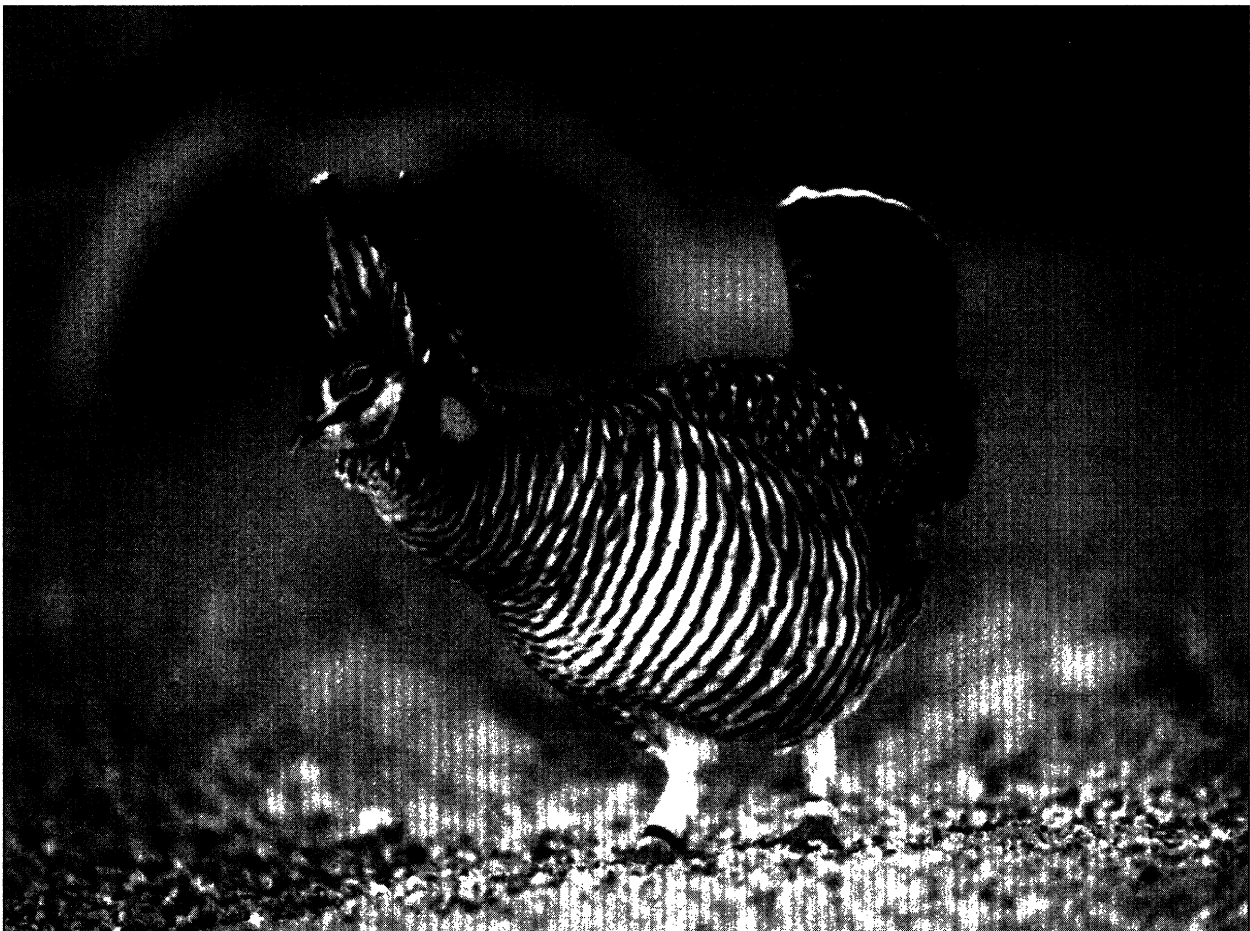


# Endangered Species UPDATE

*Including a Reprint of the latest USFWS  
Endangered Species Technical Bulletin*

March 1996  
Vol. 13 No. 3

School of Natural Resources and Environment  
THE UNIVERSITY OF MICHIGAN



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# Finding the Emerging Strategy for Endangered Species Recovery

Greg Schildwachter

Encouraging news is rising from conflicts over endangered species conservation. In Louisiana, a group of landowners, agencies, conservation groups, and academics decided to work together as the Black Bear Conservation Committee and wrote a recovery plan that was adopted by the U.S. Fish and Wildlife Service for the threatened Louisiana black bear (*Ursus americanus luteolus*). In the Sandhills of North Carolina, a working group of public agencies, conservation interests, community groups, and private landowners developed Safe Harbor, a concept that limits a landowner's legal obligation so they feel free to improve the status of red-cockaded woodpeckers (*Picoides borealis*) on their land. In Montana, Defenders of Wildlife is delivering rewards of \$5,000 to landowners on whose property endangered grey wolves (*Canis lupus*) den.

The growing number of cooperative solutions with landowners is an encouragement and a challenge. It encourages us to believe that people are capable of productive negotiation and challenges us to understand how cooperative solutions are reached so that we may learn to achieve these results more often and more effectively. To learn from these solutions is the goal of my current study, and I report here my methods and some preliminary results. In short, my study is a case-by-case analysis of voluntary agreements with private landowners. These agreements are showing that a new strategy for endangered species recovery is emerging that could lead the way toward better recovery and prevention and more satisfaction among landowners and the conservation-minded public.

My study began with the observation that people seem more willing to work hard on cooperative solutions than to pursue litigation and other controversial methods. As the pages of the *Endangered Species UPDATE* and the U.S. Fish and

Wildlife Service's *Endangered Species Bulletin* show, there have been three types of positive response to the idea that the Endangered Species Act (ESA) is flawed or inadequate. One response has been to keep working on solutions on the ground. Most of the *Bulletin* and much of the *UPDATE* is dedicated to reporting these activities. Another response has been to debate theories about how incentives and deterrents are created or changed. Seasholes (1995) and Freyfogle (1995) have taken this up in the *UPDATE* and, of course, this debate is widespread in other publications. The third response has been to incorporate into the policy process some of the ideas rising from the field and the theory. The *Keystone Dialogue on Incentives for Private Landowners to Protect Endangered Species* is the clearest example of this (Lehman 1995).

This active and dynamic stew of ideas could be the best source of a new strategy for endangered species conservation. In fact, sustaining this creative process and finding ways to implement its best fruit may itself be the best strategy.

The approach I have taken begins by focusing on agreements like those examples listed above. Working with the people who achieved these successes, I am describing these cases, testing a major theory about property rights, and designing a product that will be recognized, appreciated, and used in the search for more solutions. My focus on people and the involvement of them in my study are unusual moves for a wildlife scientist; accordingly, my analytical approach is not traditional, disciplinary wildlife science, and the results likely will suggest some shift from tradition in our management and policy also.

## The Approach

I accepted four basic premises at the outset:

(1) *the best strategy for endangered*

*species conservation will emerge from demonstrated successes.*

(2) *reaching agreement is the fundamental process in recovering endangered species.*

(3) *the relevant data mostly are qualitative, not quantitative.*

(4) *any agreement for action is a form of contract.*



The "Safe Harbor" proposal developed in North Carolina has benefited landowners and species such as the red-cockaded woodpecker (*Picoides borealis*). Photograph by Reed Noss.

I have chosen the case-study approach because, by definition, it encompasses multiple types and sources of data. Because endangered species conservation involves politics, economics, and ecology, I needed an approach

that included data and methods from each of these disciplines. Yin (1989) defines case studies as empirical studies using multiple sources of evidence to investigate phenomena within their real-life context, in which boundaries between phenomena and context are not clear.

The database I am building to support my analysis will include ethnographic, economic, and ecological data. *Ethnography* is a sociological discipline that has been used widely to document and understand non-western cultures, and that more recently has been applied by American sociologists to further understand our own culture. The data gathered in an ethnographic study are words (Strauss and Corbin 1990, Miles and Huberman 1984, Schatzman and Strauss 1973, Glaser and Strauss 1967). *Economic data* provide another important version of events and are analyzed with transaction cost/contracting techniques (Coase 1960, Allen 1991). These data describe the details of the agreements, or contracts, and how they seek conservation goals (Schildwachter 1995). The *ecological data* I use vary from case to case. Sometimes simple presence/absence data are collected, other times more expensive habitat assessments and estimates of population parameters are presented (Schildwachter 1995).

The work is progressing through three overlapping phases:

- (1) analysis of multiple cases where agreement has been reached;
- (2) identification of concepts that appear key to agreement;
- (3) combination of the most promising concepts into a prototype agreement.

Clark et al. (1995) thoroughly describe the usefulness of prototyping in endangered species conservation. By feeding the observational phases of the study back into the field experimentally, I intend to make the results directly available to those already working on new solutions. I believe the utility of this approach is strengthened by the ethnographic data and the rigorously inductive process of grounded theory development (Strauss and Corbin 1990, Schatzman and Strauss 1973,

Glaser and Strauss 1967). Grounded theories are built from the words and ideas of people on the ground and, therefore, are more easily recognized and adopted. This feature is important because people engaged in the problems may resist outside "help." As one participant to an agreement put it, "this [process of reaching agreement] would never have worked if someone had brought the idea in from the outside [of this community]."

### Preliminary Results

My approach has revealed, so far, propositions that I will take into future case studies for refinement and testing against documented experiences. These propositions are like hypotheses, and real-life contracts and negotiations are their proving grounds. My overall proposition is that negotiations are governed by a web of laws, regulations, ethics, customs, and organizations (public and private). Interplay among these components creates the unwritten ground-rules for agreement. Within the rules, incentives and deterrents influence people's choices among the possible forms of agreement. Depending on whether satisfactory agreements are possible, people may attempt to change the rules by changing laws, regulations, ethics, customs, or organizations. The following are some examples.

On private land today, agreements can be formal or informal. Conservation easements are an example of a formal, binding agreement; they transfer rights of property to conservation organizations. On the other hand, a Defenders of Wildlife Wolf Reward is an example of an informal agreement. The reward is for owning land that supports a successful den of grey wolves, which creates an incentive for landowners to ensure that dens succeed. Even though the ESA prohibits disruption of a den in the first place, Defenders recognizes that a landowner has the ability to "shoot, shovel, and shut up," rather than report the location of a den on his or her property. Even though a formal institution prohibits disruption of the den, the informal reality that a disruption could escape detection creates the need for an

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*Cover:* The Attwater's prairie chicken (*Tympanuchus cupido attwateri*). Photo courtesy of Jeffrey Hartman, Fossil Rim Wildlife Center.

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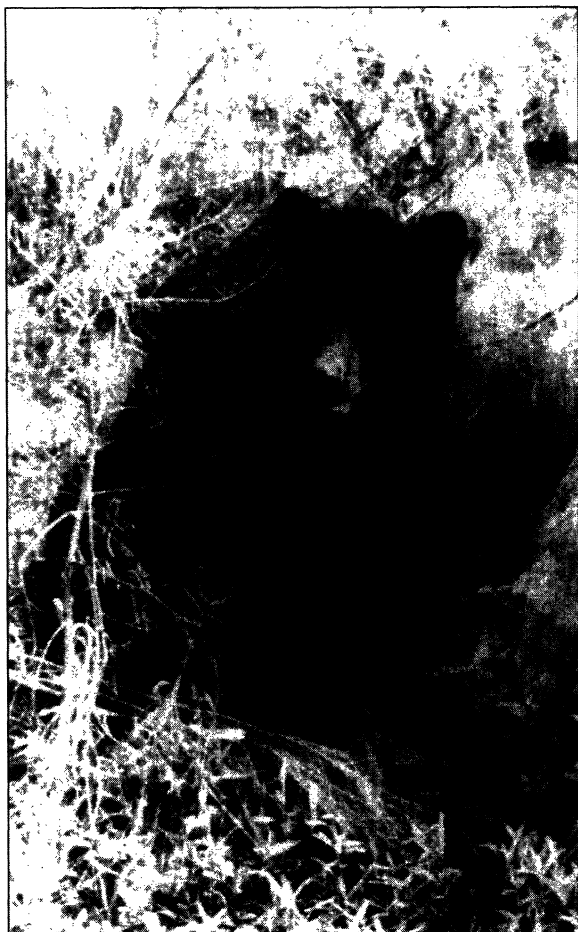
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informal agreement.

When existing ground-rules have precluded satisfactory agreements, even informal ones, people have changed the rules. Before conservation easements were possible, the only practical way to prevent real estate development was to purchase entire properties. Amendments of tax law, however, opened the way for conser-



**Black bear (*Ursus americanus*) management in the southeast U.S. has been aided by the Black Bear Conservation Committee, an independent and diverse coalition that includes landowners, industry, conservation groups, and government agencies. The Committee is working to stabilize existing black bear populations and restore bear populations to suitable habitat in the region. Photograph by Don Anderson, University of Tennessee.**

vationists to obtain only the development rights to land. The change in ground-rules effected by specifying these laws enabled an industry of land trusts to accommodate people seeking this transaction. Similarly, ground-rules for reintroducing endangered species were changed by specifying law. Disagreements were resolved over endangered species reintroduction projects after amendments to the

ESA allowed the U.S. Fish and Wildlife Service to designate reintroduced populations as experimental with restrictions on human activities negotiated on a case-by-case basis. As an example of how rules can change when property rights are created, the Environmental Protection Agency created a tradeable credit (a form of property right) that represents a quantity of air pollution. Firms that buy credits can exceed their emissions limits by the associated amount; firms that reduce their emissions below the maximum allowable pollution rate can sell credits in the amount of the shortfall. Ground-rules can be altered also by changing ethics or customs, though these changes are harder to document.

As we consider changing the rules to encourage agreements on endangered species recovery, one of the important considerations is that agreements are affected by our ability to measure results. Because ecological systems are expensive to measure, the cost of monitoring an agreement may exceed what people are willing to pay for the results of the agreement (Schildwachter 1995). For example,

because Delta Waterfowl Foundation cannot afford to estimate waterfowl population growth rates, it monitors nesting success in protected prairie potholes. The uncertainty and expense of estimating population parameters has precluded these measurements from being used in any voluntary agreement. (Please note that I would be delighted to be proven wrong on this.)

Agreements appear to be affected also by the degree and type of affiliation between parties to the deal. Several participants in agreements raised this by using phrases and words like: "the right people," "they," "the ranchers," and "the environmentalists." For example, in an agreement between a professional conservationist and a suspicious rancher, one participant described the negotiation as "hard, you know... I carried most of the conversation." In another case, a landowner who claimed to be "very very interested in seeing [my] ranch go toward conservation" had an easy time of reaching agreement on a conservation easement. This person said, "it was the right people and this was the right ranch ... we had no problem, it was easy to do." The accounts from which these are drawn suggest boundaries between clusters of people with common interests and objectives. I will pursue this idea in further interviews; it may be that affiliation is important only until people become acquainted. My main methodological concern is to avoid influencing the thinking of the participants: instead of suggesting a new concept like "getting acquainted" by asking about it, I would ask for clarification of their phrase "the right people" and listen for new concepts that they volunteer.

### **The Opportunity for Prototyping**

Based on what I have observed so far, several promising ideas could be tested in a prototype agreement. Prototypes, as described by Clark et al. (1995), are "exploratory interventions" in society. They are the nearest form of experimentation that a case-study will resemble: a test-case. The ideas I have identified for a test are:

- (1) granting landowners certainty of legal obligation, which is part of the Safe Harbor concept;
- (2) "cost sharing" in habitat development projects;
- (3) raising private funds to compensate landowners for conservation practices;
- (4) establishing a new property right in the form of a tradeable credit; and,

5) relying on "citizen-based management" to drive the agreement process (Roy and Fischer 1995).

To build the prototype, I am combining these ideas from their original applications into a single case. The prototype I imagine would grant authority to a local, multi-interest group (i.e., citizen-based management). This group would determine a landowner's basic obligation to protect an endangered species and would define a measure of habitat or population condition as the basis for a tradeable credit (e.g., if the measure were acres of habitat, then a credit might represent 10 acres). Landowners would earn the credits from the local management group as they improve habitat or population condition. A private group would raise funds to purchase credits from landowners. As I build the prototype around this sketch, I am leaving details to the people who agree to try it.

I am discussing this idea with people involved with several species, looking for a situation where it can be applied. Because of the unfolding legal status of the Safe Harbor concept, the prototype may be easiest to apply to a pre-listed or otherwise non-listed species. Another consideration is that the conservation strategy for the chosen species must already have identified feasible and measurable actions for landowners to take. I welcome any suggestions.

### Implications for Research, Management, and Policy

Regardless of whether this study uncovers an effective strategy for including private landowners in endangered species conservation, I hope it stirs a few considerations of how we study, implement, and plan conservation. The case-study approach with sociological and economic methods may be a useful tool in the study of other ecosystem-management issues because the issues do not present clear lines for disciplinary approaches. A possible implication for management is that it may need to change from a government service with public par-

ticipation to a community project provided with technical assistance from government. These complex problems may best be solved by flexible, open decision-making processes such as some of those emerging from the current ferment of endangered species ideas. This would raise the question of how federal policy should be written to sustain this active and creative process while still satisfying the public demand for accountability.

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# Report from the Field

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## Effects of the Moratorium on Listings Under the Endangered Species Act

Margaret McMillan

For the first time in the 22-year history of the Endangered Species Act (ESA), listing of endangered and threatened species has completely stopped due to a moratorium. Unlike the comprehensive regulatory moratorium that halted all federal rulemaking for a few weeks in 1992, this ban specifically targets the ESA listing process and has continued far longer, nearly a year to date. Not a single plant or animal has been added to the list since March 7, 1995. On April 10, 1995, President Clinton signed a supplementary defense appropriations bill with an amendment prohibiting all additions to the endangered species list through the end of the fiscal year, September 30, 1995.

Following that date, the listing moratorium was extended into FY 1996 by being included in the series of continuing resolutions passed to provide temporary government funding during the budget impasse. These resolutions also broadened the moratorium to include preparation and publication of listing proposals as well as final listings, which extended the impact of the legislation to the 182 species on the newly-revised Fish and Wildlife Service (FWS) candidate list, species for which the Service has sufficient information to support listing proposals (U.S. FWS 1996). At this point no species have been proposed for listing since October 2, 1995. Congress also approved measures to continue the moratorium through the entire fiscal year within other bills to fund the Departments of Interior and Commerce. However, President Clinton has vetoed those bills, calling the moratorium "misguided" and "ill-considered."

The original moratorium amendment was sponsored by Senator Kay Bailey Hutchinson (R-TX), who, in a March 6, 1995 Senate hearing, said that she felt the need for a "time-out" as Congress began reauthorization proceedings for what she termed a "clearly flawed" law. At the same hearing, Interior Secretary Bruce Babbitt allowed that a moratorium was "one of the

more unusual ideas [he'd] seen," pointing out that 75 percent of the species proposed for listing at the time were plants, for which the ESA imposes none of the restrictions on private landowners which had concerned Senator Hutchinson.

### Assessing Impacts of the Moratorium

What will be the impact of the Endangered Species Act listing moratorium? Is it an inconsequential delay or a death sentence for species already at the brink of extinction? In debate on the Senate floor, Senator Harry Reid (D-NV) said the moratorium "jeopardize[s] the existence of species," and Senator Barbara Boxer (D-CA) declared that "[T]he real agenda here is a piecemeal dismantling of the Act." Representative Lamar Smith (R-TX) justified the moratorium by saying, "[W]e must protect American landowners by putting regulators on a leash."

Until final rules are issued for the proposed species, they will be denied a wide range of protections, including:

- prohibition against "take," which is defined to include such activities as direct harm to the species and harm to its habitat;
- initiation of the recovery planning process;
- benefit of state protection in those states which automatically confer additional protection upon federally-listed species; and
- Section 7 restraints on federal activities which jeopardize listed species.

Three factors are likely to determine the impact of the moratorium: the time period for which the ban on listing continues, the pace at which development and other anthropogenic activities proceed, and the rarity of the species waiting to be listed. We do not know how long the moratorium will continue; it has al-

ready been extended almost six months past the term originally intended. Likewise, the rate of development and other adverse activities is unpredictable, and, of course, will vary from site to site. However, of the 246 species for which protection has been denied due to the moratorium, the listing agencies have proposed endangered status for 197 (80 percent), suggesting a degree of urgency likely based on rarity of the species.

The delay in listings is especially serious because species are routinely listed at a point at which their populations are already critically low. For the years 1985 to 1991, the median population for vertebrate species at the time of listing was 1,075 individuals, for invertebrates 999 individuals, and for plants fewer than 120 individuals (Wilcove et al. 1993).

Median population sizes were calculated for species currently proposed for listing where population data were available. When listing proposals gave an estimated range for the total population, the highest number was used for this study. The median total population size for proposed plants is 170 individuals (n=129). For proposed animals, the median total population size is 260 (n=8). These numbers are well below what most biologists consider a comfortable level for eventually achieving recovery. Recent work suggests that from a genetic perspective alone, waiting to protect populations until they number between 100 and 1,000 individuals is "inadequate" (Lynch et al. 1995). According to the International Union for the Conservation of Nature, a total population of 250 or fewer plants and animals in decline represents the most imperiled category, Critically Endangered (IUCN 1995).

### Species Awaiting Listing

The moratorium may have a heavier impact on plants simply because they comprise 197 of the 246 species (80

percent) awaiting listing. Although the moratorium may be less significant for plants found on private land because the Endangered Species Act does not prohibit the taking of plants on private land, some plants on private lands can benefit indirectly from habitat conservation plans established to protect listed animals. When the Fish and Wildlife Service issues Section 10 permits for incidental take, it is required to consider jeopardy to any federally listed plants as well as animals.

The impact of the moratorium is skewed geographically as well as taxonomically, with 205 (83 percent) of proposed species found in either California or Hawaii. Although a fraction of the proposed species have Mexican populations, 120 (49 percent) are found in no state other than California. An additional 6 (2 percent) are found in California and at least one other western state. Another 79 (32 percent) of the proposed species are endemic to Hawaii, while only 41 (17 percent) of the proposed species are not found in either California or Hawaii. A total of 25 states have one or more proposed species.

While the overall impact of the moratorium is not known, several case studies suggest that remaining time may be short for at least some of the species. In California's coastal Mendocino County, the Behren's silverspot butterfly (*Speyeria zerene behrensii*) awaits listing as an endangered species. Of its six original colonies, one remains, on private land where it is threatened by livestock grazing. The butterfly is also prized by collectors who are free to capture it until the species is listed. The Alameda whipsnake (*Masticophis lateralis euryxanthus*) is also in an area which is rapidly being developed—the east bay region of San Francisco. When it was proposed for listing as an endangered species over two years ago, housing projects and a quarry operation had been proposed for portions of its remaining habitat (Nagano 1996).

Although the moratorium may not prove critical to the fate of the majority of the proposed plant species, for a few it might be the final factor in their demise. One of these plants is Orcutt's spineflower (*Chorizanthe orcuttiana*),

for which extinction has become an imminent possibility.

Proposed for listing with endangered status on October 1, 1993, Orcutt's spineflower was one of 49 species already overdue (past the one year within which FWS is required to issue a final rule) for listing when the moratorium began. This southern maritime chaparral plant fluctuates widely in number, but at latest count had slipped from the under 1,500 cited at the time of proposal to 20 individuals in an area of two square yards. This site is at a trail junction in a well-trampled park in the town of Encinitas. While San Diego County has made some efforts to protect it, federal listing would raise a "big flag" on its behalf, according to FWS botanist Fred Roberts.

Thread-leaved brodiaea (*Brodiaea filifolia*) is a more widespread species found in a few of California's fastest-growing counties. On December 15, 1994, it was proposed for listing as a threatened species, but while awaiting a final rule has declined to the point where it is likely to merit endangered status. During that time, several development projects have been approved within its range. Roberts is concerned about the impact of a large development within 150 feet of one colony, noting that edge effects are noticeable up to 500 feet for plants. Invasive exotic weeds are likely to further imperil the plant (Roberts 1996).

Many of the species with the smallest populations are endemic to Hawaii. In one case threats to a species outnumber the remaining individuals: The last *Delissea undulata*, a member of the bellflower family with no common name, is imperilled by habitat degradation, predation by domestic and feral animals, fire, and competition with exotic plants.

## Conclusion

The decline in a species' population has repercussions beyond the increased possibility of extinction. As options for recovering species decline, we lose flexibility to select conservation strategies that do not impose hardships on landowners. We are forced to

resort to riskier and more expensive technologies, such as captive breeding. There are parallels with human health: delay medical treatment to the point where you spend time in a high-tech intensive care unit and you will learn that the cure—if it is still possible—is more difficult, more costly, and more invasive than early treatment in the doctor's office.

Some species may escape the moratorium with little or no damage. Perhaps the threats that imperil them will advance slowly, perhaps their numbers are large enough to withstand a longer unprotected period, or perhaps they are fortunate enough to receive protection in another form—such as that afforded to species located in an area included in a habitat conservation plan.

For other species that await listing, with populations already at precariously low levels, the moratorium has become yet another threat to their existence. Dissatisfaction with the Endangered Species Act has been cited as justification for the moratorium. Yet despite all the frustration engendered by America's health care crisis, no one has suggested locking the hospital doors until we have a better health care system.

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I am deeply grateful to Dr. David Wilcove and Michael Bean for reviewing and commenting on this article.

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## Good Land Stewardship is a Liability for Cattle Ranchers

Myra B. Hyde

America's farmers and ranchers believe that proper stewardship of the land is in their own best interest, as well as society's. U. S cattlemen, as small business owners, have a vested interest in conserving land they intend to pass on to their children (78 percent according to 1994 Rockwood Research.) Improved grazing and crop land conditions boost productivity and leave the land in better condition for future generations. It also provides forage and habitat for wildlife, which most beef cattle producers make special efforts to maintain. The 1994 Rockwood Research study showed that 87 percent of cattle producers had areas on their farms or ranches supporting wildlife. The presence of wildlife is important to cattlemen, not only because of the pleasure they get from observing wildlife, but also because an abundance of wildlife is an indicator of healthy, diverse forage growth.

Cattle now occupy the ecological niche once occupied by bison. An estimated 60 million to 100 million bison once roamed the central and western United States, grazing on range grasses as they migrated. Their hooves broke up the soil crust, increasing rainwater penetration and scattering and trampling seeds into the earth. Cropping the grasses promoted vigor in the plants. America's farmers and ranchers know that properly managed cattle grazing enhances range grasses for both cattle and wildlife.

Currently, expanding government regulations are making it more difficult for cattle businesses to remain economically viable. Increased government control of private lands, including control through environmental regulation, removes much of the decision making authority from those closest to the land, decreases the flexibility needed to manage for site-specific conditions, and removes many of the incentives that generally come with private land ownership. In addition, many of the practices that cattlemen once employed to enhance

wildlife habitat are now prohibited, and ranchers have been forced to curb their activities under the threat of punishment.

### Impact of the Endangered Species Act

From the perspective of most cattlemen, the Endangered Species Act (ESA) is one of the most troublesome environmental laws. In 1973, when the ESA was enacted, most ranchers strongly supported this law. It was not until the early 1990s that reform of the ESA became a priority issue for cattle producers. In 1993, members of the National Cattlemen's Association (now the National Cattlemen's Beef Association (NCBA)) adopted policy which identified fundamental problems with the Act. The NCBA, representing 230,000 cattle feeders, cow-calf producers and breeders, has strongly supported several bills to reform the ESA. The ESA must be amended to strengthen the scientific requirement for listing species and designating critical habitat. The recovery process must be strengthened to provide specific guidance for species conservation, economic impacts, likelihood of recovery, and clear delisting criteria. The authority of states must also be increased to allow greater participation in the decision making process. Perhaps most importantly, incentives for landowners to conserve species must be increased. Incentives *should* include such options as voluntary management agreements, but *must* include greater recognition of private property rights.

Private property rights are important because the right to own and use property is the heart and soul of the cattle production, which relies on haying, grazing and other activities on pasture, range and hay lands. Also, for most farmers and ranchers, property represents a form of collateral for operating loans, and often the accumulated value of their land represents the primary source of income for beef farmers

and ranchers. Obviously, the effect of any loss in use or value of these properties can have a profound effect on these small businesses, over 98% of which are in family ownership.

### ESA Reauthorization

Even though Congress has been unable to agree on a bill to reauthorize the ESA, most legislators have agreed that changes are necessary to make the ESA more effective. They are not alone. For the first time in many years, the administration, environmental organizations, and industry have agreed that for the ESA to truly protect endangered and threatened species, private landowners must be given some incentives to preserve species and enhance habitat. They also now agree that legislative reform is necessary to mandate incentives and to relieve some of the burdens that landowners have had to shoulder over the years of ESA regulation.

Unfortunately, the type and degree of reforms have not been agreed upon. Until they are, the ESA will continue to be a source of frustration and uncertainty for cattlemen. Farmers and ranchers are becoming less inclined to acknowledge the presence of endangered species on their property. They are apprehensive, and justifiably so, about the severe penalties, lawsuits, land use restriction and loss in property values that result from the ESA. This legal situation makes it a curse to be host to listed species on ranches and makes producers unwilling partners in the preservation of natural resources and the enhancement of the environment. The good stewardship which has fostered the protection of endangered species in the past has become a liability for landowners rather than the asset which stewardship has represented for generations.

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# Report From Washington

## Congress Proposes Changes in Forest Diversity Mandate

Robert Dewey

A U.S. Forest Service requirement that some conservationists call the strongest legal mandate to protect biological diversity on federal lands is among the latest natural resource issues to draw fire from Capitol Hill. Since 1976 the Forest Service has been under a duty to "provide for diversity of plant and animal communities" as part of the National Forest Management Act (NFMA). Efforts are underway in both Houses of Congress, however, to dramatically reduce or eliminate this authority.

Much of the current opposition to the so-called NFMA diversity language stems from the concerns of some lawmakers about the Forest Service's application of the provision in their states. Broad philosophical concerns about the relative importance of species have also been voiced. Conservationists argue that the proposed changes would prevent the agency from establishing early preventative conservation measures, which, they argue, are typically less costly and burdensome than actions taken after a species is in trouble.

### NFMA's Diversity Mandate

The NFMA diversity provision is implemented through land and resource management plans developed for individual national forests. Under existing regulations, the Forest Service must manage fish and wildlife habitat to maintain viable populations of existing native and desired non-native vertebrate species on national forests. The provision, and its implementing regulations, provides the basis for proactive Forest Service wildlife conservation initiatives across the nation. In Alaska, for example, the agency is currently working to develop a revised forest plan for the Tongass National Forest. A key objective of this plan is the establishment of habitat conservation measures to better protect various species including wolves, goshawks and grizzly bears, which are subject to long-term population declines due to logging.

### Proposed Legislative Changes

Key members of the House and Senate are currently working to curtail the Forest Service's authority to maintain viable populations. Last November, a House subcommittee considered and reported to the full Agriculture Committee legislation that would explicitly bar the Forest Service from amending forest plans or taking other actions to maintain the viability of wildlife populations on National Forests. The provision was added as an amendment to H.R. 2542, legislation sponsored by Rep. Wayne Allard (R-CO), who chairs the House Subcommittee on Resource Conservation, Research and Forestry. H.R. 2542 is a broad bill to consolidate various Agriculture Department conservation programs.

The H.R. 2542 viability provision was included at the request of Rep. John Doolittle (R-CA). Its specific goal is to block the Forest Service's California spotted owl conservation initiatives, which aim to protect spotted owl habitat in the Sierras, because of fears that the initiatives will limit logging and reduce jobs. However, despite being prompted by a specific regional concern, the language would affect Forest Service wildlife conservation efforts nationwide. In a November 8, 1995 letter to Rep. Allard, Agriculture Secretary Dan Glickman said that the viability provision raised serious policy and budgetary concerns.

In the Senate, Larry Craig, chairman of the Senate subcommittee on Forests and Public Land Management, announced plans to draft legislation to amend the NFMA after concluding a series of Forest Service oversight hearings in January. Senator Craig will likely propose significant changes to NFMA's diversity requirements in view of his stated opposition to this policy approach. In an April 21, 1995 letter to Forest Service Chief Jack Ward Thomas, Senator Craig wrote: "Too much emphasis is placed upon 'avoiding Endangered Species Act (ESA) listings. This is not, in my view, a valid

objective." Craig added, "in past attempts to change your own management to avoid ESA listings, many would argue that the cure you prescribed is worse than the disease."

The timing of legislation attempting to repeal or curtail the Forest Service's viability requirements is uncertain. H.R. 2542 was originally intended to be the "conservation title" to the farm bill, legislation Congress is expected to send to President Clinton by the end of March. At press time, however, it remains unclear whether the House farm bill will contain any conservation provisions.

In February the Senate passed a farm bill that included a major conservation title but without any changes in the viability requirements. In the House, Agriculture Committee Chairman Pat Roberts (R-KS) has indicated a desire to bring to the House floor a bill focusing only on farm commodity programs. Many conservation-oriented House members are urging the adoption of a conservation title similar to the Senate passed version. Although supportive of these efforts, environmental groups worry that the farm bill could be a vehicle for enacting the H.R. 2542 viability provision.

Regardless of whether the viability provision is added to the farm bill, Congressional action could still come later in the spring. Senator Craig is expected to introduce his bill making legislative changes to NFMA sometime this spring. In the House, Rep. Roberts in late February introduced H.R. 2973. Like H.R. 2542, this bill addresses Agriculture Department conservation programs and could be a vehicle for a provision limiting species viability conservation efforts on National Forests. In introducing his bill, Chairman Roberts announced that the Agriculture Committee would turn its attention to H.R. 2973 as soon as Congress completed work on the farm bill.

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*This article, as well as the following Conservation Spotlight and News From Zoos, are the second of an ongoing series of articles in the Endangered Species UPDATE on the species conservation programs of the American Zoo and Aquarium Association (AZA) and its member institutions.*

# AZA Species Survival Plan Profile: The Cotton-Top Tamarin

*Managing Populations in Captivity and Creating Community Concern in Colombia*

The cotton-top tamarin is an endangered New World primate endemic to Colombia. Although cotton-top tamarins have been maintained in zoos and research institutions for several decades, there were no attempts made to manage the captive population to maximize genetic diversity and behavioral competency. Thus, the mission of the Cotton-top Tamarin SSP is to develop an effective captive management plan and support conservation education, research, and training programs in the U.S. and in Colombia to ensure the survival of this species in its native habitat.

The Cotton-top Tamarin SSP supports the ongoing efforts of Proyecto Titi (Savage, In press) a comprehensive *in situ* program in Colombia. Established in 1987, this international, collaborative program combines field research and effective scientific assessment of habitats, as well as community programs that involve local inhabitants in culturally relevant, action-based programs. Making the conservation of natural habitats and resources economically feasible for local communities is of primary importance in this program. Creating a caring, informed community, as well as economic incentives for conservation, will result not only in the survival of the cotton-top tamarin, but also the native flora and fauna of Colombia. Our goal therefore, is to use the cotton-top tamarin as the flagship species for the conservation of Colombia's natural resources.

## **Captive Management**

The Cotton-top Tamarin SSP population has retained 98% of the wild gene diversity. This large amount of gene diversity results primarily from the 68 founders which produced the majority of the present population.

The genetic goal of the Cotton-top Tamarin SSP will be to maintain 90% gene diversity for a period of 100 years. Recognizing that this represents only the equivalent of five unrelated, non inbred animals, the SSP will attempt to keep gene diversity above 95% as long as possible. These goals will be challenging given the unique social structure of the cotton-top tamarin which makes extension of the generation time and maximization of the effective population size difficult. As long-term effective population size will be compromised further by tamarins that are unable to raise and care for

their own offspring, it is critical that hand-rearing of cotton-top tamarins be avoided. While this is a difficult decision for zoo and aquarium managers and keepers, it is in the best long-term interest of the cotton-top population. At present, more than one-third of the current captive population does not have the appropriate social skills required for successful rearing of their offspring. This has serious implications for the long-term management of the population.

Given the number of animals in the research community, we will actively pursue the possibility of incorporating unrelated animals or their descendants from this population. Thus, it appears likely that with careful management of our existing zoo population, as well as collaborating with the research/private community, we will be able to meet optimum genetic goals.

## **Field Studies**

We have developed new field techniques for identifying and long-term monitoring of cotton-top tamarins (Savage et al., 1993). The ease of following groups has allowed us to collect valuable information on the social behavior, infant development, feeding ecology and habitat use of this highly endangered species (Savage et al., In press; Savage et al., 1996). We have begun studies in collaboration with Drs. Bill Lasley and Susan Shideler of the University of California-Davis to examine the reproductive endocrinology of wild tamarins and studies of population genetics with Dr. Christopher Faulkes of the Zoological Society of London's Institute of Zoology (see also Gyllensten et al., 1994).

Our studies have also been useful in assisting in the long-term management of captive tamarins. We have begun a study examining natural circulating levels of Vitamin D3 of wild tamarins (Power et al., In review). This information will be useful as we continue to modify the diets of captive tamarins.

## **Public Awareness**

For conservation education efforts to be effective in Colombia, support and interest must be forthcoming from the local population. In 1988, we conducted a survey of the local school children near our study site to

assess the communities' perception of the conservation needs of the area. We found that many students had a variety of myths and misconceptions about the forest and the wildlife of the area. Approximately 70% of the high school students had never visited the forest yet it is only 4 km away from their village. Another disturbing fact was that over 90% of the students had no idea that the cotton-top tamarin was endemic to Colombia and not found in other countries in South America (Savage et al., 1989).

To increase public awareness and create an interest in our program we developed several community programs for the local villages. We distributed t-shirts produced by Conservation International and posters of cotton-top tamarins created and produced by Jersey Wildlife Preservation Trust and Penscynor Wildlife Park.

As support for our program grew, we were able to obtain a small grant from the Captive Breeding Specialist Group and matching funds from a local paint supplier in Colombia, so that the children of the village could "advertise" conservation to all that passed by. The children wanted to depict "Man and Nature Living Together in Harmony" and painted various scenes on

their school walls. The project used older students as "mentors" to assist in the actual drawing of the scenes and the younger children to "paint" the scenes. The international sign for "0" was used to encourage people not to hunt wildlife with sling shots.

Reinforcing our "no sling shot" motto we encouraged villagers to trade in their sling shots for stuffed cotton-top tamarin toys. Since toys are a prized possession for most young people in the village, we were remarkably successful in generating support for this program. But most important, the hunting of wildlife for the pet trade has significantly decreased in the village.

### Conservation Education Programs

Building on local support, we have developed several classroom and field activities that have been very successful in increasing student awareness and interest in local conservation activities. Our program aims to reach all students in the local village, and activities are designed to meet the needs of elementary, junior and senior high school students. These activities have ranged from classroom activities for elementary school children to a field biology training program for high school students (Savage, In press). Building upon the students' continued interest in addressing pressing problems in conservation, we developed an international exchange of information between middle school students in Colombia and Rhode Island. We have also focused on sustaining viable watersheds, which has led to a unique opportunity for students to exchange information with one another and participate in the first annual "Waters of our World conference". By expanding our program to include preserving natural resources, students are able to experience the delicate balance of the ecosystem that we are trying to protect not only for the cotton-top tamarins but for future generations of Colombians.

### Developing Alternatives to Forest Destruction

Given the dramatic rate of forest destruction for human and agricultural consumption, it is critical that programs are developed to reduce the dependency on non-sustainable forest products. Since the majority of families in rural communities cook over an open fire, we modified a traditional method of cooking using a "binde" (Savage, In press). By redesigning the binde so that it functions like a small cook stove, significantly less wood is con-

Photo by A. Savage.



sumed per day than cooking over an open fire. Other materials such as corn cobs, husks, and dried plant material can be burned producing less smoke, thereby reducing the human health risk. Community support for this project has been tremendous, since there is direct economic benefits from using this method. Instead of collecting or purchasing large quantities of fire wood, members of the community using bindes have significantly decreased their consumption for forest products.

## Conclusion

Proyecto Titi is a multi-national program that can serve as a model for the development of effective conservation programs in Latin America. Incorporating scientific studies with community action programs has resulted in many Colombians taking a vested interest in conserving natural resources. The Cotton-top Tamarin SSP will continue to support Proyecto Titi and to make conservation of our natural resources a priority for future generations.

## Acknowledgments

Support for the conservation of the cotton-top tamarin program has been provided by the National Science Foundation, USAID, U.S. Environmental Protection Agency, INDERENA, Roger Williams Park Zoo, University of Wisconsin-Madison, Fossil Rim Wildlife Center, The Wilds, Wildlife Preservation Trust International, Captive Breeding Specialists Group, National Geographic Research and Exploration, American Society of Primatologists Conservation Committee, Penscynor Wildlife Park, Roger Williams Park Zoo Chapter of AAZK, Sophie Danforth Conservation Biology Fund of the Roger Williams Park Zoo and the Rhode Island Zoological Society, Conservation International, World Wildlife Fund, and Walt Disney Com-

pany through the AZA Conservation Excellence Campaign. Thanks to the staff of Proyecto Titi and our collaborators for their continued support to conserve cotton-top tamarins.

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## AZA conferences in 1996

### April 10-13, 1996

The AZA Eastern Regional Conference will be held in Greenville, South Carolina. For further information, contact Bob Wilson, Greenville Zoo, 150 Cleveland Park Drive, Greenville, SC 29601 (803)467-4300.

### May 15-18, 1996

The AZA Western Regional Conference will be held in Denver, Colorado. For further information, contact Angela Baier, Denver Zoological Garden, 2300 Steele Street, Denver, CO 80205 (303) 331-5805.

### February 28 - March 2, 1996

The AZA Central Regional Conference will be held in New Orleans, Louisiana. For further information, contact Craig Dinsmore, Audubon Park and Zoological Garden, P.O. Box 4327, New Orleans, LA 70178 (504)861-5112.

September 17-21, 1996 - The AZA Annual Conference will be held in Honolulu, Hawaii. Further information will be provided in a future issue.

For information on becoming a member of AZA, please contact:  
AZA Office of Membership Services, Oglebay Park, Wheeling, WV 26003-1698  
Phone (304) 242-2160 Fax (304) 242-2283

# Conservation Spotlight: The Attwater's Prairie Chicken

The Attwater's prairie chicken (*Tympanuchus cupido attwateri*) once roamed throughout seven million acres of coastal prairie habitat from Brownsville, Texas, northward to the bottomlands of the Mississippi River in Louisiana. At the turn of the century, its population was thriving at over a million birds. However, the population has plummeted and the spring 1995 count of the Attwater's wild population was 68 birds, down from 158 counted in spring of 1994. Considered one of the most endangered species in the United States, it has been under protection of the U.S. Fish and Wildlife (USFWS) since 1973. In 1992, the Fossil Rim Wildlife Center, an AZA-accredited institution in Glen Rose, Texas, and Texas A&M University joined forces with the USFWS and others to save this bird from extinction through captive breeding and habitat protection.

The dramatic decline of the Attwater's prairie chicken over the past century can be attributed to two main forces: overhunting and habitat loss due to overgrazing and industrial expansion. In the early 1900's the prolific prairie chicken quickly became an important food source for southern settlers. The breeding habits of this grouse also made it a prime target for sport hunters: each spring, prairie chickens gather to breed on "leks" or "booming grounds." Males congregate on these exposed short grasses or bare flats of land to attract females by strutting, calling and displaying their stunning plumage. It was common for hunting parties to exterminate entire flocks of prairie chickens on the lekking grounds and leave hundreds behind rotting in the sun.

Compounding the effects of overhunting, overgrazing by cattle led to alteration of the taller-grass habitats essential for nesting and roosting. More recently, urban and industrial expansion have caused habitat fragmentation.

When the USFWS selected Fossil Rim Wildlife Center to begin the captive breeding portion of the Attwater's Prairie Chicken Recovery Program in 1992, Fossil Rim was well prepared, having undertaken an earlier pilot study on the captive breeding of greater prairie chickens (a close cousin of Attwater's). In 1994, Fossil Rim was joined in this cooperative program by both the Houston Zoological Gardens and Texas A&M University. The goal of the Recovery Program is to restore and maintain a genetically viable, self-sustaining population of at least 5,000 individuals in three different areas of Texas.

Each spring, members of the recovery team collect eggs from wild nests to be incubated and

hatched in captivity. This process begins early in the breeding season so that wild hens will reneest and their reproductive efforts will not be greatly reduced. Young produced in captivity may then be used either for future reintroduction to the wild or to bolster the captive flock. In 1994, the first captive-bred young were hatched at Fossil Rim Wildlife Center from adult birds that originated from eggs collected from the wild in 1992. In 1995, two clutches of eggs were collected from the wild population and incubated at the Houston Zoo and Fossil Rim. A total of 18 surviving chicks were produced from field collected eggs.

In August, 1995, 16 male Attwater's (produced in 1995) fitted with radio transmitters were transferred from the captive population to the Attwater Prairie Chicken National Wildlife Refuge for a pilot soft release. All birds were monitored daily, and at the time of this writing two still were surviving in the Refuge. Hopes are high for the release of a large number of birds in 1996 given the size and potential of the captive population.

For more information about the Attwater's Prairie Chicken Recovery Plan, please contact:

Bruce Williams or Gail Rankin  
Fossil Rim Wildlife Center  
P.O. Box 2189  
Glen Rose, TX 76043-2189.

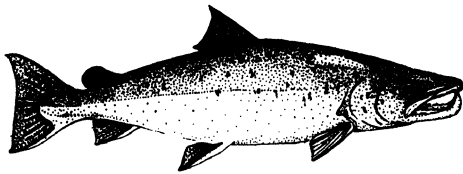
*Excerpts from J. Bowdoin, AZA Communique, Feb. 1995, and Bruce Williams, personal communication.*



**A successful captive breeding program has scientists hopeful that more birds will be reintroduced into the wild. Photograph courtesy of E. Levandoski, Fossil Rim Wildlife Center.**

# NEWS FROM ZOOS

## AZA and U.S. Federal Agencies Agree to Cooperate on Aquatic Conservation Initiatives



The AZA and its Freshwater Fish Advisory Group have signed a Memorandum of Understanding (MOU) with several U.S. government agencies, including the U.S. Fish and Wildlife Service, National Park Service, National Marine Fisheries Service, Bureau of Land Management, and U.S. Forest Service. Approved by the AZA Board of Directors and various agency heads, this historic MOU provides the basis for a cooperative effort on behalf of aquatic conservation in the United States and its associated territories. Representatives of these agencies and AZA will meet in the next few months to discuss implementation, including specific cooperative projects that might be undertaken.

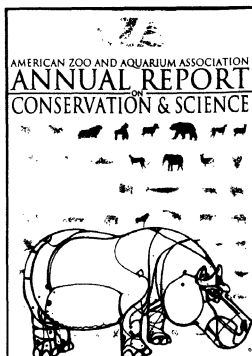
## AZA Member Zoos Cooperate With State and Federal Wildlife Agencies to Conserve the Endangered Ramsey Canyon Leopard Frog



Photograph courtesy of Arizona Game and Fish.

The Phoenix Zoo, in cooperation with the Arizona State Game and Fish Department, Arizona Senora Desert Museum (also an AZA member), The Nature Conservancy, Arizona State University-West and the U.S. Fish and Wildlife Service, released 318 captive-raised Ramsey Canyon leopard frogs (*Rana subaquavocalis*). Discovered less than eight years ago in the Huachuca Mountains of Arizona, less than 30 adults remain in the wild. The reasons for the species' decline is unknown and historical data on population size and distribution are not available. Egg masses and larvae were removed for captive-rearing in March. Plans are being considered for the construction of an on-site propagation facility to support future reintroductions. (From *AZA Communique*).

## 1994-95 AZA Annual Report on Conservation and Science Available



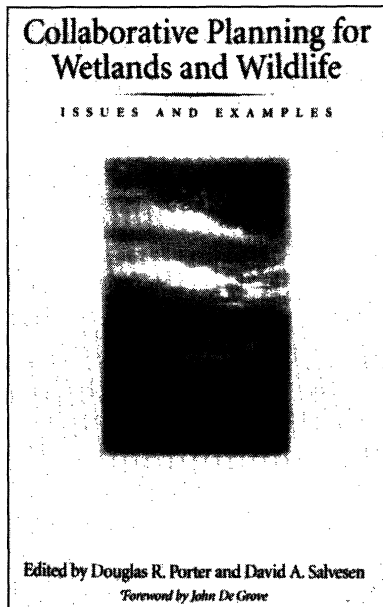
The *AZA Annual Report on Conservation and Science* (ARCS) contains progress reports from its over 100 C&S committees (Species Survival Plans, Taxon Advisory Groups, Fauna Interest Groups and Scientific Advisory Groups), as well as a listing of conservation projects and publications supported or produced by AZA member institutions. Copies of the report are available for \$25.00 (plus \$2.00 for shipping and handling) from the AZA Office of Membership Services at Oglebay Park, Wheeling, WV 26003-1698.

# Book Review

## Collaborative Planning for Wetlands and Wildlife: Issues and Examples

Edited by Douglas R. Porter and David A. Salvesen. 1995. Island Press. Washington, D.C. \$29.50. 352 pp.

Reviewed by Jodi M. Asarch



As the Endangered Species Act (ESA) and the Clean Water Act (CWA) continue to be under attack by some in Congress, it is important to find examples that demonstrate the Acts' flexibility, effectiveness and ability to bridge the gap between developmental and environmental interests. Furthermore, knowledge of alternatives to the current regulatory norms is helpful to people who deal with either the ESA or the CWA, from those needing to obtain a permit, to those trying to stop a permit, and especially including those attempting to implement a long-range local, state or regional plan. This book provides concrete examples on creative and active ways to go beyond the standard site-by-site regulatory permitting process.

The book examines the opportunities and roadblocks commonly found when communities attempt to address conservation and development through innovative and collaborative planning efforts that are consistent with the ESA and CWA. Specifically, the ESA (through Section 10) offers a way for communities to avoid regulatory gridlock by undertaking a Habi-

tat Conservation Plan (HCP). Special-area planning can be used to incorporate enforceable regulatory frameworks (such as a general Section 404 permit under the CWA) into the planning process.

The most useful parts of the book are the numerous case studies taken from around the country, from the Maryland Chesapeake Bay Critical Areas Program to Southern California's Multi-species Planning. The examples offer many descriptive illustrations of how collaborative efforts have proceeded. In addition to explaining the processes involved and looking closely at the nuts and bolts of the issues in each case, the descriptions include a "lessons learned" section that contains helpful prescriptive hints on carrying out similar projects.

In the final chapter, Porter and Salvesen provide the following prescriptive "guidelines" that help make a collaborative planning effort successful: key political leadership; the participation of all the affected stakeholders; the need for continuity through both the planning and management stages; incorporating anticipated future demands in the process; the integration of area-wide plans with local planning efforts; and the use of a mediator to help resolve contentious issues. These "guidelines" are illustrated throughout the specific case studies.

Porter and Salvesen also briefly discuss some additional important issues that need to be considered when attempting a collaborative, area-wide planning effort. For instance, a key to a successful planning effort is to establish federal agency involvement from the beginning of the process. Without this involvement, success has usually been limited, as was demonstrated by the East Everglades Planning Study.

The normal regulatory process under the ESA and CWA occurs on a case-by-case basis, at different levels of government, often causing delays and inconsistent decisions. For development interests, embarking on area-wide planning efforts could create more certainty and predictability and a less costly review process. For environmentalists, steering away from a case-by-case permitting system could translate into more effective consideration of the cumulative impacts of development and therefore better protect the resource.

The central question that the book sets out to answer, "Will wetlands and wildlife have greater protection and will developers have greater certainty under collaborative, area-wide plans than with the case-by-case permits?" cannot be answered with a definitive yes or no. The success of these programs is still dependent upon the actors and issues surrounding each particular area. These types of efforts, as shown by the case studies, continue to run the risk of accomplishing neither of these twin goals of better resource protection or greater certainty for development interests.

Nonetheless, because there have been so few attempts at collaborative planning efforts under the ESA and CWA to date, understanding the successes and failures of what has been tried is critical to furthering the successes of other projects that are just beginning. Porter and Salvesen's book is an important documentation of such efforts.

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Jodi Asarch is currently completing a Master of Science in Resource Policy and Behavior at the University of Michigan's School of Natural Resources and Environment, and was previously Research Coordinator at the Smithsonian Institution, Office of Environmental Awareness.

# Bulletin Board

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## New Publications

In *Conservation and Biodiversity*, author Andrew Dobson provides an introduction to the scientific and economic problems of quantifying the magnitude and value of biodiversity. Dobson, an assistant professor of ecology and evolutionary biology at Princeton University, explains how current extinction rates are measured, looks at different ways of managing endangered species, and analyzes the economics of different conservation strategies. In doing so he provides a well-illustrated, "lucid and accessible" book, according to Thomas Lovejoy of the Smithsonian Institute.

*Conservation and Biodiversity* (264 pages, 150 color photographs and illustrations, \$32.95 hardcover) is available from W. H. Freeman and Company Publishers, 41 Madison Avenue, New York, NY 10010, phone (212) 576-9400.

*Key Areas for Threatened Birds in the Neotropics*, by D.C. Wege and A. J. Long, and published by BirdLife International, identifies the 596 areas that are currently considered to be the most important places for the

conservation of the 290 globally threatened Neotropical birds. *Key Areas* is produced in an easy-to-use format designed for planners, decision-makers and managers, and can be ordered from Smithsonian Institute Press, P.O. Box 960, Herndon, VA 22070-0960, phone (800) 782-4612.

## Conference on Sustaining Forest Ecosystems

The conference titled *Sustaining Ecosystems and People in Temperate and Boreal Forests* is to be held in Victoria, British Columbia, September 8-13, 1996. The conference will deal with managing for sustainability in interdisciplinary ways that include aspects of economic, ecological, and social values. The themes of the conference are "Updates on National and International Issues" and "Principles and Concepts of Ecosystems and Human Values. For more information on the conference, contact: Connections Victoria LTD., P.O. Box 40046, Victoria, British Columbia, Canada V8W 3N3; phone (604) 382-0332; Fax (604) 382-2076; Email <connvic@octonet.com>.

## Wildlands Project Special Issue

*The First Thousand Days of the Next Thousand Years: The Wildlands Project at Three*, a special publication dedicated to The Wildlands Project, is now available from *Wild Earth*. The Wildlands Project is working to map and implement an interconnected ecological reserve network for North America. This publication gives an overview of the Project's mapping and reserve design work to date. Published by Dave Foreman and edited by John Davis, *Wild Earth* is a non-profit conservation quarterly focused on wilderness and biodiversity from an ecocentric perspective, and serves as the publishing voice for The Wildlands Project. Sample copies of this special issue are \$5. Subscriptions are available for \$25 (domestic); \$30 (Canada); \$45 (overseas). Contact Wild Earth, PO Box 455, Richmond, VT 05477; phone (802) 434-4077.

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*Announcements for the Bulletin Board are welcomed. Some items from the Bulletin Board have been provided by Jane Villa-Lobos, Smithsonian Institution.*

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# Endangered Species UPDATE

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