating landowners to not return their enrolled property to "baseline" conditions, meaning reverting all the conservation gains made under the agreement. No one has ever evaluated how many safe-harbor participants have returned their properties to baseline conditions, because the documents needed to answer this question are not readily available.

C. Need for Stable and Increased Funding, and Better Allocation of Funding

Inadequate and unstable funding for ESA implementation is a perennial problem that hampers every aspect of the Act. For example, only about 20% of recovery actions are funded,[15] and FWS is a minor contributor of funding to the endangered species program.[16] Absent considerably more funding, the vast majority of listed species will not recover. Inadequate funding also prevents the Services from developing internal systems and processes to improve the efficiency of their operations. For example, FWS' Information for Planning and Consultation system, which would improve and expedite the consultation process, has suffered from inadequate and unstable funding over the past decade, preventing the system from being fully deployed even today.

15. Julie K. Miller et al., *The Endangered Species Act: Dollars and Sense?*, 52 BioScience 163, 167 (2002).

16. *See, e.g.*, FWS, Federal and State Endangered and Threatened Species Expenditures 5, 6, 97 (2016), https://www.fws.gov/endangered/esa-library/pdf/2016_Expenditures_Report.pdf (reporting in Table 1 that in fiscal year 2016, FWS' total contribution to species conservation was only approximately 13.4% of total expenditure by federal agencies and states).

Recognizing that the Services will likely never receive all of the funding needed to implement the ESA, another important theme is how best to allocate the funding the Services do receive. This is a question of prioritizing resources to maximize conservation benefits across the listing, recovery, consultation, §10 permitting, and §6 state cooperative programs. For example, in recovery planning, approximately 80% of all congressional funding for the ESA is spent on 5% of species. This leads to many species being overlooked for recovery expenditures.

How best to make the difficult trade offs among species remains a very controversial topic within the environmental community. But without a more strategic approach, the Services will continue to make trade offs daily based on factors that are not apparent to the public and that are unlikely to lead to the best return on investment for conservation. For example, plants make up 56% of U.S. listed species but receive less than 5% of government funding.[17] Every ecosystem depends on plants, so the disproportionate underfunding of plants makes little sense from a biodiversity perspective.

D. Role of the States

The role of states under the ESA has been a long-standing source of debate and a topic of recent ESA legislation. The ESA is clearly unable to achieve its goals without the help of states. Engaging states productively in conservation would bring great benefits to ESA implementation, but how best to do so varies substantially by state.[18] Some state laws have provisions that, on paper, exceed the ESA's conservation standard. Most state agencies, however, lack the legal authority under state law to take over key decisions that the Services currently make.[19]

A different way of thinking about state roles is not whether a state should take over ESA responsibility, but rather how it can augment the Services' responsibilities, especially ones the Services have never been able to adequately perform. For example, state agencies often have more credibility and trust with private landowners than does FWS. Regional coordination and collaboration among states may also create opportunities for more consistent approaches to state management of species that are delisted or precluded from listing.

E. Incentives for Federal, State, and Private Landowners

Although the text of the ESA focuses on regulatory prohibitions, the conservation needs of many species depend on landowners voluntarily pursuing recovery actions. Positive incentives are crucial to supporting these actions, especially for private and state landowners that are under no ESA obligation to conserve species. And although §7(a)(1) requires federal agencies to help conserve species, this requirement is largely unenforceable as courts have generally found that the section does not require agencies to carry out any specific recovery action. Thus, incentives would also help advance recovery on federal lands.

Such incentives can come in many forms, including regulatory relief, financial support, technical support, and social recognition.[20] The optimal set of incentives for each landowner likely varies. Further, although the Services have used the ESA's flexibility to create various incentive programs like safe-harbor agreements, the process of enrolling in these programs can be expensive and complex for many landowners. Thus, incentive programs must not only exist, but be sufficiently attractive to participate in.

F. Need for More Flexible, Creative Implementation of the ESA

More flexible, creative implementation can reveal opportunities to tailor ESA protections and incentives to benefit species. First, the ESA already offers many prospects for creative implementation, but the Services have not fully exhausted those opportunities or sometimes have pursued them in ways that appear to undercut conservation. For example, the agencies have tremendous flexibility in drafting §4(d) rules for threatened species, and can even adopt restrictions that are more protective than those for endangered species under §9. In practice, however, almost all §4(d) rules reduce the amount of §9 protections a species receives, with some §4(d) rules modifying ESA prohibitions for activities that are the primary threat to a species.

Second, some aspects of the ESA might benefit from increased flexibility given the real-world constraints on the Services' implementation of the Act. For example, some people have recommended that the agencies postpone critical habitat designation until after a recovery plan is drafted, because the scope of a designation is supposed to be based on the recovery needs of a species. Others have suggested that the Services be granted the authority to issue §4(d) rules for endangered species to incentivize conservation actions for those species. These ideas are controversial, and thus point to the need for robust discussion about how greater regulatory flexibility might be employed to enhance conservation goals (including by incentivizing landowners with reduced regulatory burdens for achieving those goals).

17. Vivian Negrón-Ortíz, *Pattern of Expenditures for Plant Conservation Under the Endangered Species Act*, 171 Conservation Biology 36 (2014).
18. Temple Stoellinger et al., *Improving Cooperative State and Federal Species Conservation Efforts*, 20 Wyo. L. Rev. 183 (2020).
19. Alejandro E. Camacho et al., *Assessing State Laws and Resources for Endangered Species Protection*, 47 ELR 10837 (Oct. 2017).
20. For a review of the variety of incentives that motivate electric power utilities to carry out voluntary species conservation, see Electric Power Research Institute, Understanding Barriers and Incentives to Voluntary Conservation Opportunities Under the U.S. Endangered Species Act (2020), https://www.epri.com/research/programs/107153/results/3002018979.

G. Need for Systems to Learn From Mistakes and Successes

One challenge of ESA implementation is dealing with uncertainty. Many listed species lack adequate biological data; the "best available" science for these species is often still very poor data. Similarly, conservation techniques for many species are unproven. Mitigation measures incorporated into many habitat conservation plans (HCPs) and §7 consultations are experimental, even if they are not acknowledged as such.

These are two of the many examples of uncertainty in ESA decisionmaking, and they underscore the need for ESA decisions to reflect lessons learned from mistakes and successes. These learning systems, however, do not currently exist at any scale within the Services' ESA programs. The reasons are many, including inadequate staff to pursue this type of discretionary work that is not legally mandated but vital for understanding how to optimize future conservation decisions.

H. Need for Climate Change Adaptation and Comprehensive Ecosystem Protection

To conserve species, the United States and other countries need to reduce greenhouse gas emissions. Workshop participants, however, recognized that the ESA is not the most appropriate tool to achieve that outcome. Instead, the ESA seems better suited to focusing on helping species adapt to the effects of climate change, including in listing, critical habitat designation, recovery planning, and habitat conservation planning and management.

Creative improvements in ESA implementation are needed in this respect. An example is the need for new policies to facilitate species translocations, such as assisted migration, and to create wildlife corridors. Further, ESA implementation must also be linked to other efforts to manage the ecological effects of climate change, including public lands and invasive species management, landscape-level planning, and comprehensive federal and state adaptation planning efforts.

II. Key Recommendations

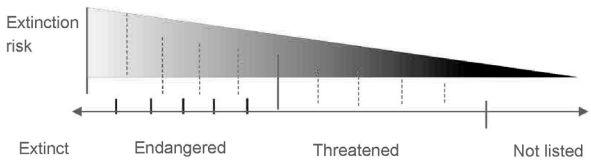
A. Tailor Protections for Threatened, Endangered, and Recovered Species and Their Habitats

The ESA's protections are afforded only to species that have been determined, through a listing process, to be "threatened" or "endangered." The ESA provides some flexibility to tailor protections for threatened species, but participants agreed that additional opportunities to tailor protections based on level of imperilment could facilitate recovery and increase political support for the ESA. While conservationists have discussed the need to prioritize limited resources for listed species,[21] they have rarely discussed tiering protections for species and their habitats based on level of vulnerability, beyond the use of §4(d) rules for threatened species and the consideration of species status during §7 consultations.

Administrative. As an initial matter, scoping session participants agreed that the Services need to establish more objective, biologically based criteria to distinguish between threatened, endangered, and recovered species. Without clear distinctions, attempts to tailor protections based on species vulnerability will remain highly subjective and susceptible to political considerations.[22]

A complementary approach is to recognize that there is a gradation of extinction risk within the existing threatened and endangered categories (e.g., the endangered category runs the entire spectrum from near-extinct to approaching downlisting, thus encompassing species with very different extinction risks). Further, the Services should better recognize a species' degree of conservation reliance[23] and develop policy or other approaches to better address the need for ongoing management of those species, such as securing assurances for long-term management.[24]

Figure 1. Extinction Risk Gradation



The current categories of endangered, threatened, and not listed (recovered) are too coarse to capture the fact that species can vary considerably in extinction risk within each of those categories. If the Services were to recognize the gradation of extinction risk within each category (as shown by the dotted lines in Figure 1), they could manage species more flexibly and precisely based on a more refined assessment of extinction risk.

Administrative. Once a clearer differentiation between the threatened, endangered, and recovered categories is established, it can be used to develop a better system for identifying different tiers of vulnerability within each category and tailoring conservation measures to each category,

21. *See, e.g.*, John Charles Kunich, *Preserving the Womb of the Unknown Species With Hotspots Legislation*, 52 Hastings L.J. 1149, 1198 (2001).
22. April 2019 Scoping Session, Advocating for Improvements in Species Conservation [hereinafter April 2019 Scoping Session].
23. October 2020 Workshop Roundtable, A Conservation Vision for the Federal Endangered Species Act [hereinafter October 2020 Workshop Roundtable].
24. UCI Law CLEANR, *15 Key Recommendations to Better Enhance ESA Conservation*, https://www.law.uci.edu/centers/cleanr/events/esa-roundtable-priorities.html (last visited July 7, 2021).

including through incentives for conservation partners. This system can include:

- More explicit differences in the amount and type of §7(a)(2) conservation requirements based on species vulnerability;

- Better use of §4(d) rules that account for whether a threatened species is improving or declining, including the use of affirmative protections beyond those in §9(a), because those protections are "necessary and advisable" to conserve the threatened species[25]; and

- If there is currently no path to recovering a species, regulate individual populations differently based on each population's level of imperilment (e.g., populations that have met their recovery goals could receive reduced ESA protections, and this could create an incentive for landowners to meet those goals).[26]

The implications of how to manage species based on their tier could also include prioritizing recovery funding, varying the rigor of §§7 and 10 analyses, and managing expectations for whether a species can be downlisted or delisted.[27]

Scoping session participants identified several advantages of tiering protections based on species vulnerability. They noted that tiering enhances the ability of the Services to identify species with the greatest conservation needs and to prioritize funding for those species.[28] It could address the negative narrative that the ESA is a failure because so few species are delisted, by clearly identifying a category of conservation-reliant species for which preventing extinction or stabilizing populations would be considered a success. Further, as alluded to earlier, the varying requirements that come with the different tiers of protection would provide incentives to landowners to help reduce threats, in an effort to move a species into a lower tier with its less-stringent protection requirements.[29]

B. Revise Incidental Take Authorization Standards

Although the ESA's goal is to recover species, projects covered by §7(a)(2) consultations or §10(a)(1)(B) HCPs are allowed to harm a species' recovery prospects. To fix this contradiction, there was broad consensus among participants that §7 and §10 authorizations need to go beyond minimizing harm to species and include a more recovery-oriented standard.

At a minimum, a permitted project should not leave a species' recovery prospects worse off. Scoping session participants discussed several potential recovery-based standards, including net benefit, no-net-loss, and full mitigation of impacts. A net benefit refers to a permitted project improving a species' conservation status, and would likely require mitigation offsets to achieve. A no-net-loss or full mitigation of impacts refers to situations where all adverse effects of a permitted project are offset, such that a species' conservation status is neither degraded nor improved.

While a net benefit standard would result in the greatest enhancement of species conservation, scoping session participants acknowledged the political difficulty of convincing the Services and the U.S. Congress to adopt that standard, the potential for a constitutional takings challenge, and the lack of monitoring data needed to evaluate whether a net benefit has occurred. Further, one scoping session participant suggested that a net benefit standard is not needed to enhance species conservation, because the current standard allows a species to decline well below the status quo. Even a no-net-loss or full mitigation standard would enhance species conservation considerably.

Legislative. A legislative change to the ESA is likely needed to create a mandatory no-net-loss or full mitigation standard. Under such a standard, the affected species would experience "no net loss" to its recovery status because all harmful effects of a project will have been fully mitigated with an adequate margin of safety to address scientific uncertainty about the effectiveness of the mitigation technique. This standard does not actually require a project proponent to advance the species' recovery, only to ensure that recovery is not impeded.

Another benefit of a no-net-loss standard is that there would be less pressure to track cumulative effects across a species' entire range, addressing criticisms that (1) the Services' cumulative effects analysis under §7 is inadequate; and (2) there is no tracking of cumulative adverse modification or jeopardy for most species.[30] For these reasons, participants largely agreed that a no-net-loss or a full mitigation standard is the most feasible starting point for ESA reform.

Critical to making this work is a practicable regulatory framework for implementation. Participants discussed formally linking §7(a)(1) (the conservation mandate for federal agencies) and §7(a)(2) (the jeopardy prohibition) as a mechanism to achieve a no net loss (or even net benefit) for federal projects.[31] For example, this could allow federal agencies to bank mitigation credits under §7(a)(1) to offset project impacts under §7(a)(2). Tracking the cumulative effects of projects across a species' range could also facilitate opportunities for banking by allowing beneficial activities in one part of the range to help offset harmful effects in other parts of the range (though there are limits to this approach).

Mitigation requires credit buyers, and one way to drive buyers is to force market-based mechanisms for mitiga-

25. April 2019 Scoping Session, *supra* note 22.
26. UCI Law CLEANR, *supra* note 24.
27. October 2020 Workshop Roundtable, *supra* note 23.
28. April 2019 Scoping Session, *supra* note 22.
29. *See, e.g.*, Rebecca Epanchin-Niell & James Boyd, *Private Sector Conservation Under the Endangered Species Act: A Return on Investment Perspective*, 18 Frontiers Ecology & Env't 409 (2020).
30. *Id.*; U.S. Government Accountability Office, GAO-09-550, Endangered Species Act: The U.S. Fish and Wildlife Service Has Incomplete Information About Effects on Listed Species From Section 7 Consultations 25 (2009).
31. April 2019 Scoping Session, *supra* note 22.

tion, similar to the no-net-loss wetlands policy.[32] As a condition of obtaining a §404 Clean Water Act (CWA)[33] permit, the no-net-loss wetlands policy requires restoration or creation of at least as much acreage of wetlands as a project would damage.[34] The policy's regulatory certainty and prioritization of off-site mitigation "opened the door to a market-based approach and sparked rapid growth in mitigation banks."[35]

Establishing a recovery-based standard for incidental take permitting under §10 of the ESA could be modeled after this no-net-loss wetlands policy, while recognizing that many populations of listed species are irreplaceable and thus are not amenable to a credit-debiting system. Roundtable participants also discussed the possibility of a streamlined system for mitigating minor impacts to listed species.

For example, one participant suggested that a structure similar to Virginia's stormwater management credit trading program could be used in the incidental take context.[36] Under Virginia's program, dischargers can purchase phosphorus credits to meet water quality requirements, and credit providers are required to provide long-term reductions in phosphorus load.[37] One roundtable participant noted that a streamlined system for mitigating minor impacts to species is crucial to adopting a no-net-loss standard. Without this mechanism, the standard would likely stop many proposed projects, creating political backlash against the ESA and prompting the Services to avoid listing a species until it is in a dire condition.[38]

Administrative. Regardless of the exact standard adopted, participants stressed that a recovery-based standard would place greater emphasis on requiring compensatory mitigation to offset the residual impacts that are not avoided and minimized.[39] As a result, participants agreed that the standard should express a preference for mitigation done in advance (as opposed to after the impacts occur). Further, there would need to be clear definitions in order to avoid uncertainty as to whether the standard has been met. This includes the need for clear requirements and guidelines for carrying out mitigation.

A participant suggested developing a multiagency mitigation requirement for all federal agencies that impact endangered species (e.g., Bureau of Land Management (BLM), U.S. Forest Service, U.S. Department of Defense), to avoid placing the entire responsibility for developing the requirement on FWS. Another raised the need for greater transparency regarding the compensatory mitigation process, and recommended legislation to create a standard mitigation policy across the federal government that includes transparency requirements. These recommendations are particularly important in light of then-Deputy Secretary of the Interior David Bernhardt's issuance of Secretarial Order 3360, rescinding the U.S. Department of the Interior's mitigation policy and BLM mitigation handbook.[40]

Administrative. More specifically, there needs to be guidance on how to balance how much avoidance and minimization is needed before turning to compensatory mitigation.[41] For some species, avoidance and minimization may be sufficient to achieve a recovery-based standard. For example, reducing human-caused mortality of golden eagles is key to improving their conservation status. On the other hand, offsets may more effectively achieve a net benefit for other species.

The overriding threat to migratory birds, for example, is habitat loss. Therefore, compensatory mitigation to fund habitat conservation may be more valuable than on-site minimization. There may also be highly imperiled species for which the risks associated with failed offsets is too high. In those instances, the Services should not allow offsets unless it has been proven to work beforehand.

A trade off of adopting a recovery-based standard is the public and political resistance to higher conservation standards. This is why participants agreed that a no-net-loss or full mitigation standard would be more feasible than a net benefit standard. Participants also raised the issue that a recovery standard could create undue hardship on small landowners. One way this can be addressed is by carving out exemptions for small landowners. However, such an exemption would require defining "small landowner," which could open up the need to determine whether small water rights holders would require an exemption as well.

An alternative to providing an exemption for small landowners is to create a federal program that provides them with resources to help achieve a no net loss standard. Another trade off of this recommendation is that its effectiveness relies heavily on clear definitions of the standard and the mitigation requirements in order to ensure species conservation is being enhanced. Finally, adequate monitoring to ensure the recovery-based standard is being achieved is critical and is not without challenges, as discussed in the next subsection.[42]

If the goal under the ESA is to enhance species conservation, this standard is essential. Other regulatory contexts

32. *Id.* (referencing "no-net-loss" goal in Memorandum of Agreement Between the Department of the Army and the Environmental Protection Agency Concerning the Determination of Mitigation Under the Clean Water Act Section 404(b)(1) Guidelines (Nov. 14, 1989)). However, a scoping session participant pointed out that the rate of protection under the no-net-loss wetlands scenario was a 60% loss of wetlands because landowners were not implementing mitigation.
33. 33 U.S.C. §§1251-1387, ELR Stat. FWPCA §§101-607.
34. *See* David J. Hayes & Nicole Gentile, Center for American Progress, No Net Loss: How Mitigation Policy Can Spur Private Investment in Land and Wildlife Conservation 4 (2016), https://www.americanprogress.org/issues/green/reports/2016/11/01/291509/no-net-loss/.
35. *Id.*
36. Virginia Cooperative Extension, Virginia Citizen's Guide to Environmental Credit Trading Programs: An Overview (2016), https://resources.ext.vt.edu/contentdetail?contentid=3050&contentname=Virginia%20Citizen%E2%80%99s%20Guide%20to%20Environmental%20Credit%20Trading%20Programs:%20An%20Overview.
37. *Id.* at 4.
38. October 2020 Workshop Roundtable, *supra* note 23.
39. April 2019 Scoping Session, *supra* note 22.
40. Secretarial Order No. 3360, Rescinding Authorities Inconsistent With Secretary's Order 3349, "American Energy Independence" (2017), https://www.eenews.net/assets/2018/01/05/document_gw_04.pdf.
41. April 2019 Scoping Session, *supra* note 22.
42. *See infra* Section II.C.1.

can provide guidance on establishing a clear definition of the standard and the mitigation requirements. Moreover, there are opportunities to lessen political resistance through other recommendations that provide incentives to landowners, as discussed in Section II.D below.

C. *Improve Recovery Planning, Including Recovery Plan Implementation*

Even after a species is listed under the ESA, its road to recovery is often unclear and insecure.[43] The ESA mandates that federal agencies contribute to the recovery of listed species, but that requirement is largely unenforceable and does not apply to nonfederal entities.[44] Further, ambiguity over what constitutes recovery has led to inefficiencies and ineffectiveness in recovery planning for some listed species. Building stronger recovery planning and implementation requirements would advance recovery.

1. Amend §4(f) to Explicitly Require Implementation of Recovery Plans, and Require Oversight

Requiring the development and finalization of recovery plans is insufficient to conserve species. The absence of an effective statutory mandate requiring recovery plan *implementation* (and congressional funding to do so) means that federal agencies are generally able to ignore or downplay this mandate.[45] Further, the fact that recovery plans are mere guidance documents without regulatory effect limits their effectiveness.[46]

Legislative. In order to enhance species conservation, §4(f) needs to be amended to create more specific and enforceable requirements for implementation of recovery plans and to make a recovery plan's downlisting and delisting criteria binding on the Services unless the criteria are formally revised. This should include deadlines for their development and implementation by the Services and all other jurisdictional federal agencies,[47] as well as deadlines for implementing plan milestones.

To ensure progress toward measurable recovery goals, oversight of the Services and other jurisdictional federal agencies should be required.[48] One way this could be done is through a new §7(a)(1) requirement that makes the recovery duty truly mandatory and allows federal agencies to be held accountable for failing to fulfill this duty. These requirements can help ensure that recovery actions described in recovery plans are taken.

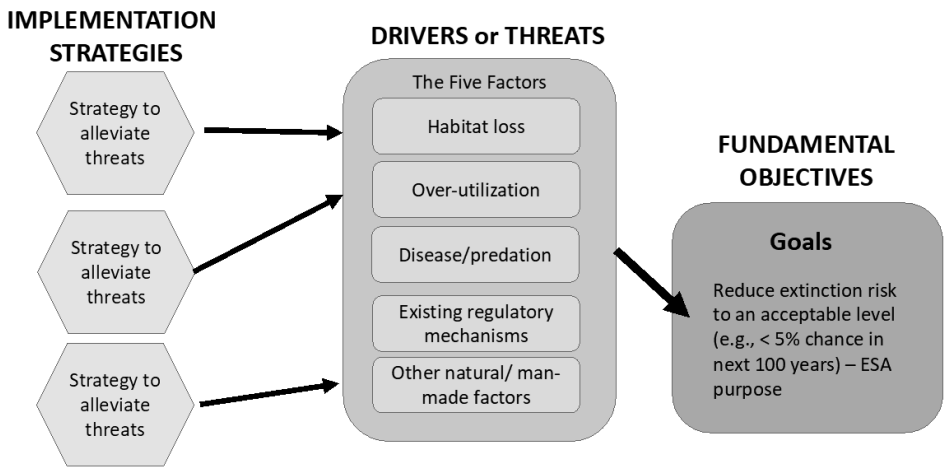
There are trade offs to imposing these requirements, including placing yet another responsibility on the already under-resourced Services. Strict deadlines may also inadvertently prevent coordination with other agencies or stakeholders. Another difficulty with making recovery plans enforceable is determining the link to delisting, which is discussed in Section II.C.2 below. Most importantly, the Services cannot effectively implement these requirements without adequate funding. However, such challenges are not insurmountable. Citizen suits are an option for enforcing deadlines, and flexibility can be built into deadlines, such as by allowing an exception in cases where coordination would otherwise be prevented.

2. Base Recovery Plans on Clear Standards, and Make Delistings Contingent on Achieving Recovery Criteria

Most roundtable participants agreed that the question of "how much is enough" to declare a species recovered remains elusive. The very concept of "recovery" is left undefined by the ESA, which instead offers a tautological statement that a species is recovered when it is no longer "likely to become [in danger of extinction] within the foreseeable future throughout all or a significant portion of its range."[49] Moreover, the ESA lacks clear criteria for how to develop recovery plans to adequately ensure progress toward the species' recovery.[50] Many criticize recovery planning criteria as not being based on the BAS.[51] Further, "plans remain unchanged for too many years despite new knowledge."[52] Static recovery plans risk becoming "increasingly irrelevant over time."[53]

43. Patrick A. Parenteau, *Rearranging the Deck Chairs: Endangered Species Act Reforms in an Era of Mass Extinction*, 22 Wm. & Mary Env't L. & Pol'y Rev. 227, 264 (1998) (arguing that there is a lack of clear standards governing what recovery plans must contain and whether they can be enforced).
44. *Id.*; Eric Helmy, *Teeth for a Paper Tiger: Redressing the Deficiencies of the Recovery Provisions of the Endangered Species Act*, 30 Env't L. 843, 853-54 (2000) (arguing that the lack of this duty has been criticized by various scholars as generally rendering recovery plans unenforceable under the terms of §4(f) and removing an important safety net of citizen suit litigation).
45. Helmy, *supra* note 44, at 846.
46. Friends of Blackwater v. Salazar, 691 F.3d 428, 42 ELR 20181 (D.C. Cir. 2012) (upholding FWS' long-standing position that recovery plans are not regulatory documents and do not bind delisting, downlisting, and uplisting decisions).
47. *See*, *e.g.*, Helmy, *supra* note 44, at 845; The Wildlife Society, Practical Solutions to Improve the Effectiveness of the Endangered Species Act for Wildlife Conservation 10 (2005).
48. Helmy, *supra* note 44, at 852; Threatened and Endangered Species Recovery Act of 2005, H.R. 3824, 109th Cong. (2005); *see also* The Wildlife Society, *supra* note 47, at 10 (suggesting that the Office of Management and Budget could hold agencies accountable, through the Government Performance and Results Act procedures, for contributing to meaningful progress in recovery of listed species); April 2019 Scoping Session, *supra* note 22.
49. 16 U.S.C. §1532(19), (6); Keystone Center, The Keystone Working Group on Endangered Species Act Habitat Issues 31 (2006).
50. *See* Parenteau, *supra* note 43, at 264.
51. *E.g.*, Maile C. Neel et al., *By the Numbers: How Is Recovery Defined by the U.S. Endangered Species Act?*, 62 BioScience 646, 647 (2012); Daniel M. Evans et al., *Species Recovery in the United States: Increasing the Effectiveness of the Endangered Species Act*, Issues Ecology, Winter 2016, at 20; Mark W. Schwartz, *The Performance of the Endangered Species Act*, 39 Ann. Rev. Ecology Evolution & Systematics 279, 283 (2008) ("Recovery plans tend to underemphasize monitoring threats to species and biotic interactions relative to monitoring population trends.").
52. Jacob W. Malcom & Ya-Wei Li, *Missing, Delayed, and Old: The Status of ESA Recovery Plans*, 11 Conservation Letters 1, 2 (2018).
53. J. Alan Clark et al., *Improving U.S. Endangered Species Act Recovery Plans: Key Findings and Recommendations of the SCB Recovery Plan Project*, 16 Conservation Biology 1510, 1515 (2002).

Figure 2. Recovery Plan Structure



Source: E-mail from Mark Schwartz, Professor, University of California, Davis, to Melissa Kelly, Staff Director and Attorney, UCI Law CLEANR et al. (Oct. 19, 2020, 09:41 PST) (on file with author).

Administrative. To address these problems, recovery plans must be based on clear science and policy standards. This could include developing default standards for what constitutes recovery, and requiring a showing of necessity for any deviation from the default when delisting a species.[54] To strengthen the scientific foundation of recovery, the Services should better integrate population ecology, conservation genetics, and habitat conservation data with external and climate risk consideration.[55] In addition, the agencies should explicitly consider survival, reproduction, and minimum habitat areas.[56] Some participants also suggested that the Services quantify the amount of extinction risk that corresponds to the definitions of "threatened" and "endangered" and develop criteria for achieving ecologically effective population sizes.

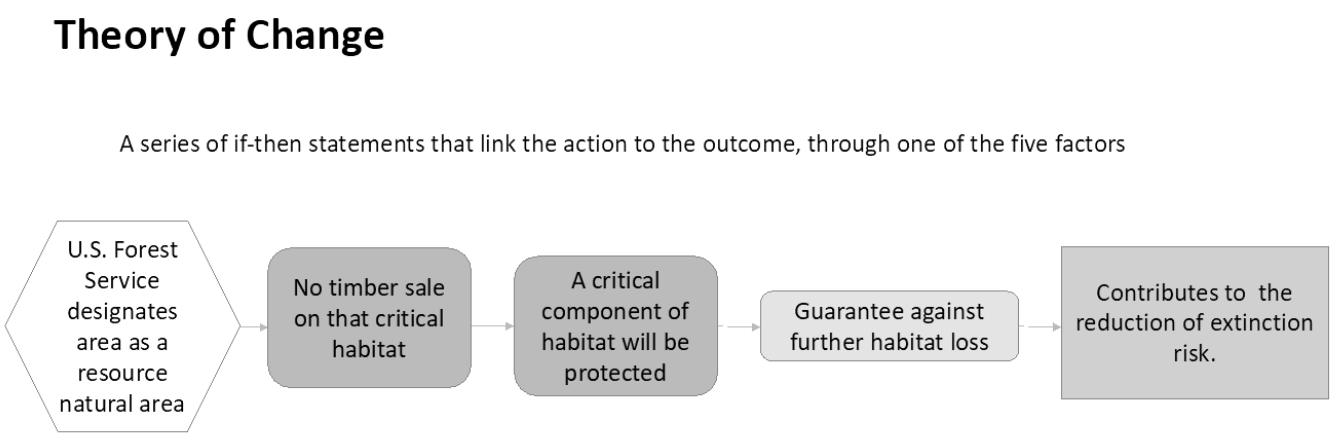
For example, one idea is to adopt an approach similar to that used in the polar bear recovery plan.[57] There, the Services identified three levels of recovery goals: (1) fundamental objectives, (2) demographic criteria, and (3) five-factor threat criteria.[58] Fundamental objectives should be stable over time because they represent a value judgment about how much extinction risk is acceptable.[59] Demographic criteria focus on how to achieve the fundamental objective and may change over time based on new information. The five-factor threat criteria are nested one layer down from the demographic criteria.[60] Those criteria are discussed in depth below in this section. Thus, to improve consistency and clarity, the Services could more consistently establish "fundamental objectives" for determining when a species is deemed recovered.

The polar bear recovery plan is one of the few examples where the Services established such objectives (e.g., the worldwide probability of persistence is at least 95% over 100 years).[61] Roundtable participants did not conclude whether a fixed percentage for all species is appropriate, or whether percentages should vary based on taxonomy or other factors. Some suggested establishing an overarching goal like "viability" to indicate when a species is deemed recovered, although this goal has been in place for more than a decade and still leads to inconsistent outcomes for what constitutes recovery. Others championed adoption of the International Union for Conservation of Nature (IUCN) Red List standard[62] for ESA determinations, and observed that the state of Florida has been using that standard for several years in listing and delisting species under state law.[63] The IUCN standard, however, does not include the five threat factors of the ESA, and adopts a maximum time frame of 100 years when assessing extinction risk.[64]

Once the fundamental objectives are defined, the recovery plan should be structured such that the five threat factors are linked to the objectives and a suite of implementation strategies that satisfy the threat factors (see Figure 2).[65] In other words, a results chain is established in which the implementation strategies are linked to the fundamental objectives through one of the five factors.[66]

54. April 2019 Scoping Session, *supra* note 22.
55. *Id.*
56. *Id.*
57. October 2020 Workshop Roundtable, *supra* note 23.
58. FWS, Polar Bear Conservation Management Plan (2016), https://ecos.fws.gov/docs/recovery_plan/PBRT%20Recovery%20Plan%20Book.FINAL.signed.pdf.
59. October 2020 Workshop Roundtable, *supra* note 23.
60. *Id.*
61. FWS, *supra* note 58, at 6.
62. IUCN, IUCN Red List Categories and Criteria v. 3.1 (2d ed. 2012), http://s3.amazonaws.com/iucnredlist-newcms/staging/public/attachments/3108/redlist_cats_crit_en.pdf.
63. Fla. Admin. Code §68A-27.0012 (2017).
64. IUCN, *supra* note 62, at 16.
65. E-mail from Mark Schwartz, Professor, University of California, Davis, to Melissa Kelly, Staff Director and Attorney, UCI Law CLEANR et al. (Oct. 19, 2020, 09:41 PST) (on file with author).
66. *Id.*

Figure 3. Theory of Change



Source: E-mail from Mark Schwartz, Professor, University of California, Davis, to Melissa Kelly, Staff Director and Attorney, UCI Law CLEANR et al. (Oct. 19, 2020, 09:41 PST) (on file with author).

The Services would need to prioritize among these implementation strategies based on how well they would achieve the fundamental objectives, taking into account means objectives such as costs.[67] Some roundtable participants suggested that any improved system for recovery planning should avoid locking in prescriptive pathways for how to recover a species—a recovery plan needs to provide the flexibility to take new information into account both in terms of the strategies for achieving recovery and the criteria that reflect fundamental objectives.

This approach would improve the consistency of recovery criteria, while still allowing flexibility to derive recovery criteria and recovery strategies on a species-by-species basis using the BAS.[68] It would also facilitate clear monitoring as to whether an implementation strategy contributed to achieving the fundamental objectives (see Figure 3).[69]

For recovery plans to be based on clear science and policy standards, the Services must also recognize that recovery not only has an abundance component, but also a spatial component that is best captured by the concept of "representation." Representation has been interpreted to mean

> the characteristics that make a species a contributor to biodiversity, whether intrinsic or extrinsic to individuals and populations. This includes representation of standing diversity in genetics and phenotypes to represent current diversity and to ensure sufficient genetic and phenotypic variation to allow for future diversification. It also means representation in the variety of ecosystems in which the species is found, and with the variety of interactions with other species, such that the species' role in those ecosystems is maintained.[70]

Some roundtable participants asserted that spatial distribution is the most challenging aspect of determining how much is enough to deem a species recovered.

Legislative. To enhance species conservation, Congress should require the Services to update recovery plans and to use science-based recovery standards as part of those updates.[71] Similarly, some scoping session participants suggested Congress require the Services to base delisting decisions on a review and update of the recovery plan, rather than primarily on the five-factor threat analysis, and on science-based recovery standards.

Requiring recovery plan updates can enhance species conservation because plans will contain updated information that better reflects how our understanding of the species, their habitat, and threats may have changed over time.[72] This periodic reevaluation of recovery plans provides additional opportunity to adapt management actions to new information and further enhance species conservation.[73]

Science-based recovery standards should serve as the basis of these updates. When recovery plan goals are well-linked to biological information on the species, the species has been found more likely to improve in status.[74]

One trade off of recovery plan updates is that they are expensive and work-intensive,[75] so there is likely to be some pushback from the under-resourced Services.[76] The pro-

67. *Id.*
68. October 2020 Workshop Roundtable, *supra* note 23.
69. E-mail from Mark Schwartz, *supra* note 65.
70. Jacob Malcom & Andrew Carter, Better Representation Is Needed in Endangered Species Act Implementation 10 (2020) (recommending this interpretation of representation from Mark L. Shaffer & Bruce A. Stein, Precious Heritage: The Status of Biodiversity in the United States (2000), over the Services' narrower interpretation).
71. April 2019 Scoping Session, *supra* note 22.
72. Malcom & Li, *supra* note 52, at 2.
73. *See* Theodore C. Foin et al., *Improving Recovery Planning for Threatened and Endangered Species*, 48 BioScience 177, 184 (1998); Clark et al., *supra* note 53, at 1516; P. Dee Boersma et al., *How Good Are Endangered Species Recovery Plans?*, 51 BioScience 643, 648 (2001).
74. Clark et al., *supra* note 53, at 1518.
75. Malcom & Li, *supra* note 52, at 2.
76. Noah Greenwald et al., Center for Biological Diversity, Short-Changed: Funding Needed to Save America's Most Endangered Spe-

portion of listed species with recovery plans has declined since 2000,[77] and the Services already have to triage to implement the highest priority recovery actions because they lack the resources to implement all recovery plans.[78] Further, a scoping session participant pointed out that the more discretion that is added to the recovery planning process, the more stakeholders may push back.[79]

Achieving recovery criteria in the species' recovery plan is one factor, but not a prerequisite to delisting.[80] To delist a species under the ESA, the Services must determine that the species is no longer threatened or endangered based on the five factors considered in listing the species.[81] Some argue that focusing on threat factors "ignores species relationships to each other and ecosystems,"[82] and threat factors themselves are inherently difficult to define precisely and in a scientifically defensible manner.[83] Further, participants raised concerns about the disconnect between the five-factor threat analysis in court decisions and recovery criteria. In general, courts have held that recovery plan provisions, including downlisting and delisting criteria, are not enforceable.[84] As a result, the Services can delist a species even if the recovery plan criteria are not met.[85]

Legislative. To address these problems, scoping session participants suggested that if the Services use the five-factor threat analysis and find a species recovered even though it has not met all of the criteria in a recovery plan, the Services should be required to provide a higher showing as to why a species has been found to be recovered. The Services could be required to show why any deviation from the recovery criteria is necessary.

Some participants also agreed that a species should not automatically be delisted if all the recovery plan objectives have been met because conditions change over time in ways recovery plans may not be able to predict. However, a presumption of delisting may be appropriate. On the flip side, if the Services propose recovery criteria that are science-based and credible, the five-factor threat analysis does not necessarily add value.

Roundtable participants identified two competing approaches to address the problem of court decisions holding that recovery criteria are unenforceable. The first is to base recovery plans on the reverse of the five-factor analysis, and define in the plan when the species is no longer threatened or endangered. Delisting criteria would serve as nonmandatory guidelines for delisting (e.g., the recent downlisting of the red-cockaded woodpecker[86] or delisting of the Virginia flying squirrel,[87] where FWS determined that all delisting criteria did not need to be met). This is the current state of the law.[88] The problem is that it makes the criteria nonbinding, and allows the far more subjective five-factor analysis to override the criteria as part of a downlisting or delisting decision.

The other approach is to make delisting decisions contingent on satisfaction of delisting criteria, with the five threat factors subservient to those criteria (e.g., the polar bear recovery plan[89] and dissenting opinion in *Friends of Blackwater v. Salazar*[90]). A trade off of these approaches is that they may require a statutory amendment in order to address the disconnect between the five-factor threat analysis in court decisions and recovery criteria.[91]

Another consideration in delisting is the conservation reliance of the species.[92] This raises the normative question of how much human intervention is appropriate before a species can be deemed delisted. Some roundtable participants expressed concern about the Services potentially declaring a species recovered while the species still depends heavily on human intervention.

Pursuing this recommendation is critical to species recovery, and will require additional resources to restructure recovery plans to ensure they are based on clear science and policy standards, to regularly update these recovery plans, and to address the disconnect between court decisions and recovery criteria.

3. Create a Cooperative Federalism Permit Program to Implement Recovery Plans

Cooperative federalism programs, in which states manage public lands jointly with the federal government, have been in place for decades.[93] However, cooperative

cies 1 (2016); *see also* Holly Doremus, *The Purposes, Effects, and Future of the Endangered Species Act's Best Available Science Mandate*, 34 Env't L. 397, 446 (2004).

77. Malcom & Li, *supra* note 52, at 3.
78. Leah R. Gerber, *Conservation Triage or Injurious Neglect in Endangered Species Recovery*, 113 Proc. Nat'l Acad. Sci. 3563, 3563 (2016).
79. April 2019 Scoping Session, *supra* note 22.
80. Crystal D. Anderson, *Reconsidering a Weakened Regulation: A Critical Analysis of Delisting in the Endangered Species Act*, 9 Fla. A & M U. L. Rev. 207, 221 (2013).
81. These five factors are "(1) the present or threatened destruction, modification or curtailment of habitat or range; (2) overutilization for commercial, recreational, scientific, or educational purposes; (3) disease or predation; (4) the inadequacy of existing regulatory mechanisms; or (5) other natural or man-made factors affecting continued existence." 16 U.S.C. §1533(a)(1).
82. Jacqueline Lesley Brown, *Preserving Species: The Endangered Species Act Versus Ecosystem Management Regime, Ecological and Political Considerations, and Recommendations for Reform*, 12 J. Env't L. & Litig. 151, 186 (1997).
83. Daniel F. Doak et al., *Recommendations for Improving Recovery Criteria Under the U.S. Endangered Species Act*, 65 BioScience 189, 195 (2015).
84. Federico Cheever, *Recovery Planning, the Courts, and the Endangered Species Act*, 16 Nat. Res. & Env't 106, 108-10 (2001).
85. April 2019 Scoping Session, *supra* note 22; *see* Friends of Blackwater v. Salazar, 691 F.3d 428, 428, 42 ELR 20181 (D.C. Cir. 2012).
86. Reclassification of the Red-Cockaded Woodpecker From Endangered to Threatened With a Section 4(d) Rule, 85 Fed. Reg. 63474 (proposed Oct. 8, 2020) (to be codified at 50 C.F.R. pt. 17).
87. Final Rule Removing the Virginia Northern Flying Squirrel (Glaucomys sabrinus fuscus) From the Federal List of Endangered and Threatened Wildlife, 73 Fed. Reg. 50226 (Aug. 26, 2008) (to be codified at 50 C.F.R. pt. 17).
88. *E.g.*, *Friends of Blackwater*, 691 F.3d at 428.
89. FWS, *supra* note 58.
90. *Friends of Blackwater*, 691 F.3d at 440 (Rogers, C.J., dissenting).
91. April 2019 Scoping Session, *supra* note 22.
92. October 2020 Workshop Roundtable, *supra* note 23.
93. *See*, *e.g.*, Special Rule Concerning Take of the Threatened Coastal California Gnatcatcher, 58 Fed. Reg. 65088 (Dec. 10, 1993) (to be codified at 50 C.F.R. pt. 17); Final Rule Governing Take of 14 Threatened Salmon and Steelhead Evolutionary Significant Units (ESUs), 65 Fed. Reg. 42421, 42422 (July 10, 2000) (to be codified at 50 C.F.R. pt. 223); Final Rule Governing Take of Four Threatened Evolutionary Significant Units (ESUs) of West Coast Salmonids, 67 Fed. Reg. 1116, 1133 (Jan. 9, 2002) (to be codified at 50 C.F.R. pt. 223).

programs in which states issue permits "have been absent from resource management law in general and the ESA in particular."[94] Because habitat degradation often results from private land uses that are under state or local control, a cooperative federalism program under the ESA could enhance species conservation.[95]

State and local land use controls provide opportunities to implement recovery plan protections.[96] In addition, a cooperative federalism program could better incorporate state and local authorities' site-specific knowledge, including "the needs of local people, local customs and culture, how to ease tensions of local property owners, and how ecosystems are changing over time" to more effectively implement recovery plans.[97] Moreover, a cooperative federalism program provides incentives to states to strengthen their species conservation laws, as discussed in Section II.D.2 below.

Administrative. One mechanism for implementing this recommendation is by using §4(d) of the ESA to exempt from the take prohibition those activities that comply with approved state species conservation programs.[98] A §4(d) rule can establish criteria for states to use in designing their land use controls.[99] Section 4(d) can be used in conjunction with §6 cooperative agreements to provide federal funding for state programs for recovery plan implementation.[100]

There are a number of trade offs of this recommendation if implemented through §4(d). It would only apply to threatened species, require additional federal funding, and have higher administrative costs.[101] Roundtable participants noted that there is not one example of a state-led recovery planning effort to date, and currently there is little hope of states doing this, with the possible exceptions of California and Florida.

Similarly, one participant noted that in the CWA context, there is significant state engagement in the §402 program while very few states administer §404. The reason is that there is federal funding for the former, but not the latter. There may also be resistance to developing a cooperative federalism program due to the "substantial investment in HCPs," and the fact that §4(d) rules are single-species- rather than multispecies-focused.[102] Finally, this recommendation may have the same problem of weak Services implementation that the §10(a) permit program does.[103]

Accordingly, a conservation-focused cooperative federalism regime would need to integrate safeguards that induce state programs to advance the ESA's conservation objectives, including science-based standards and opportunities for meaningful citizen involvement. This also reinforces that the many proposed revisions to the ESA that seek to adopt a significant recession of a federal role in ESA implementation, with the expectation of a transfer or reallocation of authority to the states, are really just pursuing deregulation masked as cooperative federalism.

Some roundtable participants emphasized the need to (1) reframe cooperative federalism so it is not about states taking control and federal government having less of a role, and (2) de-emphasize the focus of communications by state wildlife agencies on who has primary jurisdictional authority between the states and federal government. Meaningful cooperative federalism that promotes conservation requires significant federal involvement, including robust standards and funding, as well as a substantial and sustained state conservation commitment.

D. Provide Incentives for Species Conservation on Private, State, and Federal Lands

Many listed and at-risk species require habitat improvement or population augmentation measures, yet the ESA itself is silent on incentives. Despite this silence, conservationists have developed regulatory, financial, reputational, and other positive incentives to conserve species. Participants agreed that there is a need to improve incentives for species recovery and proactive conservation under the ESA. Such incentives can be particularly effective where direct harm to species is *not* what needs to be managed, but rather where certain conservation actions need to be encouraged—for example, incentives to manage invasive species or prescribed fires.[104]

While there is this basic notion that incentives can enhance species conservation, there is limited empirical knowledge of where incentives are and are not working and where conservation funding is poorly used. Candidate conservation agreements with assurances (CCAAs), for example, can have strict confidentiality provisions that hinder public transparency and monitoring of conservation outcomes.[105] Participants offered the following recommendations for making incentives more effective.

1. Incentivize Private Landowners to Promote Conservation

A majority of listed species occur on private lands.[106] Incentivizing private landowner engagement in conservation

94. Robert L. Fischman & Jaelith Hall-Rivera, *A Lesson for Conservation From Pollution Control Law: Cooperative Federalism for Recovery Under the Endangered Species Act*, 27 Colum. J. Env't L. 45, 133 (2002).
95. Robert L. Fischman, *Cooperative Federalism and Natural Resources Law*, 14 N.Y.U. Env't L.J. 179, 210 (2005).
96. Fischman & Hall-Rivera, *supra* note 94, at 134 (explaining "[a §]4(d) rule can require the planning jurisdiction to modify existing land use controls to conform with a recovery program"); *see also* Robert Fischman et al., *State Imperiled Species Legislation*, 48 Env't L. 81, 121 (2018).
97. Jordan K. Lofthouse & Camille Harmer, Strata, Improving the Endangered Species Act: Recommendations for More Effective Conservation 15 (2017), https://strata.org/pdf/2017/improving-esa.pdf.
98. Fischman, *supra* note 95, at 213-14.
99. Fischman & Hall-Rivera, *supra* note 94, at 133.
100. *Id.*; Fischman, *supra* note 95, at 212.
101. Fischman & Hall-Rivera, *supra* note 94, at 160-63.
102. *Id.* at 163-65.
103. *Id.* at 165-68.
104. April 2019 Scoping Session, *supra* note 22; *see also* Epanchin-Niell & Boyd, *supra* note 29, at 412.
105. October 2020 Workshop Roundtable, *supra* note 23.
106. Evans et al., *supra* note 51, at 14.

efforts has the potential to enhance species conservation.[107] Because a landowner does not typically capture the full value of species conservation, landowner preferences on land use will not necessarily align with goals to enhance species and habitat conservation.[108] In fact, some argue that §9 creates perverse incentives for landowners to hinder the gathering of information about species on their land, and even destroy habitat to avoid regulation.[109] Studies have found empirical evidence of the existence and influence of perverse incentives encouraging habitat destruction.[110]

Administrative. In order to promote conservation, policies should be adopted that encourage private landowners to engage in species management though a variety of financial incentives.

❑ *Direct government payments*. Direct payments made to landowners for providing and managing habitat can change the presence of endangered species on their land from a liability into an asset.[111] Direct payments can be made contingent on a commitment to specific management practices or tied to conservation outcomes such as an increase in the number of species.[112] For example, a direct payment program for species conservation could look to the Natural Resources Conservation Service's Wetlands Reserve Program, which pays landowners to "enhance wetlands on marginal agricultural lands,"[113] or alternatively provide landowners payment for eliminating invasive species.[114]

❑ *Tax incentives*. Providing tax credits can incentivize landowners to manage their land for species and habitat conservation purposes.[115] "Tax incentives do not seek to bridge the considerable distance between status quo, land-based revenues, and unrealized opportunity costs. They are intended as motivating incentives and economic signals, *not* as compensation for the effects of lawful and appropriate government regulation."[116] Thus, tax incentives should not be provided for mere compliance with the ESA, but rather for active conservation efforts such as creation of new habitat.[117] For example, legislation could provide estate tax deferral to landowners who agree to endangered species conservation agreements on inherited property.[118]

Scoping session participants pointed out that only regulating landowners with remaining habitat penalizes those landowners while overlooking landowners who have developed their land and destroyed habitat. A participant recommended creating a tax authority or another legal mechanism to enable capturing the economic benefit landowners realized from destroying habitat and developing on their land.[119] For example, a tax authority could be established to spread the costs of HCP management across landowners, and not just those specific landowners whose land is within the HCP.

❑ *Species conservation banking arrangements*. Species conservation banking is a market-based program that incentivizes landowners to permanently protect and manage habitat for species in exchange for credits, which can be sold to those who need to mitigate adverse impacts to species and habitat.[120] There are more than "130 conservation banks nationwide that collectively conserve more than 160,000 acres of valuable habitat."[121] Species conservation banking is based on a landscape-scale approach.[122] It has the benefit of achieving mitigation before impacts occur,[123] and creates opportunity for habitat connectivity if credits are banked for future use in a concentrated area, as opposed to mitigation conducted on a project-by-project basis.[124] Conservation banking can also address permanence and structural needs to promote long-term commitments.[125]

Given that species conservation banks generally offer the highest standard of offsets under the ESA, the Services should create an explicit requirement for ESA mitigation offsets to use banking credits where available or in-lieu-fee mitigation that is performed prior to a permitted impact. This preference would align ESA mitigation policy with the 2008 U.S. Environmental Protection Agency (EPA) and U.S. Army Corps of Engineers rule on compensatory mitigation under §404 of the CWA.[126] That rule is gener-

107. *See id*.; Randy T. Simmons, *Fixing the Endangered Species Act*, 3 Indep. Rev. 511, 521-22 (1999).
108. Stephen Polasky et al., *Endangered Species Conservation on Private Land*, 25 Contemp. Econ. Pol'y 66, 75 (1997).
109. *E.g.*, Gardner M. Brown & Jason F. Shogren, *Economics of the Endangered Species Act*, 12 J. Econ. Persp. 3, 7, 16 (1998); Robert Innes et al., *Takings, Compensation, and Endangered Species Protection on Private Land*, 12 J. Econ. Persp. 35, 39 (1998); Christian Langpap, *Conservation Incentives Programs for Endangered Species: An Analysis of Landowner Participation*, 80 Land Econ. 375 (2004); Brown, *supra* note 82, at 246.
110. Christian Langpap et al., *The Economics of the U.S. Endangered Species Act: A Review of Recent Developments*, 12 Rev. Env't Econ. & Pol'y 69, 78 (2017).
111. *See*, *e.g.*, Robert L. Fischman, *Predictions and Prescriptions for the Endangered Species Act*, 34 Env't L. 451, 474-75 (2004).
112. *E.g.*, *id*.; Langpap et al., *supra* note 110, at 80 (citing study examining incentives where payments are tied to environmental outcomes and those that are contingent on specific conservation actions).
113. Fischman, *supra* note 111, at 474.
114. *Id*.; *see* April 2019 Scoping Session, *supra* note 22.
115. *E.g.*, The Wildlife Society, *supra* note 47, at 12; Donald C. Baur et al., *A Recovery Plan for the Endangered Species Act*, 39 ELR 10006, 10009 (Jan. 2009).
116. Simmons, *supra* note 107, at 531 (citing Larry D. McKinney, *Reauthorizing the Endangered Species Act: Incentives for Rural Landowners*, *in* Building Economic Incentives Into the Endangered Species Act 74 (Hank Fisher & Wendy Hudson eds., 1994)).
117. Jonathan Evans, *The GOP Endangers the ESA*, W. Env't L. Update, at 8 (2006), http://www.pielc.org/WELU/WELU2006.pdf (criticizing the Collaboration for the Recovery of Endangered Species Act of 2005 for "fail[ing] to limit . . . tax breaks to landowners who engage in active conservation" and "primarily paying developers to comply with the law" by requiring reimbursement for costs of conducting environmental analyses under the National Environmental Policy Act).
118. This was proposed in the Endangered Species Recovery Act of 1999, H.R. 960, 106th Cong. (1999).
119. April 2019 Scoping Session, *supra* note 22.
120. FWS, Conservation Banking 1 (2019), https://www.fws.gov/endangered/esa-library/pdf/conservation_banking.pdf.
121. FWS, *For Landowners—Conservation Banking*, https://www.fws.gov/endangered/landowners/conservation-banking.html (last updated Jan. 30, 2020).
122. Endangered Species Act Compensatory Mitigation Policy, 81 Fed. Reg. 95316, 95318 (Dec. 27, 2016).
123. *Id*.
124. Jessica Fox & Anamaria Nino-Murcia, *Status of Species Conservation Banking in the United States*, 19 Conservation Biology 996, 997 (2005).
125. October 2020 Workshop Roundtable, *supra* note 23.
126. Compensatory Mitigation for Losses of Aquatic Resources, 73 Fed. Reg. 19593 (Apr. 10, 2008) (to be codified at 40 C.F.R. pt. 230).

ally regarded as establishing far more effective mitigation requirements than those under the ESA.

❑ *Habitat leases*. As an alternative to easement or other legal determination for a parcel of land, habitat leases are "long-term contracts (e.g., 10-30 years) that recognize and compensate landowners for ecological benefits currently provided by open, well-stewarded lands."[127] These are "designed to secure existing habitat and ecological services currently provided on private lands that meet threshold requirements for ecological site condition."[128] Agricultural production would be allowed to continue so long as it is compatible with conservation patterns.[129] Further, "in some cases, supplemental lease and cost-share payments could support landowners for adoption of new practices or additional investments to increase habitat," for example.[130]

❑ *Strategies for securing funding for financial incentives*. Financial incentives for landowners require funding. Strategies for securing funding for these financial incentives to landowners could include the creation of a recovery fund for private landowners, the issuance of government bonds to pay for species recovery actions, and the diversion of additional funds through future farm bill legislation[131] to habitat conservation programs.

❑ *Trade offs of financial incentives*. While direct payments, tax incentives, and species conservation banking promote species conservation by incentivizing private landowners to manage their land in a way that protects species and their habitat, such incentives have their trade offs. Inadequate funding is a pervasive problem for most federal programs, and each of these incentive strategies relies on an adequate fund or budget allocation in the case of tax incentives.[132] Further, because species and habitat conservation in this context depends on the actions of private landowners, monitoring is critical.

However, limited resources may make effective monitoring difficult.[133] Finally, there are challenges to determining the precise payment or credit amount that will effectively incentivize landowners. Because such financial incentives are not intended to fully compensate landowners for the value of developing their land, some landowners may ultimately not be incentivized by these strategies.[134]

Given that the majority of listed species occur on private lands, the advantages of providing financial incentives to private landowners necessitate securing adequate funding and resources for financial incentives and the monitoring necessary to ensure their effectiveness.

2. Induce States to Strengthen Conservation Laws and Enhance Non-Game Species Programs

Most state conservation laws are weaker and less comprehensive than the ESA.[135] Only 18 states cover all animals and plants covered by the ESA, 2 states do not have any endangered species laws, and 17 states do not protect endangered or threatened plants.[136] Further, almost one-half of the states do not expressly require that decisions regarding whether to provide species protections be based on science.[137]

In order to enhance species conservation, participants stressed the need to induce states to strengthen their species conservation laws and enhance their non-game species programs. Not only would state laws be more on par with federal protections, but strengthened state laws might also enhance species conservation by integrating local knowledge and data more effectively than the federal ESA.[138]

Legislative. Some recommend inducing states to strengthen their conservation laws by granting them more authority similar to federal delegation of permitting under pollution-control statutes to the states.[139] This could mean delegating "otherwise federal protections, such as section 10 permitting, to states fulfilling minimum standards that advance the goals of the ESA."[140] Just as EPA can reassume primary enforcement authority if a state program is not achieving the goals of the CWA,[141] the Services could step in if a state program is no longer meeting minimum standards.

The cooperative federalism recommendation in Section II.C.3 above is an example of this type of incentive. Similarly, states could be allowed to develop ecosystem-protection agreements with the Secretary of the Interior in exchange for reduced federal ESA enforcement activities in the state.[142]

This type of delegation to the states has its trade offs. The already under-resourced Services would need to actively monitor states' species conservation programs to ensure they are enhancing species conservation and meeting the ESA's goals. Strengthening state conservation laws will also require funding, including an increase in §6 grant funds. Scoping session participants raised the possibility

127. Western Landowners Alliance, *Habitat Leasing*, https://westernlandowners.org/policy/habitat-lease/ (last visited July 7, 2021).
128. *Id.*
129. October 2020 Workshop Roundtable, *supra* note 23.
130. Western Landowners Alliance, *supra* note 127.
131. *Cf.* Agriculture Improvement Act of 2018, Pub. L. No. 115-334, 132 Stat. 4490.
132. *See* Brown, *supra* note 82, at 247; Fischman, *supra* note 111, at 475.
133. *See, e.g.*, Royal C. Gardner, *Rehabilitating Nature: A Comparative Review of Legal Mechanisms That Encourage Wetland Restoration Efforts*, 52 Cath. U. L. Rev. 573, 596 (2003).
134. *See, e.g.*, David Farrier, *Conserving Biodiversity on Private Land: Incentives for Management or Compensation for Lost Expectations?*, 19 Harv. Env't L. Rev. 303, 406 (1995).
135. *See* Camacho et al., *supra* note 19, at 10838.
136. *Id.*
137. *Id.* at 10839.
138. *See, e.g.*, Keystone Center, *supra* note 49, at 27; Alejandro E. Camacho & Michael Robinson-Dorn, *Turning Power Over to States Won't Improve Protection for Endangered Species*, Conversation, Jan. 11, 2018, 6:42 AM, https://theconversation.com/turning-power-over-to-states-wont-improve-protection-for-endangered-species-87495.
139. Fischman et al., *supra* note 96, at 119.
140. *Id.*
141. *See id.*
142. Kristen Carden, *Bridging the Divide: The Role of Science in Species Conservation Law*, 30 Harv. Env't L. Rev. 165, 249 (2006).

that there are opportunities to provide funding through the Recovering America's Wildlife Act (RAWA).[143]

RAWA would "amend the Pittman-Robertson Wildlife Restoration Act to make supplemental funds available for management of fish and wildlife species of greatest conservation need as determined by State fish and wildlife agencies."[144] The bill would provide almost $1.4 billion in "dedicated annual funding for proactive, collaborative efforts by the states and tribes to recover wildlife species at risk."[145] However, some environmental groups have criticized the bill's inadequate funding for endangered species, lack of accountability measures to ensure the bill's objectives are met, and failure to address plant species conservation.[146]

Despite these trade offs, this recommendation is worth pursuing. Roundtable participants encouraged finding bipartisan ways to talk with state legislatures about changing state endangered species and wildlife laws to be more protective. This should be done on a state-by-state basis to account for the different political dispositions across states. Some participants also emphasized that state agencies need to be environmental agencies, not only fish and game agencies, in order to recognize the broader responsibility of wildlife protection. This change might be achieved through working with the National Caucus of Environmental Legislators.

3. Streamline §7 Consultations and §10 Agreements Where a "Net Benefit" Is Clear

On paper, the procedures required for §7 consultations and §10 agreements are the same regardless of whether a project would benefit listed species.[147] Some argue that projects that would clearly benefit species "face the same regulatory obstacles as projects that offer no benefits to listed species or would cause harm to them, thus delaying their approval and implementation."[148] To incentivize more projects that would benefit species, many suggest providing incentives in the form of reduced regulatory burdens.[149]

Administrative. Scoping session participants discussed how to best ensure enhanced species conservation by reducing regulatory burdens. Participants agreed that providing a voluntary opportunity to achieve a net benefit standard in exchange for a reduction in regulatory burden could provide an important incentive for conservation.[150] A reduced regulatory burden could take the form of streamlined consultations or §10 agreements where the net benefit is clear and established upfront.

Participants distinguished between providing assurances to federal agencies and private landowners. Some participants did not think federal agencies would be responsive to incentives because their obligations are not currently stringent enough, while others thought that federal agencies would be incentivized by receiving assurances similar to those provided to private landowners through safe-harbor agreements or by reducing transactional costs. Some also suggested that greater management flexibility could be provided as an incentive for federal agencies that "help a species exceed its recovery milestones."[151]

A trade off of this recommendation is that rigorous monitoring is essential to determining whether a net benefit to the species has been achieved. The same monitoring challenges discussed in Section II.C.1 above with respect to the lack of adequate resources apply here. In addition, as with financial incentives to private landowners and incentives to induce states to strengthen conservation laws, funding is needed to effectively implement this type of incentive program while ensuring enhanced species conservation. The challenge of ensuring adequate monitoring resources is common to many of these recommendations and, thus, ensuring additional resources would address the trade offs of multiple recommendations.

Administrative. This recommendation also implicates the question of what level of agency discretion is appropriate. Existing levels of discretion for the Services in CCAAs and other ESA permitting contexts seem to have been helpful for some species (e.g., Delta smelt,[152] New England cottontail[153]), but not others (e.g., dunes sagebrush lizard[154]).[155] One way to reconcile this difference is to evaluate the compatibility of the covered activity with the conservation of the species. That is, the degree of the Services' discretion would increase where the covered activity is compatible.

A roundtable participant also pointed out that there needs to be a clear trigger for the Services to be able to list the species if a CCAA is not working. Further, 12-month decisions that a species does not warrant listing should be

143. Recovering America's Wildlife Act of 2019, H.R. 3742, 116th Cong. (2019).
144. *Id*.
145. National Wildlife Federation, *Recovering America's Wildlife Act*, https://www.nwf.org/Our-Work/Wildlife-Conservation/Policy/Recovering-Americas-Wildlife-Act (last visited July 7, 2021).
146. Press Release, Defenders of Wildlife, The "Recovering America's Wildlife Act" Fails to Adequately Respond to the Extinction Crisis (Dec. 5, 2019), https://defenders.org/newsroom/recovering-americas-wildlife-act-fails-adequately-respond-extinction-crisis; Press Release, Center for Biological Diversity, Flawed Wildlife Bill OK'd by House Natural Resources Committee (Dec. 4, 2019), https://biologicaldiversity.org/w/news/press-releases/flawed-wildlife-bill-okd-by-house-natural-resources-committee-2019-12-04.
147. Baur et al., *supra* note 115, at 10008.
148. *Id*.
149. *E.g. id*. at 10009 (recommending revising the FWS consultation handbook to allow clearly beneficial actions to be authorized based on a concurrence letter from the Services and an appended incidental take statement, rather than require a formal consultation; applying programmatic safe-harbor agreements to participants in farm bill conservation programs so that "beneficial actions would not subject participants to new regulatory restrictions" and further incentivize species conservation on agricultural land); Keystone Center, *supra* note 49, at 27; Epanchin-Niell & Boyd, *supra* note 29.
150. *See* April 2019 Scoping Session, *supra* note 22.
151. Jake Li et al., *Species Protection Will Take More Than Rule Reversal*, 370 Science 665, 666 (2020).
152. FWS, Species Assessment and Listing Priority Assignment Form: Delta Smelt (2016), https://ecos.fws.gov/docs/species/uplisting/doc4835.pdf.
153. FWS, Programmatic Candidate Conservation Agreement With Assurances for the New England Cottontail in Southern New Hampshire (2011), https://ecos.fws.gov/docs/plan_documents/ccaa/ccaa_873.pdf.
154. FWS, Texas Conservation Plan for the Dunes Sagebrush Lizard (2012), https://ecos.fws.gov/docs/plan_documents/ccaa/ccaa_1611.pdf.
155. October 2020 Workshop Roundtable, *supra* note 23.

subject to peer review and public comment before being finalized.[156] A participant also noted that improving ESA enforcement is critical because without effective enforcement, the Services have few alternatives to accepting the terms of voluntary conservation agreements that states or private landowners offer the Services. This can lead to weak CCAA conservation measures.

This recommendation enhances species conservation by streamlining §7 and §10 agreements where a net benefit to species recovery is clear and established upfront, and in the permitting context, the Services' discretion is dependent on the compatibility of covered activities with the conservation of species.

E. Account and Prepare for Ecological Change

The ESA conceptualizes its goals as maintaining the constancy of species within ecosystems that are actually dynamic.[157] Goals of static, enduring species populations are undoubtedly problematic in light of naturally occurring population fluctuations, evolution, and extinction.[158] Climate change is a growing threat to many species, but ESA decisions and processes often do not adequately address climate change, nor are there effective ESA policies on how to help species adapt to climate change. A 2019 study of ESA-listed endangered animals found that 99.8% are sensitive to climate change.[159] However, the Services "only consider climate change a threat to 64% of listed species and plan management actions for only 18%."[160]

Participants recognized that addressing ecological change is a larger issue that goes beyond the confines of the ESA. While the ESA could, in theory, allow the Services to regulate greenhouse gas emissions, it should not be the primary approach for doing so or for addressing climate change more broadly. Thus, participants focused the discussion on how the ESA could better account and prepare for ecological change in (1) listing, (2) authorizations, and (3) recovery planning and implementation.

1. Expansively Define "Foreseeable Future," Integrate Climate Change Into Vulnerability Assessments, and More Effectively Analyze Data on Changes

The listing process does not adequately prepare and account for ecological change because of the ESA's static view of species and their habitats.[161] To address this, participants largely agreed that listing, reclassification, and delisting decisions need to be clarified to expansively define "foreseeable future" or replace the concept of the "foreseeable future" with time frames that better reflect the ESA's normative values.

The ESA defines "threatened species" as "any species which is likely to become endangered within the foreseeable future throughout all or a significant portion of its range,"[162] but it does not define "foreseeable future." On average, the foreseeable future time frame across ESA decisions from 2010 to July 2019 was 46 years.[163] In August 2019, the Donald Trump Administration finalized revisions to the ESA implementing regulations.[164] These revisions included defining "foreseeable future" as "extend[ing] only so far into the future as the Services can reasonably determine that both the future threats and the species' responses to those threats are likely."[165]

Several environmental groups sued the Trump Administration over these revisions, specifically claiming that the definition of "foreseeable future" improperly deprives "species facing extinction from the impacts of climate change or other future events involving prediction and uncertainty . . . of protection."[166] Others see the definition as being ambiguous about how the foreseeable future interpretation would change.[167]

Administrative. To enhance species conservation, "foreseeable future" should be defined expansively and looked at along with climate change in light of the BAS.[168] A longer foreseeable future time frame is more informative, and is particularly important in delisting decisions because it is assumed that "a species will be secure for the *entire length* of the foreseeable future."[169] An expansive definition of "foreseeable future" acknowledges the impending effects of climate change and enables the Services to more proactively list species to address such effects.[170]

Some suggest that given that the year "2100 is embedded in many of the global climate projections constructed by the Intergovernmental Panel on Climate Change," that date should be used as "a conservative starting point for assessing species vulnerable to climate change."[171] The Services also need to establish internal guidance on how to address uncertainty in foreseeable future determinations in a consistent manner.[172]

156. *Id.*
157. Holly Doremus, *The Endangered Species Act: Static Law Meets Dynamic World*, 32 Wash. U. J.L. & Pol'y 175 (2010); Simmons, *supra* note 107, at 515 ("Instead of constancy and stability, disturbance and change have been the norm throughout the evolutionary history of the earth.").
158. Doremus, *supra* note 157, at 182; Simmons, *supra* note 107, at 516.
159. Aimee Delach et al., *Agency Plans Are Inadequate to Conserve U.S. Endangered Species Under Climate Change*, 9 Nature Climate Change 999 (2019).
160. *Id.*
161. *See, e.g.*, Doremus, *supra* note 157, at 188-203, 215.
162. 16 U.S.C. §1532(20).
163. *See* Jake Li & Angus McLean, *Why the "Foreseeable Future" Matters*, Env't Pol'y & Innovation Center, http://policyinnovation.org/foreseeable-future/ (last visited July 7, 2021).
164. Regulations for Listing Species and Designating Critical Habitat, 84 Fed. Reg. 45020 (Aug. 27, 2019) (to be codified at 50 C.F.R. pt. 424).
165. *Id.*
166. Complaint at 19, Center for Biological Diversity v. Bernhardt, No. 3:19-cv-05206 (N.D. Cal. Aug. 21, 2019).
167. Li & McLean, *supra* note 163.
168. October 2020 Workshop Roundtable, *supra* note 23.
169. *Id.*
170. *See* James Ming Chen, Αρκτούρος*: Protecting Biodiversity Against the Effects of Climate Change Through the Endangered Species Act*, 47 Wash. U. J.L. & Pol'y 11, 19 (2015).
171. Jake Li et al., *Species Protection Will Take More Than Rule Reversal*, 370 Science 665, 666 (2020).
172. October 2020 Workshop Roundtable, *supra* note 23.

Administrative. Further, given the significant "gap between the sensitivity of endangered animals to climate change and the attention that climate change receives from the agencies charged with recovery of these species,"[173] better integration of climate change into vulnerability assessments for listed species[174] is critical to enhancing species conservation. More effective analysis of data on range shifts, behavioral changes, and changes in habitat niche is important because such changes "can undermine even the largest and best-managed preserves."[175]

Administrative. Some roundtable participants also recommended shifting the focus to time frames embedded in the values reflected in the ESA, which may involve replacing the foreseeable future concept with a different standard of the time frame over which society values conservation. For example, participants suggested adopting the IUCN's approach to time horizons, which uses a maximum time horizon of 100 years.[176] Participants cautioned, however, that the time horizon should not be tied to the availability of evidence. This would create a perverse incentive not to learn and gather additional data, because more data reduces uncertainty and allows agencies to look further into the future, thus expanding the number of species that qualify for listing.

Clearly stated fundamental objectives could include the number of years or generations for which society wants the species to exist.[177] Participants also pointed out the importance of looking not only at when the foreseeable future ends, but also when it begins. Temporally, the latter distinguishes threatened and endangered species, a demarcation that has remained fuzzy for far too long. As discussed in Section II.A, the absence of a clear, meaningful distinction between these two categories is a major barrier to adjusting levels of ESA protection based on a species' level of vulnerability.

The trade offs of this recommendation include politicization of the issue of climate change,[178] which makes the feasibility of implementing a more expansive definition of "foreseeable future" and better integration of climate change into vulnerability assessments a challenge. While adjusting regulatory interpretation of "foreseeable future" is an option, the cleanest clarification to address the problems with the current definition of "foreseeable future" may require legislative change. The Services will also need additional resources, both in terms of funding and staff, to ensure adequate consideration of climate change and more effective analysis of range shifts, behavioral changes, and changes in habitat niche.

2. Develop More Proactive Recovery Planning and Implementation Policy

A 2019 study found that while many species are adapting to climate change, their long-term survival is not guaranteed because climate change is outpacing species adaptation.[179] Traditionally, conservation strategies focused on preservation—"[t]he idea that the best action for preserving nature is inaction."[180] However, such "[p]assive management strategies are poorly matched to climate change and will insufficiently safeguard biodiversity."[181] Recovery plans do not adequately recognize or address threats imposed by climate change, nor do they have enough principles to guide effective climate adaptation.[182] More proactive species management measures are needed to help species adapt to our rapidly changing climate.[183]

Administrative. The Services should develop policy for recovery planning and implementation that encourages proactive measures, including:

- Assisted migration or relocation of entire species where necessary for recovery[184];
- Invasive species or disease control, proscribed fires, and other non-climatic stressors[185];
- Wildlife corridors[186];
- Protection of future suitable habitats[187];
- Engineering of habitat[188];
- Genetic augmentation;
- Section 5 land acquisition.

A policy encouraging these measures should ensure regular monitoring and evaluation of the measure employed, as well as online publication of such assessments to allow for "interjurisdictional information sharing and discourse."[189]

173. Delach et al., *supra* note 159, at 1001.
174. Evans et al., *supra* note 51, at 23 (discussing a three-factor framework: "(1) the species' exposure to climate change based on past and future projected change; (2) the species' biological sensitivity (using long term physiological or ecological studies documenting species' responses to climate change); and (3) the potential that both the species and their habitat has to adapt to climate change").
175. *See, e.g.*, Doremus, *supra* note 157, at 226.
176. IUCN, Guidelines for Using the IUCN Red List Categories and Criteria v. 14, at 19 (2019), http://cmsdocs.s3.amazonaws.com/RedListGuidelines.pdf.
177. October 2020 Workshop Roundtable, *supra* note 23.
178. *See* Delach et al., *supra* note 159, at 1002.
179. Victoria Radchuk et al., *Adaptive Responses of Animals to Climate Change Are Most Likely Insufficient*, Nature Commc'n, July 2019, at 1; *see also* Jenny Howard, *Some Animals Can Adapt to Climate Change—Just Not Fast Enough*, Nat'l Geographic, Aug. 19, 2019, https://www.nationalgeographic.com/environment/2019/08/many-animals-can-adapt-climate-change-just-not-fast-enough-/.
180. Doremus, *supra* note 157, at 206.
181. Alejandro E. Camacho, *Assisted Migration: Redefining Nature and Natural Resource Law Under Climate Change*, 27 Yale J. on Reg. 171, 234 (2010).
182. *See, e.g.*, Evans et al., *supra* note 51, at 28; The Wildlife Society, *supra* note 47, at 14.
183. Evans et al., *supra* note 51, at 24; *see also* Camacho, *supra* note 181.
184. *See, e.g.*, Camacho, *supra* note 181; Evans et al., *supra* note 51, at 24.
185. *See* Evans et al., *supra* note 51, at 23.
186. *Id.*
187. *Id.* at 24.
188. *Id.*
189. Camacho, *supra* note 181, at 255.

From these measures, the Services should also develop a set of emergency tools for species with an extremely high risk of extinction from threats, including climate change,[190] invasive species, and disease, and should develop guidance on when more active strategies can and should be adopted.[191] Such emergency measures may include assisted migration, genetic augmentation, and §5 land acquisition to create emergency habitat.[192] Further, recovery planning and implementation must be linked to other comprehensive adaptation planning efforts outside of the ESA.[193]

Trade offs of this recommendation can vary depending on the proactive measure. For example, assisted migration is particularly controversial, and may face more political resistance.[194] Skeptics of assisted migration criticize the uncertainty surrounding the strategy, information gaps, and risks of ecological harms.[195] Many also argue that proactive measures can have high administrative costs.[196] However, in light of the rapid pace of climate change, these challenges are outweighed by the need for proactive measures to help species adapt and to enhance conservation.

Climate-affected species also raise the question of whether those species can even survive in their current habitat. If not and they require translocation, do those species cease to exist as we understand them?[197] For example, if Key deer need to be moved to the mainland of Florida because their entire habitat is lost to sea-level rise, what then distinguishes this subspecies from the whitetail deer? This raises more fundamental questions about how society will deal with the ethical, legal, and scientific aspects of climate adaptation for highly vulnerable species, especially species that will become extirpated from their current range because of climate change. Today, the Services have no framework for handling these situations, and participants pointed to the need for a much broader discussion on this topic.

F. Improve Generation, Quality, and Public Dissemination of ESA Data

The ESA is often criticized for its failure to use sound science due to a lack of quality data, as well as inadequate data-sharing and transparency.[198] There is a broad need for the Services to improve how they collect, analyze, and share data, and to more clearly differentiate between scientific and policy judgments.

1. Develop an Organized Advocacy Campaign

Roundtable participants stressed the need for an advocacy campaign, organized and carried out by nongovernmental conservation organizations and directed at the leadership level of the Services, to address the lack of information and highlight the benefits of acquiring information, including the ability to use such information to ensure funds are invested in ways that are best for conservation.

To improve information generation, roundtable participants discussed the option of engaging third parties. However, participants were concerned that this would raise liability and data quality issues, and merely shift Services staff responsibilities away from data collection toward data review without alleviating work load. Instead, participants recommended placing the data-collection burden on permit applicants. The data standard could be more demanding in order to help the Services with the listing analysis.[199] One challenge of this approach is protecting the confidentiality of agency data. However, this might be addressed by the Services adopting a program similar to the U.S. Forest Service's Forest Inventory and Analysis Program,[200] which allows the public to seek agency information so long as an explanation is provided regarding the intended use of the information.[201]

The campaign should promote interagency coordination to leverage agency scientific expertise and resolve areas of scientific disagreement or uncertainty. With greater information generated and improved interpretation of that data through interagency coordination, the Services would better be able to enhance species conservation. Further, this data should be made more publicly accessible through a clearinghouse with a searchable online portal.

2. Improve the BAS Standard

Decisions under the ESA pertaining to listing, critical habitat designations, and interagency consultation must be based on the BAS[202] to ensure "objective, value-neutral decision making by specially trained experts."[203] The ESA does not provide a definition of the standard[204]; however, courts have provided guidance. Courts have generally found that the BAS standard is met so long as the agency

190. For example, the habitat of the Key deer and Key Largo woodrat will be eliminated by climate change within the next few decades. October 2020 Workshop Roundtable, *supra* note 23.
191. *Id.*
192. *Id.*
193. *Id.*
194. *See* Camacho, *supra* note 181, at 173, 225; Jessica Kabaz-Gomez, *Rules for Playing God: The Need for Assisted Migration & New Regulation*, 19 Animal L. 111, 122-25 (2012).
195. Camacho, *supra* note 181, at 173, 185-88, 225; Kabaz-Gomez, *supra* note 194, at 120-21.
196. Camacho, *supra* note 181, at 184 (citing Jason S. McLachlan et al., *A Framework for Debate of Assisted Migration in an Era of Climate Change*, 21 Conservation Biology 297, 299-300 (2007)); *see also* Kabaz-Gomez, *supra* note 194, at 122; Evans et al., *supra* note 51, at 24.
197. October 2020 Workshop Roundtable, *supra* note 23.
198. *See*, *e.g.*, The Wildlife Society, *supra* note 47, at 13-14; Holly Doremus, *Preserving Citizen Participation in the Era of Reinvention: The Endangered Species Act Example*, 25 Ecology L.Q. 707, 715 (1999).
199. October 2020 Workshop Roundtable, *supra* note 23.
200. U.S. Department of Agriculture Forest Service, *Forest Inventory and Analysis*, https://www.fia.fs.fed.us (last modified Apr. 14, 2020).
201. October 2020 Workshop Roundtable, *supra* note 23.
202. Dennis D. Murphy & Paul S. Weiland, *Guidance on the Use of Best Available Science Under the U.S. Endangered Species Act*, Env't Mgmt., Apr. 2016, at 3.
203. Doremus, *supra* note 76, at 419; *see also* J. Tavener Holland, *Regulatory Daubert: A Panacea for the Endangered Species Act's "Best Available Science" Mandate*, 39 McGeorge L. Rev. 299, 303 (2008).
204. Elizabeth Kuhn, *Science and Deference: The "Best Available Science" Mandate Is a Fiction in the Ninth Circuit*, Geo. Env't L. Rev. Online 1, 3 (2016).

considers relevant, available data.[205] Courts have also refused to interpret the standard as placing an obligation on agencies to generate new data.[206]

Scoping session participants raised issues with the BAS standard, pointing out that it is the lowest standard because it creates no obligation to conduct science. Limited biological data are available for many listed species. As a result, the BAS at the time of a decision may be very poor. In other regulatory contexts, agencies are not permitted to make decisions if it is clear that additional data are needed to make an informed decision. For example, in stark contrast to the ESA's BAS standard, pesticide registrants under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)[207] must conduct research for eight to 10 years before a review.[208] Some argue the BAS standard has allowed agencies to hide behind the science screen, giving them unreviewable discretion.[209]

Scoping session participants also raised the issue that while decisions under the ESA about the acceptable amount of risk to a species need to be informed by science, they are also value or policy judgments.[210] This can be problematic if political appointees interfere in attempts to influence scientific findings in ways that advance their political or financial interests. This type of interference has existed in various administrations, but the Trump Administration, in particular, failed to insulate agency staff from political appointees.[211]

Administrative. These issues emphasize the need to improve the BAS standard. This could include:

- Requiring minimum standards that place the burden on project proponents to conduct the research needed to arrive at an informed regulatory decision;
- Mandating that other federal agencies collect relevant scientific data to support their §7(a)(1) duty;
- Placing limits on how political appointees can interpret the BAS standard; and
- Requiring consideration of any and all credible scientific data throughout the regulatory process, regardless of source.

These recommendations would enhance species conservation by building and improving the knowledge base on species to facilitate more well-informed, scientifically sound decisions. To mandate other federal agencies to collect relevant scientific data and place the duty of conducting research on project proponents, some recommend using information-forcing tools that already exist in the ESA,[212] or borrowing from other statutes such as the National Environmental Policy Act (NEPA).[213]

For example, the ESA's §7 consultation provisions require agencies to "use the best scientific and commercial data available or which can be obtained during the consultation."[214] This could be revised to require a jeopardy opinion, "unless the available information is sufficient to establish that the proposed action more likely than not will not jeopardize the species."[215] This would not only incentivize data generation where data are lacking, but would also place the burden of that data generation on project proponents.

Placing limits on how political appointees can interpret the BAS standard would enhance species conservation by ensuring that agency scientists' data analyses and findings are better insulated from influence by political appointees.[216] This ties into scoping session participants' more general recommendation to develop a protocol for the science process to avoid making policy decisions about the process of science itself.[217] "Both scientific and political integrity are essential to accurate and legitimate policy choices."[218]

Administrative. To preserve this integrity, the Services should publish regulations to better ensure the scientific research and analysis process is conducted by scientists who are firewalled from political staff and external interest groups.[219] These regulations should require distinguishing between scientific questions and policy questions in notices of proposed rules and guidance,[220] recording scientific synthesis documents before they go to political officials,[221] and logging and publishing all communications between staff and political officials and interest groups.[222] The Services should develop expertise and training standards for staff and possibly political appointees on applying the BAS stan-

205. *Id.* at 3, 7 (citing Conner v. Burford, 848 F.2d 1441, 1454, 18 ELR 21182 (9th Cir. 1988), and San Luis & Delta-Mendota Water Auth. v. Locke, 776 F.3d 971, 995, 44 ELR 20276 (9th Cir. 2014)).
206. *Id.* at 3 (citing *Locke*, 776 F.3d at 995, and American Wildlands v. Kempthorne, 530 F.3d 991, 998-99, 38 ELR 20165 (D.C. Cir. 2008)).
207. 7 U.S.C. §§136-136y, ELR Stat. FIFRA §§2-35.
208. *Id.*; 7 U.S.C. §136.
209. April 2019 Scoping Session, *supra* note 22; *see also* Wendy Wagner, *The Science Charade in Toxic Risk Regulation*, 95 Colum. L. Rev. 1613, 1662-66 (1995) (noting that judicial reluctance to oversee technical decisions encourages agency "science charades").
210. April 2019 Scoping Session, *supra* note 22; *see also* Holly Doremus, *Scientific and Political Integrity in Environmental Policy*, 86 Tex. L. Rev. 1601 (2008).
211. Coral Davenport, *Trump Administration Moves to Lift Protections for Fish and Divert Water to Farms*, N.Y. Times, Oct. 22, 2019, https://www.nytimes.com/2019/10/22/climate/trump-delta-smelt.html.
212. Doremus, *supra* note 76, at 444.
213. April 2019 Scoping Session, *supra* note 22; 42 U.S.C. §4332, ELR Stat. NEPA §102.
214. 16 U.S.C. §1536.
215. Doremus, *supra* note 76, at 445.
216. Doremus, *supra* note 210, at 1635.
217. April 2019 Scoping Session, *supra* note 22.
218. Doremus, *supra* note 210, at 1602.
219. *See* Center for Science and Democracy at the Union of Concerned Scientists & UCI Law Cleanr, Conflicts of Interest at Federal Agencies: Recommendations for 2021 and Beyond (2020), https://www.ucsusa.org/sites/default/files/2020-09/conflicts-of-interest-at-federal-agencies.pdf; Thomas O. McGarity & Wendy E. Wagner, *Deregulation Using Stealth "Science" Strategies*, 68 Duke L.J. 1719, 1802-03 (2019).
220. Bipartisan Policy Center, Improving the Use of Science in Regulatory Policy 15 (2009), https://bipartisanpolicy.org/wp-content/uploads/2019/03/BPC-Science-Report-fnl.pdf.
221. McGarity & Wagner, *supra* note 219, at 1792.
222. Martha Kinsella et al., Brennan Center for Justice, Executive Actions to Restore Integrity and Accountability in Government 14 (2020), https://www.brennancenter.org/sites/default/files/2020-07/ExecutiveActions_Draft03-2.pdf.

dard and addressing scientific uncertainty. To strengthen independent oversight of this process by which science is incorporated into ESA decisions, participants recommended periodic audits or creation of a scientific advisory body within the agency.[223]

There are trade offs associated with these recommendations. Building the knowledge base on species requires greater resources to not only generate data, but also review it. As with many of the recommendations in this report, this recommendation implicates the chronic problem of inadequate institutional capacity and funding at the Services.[224] There may also be greater delays in the regulatory process when other agencies are required to generate data and the additional steps that need to be taken to ensure effective firewalls are in place. Further, scoping session participants pointed out that changes to the BAS standard would reduce an agency's discretion, which will inevitably draw significant pushback from agencies.[225]

III. Conclusion

Recommendations for improving the ESA from a conservation perspective are long overdue. Biodiversity loss is accelerating at an unprecedented rate—"a quarter of all species face extinction, many within decades."[226] The ESA has been effective at protecting many species, but there is far greater potential to enhance species conservation by implementing these six changes to the ESA or its implementation regulations and policies:

1. Tailor protections for endangered, threatened, and recovered species and their habitats based on level of vulnerability
2. Revise incidental take authorization standards to "no-net-loss," "full mitigation," or "net benefit or recovery contribution" standard
3. Improve recovery planning, including recovery plan implementation by all relevant federal agencies
4. Provide incentives for species conservation on private, state, and federal lands
5. Account and prepare for ecological change in listing, authorization processes, and recovery planning and implementation
6. Improve generation, quality, and public dissemination of ESA data

223. April 2019 Scoping Session, *supra* note 22, and October 2020 Workshop Roundtable, *supra* note 23.
224. *See*, *e.g.*, Murphy & Weiland, *supra* note 202, at 8.
225. April 2019 Scoping Session, *supra* note 22.
226. Gerardo Ceballos et al., *Vertebrates on the Brink as Indicators of Biological Annihilation and the Sixth Mass Extinction*, 117 Proc. Nat'l Acad. Sci. 13596, 13596 (2020) (citing recent United Nations report).