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**“The Power of Incentives: Can We Get Better ESA  
Performance From Private Lands?”**

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## **THE POWER OF INCENTIVES: CAN WE GET BETTER ESA PERFORMANCE FROM PRIVATE LANDS?**

*R. Neal Wilkins*

The basic intent of the Endangered Species Act (ESA) is clear – for species at-risk of extinction, the Act is to be a defense against species loss and a means for recovery. Upon examining the Act’s overall performance, it is increasingly clear that the record of recovery is poor. If the performance metric for the ESA is recovery and delisting, then the Act has not performed well at all. Econometric analyses have demonstrated what some have observed from experience – the action of listing a species under the ESA is ineffective in promoting recovery, it is often negative, and only becomes positive when accompanied by substantial funding (Ferraro et al. 2007). Other analyses conclude that recovery and delisting are not to be expected given the slight commitment of governmental resources for implementation (Schwartz 2008). Simply put, the ESA is not doing its stated job of recovering at-risk species and may be doomed to insufficient performance unless reformed (Bean 2006). With implementation for most species being directly focused on guarding against harm, mere survival may be the only expected outcome unless some effective solutions emerge.

The opportunities to thwart the stated intentions of the ESA are many, and the incentives to accomplish otherwise are few. Nowhere but on private lands are there greater obstacles to better ESA performance. More rare, threatened or endangered species rely on private lands than any other class of ownership. In fact, the majority of listed species are estimated to have 80% or more of their habitat on private land (USFWS 1997), and as much as one-third of the nation’s at-risk species are thought to be exclusive to private lands (Murphy and Noon 2006). As a consequence, the solutions to ESA performance are largely to exist where the act involves private lands.

The following discussion lays out some of the obstacles and opportunities for a more effective and incentive-driven approach to endangered species recovery on private lands. While the discussion gives particular focus to private lands, some of the reforms suggested have broader implications. The purpose here is not to lament the way in which the ESA has been implemented. Rather, the intention is to concentrate attention on the obstacles to recovery efforts on private lands, draw some lessons from the private lands “experience” and then use those lessons to recommend simple reforms that could result in more innovative approaches to recovery on private lands through efficient incentives.

### **UNCERTAINTY AND FEAR**

There is a growing body of empirical evidence that the overall outcome of the ESA’s influence on private lands is counterproductive – the symptoms include political pressures that delay species listings (Ando 1999), preemptive habitat destruction (List et al. 2006:26-27, Lueck and Michael 2003), and denial of access resulting in unreliable information on species status and distribution (Polasky and Doremus 1998). These outcomes point to a situation where fear and regulatory uncertainty of the ESA emerges as defiance on the part of private landowners, especially in the case of high-profile ESA listings that threaten to reduce future land values through land use regulations.

***An Example: the Lesser Prairie Chicken***

On May 12, 2009, over 100 local farmers, ranchers, and business-owners gathered at the Community Center in Hereford, Texas to hear from State and Federal wildlife biologists about the future of the Lesser Prairie Chicken, and the potential to create partnerships for habitat restoration. The Lesser Prairie Chicken now occupies less than 90% of its original range due to loss of native short-grass prairie habitat through agricultural conversion, fire suppression, excessive grazing, and petroleum development (Hagen et al 2004). Some landowners in Deaf Smith County restored lesser prairie chicken habitat through participation in federal and state cost-share and technical assistance efforts, proudly providing some of the last habitat for the species.

The Lesser Prairie Chicken is a candidate for listing under the ESA, with the official listing decision being perhaps a year or more away. In the meantime, the species may be on a collision course with another environmental objective – green energy. The southern high plains of Texas, part of the last refuge for the Lesser Prairie Chicken, is also one of the nation’s most active regions for wind-power development. Contracts for wind energy development are lucrative for local landowners. This could pose a problem for the Lesser Prairie Chicken. As is most-times the case, the specific ecological circumstances are unique and the social and economic issues are complex; but some of the responses are predictable. First, wind turbines, with their associated service roads and transmission lines, are likely to further reduce habitat quality for the species, thus resulting in a “take” under ESA Section 9. Some private landowners, facing tough economic conditions, are anticipating economic windfalls through contracts for wind energy companies to erect turbines on their land. Unless provided with an incentive to do otherwise, many of these landowners will balk at the opportunity to enhance and restore endangered species habitat. In addition, the uncertainty created by an impending ESA listing may actually motivate some to do what wildlife biologists are afraid to mention – they could actually destroy habitat that is currently supporting the species.

In theory, the answer to the Lesser Prairie Chicken dilemma is relatively simple. The former range of the species is expansive, the ecology of the species is relatively well-known, and the technology for habitat restoration is understood. Throughout the range, some lands will be more suited for installing wind turbines and transmission lines, others will be more suited to habitat restoration for prairie chickens, and still others will likely remain in some form of agriculture. Costs for conservation and recovery actions could be paid by those standing to benefit from the wind energy industry as a cost of doing business. This is where the simplicity ends.

The complex implementation history, structure, and administrative process of the ESA now begin to complicate the picture. First, because the species is not yet listed, the US Fish & Wildlife Service (USFWS) cannot use its regulatory authority to threaten action (although there is posturing) against the landowners and the industry. Landowners, even those who have contributed to conservation of the species, are now less certain that creating habitat for prairie chickens is a good idea – and some are asking the Texas Parks & Wildlife Department to trap the species from their land and move them to other areas.

The example illustrated here has themes familiar to numerous other cases. These examples demand some simple, but effective reforms to the ESA. Such solutions would reward private landowners for measureable conservation outcomes, remove the

disincentives of the current regulatory approach, and simplify the administrative procedures that occupy wildlife biologists who should be advising landowners about effective recovery measures.

### ***Access and Information***

In most cases, private landowners can control access to their property, and they can also choose to withhold information concerning the biological resources that exist there. An accumulation of reliable information is key to properly implementing the ESA. Species listings, critical habitat designations, status reviews, recovery plans and enforcement actions all depend upon the reliability of accumulated, site-specific information for the species. In its annual reports to Congress, the USFWS describes the status of listed species as “improving”, “stable”, or “declining.” From 1988 to 2002, the USFWS had insufficient information to assess status for about 40% of all listed species (Male and Bean 2005). Much of the information required for status determination for those species that depend largely on private lands remains either uncollected or under-reported.

Access denial thwarts efforts aimed at determining a species’ status and hinders legitimate recovery efforts. In order to plan recovery efforts, wildlife ecologists seek basic information on habitat occupancy, life history traits, and species—habitat relationships. Most landowner’s reasons for denying access have nothing to do with obstructing science. Instead, many private landowners simply deny access to scientists and researchers out of fear of creating a regulatory burden should an endangered species be found. The same information used to determine species status and aid in recovery planning is also used for designating critical habitat and ESA Section 9 enforcement actions – and it is the threat of this enforcement action that often causes landowners to deny access to those collecting information. Under the current legal regime, information is the prerequisite to regulation of land use on private lands (Polasky and Doremus 1998:26-29). By denying access, many private landowners are simply reacting as expected given what is at stake when their property becomes a known location for endangered species. Within the USFWS there is little or no separation of the personnel involved in permitting and enforcement from those overseeing the science and recovery of a species. Therefore, the private landowner’s fears are well-founded.

### ***Preemptive Action and the Take Prohibition***

Much of the problem with attaining meaningful endangered species conservation on private lands stems from the ESA’s Section 9 prohibition of take. In many cases the outcome of this prohibition is simply a failed attempt to protect individual organisms at the expense of population recovery (see Wilkins 2000 for a discussion). In practice, this prohibition suffers from the dual problem of enforceability and weak enforcement. The definition of “take” under the ESA is so broad that it is often difficult to clearly determine when the take prohibition has been violated. The legal definition of take includes actions that may result in “harm” with a subsequent definition that includes “significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering” (50 CFR 17.3). The difficulty in deciding whether one or more individuals might be taken through such a broad definition of “harm” has rendered the take prohibition largely

unenforceable in all but the most blatant of circumstances. However, the threat remains, and the uncertainty that it causes results in some interesting and counterintuitive outcomes.

From a private lands perspective, there are two basic strategies that land managers use to deal with the prohibition on incidental take. The first is to simply identify existing suitable habitat, make some standardized effort to determine if it is occupied, and then avoid any actions that disturb the habitat. The other approach is to identify habitats that are, or could become, suitable and occupied and then take preemptive action to reduce habitat suitability – at times this preemptive action might include actually refraining from certain activities that could enhance habitats. When met with the potential for incidental take, most private landowners strategically apply a combination of these two approaches to manage their risks. As a consequence, the techniques for avoiding a Section 9 regulatory burden are now well-embedded in the culture and practice of private lands management. These avoidance techniques often detract from species recovery.

### ***Relief from Regulation***

Despite the self-defeating outcomes of the take prohibition, there are some promising examples of voluntary conservation and recovery efforts on private lands that fall into the category of regulatory incentives. These agreements reduce uncertainty through an ESA Section 10 habitat conservation plan (HCP) for permitting incidental take, or establish baselines above which future incidental take is allowable (safe harbor agreements), and increasingly through candidate conservation agreements (CCAs). These binding agreements are often accompanied by “no surprises” policies and other “assurances” that offer a level of certainty that no further conservation actions will be required through the term of the agreement. In fact, the successful negotiation and overall conservation value of such agreements are often contingent upon landowners being shielded from future changes in conservation requirements (Lanpap and Wu 2003). The significant investment of time, energy, and finances to endure the current administrative processes and arcane procedures required discourages general use (Bean 2006). But nevertheless, these agreements have demonstrated some utility as regulatory incentives.

If it is uncertainty of future regulations that is the incentive behind voluntary conservation under ESA, it can also be said that is this same uncertainty that incentivizes preemptive habitat destruction (Lueck and Michael 2003). It appears that the major successes and the chief failures of the ESA on private lands both originate from the same fear of future uncertainty. Therefore, if preemptive habitat destruction emerges as an unintended incentive of ESA Section 9, then we should also consider the positive attributes of most HCPs and CCAs as being products of an unintended incentive – both being a response to the same fear. In its effect, however, an HCP can provide an indirect economic incentive by, for example, securing predictable rights to timber harvest and economic forest management (Wilkins 2000). However, if it is only the uncertainty of future conservation requirements – specifically the expectation that future requirements will be more restrictive than those at present – that is the primary “incentive” for private landowners to take conservation actions now, then it may be that much potential for conservation from private lands is yet left untapped.

### ***Compensation***

Compensating landowners for lost property values incurred when their lands are needed for protecting endangered species has remained a controversial topic since the early days of implementing the ESA. Compensation programs have increasingly taken the form of public purchase of land, development rights, or conservation easements by local and state governments. In one such program in California, the conservation investments of \$2.8 billion from 1990 to 2006 resulted in outcomes (species conservation) that were less than optimal due to acquisitions being concentrated in coastal areas and population centers (Underwood et al. 2009). The California example (one of the largest conservation expenditures in the nation) illustrates one of the problems in relying on these compensation programs as a primary conservation tool. Moreover, there is some evidence that relying on purchase of full or partial rights in land as a conservation tool may actually undermine conservation outcomes when land market dynamics are ignored (Armsworth et al 2006).

Nevertheless, compensation programs do reduce some of the local resistance to ESA constraints (Innes et al 1998), and they may assist in maintaining habitats of last resort for some species. Programs whereby landowners in the path of development are assigned tradable development rights that may be bought and sold may enhance the efficiency of compensation programs (Innes 1997). The problems of efficiency and the unintended outcomes do not call for the abandonment of compensation programs; but it is apparent that new incentives are needed if measureable recovery efforts are to be expected from private lands. Furthermore, turning private lands into public lands does appear to be the best answer. The obvious financial and political costs of transferring enough private ownership into the public domain makes a recovery-via-public-lands scenario viable for only a minority of currently listed species. In addition, there is growing evidence that private landowners are capable and willing to contribute to species recovery given appropriate incentive.

### **NEW INCENTIVES**

In 1991, several members of US Congress wrote to the National Research Council asking for a study of the ESA. The issues raised for study were broad and related to the overall purpose of the Act. The response, prepared by a committee of 17 scientists, concluded with the following statement: *“To conserve natural habitats, approaches must be developed that rely on cooperation and innovative procedures; examples provided by the ESA are habitat conservation plans and natural community conservation planning. But those are only the beginning. Many other approaches have been discussed in various forums. They include cooperative management (sharing decision-making authority among several governmental and nongovernmental groups), transfer of development credits, mitigation banks, tax incentives, and conservation easements.”*(National Research Council 1995).

What is interesting, and perhaps hopeful, is that many of the instruments that were considered to be emerging at the time are now relatively well-developed. For example, relatively few habitat conservation plans (HCPs), were in effect at that time – now they are in common use ( 607 now in effect). In some cases, however, the science underlying these approaches has lagged behind the policy innovations. For example, a review of HCPs by the National Center for Ecological Analysis and Synthesis found serious

shortcomings in the scientific data used in their development (Karieva et al, 1999). While market-based approaches to water conservation were discussed by some academics at the time (e.g., Anderson and Leal 1992), there was limited discussion of market-based incentives for endangered species conservation. In contrast, among both academics and practitioners, there is now a heavy dialogue and serious analysis of habitat trading and other market-based systems for endangered species conservation (e.g., Hartig and Dreschler 2009, Bruggeman and Jones 2008, Jack et al. 2008, Dreschler et al. 2007).

This new dialogue could create scenarios whereby private landowners could reap substantial benefits from the fact that they possess suitable habitat for an endangered species, regardless of whether they feared a regulatory constraint. Consider the conservation and recovery benefits of a scenario whereby landowners are provided with payments for identifying, enhancing, and restoring endangered species habitats. If such a program were market-based, the landowner might actually compete to participate. Program costs could be aligned with conservation benefits and a landowner's willingness to participate.

### ***Recent Innovations: Conservation Banking and Recovery Crediting***

Why should a private landowner choose to protect endangered species' habitats and ultimately participate in a recovery effort? As reviewed in the preceding sections, the structure and implementation of the ESA has often stifled any motivation for a conservation-minded landowner to contribute to species recovery. The recent success of safe-harbor agreements seems to demonstrate that by eliminating the threat of additional take prohibitions, some landowners are willing to implement conservation efforts that could contribute to recovery. Contributions from other landowners may take a little more stimulation. For this stimulation, we need look no further than the entrepreneurs establishing new marketplaces for ecosystem services. Farmers, ranchers, and forest managers understand the process of developing products from their land, and the value of having secure property rights to those products. If a product happens to be a tangible unit of conservation (i.e., a credit) for a particular endangered species, and there is a market for accumulating such credits in anticipation of their value in offsetting habitat loss elsewhere, then a landowner might be motivated to protect, restore and enhance habitats for endangered species.

This idea was the impetus behind the establishment of conservation banking. Conservation banking is a tool used largely for more efficiently meeting the mitigation requirements of Section 10 HCPs or Section 7 consultations. Following the pioneering of conservation banking in California, the US Fish & Wildlife Service adopted guidance for habitat conservation banks in 2003 (USFWS 2003). Since then, the practice of conservation banking has expanded geographically, but has been limited in its overall impact. Among the limitations is the fact that most banks receive credit only for preserving existing habitat – i.e., there is little direct incentive for restoration. In addition, the guidance requires that habitat must be protected and managed “in perpetuity” through a conservation easement with an inexhaustible management endowment. Conservation banks, while representing an important opportunity for investing in conservation on private lands, are limited in their scope. They are primarily tools for facilitating development, and are not likely to fundamentally contribute to recovery for the species they target (Fox et al. 2006). A conservation strategy that relies

foremost on securing habitat with perpetual conservation easements assumes that habitat quality is static, or that it can be maintained as such forever, literally. Evidence for most species clearly demonstrates that habitat quality is ephemeral. Thus the idea of permanently securing functional habitat begins to stumble when faced with the dynamic processes responsible for creating suitable habitat conditions in the first place.

A more recent innovation addresses some of the shortcomings of conservation banking. On July 31, 2008 the USFWS issued guidance for “Recovery Crediting.” The idea behind recovery crediting is to provide additional means for federal agencies to meet their ESA Section 7 obligations from actions on private and other non-federal lands. According to the guidance, “a recovery credit is a quantifiable unit of measure recognized by the Service representing a contribution to the recovery” of a listed species (USFWS 2008, FR 73 148). The process allows recovery credits to be accrued through accomplishing recovery tasks for the species on non-federal lands. The credits are then available to offset adverse impacts elsewhere to the same species. Accumulating credits to offset debits under a recovery credit system is to be conducted in such a manner as to yield a net benefit to recovery for the species. Biological monitoring is required for both the credit and debit phase of the program.

While the USFWS guidance for recovery crediting is substantive and wide-ranging, any mention of the incentives required for motivating private landowners to participate in such a program is all but absent. Recovery crediting was first developed for endangered golden-cheeked warblers in Central Texas, and it was applied as a 3-year “proof-of-concept” across a 2.5 million acre area surrounding Fort Hood Military Reservation. Fort Hood has a large population of golden-cheeked warblers and its training actions often result in impacts to the species’ habitat. While it is yet too early to assess the full ecological benefits of the recovery credit system (RCS) on golden-cheeked warbler populations, the resulting response by private landowners demonstrates some of the principles that could be used to reform ESA.

Following are some of the key features of the RCS program:

- The RCS was designed mostly through the participation of conservation non-governmental organizations, state agencies, landowner groups, and university scientists. Federal agencies participated in the advisory and oversight functions.
- Species experts were convened to establish a method for determining a standard unit of recovery, a “Credit” based on habitat protection, enhancement and restoration using known species—habitat relationships. This was a unit of habitat ecologically relevant to GCW, with adjustments depending on factors such as patch size, proximity to other known GCW populations, and specific needs for the recovery unit.
- University researchers were engaged to launch a monitoring program for the private lands across the 2.5 million acres landscape. The monitoring program is designed to validate the credit criteria, establish habitat occupancy models, determine population baselines, and follow trends in habitat recovery and population response.
- Landowners are recruited into the RCS through an outreach team that includes University Extension, Environmental Defense Fund, and the local cattlemen’s association.



- Landowner information and site-specific endangered species information is kept confidential and is not made publicly available – nor is it available to USFWS.
- A management plan that includes conservation and recovery actions is established for each private property where landowners identified themselves as potential participants in the program.
- Funding is made available through program sponsors (including Department of Defense, US Army, National Fish & Wildlife Foundation, and USDA-Natural Resources Conservation Service).
- Landowner contracts and their implementation are administered by a local non-profit foundation.
- Landowners are informed of program details, including contract terms, site-specific conservation and management practices required, and the number of eligible “credits” for their property.
- Landowners compete for participation in the program through a reverse auction process whereby they placed bids that include their credits, amount of cost-share they are willing to contribute, contract length (10 to 25 years), and the amount of annual payment they expect.
- Competing bids are compared according to their cost-effectiveness at providing the most credits, for the longest contract term, at the lowest price.

The RCS process results in a market-based system whereby landowners actually compete to provide tangible conservation benefits for a target species. Following eight bid rounds over a 3-year period, the program now has 13,858 acres of private lands enrolled, including 2,201 acres of occupied GCW habitat. Approximately 33% of the total area is enrolled in 25 year contracts. Total cost of the area enrolled thus far is \$1,954,666.

Once recovery credits are established, they are held in trust for use by the sponsor until they are needed to offset an adverse action – debiting. The guidance requires that the combined effect of crediting and debiting must be designed to provide a meaningful “net benefit to recovery” for the species.

The science database emerging from the monitoring program for the RCS is considerable. An important but controversial feature of the RCS at Fort Hood is that landowners may participate while maintaining confidentiality. In other words, site-specific information about endangered species is not directly released to the USFWS. The information is used by researchers for monitoring, recovery planning, and understanding species—habitat relationships. The results, but not the raw data, become available. As a consequence of what many have called a “landowner friendly” approach, the RCS has garnered support from several local landowner associations including Texas Farm Bureau and Texas & Southwestern Cattleraisers Association. As a result, the program has spurred enough interest in the species, and enough trust from landowners that gates are beginning to reopen and real recovery efforts are now being implemented.

Nevertheless, the Fort Hood proof-of-concept for the RCS has drawn criticism. The confidentiality agreements with landowners have created a perception of “secrecy” making the program a target among critics in the popular media (Washington Post 2009). Another major criticism is that the mechanism does not include a perpetual easement – the concern being that the current RCS contracts do not obligate landowners to preserve

habitat permanently (Canes and Rohr 2008). Those supporting the concept of recovery crediting for private lands, appear to express their support for reasons similar to what critics are expressing as their concern – that is, confidentiality and non-perpetual agreements.

A large fraction of private landowners avoid formalized conservation programs that require them to reveal site-specific information – especially when it concerns endangered species. As a case in point, private landowners in many parts of Texas had refused to allow wildlife biologists on their property until legislation was passed that required site-specific wildlife data to be specifically shielded from disclosure, even to federal agencies (Texas Parks & Wildlife Code §12.0251). Many private landowners also avoid permanent surrender of land use decisions. In a polling of landowners in the Edward's Plateau of central Texas, Olenick et al (2005) found that a perpetual conservation easement was the least preferred instrument for incentivizing conservation efforts on private lands. Performance contracts and lease agreements were the most favored (Olenick et al. 2005). While permanent easements have proven to be a valuable tool for protecting lands from development impacts, the financial expense and unfavorable reception by some landowners limits the use of that tool for recovery of endangered species across large expanses of land.

### ***Evolution of Effective Market-based Systems***

Some of the lessons from recovery crediting are transferrable to other landowner incentive programs that could emerge. As mentioned in the previous section, however, the most important lessons for creating an incentive program that attracts and motivates landowners were not covered in the USFWS guidance for the program. This is not necessarily a problem as long as there are some reforms to the ESA and its implementation.

The fact that the guidance for conservation banking was already in place and operating was instrumental in the conceptual design of the RCS – in fact, without the existence of conservation banking and the 2003 guidance, it is unlikely that RCS guidance would have been established. But how does RCS stack up against conservation banking? Using the example above, the equivalent cost would have been approximately \$16.5 million to obtain a similar initial conservation impact under an existing conservation bank for the species. In the single existing example, use of RCS cost about 12% of a similar habitat area impact under conservation banking. But there are some important differences to note. Conservation banking requires that a permanent conservation easement be placed on the property, while RCS contracts are for limited terms. One of the features of an RCS is that the currency of trade is a credit that takes account of factors influencing habitat value. As a consequence, a unit that constitutes a recovery credit may more closely approximate a uniform measure of performance than the simple measure of land area that is common to conservation banking. Finally, conservation banking is becoming a large and relatively well-established industry. Thus, one advantage of conservation banking is that there is growing educational effort and political support arising as a result of organized efforts of an association.

The comparison of RCS with conservation banking illustrates a point about the relative cost-effectiveness of habitat conservation measures when they are considered

separately from the investment in a perpetual conservation easement. It is important to note that the conservation banking approach promises to maintain the function of the habitat “in perpetuity” – and this has value. Whether recovery crediting is to become broadly applied is yet to be known. The guidance for conservation banking had been in effect for over 5 years by the time recovery crediting guidance was issued.

In the same way that recovery crediting built upon some of the lessons and desirable attributes of conservation banking, it is likely that further innovation will build upon recovery crediting. The fact that a new innovation for endangered species incentives took over 5 years to emerge after conservation banking argues for a more active approach. The development of market-based conservation programs for endangered species is truly in its infancy. As new programs emerge, those that have organized to support the prior innovations may tend to fight newer ideas. This was the case with the guidance for recovery crediting. The national organization that supports mitigation banks actively opposed the development of recovery crediting, partly on the grounds that they anticipated competition. Comments in response to the draft guidance for recovery crediting actually included a recommendation that the Service examine the economic effects that recovery crediting would have on the conservation banking industry (US Fish & Wildlife Service 2008). Obviously, such resistance could stifle innovation. Similar concerns were expressed by LMI, a consultant to the US Army Environmental program – the concern being that RCS could compete for limited funding against Army Compatible Use Buffer (ACUB) proposals (Canes and Rohr 2008). The ACUB uses perpetual conservation easements to protect against encroachment to Army installations.

While some of the resistance to RCS and similar innovations appears as rent-seeking and protection against funding competition (as in the above examples), there are concerns expressed in the interest of species conservation. For example, Environmental Defense Fund and other national environmental groups have participated in development of RCS and similar innovations, but they have encouraged rigorous evaluation to validate the instrument’s likely impact on species recovery. Independent evaluation of policy innovations, followed by public disclosure of the evaluator’s conclusions may be the most productive means for speeding market-based innovations into application. Without independent evaluation, market-based systems for endangered species recovery may suffer criticisms similar to conservation programs in the US Farm Bill. Criticisms aimed at Farm Bill conservation programs include claims of inadequate performance measures, lack of evaluation, and placing farm income support above the intended goal of natural resource protection (Batie 2009).

For endangered species recovery, a regulatory framework that encourages testing of a wide variety of market-based approaches but then requires independent evaluation and public scrutiny of results, would be superior to the more cautious approach taken thus far. Inasmuch as financial costs may override other concerns, it is important that evaluations gauge cost-efficiency against the benchmark of prevailing programs. Finally, for an evaluation process to withstand scientific scrutiny, the process must rely on well-designed field monitoring for documenting actual recovery outcomes. In the end, an informed evaluation must include a collection of field data within a sampling scheme designed to yield reliable information on species status and trends.

### ***Emerging Concepts***

Concepts for revolutionizing market-based incentives for endangered species conservation on private lands are emerging rapidly. Ecologists are developing spatially-explicit and model-based methods for more reliable alignment of credit metrics with conservation outcomes (Hartig and Drechsler 2009). Business experts are tackling the technical concepts for establishing prospective restoration credits as a business framework for market-based incentives leading to proactive habitat restoration (Stahl et al. 2007). Environmental entrepreneurs are developing novel financial instruments to generate capital for private endangered species conservation efforts (Mandel et al. 2009). The ESA must adapt to the idea of market-based incentives for these innovations to move from concept to practice.

### **LESSONS FOR REFORM**

In his commentary on the organizational science of endangered species recovery efforts, Ron Westrum made a simple observation on the failure of recovery efforts – “*Recovery efforts fail for four basic reasons: intention, incompetence, ignorance, and ill fortune*” (Westrum 1994). So overcoming the obstacles to recovery requires motivation, skill, information, and luck. The history of failure on private lands demands some simple but effective solutions for overcoming Westrum’s obstacles. Ideally, such solutions would engage private landowners in conservation actions mostly due to incentives, and rarely due to regulatory requirements. Such solutions must also include incentives for scientists, wildlife conservation interests, and the agencies responsible for administering the ESA.

By all evidence, the current ESA functions as an adequate “safety net” against species extinction. The social, economic, and political costs of the ESA are extremely high for an Act that does not yet serve its additional purpose of conserving threatened and endangered species through actions leading to recovery.

While the recent calls to reform the ESA in the US have not yet produced much in the way of a more effective statute, the lessons drawn from a history of the ESA’s regulatory approach resulting in defiant private interests may have influence elsewhere. In neighboring Canada, the negative lessons of the ESA apparently influenced that nation’s 2002 *Species at Risk Act* (SARA) such that the Canadian statute avoids imposing endangered species conservation costs on the private sector in favor of funding for voluntary stewardship and regulatory compensation (Illical and Harrison 2007). Another important difference is that the Canadian statute defers implementation to provinces and territories (with the exception of aquatic species and migratory birds), while under the ESA, States may only be authorized to take implementation responsibility under strict federal terms (Illical and Harrison 2007).

### ***Separate Regulatory and Recovery Duties***

A separation of the permitting and enforcement obligations of the ESA from the science, monitoring and recovery functions would likely result in more effective species recovery through increased access and information from private lands. Upon revision, the ESA should direct the Secretary of the Interior to defer the science, monitoring, and recovery functions to appropriate State wildlife agencies. Through cooperative agreements, data collected from private lands could then be made available to inform status reviews and

monitor recovery efforts. Under the authority of the states, these data could be treated as confidential information. The benefits of this reform would be two-fold: 1) landowners will be more likely to allow access and provide species information; and, 2) personnel and resources for the important activities of coordinating monitoring efforts and planning recovery actions will be less likely to be overridden by the urgent activities of permitting and enforcement.

***Authorize Non-governmental Third-parties to Work with Private Landowners***

The ESA should be revised to allow qualified third-party technical service providers to work with private landowners in the development and implementation of site-specific plans for recovery actions connected with conservation incentives. Landowners are more likely to trust non-governmental organizations with site-specific information and property access. The USFWS could use a registry program for qualified technical service providers similar to that used by the federal agencies responsible for implementation of Farm Bill Conservation Programs.

***Modify the Section 9 Prohibition on Take.***

Section 9 of the ESA should be revised to allow broad exemptions from Section 9 prohibition for combined actions that demonstrate a net benefit to a species' population through habitat modification that might cause short-term harm to one or more individual organisms. Provisions for expedited exemptions from Section 9 should be authorized for actions that may risk some incidental take, but will clearly provide long-term net benefit to species recovery. This provision would spur innovative conservation actions in concert with common land management practices (e.g., forest management, grazing, agriculture) that do not permanently eliminate species habitat.

***Stimulate the Development of Market-based Conservation Programs***

The ESA should direct the Secretary of Interior to produce regulations that map the rules for market-based conservation programs. The regulations should provide broad guidance that is developed specifically to stimulate the development of habitat trading, and other crediting programs.

***Establish Recovery Goals at Time of Listing.***

In order to facilitate better planning and to create some certain targets for market-based programs, the ESA should direct the USFWS to establish recovery goals at the time of species listing. Some exceptions (e.g., for emergency listings) should be established. Market-based incentives for conservation will also stimulate private investments in science and monitoring. As a consequence, the information required for developing recovery goals should become more readily available.

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