

Protecting Biodiversity on Private Property:

The Role of Landowner Norms and Beliefs

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Introduction

Many scientists now agree that human-caused extinctions of other species are proceeding at an unprecedented rate (Thomas et al. 2004; Novacek and Cleland 2001; Myers et al. 2000; Pimm et al. 1995; Wilson 1992). The results entail serious risks for society: other species play a critical but unpredictable role in providing medicines, foodstuffs, and other vital resources for human society. The causes of the "biodiversity crisis" are many, but can be traced primarily to habitat loss and the introduction of invasive species, both resulting from the expanding reach of a globalizing human society. Ecologists and environmental scientists regularly point to the loss of biodiversity around the globe as a leading environmental threat to society.

Policy makers have struggled to address the biodiversity problem. In the United States, the primary mechanism for preventing extinction is the Endangered Species Act, passed on the heels of two ineffective statutory precedents in 1973. Yet the Endangered Species Act (ESA) has struggled in its efforts at conservation for a plethora of reasons, most importantly its conflicts with private property. Sometimes called the "pit bull" of U.S. environmental laws, the ESA has the legal authority to impose substantial limitations on the use and development of private property in order to protect species habitat (Sheldon 1998, Sax 1997, Farrier 1995). This is important ecologically, since ninety percent of endangered species rely on some private habitat (Brooke et al., 2003), and more than fifty percent of endangered species are found *primarily* on private property (Parkhurst et al. 2002). But despite the law's theoretical power, studies indicate that endangered species fare much worse on private than public lands (Sheldon 1998). Clearly, protecting biodiversity on private property remains a major policy challenge.

Not surprisingly, the academic literature on this topic is rife with policy suggestions and strategies for improving conservation on private lands, including stricter regulation, more

acquisition, and the promotion of new ideas of ownership. Unfortunately, none of these strategies have proven particularly effective so far at managing the biodiversity crisis on private land. In our view, this failure is partially due to neglect of the actual values and beliefs of private landowners regarding species conservation and private property. Unfortunately, in the current political climate, most of our information on landowner beliefs comes from anecdote and symbol, emphasizing stories of grandmothers losing the family estate to an endangered owl and the like, rather than detailed research. In this paper, we argue that policy makers need to pay more attention to the values, attitudes and behaviors of private landowners if they are going to begin dealing with the biodiversity crisis successfully. We then try to take a first step in that direction, through research on the beliefs and values of private property owners in a conservation management area for the endangered Indiana Bat. Essentially, we ask the following question: do *existing* landowner beliefs, even in a conservative "red state" like Indiana, suggest potential for better species conservation on private lands? Our tentative answer is "yes."

We begin with a review of proposals to improve the ESA, highlighting the inadequacies of several of the more prominent approaches. Shifting to the idea of landowner cooperation, we also briefly explore the existing literature on landowners' environmental values. Here, we note two deficiencies in the literature: the neglect of the ideas of landowners who are not farmers or ranchers, and limited attention to attitudes regarding private property rights. Following this review of the literature, the paper presents results from interviews with twenty-two landowners in the Indiana Bat Conservation Management Area (CMA) regarding their conservation values and attitudes toward private property rights. We conclude that our data suggest that cooperation between landowners and USFWS is not only necessary for the recovery of endangered species

on private lands, but is also possible--particularly when paired with an incentive based policy approach.

I. Existing Work on ESA Reform and Private Property

The initial approach of the ESA toward conservation on private lands was regulatory. Starting with the "no take" provisions of the law under Section 9, the statute took a "command and control" approach to protecting species on private property. Subsequent court decisions and regulatory interpretations by the USFWS expanded the idea of "take" to include the loss of critical habitat on private property, even in the absences of actual species in residence. This "no corpses" provision of the regulations raised the issue's political temperature and inspired legal challenges, culminating in the 1995 *Sweet Home* decision in which the Supreme Court refused to declare such prohibitions a legal taking under the 5th Amendment of the U.S. Constitution.

Despite its vindication in the courts, however, the ESA's regulatory approach appears to be failing on the ground. Few species have sufficiently recovered under the law to be delisted, and the law's prohibitions remain rarely enforced (Houck 1993). Some argue this is because the ESA has never been adequately funded (Patlis 2003), while others point out that the USFWS has never had the ability or desire to enforce the law effectively on private land (Sheldon 1998). Over time, this line of argument claims that the ESA has been "substantially amended, transforming it from an act of specific requirements into a more discretionary permit system" (Houck 1993: 358). Thus, the solution could be to reinvigorate the power of the ESA via greater funding and stricter enforcement of the law--an idea sometimes referred to as the "hammer harder" strategy (Elmendorf 2003).

However, the hammer harder approach has several important drawbacks. First of all, it is politically unpalatable: even as early as 1994, political pressures on the ESA were focused quite strongly on reducing the law's impact on private property rather than intensifying it (Sax 1997). Those forces are in anything stronger today than they were a decade ago (Weiser 2005). In addition, the law's existing "ferocity" on private property is actually an inhibition to enforcement. Because the ESA leaves very little room for leniency depending on circumstances, a decision to sanction landowners sometimes seems too harsh. Officials and citizens alike are disinclined to impose harsh sanctions on others, and will frequently go to great lengths to avoid giving them (Stone 2002). Ostrom (2000) has shown that a lack of graduated and flexible sanctions makes enforcement challenging in many resource management settings, while Farrier (1995: 395) points out that "regulatory agencies faced with making case-by-case decisions on permissible land use are more likely to compromise where they have something to offer as a palliative for decisions that bear harshly on individuals." In other words, regulators would be more likely to hand out sanctions and enforce the ESA as intended, ironically, if the law were less strict and more flexible in its punishments.

In addition, it has been shown that Section 9 of the ESA creates perverse incentives for landowners, encouraging them to destroy potential habitat before it becomes occupied by protected species. This has become known informally as the "scorched earth" technique of land management, preventing the creation of any habitat on one's property at all costs (Bean 2002). Evidence for such behavior is not just anecdotal: In a remarkable study involving the red-cockaded woodpecker (RCW) in North Carolina, Lueck and Michael (2003) found that landowners with potential forest habitat for the RCW were significantly more likely to harvest their land as the trees approached the age (greater than 80 years old) where they could serve as

woodpecker habitat. Thus, as they conclude (2003: 30), “the ESA might actually cause a long run reduction in the habitat and population of a listed species” and succeed at achieving the exact opposite of its intended outcome – even when it is fully enforced and properly funded. This implies that “hammering harder” (or even "hammering smarter," as some suggest) is not going to solve the biodiversity crisis of conservation on private property.

An alternative to regulation is for government and private actors like land trusts to acquire endangered species habitat on private land (Anderson and Leal 2001; Hocker 1996). Indeed, the successes of the modern land trust movement, combined with the strong powers traditionally afforded to property owners in U.S. society, has made the acquisition strategy increasingly appealing in recent years. However, a significant flaw in this line of thinking is again financial – there simply is not enough money to buy a large portion of the land required. Certainly, the current FWS budget dedicates relatively little money to acquisition - approximately \$18 million out of the \$348 million reportedly spent in 1995, for example (Barker 1999). Although the Bush administration has recently pushed for full funding of the Land and Water Conservation fund, only a small percentage of that source is likely to go toward habitat protection. More generally, the staggering costs of many recent acquisitions indicate the limits of the acquisition approach: recent purchases in areas like Redwoods National Park or the Headwaters forest have run into the hundreds of millions of dollars for relatively modest parcels, at rates greater than \$70,000 *per acre*. While not every habitat will achieve the value of old growth redwoods, it is abundantly clear that however appealing the notion, we cannot buy it all (Fairfax et al. 2005).

Moreover, the acquisition approach has its other problems beyond its budget constraints. Based on voluntaristic behavior, acquisition strategies risk the creation of "buckshot" protection

of scattered and fragmented landscapes, counter to the dictates of conservation biology (Keiter 2002). Acquisition policies frequently confront the “holdout problem”: private landowners who refuse to sell their properties, even after many others have sold. This is problematic because hold outs break up contiguous habitat areas and migration corridors (Parkhurst and Shogren 2005). In another example of perverse incentives, holdouts also free ride on larger conservation efforts that actually increase the value of their own properties (Elmendorf 2003). As the Fish and the Wildlife Service makes strides toward returning a conservation area to nature, remaining private landowners benefit from living in a pristine nature conserve that may decrease the incentive for them to leave. Even if USFWS could afford to buy it all, in other words, not all property is likely to be for sale.

In light of these limitations, policymakers are paying greater attention to incentive based approaches. The most common incentive used in conjunction with the ESA at present is the Habitat Conservation Plan (HCP). Added to the law by amendment in 1982, HCPs offer “Incidental Take Permits” to landowners legalizing a limited degree of habitat destruction in exchange for other mitigation actions. However, it is important to recognize that HCPs provide incentives only against a backdrop of threatened ESA sanctions against the landowner, and are unlikely to work in the absence of an impending regulatory "hammer" (Thomas 2003). Their voluntary nature risks additional fragmentation of conservation efforts across diverse landscapes (Raymond 2006). Furthermore, it is not clear if the approach is providing a serious ecological benefit or actually *impeding* species recovery in some cases (Doremus 2001; Kareiva 1998). As an incentive-based approach to biodiversity protection on private lands, in short, HCPs are far from the last word.

Nor are incentives without their own drawbacks. They can be costly and sometimes unnecessary. Incentives may be especially problematic when framed as “compensation” for landowners, thereby allowing them to “externalize the problem and deny that they have any responsibility for the conservation of biodiversity” (Farrier 1995). Essentially, in the worst case incentives may pay landowners to do what they should be doing anyway – or what they would already do for free (Raymond and Fairfax 2002). Also, there is the concern that incentives will gradually become the norm, leading landowners to expect to be compensated and/or rewarded for any conservation effort they might make on private land.

Thus, while the difficulty of conservation on private lands is readily apparent, the solutions are much less clear. Present ESA strategies are problematic as more often than not they work against landowners rather than with them. Therefore it seems evident to us, upon reviewing the literature, that the USFWS must seek new ways to cooperate with landowners on habitat protection. But in order to cooperate with owners, the service must first understand them. Therefore, we need to pay greater attention to the values, attitudes and behaviors of landowners, especially in regard to conservation values and varying conceptions of private property. Only through understanding the perspectives of landowners can their much needed cooperation become possible.

While the literature on personal environmental values is substantial, there is a general consensus that such values are significantly related to individual behavior. In a recent review of the literature, Dietz, Fitzgerald and Shwon (2005: 1231) conclude that there is a “moderately strong relationship at the individual level between various measures of values and measures of environmentalism, including reports of actual or intended behavior.” Schwartz and Bilsky (1987) even define “values” as “concepts or beliefs about desirable end states or behaviors that

transcend specific situations, guide selection or evaluation of behavior and are ordered by relative importance” (519). Embedded in this definition is the implication that values matter because they guide behavior, but the causal connection remains poorly understood.

Research specifically on the attitudes of farmers and ranchers (Erickson and DeYoung 1992-3; Reading and Clark 1993; Sullivan et al 1996) confirms that landowner attitudes generally predict behavior (Kraus 1995). These recent studies also confirm the work of Stephen Kellert, who has shown over the years that farmers and ranchers tend to possess utilitarian and negativistic attitudes toward the environment, especially when they feel threatened or imposed upon. Unfortunately, this literature provides little insight into the values of certain kinds of landowners – non farmers and non ranchers – who are becoming increasingly important for biodiversity conservation efforts today as family farms and rural life give way to urbanization (Nijhuis 1999). Moreover, there is also little information in this literature on landowner attitudes regarding private property. The latter oversight is quite surprising given the very high salience of private property rights issues in conflicts over ESA implementation and reform today (Weiser 2005).

It is no secret that many Americans favor a Lockean notion of property in which ownership implies natural or "intrinsic" rights of ownership that government should rarely infringe upon. This is important as Brooke et al (2003) show in their study of the threatened Preble's meadow jumping mouse that landowners with strong beliefs regarding private property rights are likely to be hostile to outside intervention on land-management issues. Nevertheless, there has been virtually no in-depth investigation into how Lockean (or other) notions of private property among landowners could affect the conservation of endangered species on private land.

Instead, perhaps surprisingly, there is an opposite trend toward fostering *new ideas* of ownership upon society and landowners alike. In his eloquent book *The Land We Share* (2003: 8), for instance, Eric Freyfogle boldly argues that “private ownership is in need of fundamental change if it is going to serve America well in the 21st century.” The problem for Freyfogle is that America’s Lockean notion of property excludes a “broader sense of value” or “greater ecological awareness.” Expanding on the earlier ideas of Joseph Sax (1993) (and even C. B. Macpherson (1977)), Freyfogle insists that landowners must adopt a more *ecological* vision of property that recognizes the malleable nature of private rights in the face of compelling public needs like environmental protection. Under this approach, environmentally sound land use becomes an obligation of private ownership rather than a praiseworthy act deserving compensation. In sum, landowners need to change their outlook and accept “a revitalized property system in which landowners are expected to use their land in gentler and more communally responsive ways” (2003: 211).

Unfortunately Freyfogle and his peers appear to underestimate the normative power of Lockean values in American society. There is an element of wishful thinking in this particular line of thought: that exhorting others to view property in a new light will be sufficient to bring about change. In actuality, the Lockean view of ownership is deeply entrenched in our culture and resistant to academic interference. While Sax (1983: 495) acknowledges that the changes he proposes “will not be easily assimilated in American thought,” and Freyfogle (2003: 109) admits “the law of ownership does more than reflect a set of values, it helps instill them and carries them on,” both authors nevertheless exude optimism about the coming “economy of nature.” However, there is little empirical work to suggest that fomenting a revolution in property values

is a plausible strategy for policy makers--indeed, recent controversies over eminent domain in the 2005 *Kelo* decision indicate the continued strength of the Lockean perspective.

Conservation efforts on private property are essential to the success of the ESA. At present, notions of “hammering harder,” increasing acquisition efforts, providing blanket subsidies or urging new views of ownership on landowners are proving inadequate to that task, both in theory and practice. As an alternative, we argue that government is going to have to work collaboratively with landowners, including smaller property owners, to achieve conservation and recovery on private lands. But if the USFWS is going to garner more landowner cooperation, then more time and effort needs to be spent on gaining insight into the values of landowners in regard to conservation and private property - especially among landowners who are not farmers or ranchers. Only when the government understands how landowners feel about owning land, what it means and what rights it entails, can the government chose an optimal conservation strategy. In order to help move that process forward, this paper turns to a discussion of the beliefs and values of private landowners in the Conservation Management Area (CMA) for the Indiana Bat.

II. CMA History & Background

In 1991 the Indianapolis International Airport Authority (IAA) started planning an airport expansion for a new United Airlines Center. The land area being considered for the expansion was home, however, to the Indiana bat (*myotis sodalis*), a federally listed endangered species. In compliance with the Clean Water Act and the Endangered Species Act, the IAA agreed to create the CMA for the bat to replace the acres lost to the airline expansion. Later, the CMA also came to play a role as mitigation for a nearby highway expansion and accompanying HCP ratified in

2002 (Raymond 2006). The resulting 1,890 acre reserve now stands as one of the largest mitigation and private conservation areas within Indiana, with an ongoing extensive voluntary acquisition program by the airport to buy out private owners in the area and reforest much of their properties in native hardwood species favored by the bat for roosting. Despite the acquisition program having continued for more than 14 years, however, something like 33% of the CMA remains privately owned as of this writing.

The Indiana bat hibernates throughout the Midwest (Kentucky, Indiana, Illinois and Missouri) from October to April, but during the summer the bat migrates to specific areas, one of which was the site of the proposed United Airlines Center. The most important factors for summer bat habitat include roosting and foraging habitat. The bats favor recently dead trees, such as Shagbark Hickory trees, that provide loose slabs of thick bark suitable for roosting. Roost trees are usually located in shady areas close to a water source, such as a river or a creek. From 1992 to 1996 the IAA built and monitored over 3,000 bat houses in the CMA and through studies with Indiana University over 700 bats of various species have been observed utilizing the structures. However, between the years of 1992 and 1999, only four individuals of *myotis sodalis* were captured. At present the success of the CMA in regards to preserving the bat is questionable, particularly in the eyes of many local landowners.

III. Methods and Case Selection

The CMA presents several practical and analytical advantages as a case study of private landowner beliefs and values related to biodiversity conservation. For one thing, the area has undergone more than 15 years of efforts to protect an endangered species, raising the salience of the issue for those living in the region. The number of remaining landowners is small enough to

allow for in depth personal interviews, yet large enough to encompass a diverse range of perspectives. In addition, the CMA represents something of a "hard case" for those (like ourselves) recommending more cooperative policies with private landowners. Indiana is a politically conservative state--solidly Republican in all recent Presidential elections and solidly conservative on a variety of social, environmental, and fiscal policies. Hendricks County, site of the CMA, is a relatively rural and suburban mix of communities located in a conservative part of the state. Put simply, property rights are popular with many Indiana residents; environmentalists are not. Thus, any findings we obtain in favor of voluntary or collaborative ESA protection efforts in this region bode well for similar efforts in other, more environmentally friendly parts of the nation.

We conducted our study through guided interviews with twenty-two landowners currently owning land within the CMA in the fall of 2005. These interviews asked respondents in some detail about their views toward endangered species conservation and private property rights in general, as well as toward the CMA and the Indiana bat in particular. There are presently 45 private parcels remaining in the CMA, four of which are businesses or churches. We attempted to contact all 41 of the private, individual CMA landowners through an initial contact letter followed by a phone call to arrange an in-person interview. Addresses were obtained from public tax records for the county. Landowners were offered a modest human subjects payment (\$25 for a one hour session) representing a reasonable estimate of the opportunity costs for their time. Eleven landowners were unreachable for various reasons (no address, disconnected phone, no answer in three or more attempts), while eight landowners declined to be interviewed. Therefore, our overall response rate was an encouraging 54%.

The guided interviews lasted between 30 and 60 minutes and covered landowner views on six main topics:

- 1) Description of land and land management decisions;
- 2) Endangered species conservation;
- 3) Property rights;
- 4) Knowledge of the CMA;
- 5) Influence of bat on land management decisions; and,
- 6) Trade-offs between property rights and the ESA.

The interviews were digitally recorded and transcribed following each interview. Responses were coded by the co-investigators mostly as yes/no/don't know or on a five point scale ranging from strongly disagree to strongly agree. Some quantitative results of the coding (which was also tested for intercoder reliability) can be found in Tables 1 and 2 below, and the full interview instrument is presented as Appendix A. The transcripts were also carefully scrutinized qualitatively for a more nuanced understanding of landowner's beliefs and values.

IV. Results and Discussion

In general, our landowners were individuals with long histories in the area living on medium-sized plots of land for their primary residence. 19 out of 22 used the land mainly as their place of residence while three were also involved in farming of crops and cattle. The average time-span of ownership was 22 years (with a minimum of 7 and a maximum of 40 years), while the average parcel size was 30 acres (with a median size of 2 acres). Few landowners had cleared many trees on their property, despite the fact that a majority had made large one-time changes like building a new structure or adding on to an existing one.

Most owners (82%) had heard of the ESA, but only 9% expressed an ability to say anything meaningful about how the law works (See Table 1). This is surprising given that these

landowners live in a conservation area for a federally listed endangered species. While one might expect that living in a conservation area for a federally-protected species should have some impact on the and management decisions of these owners, a large majority (77%) claimed that living in the CMA has had no affect on them at all. A substantial minority did not even realize that they were living inside the boundaries of the CMA. In sum, one landowner seemingly spoke for the group by admitting that “the bat never enters my mind.”

Table 1: Landowner views on the ESA and CMA (n = 22)

Question:	No	Yes	Maybe	Don't Know
Have you heard of the ESA?	18%	82%	-	-
Can you explain how the law works?	9%	91%	-	-
Do you support the ESA?	11%	56%	22%	-
Have you heard of the CMA?	32%	68%	-	-
Does living in the CMA affect you or the choices you make about your land?	77%	18%	5%	-

Despite their lack of knowledge in regard to the details of the ESA, almost all of the respondents claimed that it was important or very important for human beings to protect other species, with many supporting the idea that human-caused extinction is always wrong (See Table 2 below). One landowner reacted to the suggestion that sometimes it might be okay for human beings to cause the extinction of a species this way: “No, not ever. Not if you know you are doing it. If you know then it is wrong. It’s one of those basic right and wrongs.” This view contradicts a common perception dating back to Kellert about landowner skepticism regarding biodiversity conservation.

In addition, not all landowners limited themselves to anthropocentric or utilitarian reasons for species conservation. Instead, many spoke eloquently on behalf of views that might seem more at home at an Earth First! rally than a rural Indiana neighborhood. Appeals to ecosystem interdependence and the balance of nature were common: As one respondent put it,

“the ecology of the planet depends on the cause and effect of animals and insects and it has evolved over millions of years and it kind of has a balance...” Moreover, Table 2 indicates that nearly half of those interviewed ultimately felt that other species have an *intrinsic* right to exist, while a surprising 40% felt it is equally important to protect *all* endangered species regardless of type—charismatic and noncharismatic alike.

In terms of the rights and responsibilities that come with being a landowner, responses were also varied and often surprising. While half the respondents claimed that the most important right of ownership was the ability to do whatever one wants with the land, other reasons offered included a right to privacy, a right to safety, and a right to have a say in what goes on around one's property. In terms of responsibilities, common responses included keeping one's property neat and tidy, keeping it safe, and having a responsibility to neighbors as well as to the environment. In fact, a significant group (27%) stated that the most important responsibility they have as a landowner is to the land itself. Besides the basic claim that “I think we have a responsibility not to ruin it” one landowner said, “I feel that I shouldn't poison the environment and that I should think about the kinds of things that I do and what impact it might have in the long run.”

More specifically, views about property tended toward a Lockean notion of absolute or natural rights of ownership. At first, respondents seemed to misunderstand our questions on this point, with 73% agreeing that property is a government created and changing right, while at the same time 63% agreeing with the opposite view that property is a natural/absolute (Lockean) unchanging right. While these two ideas seem to contradict each other, the details of the conversations make it clear that many respondents misinterpreted the question about property as

a government created right as an *empirical* question, rather than a *normative* one. For example, it was not uncommon to for a conversation to take the following pattern:

Interviewer: *Do you think property is a right created by government that can change over time as the needs of society change?*
 Landowner: *Well, obviously the government controls it – it is a government right.*
 Interviewer: *Okay, but do you wish it was the other way?*
 Landowner: *Well it would be nice, but it is not practical.*

Whereas with the second question, is property a natural and absolute right, respondents answered more normatively – speaking to their own beliefs about private property (See Table 2). This was confirmed by the fact that when we ultimately asked landowners to place themselves on a continuum ranging from an instrumental conception of property to an intrinsic, Lockean ideal, 55% aligned themselves closer to the Lockean pole while only 18% tended toward the instrumental view (The remainder either placed themselves in the middle or were unsure). Many landowners invoked a Lockean viewpoint by expressing that America was founded upon that notion of private property. Interestingly, one environmentally-inclined interviewee surprised us by supporting an very absolute notion of property, claiming:

That is part of what the US is about itself. The fact that we have the ability to own private property and no one can basically tell you what to do with that property. And that is sorta, you know, one of those basic inalienable rights that we have. Personal ownership of property is very important.

Table 2: Landowner views on species conservation and private property (n = 22)

Question:	Strongly Disagree	Disagree	Agree	Strongly Agree	Don't know
Do species have a right to exist?	5%	41%	32%	13%	
Is it okay for human activity to lead to extinction of a species?	14%	36%	36%	5%	
Private property is a right created by government.	5%	22%	68%	5%	0%
Private Property is a natural or absolute (unchanging) right.	5%	27%	41%	22%	5%
Do landowners have an obligation to not harm species found on their land?	5%	13%	54%	18%	10%

Within views on private property, we did find some evidence of cognitive dissonance— as some landowners themselves recognized. When asked about his views on the rights of landowners, one individual favoring a responsibility to other landowners responded: “Pretty much I feel like you have the right to do on your land what you want to do. And I know that contradicts the first thing I just said. Sorry.” Furthermore, we also had respondents who felt that protecting endangered species is very important, but later reported that landowners do have an obligation to protect species found on their property.

Many landowners (41%) felt that some types of limits on private land use would be appropriate for the protection of endangered species. However, most had a strong negative reaction to the idea that a landowner should have to bear the cost of protecting a species without incentives or compensation. One respondent expressed “I almost think it is wrong. I don’t want anyone regulating what I do with the land.” As another said, “well, if they aren’t going to give them the right to use their land then they should reimburse them.” Moreover, a few landowners felt that incentives should be attempted before regulation. For example, one landowner pointed out that “At least, I believe those kinds of things [incentives and co-operation] should be used first before you can use a 2 by 4.” Another pointed back to enforcement realities as well as fairness:

- Landowner: *If it is six bat houses it is one thing, but if there are saying they need a pond [on private land] then that is 40 thousand dollars. They [the government] don’t have to pay for it all, but subsidize it.*
- Interviewer: *Is subsidizing the only way?*
- Landowner: *Unless you put a lot of bat cops out here.*

Indeed, speaking of "bat cops," in terms of regulatory policy options we found little evidence that agencies might depend on landowners to self-police, as has been suggested by some

reformers (Elmendorf 2003). While a majority (63%) claimed they would take action if they knew a neighbor was directly harming the bat, very few (13%) said they would report a violation to the authorities. The unwillingness to report neighbors seems to stem from a strong norm in favor of minding one's own business and not telling others what they can and cannot do with their own land. As one landowner said, "I don't want people to feel like I am going to interfere with what they want to do and I feel the same way because I don't want them coming over and saying 'you play volleyball too late.' I mean, I don't want to get into that kind of situation with them." These landowners value privacy and support a basic Lockean notion of property that makes self-policing challenging.

Finally, our data speak to the need for increased communication between the FWS and landowners. CMA landowners generally want more information and expressed a willingness to help with bat conservation efforts. A substantial majority responded that the best way the government could help conserve endangered species on private land was education and information. For example, one landowner suggested that the FWS should "just let me know a little more about what they are trying to do and maybe make suggestions about what I maybe should try and plant if I have a chance to." Similarly, another landowner said "I am sure if there is some way I could help I would." Furthermore, when asked about what one could imagine doing on a voluntary basis to help the bat it was not uncommon to hear "I don't know because I have never been asked." One landowner, mimicking the actions of the IAA tried to build bat-houses, and reported "I am trying to attract more bats. I think they are cool. I like watching them. And so, I just thought maybe I could get some to come live in my bat houses, but I never did." In short, these landowners want to help but do not know how because no one has provided them with that information, nor even asked for their co-operation.

Increased communication is also necessary to correct the misperceptions and rumors afloat in the CMA. As noted above, 32% of our interviewees had never heard of the CMA in which they are living, and 10% had never heard of the bat. Most landowners who had heard of the CMA expressed similar views to the respondent who claimed “All the information I have had about the CMA has been informal. There is nothing that I have seen that has been official or from the government or some department.” This informality has led to skeptical and questioning landowners. For example, one owner felt as though “this whole bat habitat thing is a sham” and that “it is just another capitalist thing with NAFTA. It is all a part of NAFTA.”

Likewise, another respondent claimed:

They [government] kind of presented it like it was for the bat, and I have got to believe that they have other plans for what they are going to do with that land. I just think they are going to buy it all and make it commercial and re-zone it and put businesses in there. That is my perspective on it.

While under the ESA and the airport HCP both the endangered species and the CMA habitat are protected, many of these property owners still feel as though the airport and FWS are trying to make a profit via the bat. The CMA is in an area with significant development pressures and rising land values, landowners find it hard to believe the area won't ultimately be commercialized. The fact that many landowners agree with the idea that the government may not be “telling the whole truth in some cases” is detrimental to the idea of fostering landowner’s cooperation.

Lastly, our interviews confirm that the CMA is unintentionally creating a hold out incentive. More than one landowner expressed the sentiment that “I am happy because I have a nature preserve around me and I have the benefit of having the country around me... so I have the best of both worlds as long as they don’t push me off.” While 45% of the people we interviewed admitted that have considered selling, the fact remains that most of these landowners have held

out for 10 years or longer and only one is presently in negotiations with the IAA. Thus, it is a distinct possibility that the remaining 45 private owners in the CMA represent a large number of long-term holdouts owning more than 1/3 of the CMA acreage. This reinforces the fact that the FWS has to work cooperatively with these landowners if the chances for the Indiana bat's recovery are going to be maximized.

V. Conclusion and Implications

In the Conservation Management Area for the Indiana Bat - an 1,800 acre plot of suburban forest and agricultural land in the middle of a conservative “red” state – we find strong support among landowners for protecting endangered species. Despite the lack of communication with federal authorities and the numerous misperceptions afloat among these landowners, there was still a genuine commitment to the protection of endangered species of all types, often on moralistic grounds. Furthermore, many landowners spoke passionately of the importance of ecosystems and intrinsic rights as opposed to focusing solely on the human impacts of the impending biodiversity crisis. This was true despite nearly as strong support among landowners for an intrinsic, uncompromising understanding of private property rights. While owners were open to some limitations on their land use in order to protect species, they were wary of any serious interference with property rights and far more supportive of collaborative or incentive based approaches to the problem.

That said, our findings also speak to the continued ineffectiveness of the ESA as currently implemented on private property. While one landowner had his ability to harvest some trees limited by the FWS (much to his anger and dismay), our findings largely agree with recent work by Brook et al (2003) concluding that the listing of an endangered species and protection of its habitat has little or no net effect on landowners' behavior. Most of the landowners we spoke

to were largely unaffected by the CMA, and 1/3 of them did not even know about the conservation area at all. Almost none were able to clearly identify the purpose of the CMA. This suggests that a regulatory approach remains insufficient for the full recovery of the Indiana bat. The FWS cannot assume that listing a species will significantly affect a landowner's behavior; other steps have to be taken if recovery, or even simply protection from extinction, is going to be achieved.

The reality of the situation is that if landowners believe that property is a natural right that government has little right to change or infringe upon, enforcement and regulation of the ESA will always be difficult. The apparent prevalence of such views in the CMA may therefore seem discouraging. Yet certainly it is important to recognize, first of all, the apparent strength of such views as a reality check if nothing else. In addition, we find hope for conservationists in these results. One landowner claimed, "I think the government needs to try and work in a more cooperative way – and I know how difficult it is because I worked in local government for five years." But if collaboration is not easy, there are signs here that it holds some promise. Landowners are willing to accept some limits on land use, especially when even modest incentives are offered. The acceptance of reasonable limits, a genuine willingness to help protect species, and the mention of incentives as possible strategies speaks to the idea that there is a window of opportunity within which government can work with landowners.

One should not overstate the significance of this cooperative spirit in rural Indiana. A small minority of landowners in our group were openly hostile to the bat, and to the protection of any endangered species in general. Furthermore, there is an important risk of sample bias: that individuals more inclined to support species conservation were more likely to respond to our survey request (although one could also argue the other way - that those most angry about the

CMA were most likely to talk). In addition, we are keenly aware that it is easy to call for more incentives to encourage desired behavior among landowners, but far more difficult to find the funds to sustain such efforts. For all of these reasons, we recognize that collaboration with landowners is only likely to work as part of a larger portfolio of conservation policy efforts, including a continued regulatory backstop and a proactive, targeted acquisition program.

Yet it is also important in this case to avoid having perfection be the enemy of the good. ESA implementation is a mess as of this writing, particularly on private land, and there is a crying need for new approaches and experimental efforts to revive the law. Working with landowners may be messy, slow, and imperfect - but the alternatives all look worse. Nor is money for incentives an insurmountable obstacle: The IAA, for example, has already invested substantial funds buying property, tearing down houses and planting trees in the CMA when in some cases it is possible that incentives for landowner cooperation and habitat creation or preservation would have been cheaper and easier. As one landowner pointed out, “could that same amount of tax dollars been spent in a better way?”

As with many case studies, more research is required to determine the extent to which our findings can be generalized to other endangered species, including more charismatic ones. Indeed, our results suggest one particularly intriguing new hypothesis - that landowners are more willing to cooperate in our case in part because of the lack of previous conflicts over bat management. If correct, this idea would suggest that landowners in more politically liberal communities might actually be *less willing* to work collaboratively to protect species, due to entrenched and polarized opinions developing during long conflicts with government agencies. Thus, paradoxically, Indiana may present a *better* opportunity for ESA collaboration, with more pro-conservation attitudes among landowners, than many more traditionally liberal areas with

more long-running and entrenched species conflicts. We feel that future comparative work is urgently needed in this regard to test this hypothesis and expand the analysis, and we hope to do such work in the near future.

Nevertheless, the fact that a window of opportunity seems to exist even in a "hard case" like ours, concerning a negatively constructed species in a politically conservative area, is ultimately encouraging. As pure policy strategies of regulation, acquisition and strict enforcement remain or become problematic, the government needs to turn to landowners for other possible alternatives, including those relying more on incentives. Our findings suggest that there is room to draw on a positive reservoir of support for species conservation in a collaborative manner, without wishful thinking about tougher, self-enforcing regulations, boundless acquisition, or the radical spread of new ecological ideas of ownership.

Appendix A: Interview Instrument

I. Basic and Demographic and Land Management Information

1. How long have you lived at your property?
2. Describe your motivations for buying land in this area. What attracted you to the property?
3. What do you mainly use your land for?
4. What kinds of landscaping or maintenance actions do you regularly take on your land?
5. Have you undertaken any larger, one-time changes to your property (construction, clearing trees, brush, letting areas go fallow, etc)? When and what type?
6. Have you planted or cleared any trees on your property over time?
7. Do you use pesticides or herbicides on your land? How regularly?
8. What kind of outdoor lighting do you have?

II. Endangered Species Norms/Values

10. Are you familiar with the Endangered Species Act? What is your understanding of how the law works?
- 10b. [Skip if don't know law under 10]. Do you support the Endangered Species Act as it is implemented right now? Why or why not?
11. How important would you say it is for humans to protect other endangered species?
- 11b. Can you explain a little why you think it is important or not important in the way you just described?
12. Some people argue that all species have a right to exist. What do you think of this idea?
13. Some people argue that it is sometimes OK for human activities to result in the extinction of a species? What do you think of this idea? (When and why?)
14. Do you think the reasons for protecting endangered species vary by *species*? If so, how?

III. Property Rights (Norms)

15. Lets talk very generally about property rights for a moment. What kinds of rights and responsibilities do you think come with being an owner of land?
16. Some people think of private property as a right created by governments that can be changed over time according to changing needs for society. Thus, landowners might have specific powers (such as tiling and draining their land, or building a subdivision) in one era but not in another, as society's views and goals change. What do you think of this view?
17. Others view property in a different manner. They see private ownership as an absolute or "God-given" right that must be respected by any legitimate government. This view generally sees ownership as including specific powers that don't change over time. What do you think of this view?
18. Of those two perspectives, which do you see as closer to you own personal views? Can you explain why a little bit?
19. Based on the preceding discussion, what do you think about the status of private property rights in this country today? Are they too strong, not strong enough or about right?

IV. Assessment of Knowledge: Project and Endangered Species

20. Do you know of any endangered species who live on or near your property?
21. Have you heard of the Indiana Bat? If so, what do you know about it and where did you get the info?

22. Have you ever heard of the Conservation Management Area for the Indiana Bat? If so, what do you know about it and how did you find out? [if they don't volunteer that they are in it – then probe: Do you know if your parcel is part of the CMA or not?]
23. In your experience how does living in the CMA affect you? Does it affect your choices about managing your land in any way? How?
24. Have you ever taken part in a meeting about the CMA or the Indiana Bat?
25. Are you aware of the airport's program to buy property in this area? Is so, from what source? Have you ever considered selling your land under this program?
26. How much contact do you have with employees of the airport? Any other conservation officials or government employees? Describe your relationship with these persons – regular or infrequent, positive or difficult...
27. Do you feel like you have been provided with enough information about the CMA and the Indiana Bat? What additional information would you like, if any?

V. Bat and Land Management Decision

28. Has wildlife, including the bat, ever caused problems for you in the past? How did you deal with it?
29. Have you ever taken any specific actions on your property because of the bat or being in the CMA? What were they and why?
30. Have you ever NOT taken any specific actions on your property because of the bat or being in the CMA? What were they and why?
31. Under what circumstances would you consider the taking the following actions (listed below) in order to help bat recovery efforts
 - Lowering herbicide/pesticide use?
 - Reducing night lighting?
 - Planting trees/creating more forested habitat for roosting?
32. Have you and a neighbor ever discussed the CMA? The Indiana Bat? In what context?
33. To what degree do you think your fellow landowners in the bat conservation area take or refrain from similar actions affecting the bat?
34. Would you take any action if you knew or suspected that your neighbor was harming the bat in some way? What action would you take?

VI. – Tradeoffs between Property Rights and ESA

35. Some people think it is unfair to expect private landowners to bear the cost of protecting endangered species on their property? Do you agree?
36. Some people say that private landowners have an obligation to not harm endangered species found on their property? Do you agree?
37. What limits on private property rights, if any, do you think are appropriate for protecting endangered species? Why?
38. As a private landowner, what do you think are the best ways the government could help protect endangered species on private lands like yours?
39. Are you familiar with the following terms?
 - HCP - No Surprises Policy - Safe Harbor Policy
- 39b. [If they are, ask]: What's your view of such policies. Positive or negative? Why?
40. Any final thoughts or comments you would like to add?

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