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Researching a Reimagined ESA: The Continued Need and Opportunity for Voluntary Conservation

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SUMMARY

Since passage of the U.S. Endangered Species Act (ESA) more than 40 years ago, federal agencies have sought to enhance the engagement of non-federal landowners and managers in recovery actions. An effort to design programs and policies to facilitate voluntary conservation activities under the ESA has been renewed, but the adoption and effectiveness of these activities could be diminished by the lack of data to address three issues. First, landowners and land managers must be motivated to participate in pre-listing and voluntary conservation and to do so at the scale necessary to achieve conservation outcomes. Second, activities need to be effective in promoting conservation. Third, laws and administrative processes must accommodate or facilitate desired approaches.

This paper identifies data needs in each of these three areas, reviews experience with existing voluntary conservation approaches under the ESA, and recommends research and implementation strategies to make voluntary conservation approaches more widespread.

Incentives, Tools, and Implementation of the ESA

Many species-rich ecosystems in the United States are located on non-federal land (Bean and Wilcove 1997), and at least 80 percent of the habitat of more than half of listed endangered species is on private property (Langpap and Wu 2004). Since passage of the U.S. Endangered Species Act (ESA or the Act) some 40 years ago, subsequent legislative, regulatory, and policy reforms of this flagship conservation law have generally attempted to further enhance engagement by non-federal landowners and managers. A renewed emphasis on voluntary conservation is now under way. But as we argue below, increased utilization of voluntary efforts is currently constrained by a lack of understanding of how ESA administration and implementation interacts with landowner motivations for participation and with subsequent conservation outcomes.

The ESA has been criticized for its ineffectiveness at motivating private landowners to contribute to recovery, however. It has been characterized as capable of deterring actions deemed harmful to species survival, but poorly designed to encourage and reward proactive conservation (Brook et al. 2003, Langpap and Wu 2004, Norris, 2004). In some cases, the motivation to avoid protracted regulatory engagements may even lead to the preemptive destruction of habitat (Lueck and Michael 2003; Zhang 2004). Although a focus on the "private side of conservation" has been endorsed for nearly two decades (e.g., Bean and Wilcove 1997; Wilcove et al. 2004), progress in eliciting conservation at the scale necessary to achieve meaningful recovery has been slow.

The recognized need for engagement by non-federal landowners is evidenced by the variety of tools designed to counteract perverse incentives and motivate conservation by private actors. Under the ESA, habitat conservation plans (HCPs) and safe harbor agreements (SHAs) provide long-term assurances for non-federal actors while allowing for the incidental take of listed species. Candidate conservation agreements (CCAs) reduce uncertainty for actions taken to benefit species proposed for protection under the act. Within the broader conservation policy toolbox, the National Resource Conservation Service's Environmental Quality Incentives Program (EQIP) and the U.S. Fish and Wildlife Service's Partners Program provide funding and technical assistance to diminish the cost and other hurdles associated with habitat management for species of concern.

Despite the growing number of tools to enhance conservation of at-risk and endangered species on non-federal lands, widespread recovery of at-risk and listed species has been slow for several reasons. First, recovery requires restorative action and maintenance, a requisite that generally rises well above the ESA's focus on take-avoidance and impact minimization or mitigation (Bean and Wilcove 1997). Second, technical guidance on the options and process for attracting endangered species to private property and information about the accompanying regulatory burdens for doing so are in short supply (Wilcove and Lee 2004). Third, there exist few forums for landowner engagement, information sharing, effective monitoring, and county-level coordinated land-use planning (Theobald and Hobbs 2002). Fourth, trust between landowners and the U.S. Fish and Wildlife Service (FWS) may be lacking due to a legacy of command-and-control regulation (e.g., Clark 1997).

This paper reflects on the outcomes of a workshop in late 2014 that brought together researchers, private sector representatives, and federal agency staff operating at the interface of private and federal land management (Galik 2015). The workshop explored experience with voluntary conservation measures and knowledge gaps that impede their wider use. Drawing on this information, the paper considers the future of voluntary conservation programs by identifying critical questions for which answers could help reshape ESA implementation. These questions can serve as the basis for an interdisciplinary research agenda to shape scientific discovery into applicable knowledge.

Needs and Realities of Voluntary Conservation under the ESA

Voluntary conservation occurs both before species listings (pre-listing conservation) and after listing within the strictures of the act. In both cases, the operative distinction between voluntary conservation and other practices available under the ESA is the affirmative choice to undertake greater conservation action or to take action sooner than is otherwise required. Drawing from the 2014 workshop and the conservation literature, this paper identifies three interrelated issues that, if addressed, could help expand the use of pre-listing and voluntary conservation tools under the ESA. First, landowners and land managers must have a reason to participate and to do so at the scale necessary to achieve conservation outcomes. Second, the activities must be effective in promoting conservation. Third, laws, administrative processes, and stakeholders must have the capacity to accommodate desired approaches. Answers to questions related to these three issues will greatly influence the future success of conservation efforts under the ESA.

Participation

Voluntary conservation programs seek to elicit the cooperation of landowners by reducing the costs and enhancing the benefits of managing land to protect species or their habitat. Existing tools, however, have failed to garner participation at a rate sufficient to forestall species decline (Thompson 1997; Adler 2008). For example, the Safe Harbor program provides an incentive—assurances against future regulations—but participation is likely reduced by the transaction costs associated with generating baseline species data and obtaining necessary approvals (Hadlock and Beckwith 2002). Pre-listing programs such as Candidate Conservation Agreements with Assurances (CCAAs) likewise suffer from many of the same issues (Womack 2008).

Based on the lessons from these and other programs, new approaches have sought to respond to the incentives landowners seek. A proposed pre-listing conservation policy aims to engage landowners in habitat programs by allowing the conserved or restored habitat to be used for risk mitigation or for revenue generation (U.S. FWS 2014b). As landowners create habitat for at-risk species, they generate credits that they could either use as mitigation or, if the species is listed under the ESA, trade to another party. Such market-based approaches can help encourage participation of landowners seeking to mitigate risks or enhance revenue sources on their land.

Other approaches leverage old tools for a new use: coordinating conservation across large land areas to achieve both individual species- and broad ecosystem-level benefits. Conservation easements, for example, are being targeted and deployed in the southern United States to restore and preserve longleaf pine at the landscape level (The Conservation Fund 2015). In protecting and restoring these large blocks of land, the program aims to conserve entire ecosystems in perpetuity while creating economic opportunities for participating landowners and bestowing benefits to at-risk species such as the threatened gopher tortoise.

The research questions below speak to two vitally important aspects of voluntary conservation participation: the factors that influence individual participation and the expected or aspirational scale of participation.

What Incentives Influence Pre-listing Conservation Behavior?

Direct payments encourage participation either by offsetting its costs of or by providing an added inducement. The timing of these payments is important, especially if conservation practices must be implemented before credits are marketed. Payments can also be counterproductive if consideration is not given to other stakeholder values (Sorice and Donlan 2015). Rather, participation is enhanced by supporting landowners' need for self-directed behavior, a perception that their behavior is freely chosen rather than coerced, and a recognition that they are competent stewards (Sorice et al. 2013).

Future research should focus on how the design of programs affects both participation and landowners' stewardship ethic (Ramsdell et al. 2015). From a theoretical perspective, work should explore landowner behavior in a pre-listing context, because incentives for this behavior are different than those for the post-listing behavior and have generally received less research attention. Economic models of landowner behavior can be used to gain insight into responses to different types of incentives and to gauge the relative performance of these policy alternatives. Empirical research could gather data from participants in voluntary conservation programs using revealed preference approaches, stated preference approaches, or both to gain insight into participation drivers. Field experiments could also be developed, using randomized trials to identify causal effects of different incentive designs on participation decisions.

What Is the Economic Value of Pre-listing Conservation and Voluntary Conservation Efforts?

Economic value from voluntary conservation is a function of both benefits gained (through the sale of credits) and costs avoided (by mitigating future regulation). Several unknowns complicate this equation. One is the offset cost of regulation. Compiling ESA expenditures (e.g., U.S. FWS 2014c) is a different exercise than compiling the complex and realized costs of ESA implementation, and has therefore remained an elusive undertaking. On the other side of the equation is the cost of implementing alternative practices. Unnecessary bureaucracy and high transaction costs were common complaints from landowners participating in CCAA agreements (Womack 2008). Future research in this area could use in-depth case studies to compare investments in preemptive conservation with the economic impacts of restrictions that would be triggered by listing. An accounting of benefits could include measures of species viability (e.g., probability of persistence, projected population sizes) under listing and no-listing scenarios, monetized using an estimate of willingness to pay.

What Is the Role of Regulatory Avoidance and Other Administrative Incentives in Motivating Pre-listing Behavior?

As demonstrated in the cases of the lesser prairie-chicken (*Tympanuchus pallidicinctus*) and the greater sage-grouse (*Centrocercus urophasianus*), the threat of listing can motivate broad groups of stakeholders to pursue pre-listing conservation approaches (e.g., U.S. FWS 2015a). Short of avoided listings, other administrative tools, such as fast-tracked permitting or decreased permitting time, may be used to induce voluntary conservation (Galik and Bowman 2014). Insight into this issue could be gained through observation of individual responses to different incentive designs and regulatory drivers.

How Do Agency Working Relationships Influence Participation?

The regulatory power of the ESA, combined with the permanence of species loss, creates a potentially conflict-ridden environment. Trust in institutions administering programs is critical in such situations. Landowner trust in voluntary programs under the ESA is a function of the programs' past performance, the system of rules and procedures that instill feelings of security in participants, and landowners' feelings of connectedness to other participants and to institutional administrators (Stern and Baird 2015). Although the variation inherent in program implementation in decentralized agencies like the U.S. Fish and Wildlife Service (FWS) can be frustrating for stakeholders, it can also promote experimentation and drive innovation.

Future research into trust ecology can establish the conditions that engender social trust in programs and institutions, thereby increasing participation. Field experiments could be designed to explore governance structure and participation. Observational research could examine how participation in programs like CCAA, SHA, and HCP differs across regions, agencies (National Marine Fisheries Service, FWS), or programs run by different levels of government (e.g., federal, state).

How Does the Current Regulatory Framework Influence Opportunities for Pre-listing and Voluntary Conservation?

As Wi and Male (2015) show, the current structure of the ESA and its implementing regulations play a critical role in determining the options that landowners may choose for conservation project implementation. At issue is whether the ESA has the structural capacity to encourage both broad-based and long-term voluntary conservation on a sufficient scale. For example, the short period between the beginning of a species' status review and issuance of a final listing decision can preclude not only development of conservation initiatives to keep the target species off the list but also opportunities for initiatives to gain traction. Research in this area could focus on the observed outcomes—both process- and species-related—that are shaped either by the choice of a particular framework (e.g., HCP, SHA) or by the participation of courts or third parties.

What Is the Scale or Scope of Habitat or Pre-listing Credit Markets?

Markets for species conservation are being developed at the state, regional, and national levels (Environmental Defense Fund 2015), and attempts have been made to characterize the attributes amenable to pre-listing conservation in specific ecosystems (Auerbach and BenDor 2015). However, the ultimate size and reach of these markets remain unclear. Are they suitable for a small subset of all at-risk species, and if so, what are the attributes that lead to a successful market? As Auerbach and BenDor (2015) argue in the case of freshwater aquatic species, these attributes need not relate only to the species of interest, but also to the stakeholders and activities involved. Yet other attributes could include the state of knowledge about the species, the timeframe in which decisions must be made, and institutional knowledge and capacity to administer any resulting market. Each of these attributes will in turn be influenced by the terms of the authorizing policy (see, e.g., Wi and Male 2015), creating a complex feedback that complicates a full understanding of market potential. Building on the work recommended above, a conceptual framework for evaluating market potential could be developed with spatial resource data and species life history information to screen species or systems as well as aggregate data on program reach.

What Role Do Data Provision and Technical Assistance Play in Motivating Pre-listing Conservation?

Good data, especially information that signals potential for successful program implementation, can motivate and improve participation (Van Vugt 2009; Santo et al. 2015). Past data provision efforts have been praised for delivering data necessary for planning and conservation project targeting (Sonner 2013), but data availability can also trigger fears of increased regulatory pressure should a species be listed, raising the question of whether improved data are an asset or a liability. Furthermore, not all data are equally useful for all applications, creating potential conflicts over the source of the data and the relevance or appropriateness of a particular dataset to the question at hand. Research in this area could begin by drawing from lessons from other environmental arenas, such as previous responses to watershed management data provision and technical assistance programs (e.g., Watershed Resources Registry 2013).

Effectiveness

There are at least as many questions about the ultimate effectiveness of newly proposed or implemented conservation programs as about participation in them. A number of papers have empirically examined the determinants of species recovery and the effectiveness of the ESA. Male and Bean (2005) found that taxa, funding, extinction risk, and recovery potential are correlated with species' recovery. Kerkvliet and Langpap (2007) found evidence that increased spending reduces the probability of a species being classified as extinct or declining. Ferraro et al. (2007) found that the act of listing a species under the ESA was actually detrimental to recovery unless accompanied by substantial government funding, in which case species status tended to improve. Other researchers have found positive correlations between management actions and recovery outcomes (Rachlinski 1997; Abbitt and Scott 2001).

In contrast, the only current voluntary programs for which a rigorous empirical assessment of effectiveness is available are HCPs. Apart from resulting in a permit for incidental take of listed species, HCPs provide an organizational structure and strategy for conservation efforts, direct resources toward species conservation, and raise awareness (Langpap and Kerkvliet 2012). However, there are many critiques of the effectiveness of HCPs, including their short-sightedness, limited funding, and poor planning, implementation, and monitoring (Bean and Wilcove 1997; Merenlender et al. 2004; Polasky and Doremus 1998). Only a fraction of HCPs have an effective monitoring plan to evaluate their individual success (Kareiva et al. 1999). There are also potential tradeoffs between regulatory assurances, participation rates, and the level of conservation supplied by participating landowners (Langpap and Wu 2004). For example, the "no surprises" rule, in policy since 1994 and rule since 1998, may encourage participation but may also hamper long-term conservation objectives by failing to build sufficient incentives to gather information and improve management practices (Wilhere 2002). There is evidence that these agreements have had a positive effect on the recovery of listed species (Langpap and Kerkvliet 2012), but a great number of questions nonetheless remain.

How Can the Effectiveness of Different Approaches Be Assessed?

Despite their established presence in ESA policy and practice, the effectiveness of tools such as CCAAs, SHAs, mitigation banks, and others remain understudied. One reason is the complexity underlying their implementation, making it difficult to establish causal relationships. From a research design perspective, an experimental approach to policy implementation would perhaps be the most straightforward way to address this data gap. Under such an approach, programs and practices could be implemented with carefully developed exogenous variation in design and administration (timing, location, stringency of conditions, and so on). Doing so, however, would present a host of equity, ethical, and legal issues that would require careful consideration. Absent a full experimental design, observational research similar to that undertaken for HCPs could be replicated for SHAs, CCAs, and CCAAs (should they become more common) and even for long-running working-lands conservation programs such as EQIP.

Does Habitat- and Landscape-Scale Management promote Recovery of Species, and How Does It Compare with Species-focused Management?

Overlap of species' ranges and habitats suggests substantial opportunity to manage for groups of species by using integrated, region-wide ecosystem management approaches. The benefits of such approaches have been touted for quite some time, but they have been applied in limited circumstances with mixed success (Layzer 2008; Wolfe et al. 2012; Womack 2008). Observational research, such as the leverage of natural experiments to assess differences in species improvements across variations in conservation program design and implementation, could potentially address this data gap.

How Do Participation Incentives Influence Conservation Outcomes?

There is a strong relationship between program design elements that encourage private and non-federal actor participation in voluntary conservation and those that ensure the effectiveness of conservation efforts. Increasing participation by easing the stringency of governing regulations or required conditions may increase the number of individuals in a given program. Even then, programs must still be based on rigorous natural science so as not to undercut conservation objectives (Naeem et al. 2015). The emergence of multiple ecosystem service markets (e.g., water quality, carbon, and biodiversity) likewise present both risk and opportunity worth evaluating (Cooley and Olander 2011), specifically as they pertain to the practice of stacking—generating multiple benefits from a single activity or set of activities. Research to address these issues could include fundamental applied research (e.g., computer-based experiments assessing tradeoffs between aggregate participation and individual conservation obligations), observation of the outcomes of natural experiments, and carefully designed projects that include variations in conservation requirements.

Administration and Implementation

Unlike other major environmental laws like the Clean Air Act and Clean Water Act, the ESA is relatively short on detail, even though it is arguably among the most potent of environmental laws. That brevity requires implementing agencies to make interpretations that are regularly challenged in court. The lack of detail in the Act can also be a strength in that it provides a flexible framework for a range of conservation tools. Many of the tools now endorsed in Section 10 of the ESA were pilot programs created through administrative action before they were later sanctioned by Congress.

Where the ESA is specific, such as hard deadlines for listing decisions, litigation has forced the implementing agencies to adopt judicially approved consent decrees that commit them to using agency resources for specific actions within certain timeframes (U.S. FWS 2014a). Where the act is less specific, the agencies have been able to experiment with implementation. The flexibility afforded by the act and its decentralized implementation by the FWS, combined with its strict timelines and process requirements, create administrative uncertainty that can sometimes facilitate and sometimes impede the use of new voluntary conservation approaches. Some of this uncertainty might be reduced through applied research to answer the questions below.

What Are the Legal Barriers to Use of Novel Approaches?

Even when rooted in the language of the ESA and its implementing regulations, new tools and approaches are often the subject of legal challenges. Judicial review of agency actions often hinges on the level of deference given to implementing agencies, which varies with the subject of the legal challenge. For issues framed as procedural or legal, courts give little deference to the agencies. This means that courts have played an especially active role in legal issues like the deadlines for agency actions listed in the act. Unknown is whether courts' role in the process forces agencies to accomplish more than they otherwise would have, or whether it prevents agencies from experimenting with creative approaches that could otherwise improve ESA implementation. Also unknown is how reviewing courts will characterize the mix of science, uncertainty, and legal issues in voluntary conservation and how much deference they will ultimately give to the agencies.

These questions could be tackled by research that looks at how courts have characterized agency action when handling ESA cases, particularly whether the issue is framed as interpreting the text of the law or whether it is a question of implementation, and look at how much deference the court gives the agency and whether the action is ultimately upheld. Also informative here is how the agencies have responded (i.e., appeal). Recent challenges to FWS consideration of conservation actions in the listing of the lesser prairie-chicken only add relevance and currency to this issue (Rothschild 2015).

How Do Federal Entities Navigate 7(a)(1) and 7(a)(2) Obligations, Acting as Both Facilitator and Regulated Entity?

Federal agencies, the largest land managers in the country, are not eligible to participate in many of the Section 10 programs like SHA and CCAA, but they often play an outsized role in conservation efforts. This state of play has prodded federal agencies to forge creative approaches while operating within the confines of the ESA. For example, the Department of Defense (DOD) and multiple other stakeholders have entered into a unique partnership to protect red-cockaded woodpeckers (RCW) on Fort Bragg in North Carolina (U.S. FWS 2012), and federal transportation funding mechanisms have been used to authorize the construction of mitigation banks to serve future conservation projects (23 CFR 771; 777). But as with all federal actions, the short-term nature of appropriations potentially restricts the ability of agencies to pay ahead of need. Regulatory certainty is also lacking when it comes to pre-listing conservation efforts, reducing the incentive for federal agency participation (Orndorff 2015). In the absence of greater certainty, creative and workable alternatives could be identified through pilot projects or case studies that build on observed differences in implementation practices in areas of the country with different mixes of land ownership and species composition.

What Is the Role and Capacity of States to Implement Programs under the ESA?

The critical role of states in species management and conservation is receiving increased attention. States play pivotal roles in listed species conservation as well as in both proposed pre-listing conservation policy and proposed changes to the petition and listing process (U.S. FWS 2014b,c; U.S. FWS and NMFS 2015). Questions remain about the frameworks, resources, and processes best suited to implement this work. While acknowledging past successes, states have expressed frustration over inconsistent implementation of the Act and the potential for federal overreach (AFWA 2014).

Dialogue with the states represents a first step in identifying needs and opportunities, and could be augmented by targeted workshops, symposiums, or convenings to elicit additional details.

Toward a Comprehensive Research Agenda: Taking Case Studies to Scale

Voluntary conservation can be effective in improving species' population trends, achieving lesser listing determinations (e.g., threatened versus endangered), and avoiding listings altogether. As of July 2015, there were 63 instances in which a species was precluded from listing due in some part to conservation activities (U.S. FWS 2015b). Proactive conservation planning has also accelerated recovery of already-listed species and has demonstrated new ways of approaching private landowner conservation (e.g., U.S. FWS 2012; Wolfe et al. 2012).

Much of this success has been achieved through individual projects and tailored agreements unique to the species and situation. The role of such projects and agreements in advancing new and emerging policies and practices is well recognized (Wi and Male 2015), but their success could be increased if more thought were given to what knowledge is needed before they are implemented. By supporting implementation with applied research, agencies and researchers can create evidence-based programs that meet landowner needs and have a high potential to be scaled up.

The research questions posed above can form the basis of a research agenda with two separate but related tracks. The first includes questions that can be answered in the short term or for which data and research approaches are available. For instance, data on participation in different programs could be relatively quickly collected or generated. The second track of research would focus on questions (e.g., participation in CCAAs or the efficacy of new conservation credits policy) that can only be answered with data that will develop as programs expand or with research methods that are relatively difficult to implement (e.g. randomized trials). The questions noted above are only some of those that could be asked, but acknowledging the data needs in advance of pilot projects and tailored agreements could nonetheless accelerate implementation and scaling up of innovative conservation programs.

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