

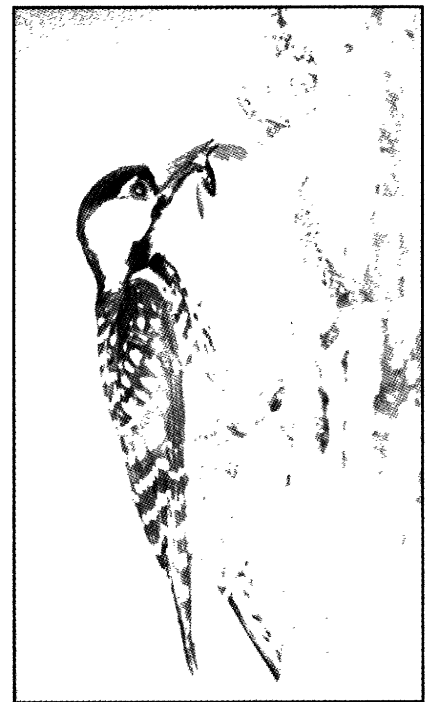
# Endangered Species UPDATE

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July/August 1997  
Vol. 14 Nos. 7&8

School of Natural Resources and Environment  
THE UNIVERSITY OF MICHIGAN

**Special  
Issue**



**Habitat  
Conservation  
Planning**

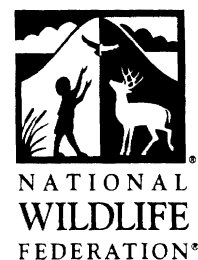
## A NOTE OF THANKS

This Special Issue on Habitat Conservation Planning grew out of a national conference sponsored by the National Wildlife Federation in Washington D.C. in May of 1997. The conference featured speakers from businesses, non-profit organizations, and government agencies, and made clear that no single entity, or even sector, has all the answers to the controversial issues surrounding species conservation. Indeed, to us, the conference highlighted the need for concerted efforts towards species conservation by all parties.

We believe that an issue on a controversial topic must have multiple funders, from different views and sectors, in order to maintain legitimacy among all readers and reflect the need for partnerships. We approached corporations, non-profit environmental organizations, and public agencies, and are pleased to have obtained funding from all three. The sponsors and supporters of this issue do not all agree on how best to balance the needs of species conservation and private economic development. In funding this issue, however, they have signalled their desire to be part of the search for creative, common solutions that balance a scientific understanding of the biological needs of species with the need to allow for economic development. We thank each organization for its support of the production of this Special Issue, and for its desire to be part of the solution. (The order in which sponsors and supporters are listed does not reflect the level of giving.)

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The Irvine Company, the Environmental Defense Fund, and the law offices of Nossaman, Guthner, Knox, & Elliott, LLP also contributed towards the publication of this Special Issue. Our sincere thanks for their support.

*The Endangered Species UPDATE would also like to acknowledge the continued support over the past years by the Walt Disney World Company, Boone and Crockett Club, and Chevron Corporation. Their major gifts support printing of regular issues and general operating costs and allow for the continued existence of the UPDATE.*

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## From the Editors

The use of habitat conservation plans (HCPs) has exploded over the past several years. This is due in part to an effort to define a role for private lands in species conservation and in part to the U. S. Fish and Wildlife Service's (FWS) institution of policies designed to make the use of HCPs easier. Seeing a need to learn from current efforts and address the development and use of future HCPs, the National Wildlife Federation sponsored a national conference on HCPs in Washington, D.C. in May of 1997. This Special Issue of the *Endangered Species UPDATE* features many of the conference's speakers, and focuses on the concerns surrounding the use of HCPs: their benefits, drawbacks, challenges, as well as the uncertainty and unknowns inherent within HCPs.

The Special Issue is divided into several sections. The first is intended to lay the groundwork for the issue. Articles include an explanation of the history and nuts-and-bolts of habitat conservation planning; the view from the FWS, the agency responsible for approving HCPs; a history of the Endangered Species Act to provide historical perspective for HCPs; a look at the lack of data in our current knowledge of HCPs; and an explanation of the need for a regional approach to species conservation.

The next three sections highlight species conservation efforts in three regions of the United States: southern California, the Pacific Northwest, and the southeastern states. Section Two focuses on the Natural Community Conservation Planning (NCCP) approach being developed in southern California, including an article that provides an interim report on NCCP, and one that raises the question of who benefits from the approach. Section Three examines the Pacific Northwest, with articles on the use of HCPs in industrial forests and the role of mitigation and citizen participation in plan development; the relationship between HCP efforts and adaptive management; and a description of one timber company's HCP and species conservation efforts. Section Four focuses on management of a single species found in the southeastern United States, the red-cockaded woodpecker (*Picoides borealis*). Articles provide an overview and evaluation of the FWS's private lands conservation strategy; a discussion of alternative ways to encourage involvement of private landowners in species conservation; and the importance of basing conservation strategies on a species' biological needs.

The last two sections address issues underlying all HCP efforts across the country. Participation by independent scientists and concerned citizens in the HCP process is the focus of Section Five, with articles emphasizing the value of citizen involvement; lessons that can be learned from participation efforts in watershed analysis; and the role of academic scientists in the development and implementation of HCPs. Section Six focuses on the issues of landowner assurances and recovery of species. Two authors discuss the No Surprises policy and its role in providing assurances necessary for involvement of private landowners. The third article addresses the issue of recovery and where this fits within the HCP approach.

In an attempt to distill the issues in the debate over the role of HCPs, we have written concluding comments that draw together the main points presented in the articles throughout this Special Issue. We hope that this Special Issue as a whole will provide a foundation and point of departure from which to move as we question, debate, and determine future directions for successful species conservation.

## Endangered Species UPDATE

A forum for information exchange on  
endangered species issues

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*Cover:* Northern spotted owl (*Strix occidentalis caurina*), San Joaquin kit fox (*Vulpes macrotis mutica*). Photographs by B. Moose Peterson/WRP. Red-cockaded woodpecker (*Picoides borealis*). Photograph by Jim Hanula, U. S. Forest Service.

The views expressed in the *Endangered Species UPDATE* may not necessarily reflect those of the U.S. Fish and Wildlife Service or The University of Michigan.

# Introduction to Habitat Conservation Planning

Peter Aengst, Jeremy Anderson, Jay Chamberlin,  
Christopher Grunewald, Susan Loucks, Elizabeth Wheatley, and Steven Yaffee

Habitat conservation plans (HCPs) have become an increasingly prevalent land management tool that seeks to balance the needs of endangered or threatened species with the needs of non-federal landowners. HCPs are voluntary agreements under the Endangered Species Act (ESA) negotiated between the federal government and private landowners or state and local governments, and, in some cases, other stakeholders. These agreements are designed to allow landowners to receive a federal permit—known as an incidental take permit—to unintentionally harm listed species in the course of completing proposed projects. In exchange for a permit, landowners agree to pursue specific management protections for endangered and threatened species.

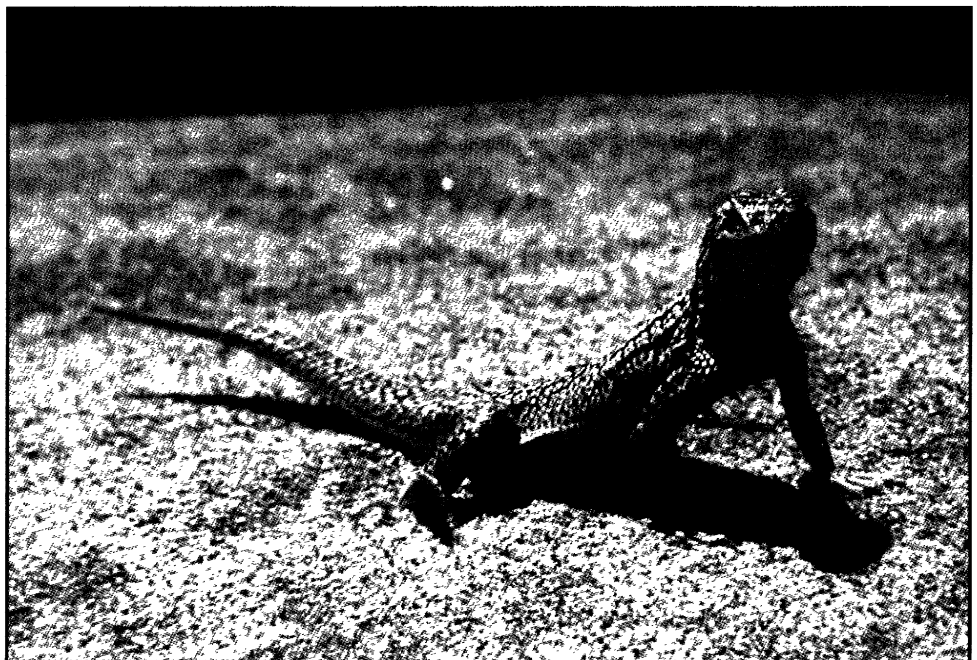
HCPs are as varied and diverse as the habitats they aim to protect. HCPs range in size from a few acres to over a million acres. Some plans focus on a single species, while others focus on multiple species or ecosystems. Some HCPs are negotiated directly between the U. S. Fish and Wildlife Service (FWS) and the landowner; others involve a host of stakeholders, such as state and local governments, environmental groups, recreational groups, non-applicant landowners, and business organizations. HCPs also differ in their duration—permits range from one year to 100 years—and use a variety of funding mechanisms (Beatley 1994; FWS 1997b). Finally, HCPs vary in the means the parties to the agreement use to protect species: some HCPs focus on preserving key habitat areas while others require predator control, prescribed burning, or other mitigation measures.

One example of an HCP is the Coachella Valley HCP near Palm Springs, California (Beatley 1994). This HCP developed because rapidly expanding housing development on private land in the

California desert increasingly threatened the habitat of the Coachella Valley fringe toad lizard (*Uma inornata*). Rather than go to court, the housing developers, federal and state agencies, conservationists, affected county governments, and other parties negotiated an HCP that was designed to allow development to continue and still protect key portions of the lizard's habitat. Completed in 1986, the HCP established three reserves totaling 17,000 acres, 8,000 acres of which is potentially occupiable lizard habitat. The parties acquired the reserve holdings using funds from The Nature Conservancy, the Federal Land and Water Conservation Fund, and other sources. Counting the reserve system and public lands in the valley managed as lizard habitat, the HCP protects roughly 15 percent of the total lizard habitat that remained in 1985. The rest of the lizard's range is open for development largely without restriction; counties do, however, assess a per-acre mitigation fee on all new development within the lizard's historic range. The FWS permitted the HCP

for a period of thirty years, and it has largely been implemented as planned.

HCPs are likely to play an increasingly important role in species conservation in the United States. First, more attention is being paid to protecting listed species on non-federal lands, where conflicts between development and species are most likely to occur. According to a 1994 report by the General Accounting Office, over 80% of listed species reside in habitat on non-federal lands and nearly three-quarters of listed species have more than 60% of their habitat on non-federal lands (U.S. General Accounting Office 1994). Moreover, federal conservation efforts have begun to focus species recovery efforts on a number of "hot spot" areas, especially Florida, Southern California, Texas, and old growth forests in the Pacific Northwest, where high levels of endemism exist, and where biodiversity is jeopardized by rapid economic growth and development (K. Day, FWS, personal communication, Oct. 2, 1996; see e.g., Rodriguez et al. 1997). Approved HCPs are already most numerous in these areas and will continue to play important conservation roles there.



The Coachella Valley fringe toad lizard (*Uma inornata*) was one of the first endangered species covered under an HCP. Photograph by B. Moose Peterson/WRP.

HCPs are also important because they may help address weaknesses in the ESA. While the ESA has functioned well as a last ditch effort to prevent extinction, it has routinely failed either to address the habitat needs of species before they face extinction or to recover species to the point that they can be removed from the endangered species list (see e.g., National Research Council 1995). Both supporters and critics of the ESA have also identified the law's focus on individual species and lack of an overall habitat-oriented perspective as major weaknesses (Rohlf 1991). The lack of resources available for endangered species protection efforts has also been a continuing problem.

Many have pointed to HCPs as a promising tool to address these concerns (see e.g., Thornton 1991). For example, because HCPs can be designed as multi-party collaborative processes that can include both public and private lands and species other than those that are listed under the ESA, they can provide opportunities to protect species before they face extinction and to implement ecosystem-based management (FWS and NMFS 1996). HCPs can also function as a surrogate for community open-space planning, which may engage people who might otherwise not be concerned about endangered species in the process of protecting their habitats. Finally, HCPs may also provide opportunities to leverage significant private and public resources to implement species protection measures.

### **Legislative and administrative history**

HCPs arise from Sections 9 and 10(a) of the ESA. Under Section 9 of the ESA it is illegal to "take" (i.e., kill, harm, or harass) a listed species. This prohibition against the take of species applies to private and public lands and has been interpreted broadly to include habitat destruction or modification. This prohibition has been particularly problematic for private landowners who could be subject to criminal and civil penalties for undertaking development activities that could harm or kill listed

species on their lands (Beatley 1994). However, under Section 10(a) of the ESA, non-federal landowners who plan activities on their lands that may "incidentally take" (i.e., unintentionally harm) a threatened or endangered species may apply to the FWS or National Marine Fisheries Service (NMFS) for an incidental take permit (ITP) that exempts them from this strict Section 9 prohibition against take. In order to receive this ITP landowners must, among other things, prepare an HCP.

Congress was urged to create the Section 10(a) exemption by proponents of a conservation plan on San Bruno Mountain, California that was crafted in the early 1980s. In the conference report on the 1982 ESA Amendments, Congress specified that it intended the San Bruno plan to act "as a model" for future conservation plans developed under the incidental take exemption provision and that "the adequacy of similar conservation plans should be measured against the San Bruno plan" (H.R. Rep. No. 835, 97th Cong., 2nd Sess. 32, 1982, p. 31). Congress further noted that the San Bruno plan: (1) was based on "an independent exhaustive biological study" completed prior to the development of the plan; and (2) protected at least 87% of the habitat of the listed butterflies that led to the development of the HCP—enough habitat "to allow for enhancement of the survival of the species" (H.R. Rep. No. 835, 97th Cong., 2nd Sess. 32, 1982, p. 32).

To receive an ITP under Section 10(a), applicants must at a minimum submit a conservation plan that specifies (1) the impact which will likely result from their proposed incidental take; (2) what steps they will take to minimize and mitigate impacts, and the funding that will be available to implement such steps; (3) the alternative actions the applicant considered, and why they are not being used; (4) other measures required by the agency; and (5) procedures to deal with future unforeseen circumstances that may affect the health of the species or the success of the HCP (50 C. F. R. §§ 17.22, 17.32(b)(1)).

### **The habitat conservation planning process**

The planning process has three general stages: development, approval, and implementation. The development of an HCP typically requires significant scientific baseline collection and analysis, often conducted by outside consultants hired by the applicant. The whole process can take many years and cost millions of dollars. Usually, district-level FWS or NMFS staff assist in the applicant's development of the HCP by providing clarification, scientific information, and feedback. For many large or complex HCPs, a steering committee representing affected stakeholders and scientific and agency interests is formed.

In the development stage, parties also negotiate the terms of the agreement. In return for allowing an incidental take of a species, the parties agree to pursue specific management protections for the species. Almost all HCPs share a basic central strategy of identifying and protecting certain high value habitat areas (Beatley 1994). In some cases, the landowner sets aside a portion of his or her own land for conservation purposes; in others, the landowner or independent parties (e.g., private land trusts; local, state, or federal government entities) purchase the habitat conservation areas. Local zoning restrictions have also been used to protect designated areas (Beatley 1994). In addition to these land protections, HCPs can also include other mitigation actions, such as public education campaigns, habitat restoration, land-use restrictions on nearby public lands, control of exotic species or predation, captive breeding, or changes to the design or density of landowners' projects (Beatley 1994).

The approval stage of the HCP planning process involves both internal agency analysis and external public review. The applicant usually submits four documents for agency approval: (1) a completed permit form which requests the specified amount and rate of incidental take; (2) the HCP, which includes the scientific information and details of the mitigation plan; (3) an implementation agreement which serves as a binding contract and details how



The gray wolf (*Canis lupus*) is covered by several multi-species HCPs. Photograph courtesy of U.S. Fish and Wildlife Service/John and Karen Hollingsworth.

the elements of the plan will be carried out, paid for, and monitored; and (4) the appropriate National Environmental Policy Act (NEPA) documentation (i.e., environmental assessment or environmental impact statement). The agency in turn will amend the NEPA documents if necessary and publish notice of the HCP and a minimum 30-day public comment period in the Federal Register. If the agency approves the HCP, it issues the applicant an ITP. This permit action qualifies as a federal agency action; thus, the agency must engage itself in a "self-consultation" process to evaluate whether the proposed action is in compliance with Section 7 of the ESA (50 Federal Register 39685, Sept. 30, 1985). State endangered species laws and environmental reviews, as well as local zoning or planning regulations, may require additional documentation or public review.

Implementing the HCP involves carrying out the prescribed mitigation actions, collecting funds, and monitoring take levels and overall species impacts. Funding for implementation of the HCP can take many forms and often involves some combination of federal, state, local, and private sources, such as per-unit fees on new development, community-wide taxes, contributions from participating groups (e.g., The Nature Conservancy), state wildlife funds, issuance of city bonds, and Federal Land and

Water Conservation Fund appropriations (Beatley 1994). Monitoring responsibilities for approved HCPs are usually jointly shared by the applicant and the FWS or NMFS and often involve preparation of periodic reports documenting the amount of development that has occurred, number and type(s) of listed species taken, and the amount of money generated and spent to date (see Dohner and Smith, this issue).

### The growth of HCPs

Landowners and the agencies initiated relatively few HCPs in the years following the creation of the Section 10(a) incidental take provisions in 1982. Traditionally, the agencies focused their efforts on those projects or actions that included federal lands or some federal permit approval. Since the Section 10 process is voluntary, most potential applicants chose not to participate and appear to have relied on lax enforcement of the Section 9 take prohibitions on private property (Houck 1993). Moreover, the HCP process was historically viewed as procedurally difficult, costly, plagued with delays, and risky in terms of regulatory assurances (Thornton 1994).

Habitat conservation planning, however, has changed dramatically in recent years. Growing scientific recognition of the role of private lands for

endangered species recovery and the landmark 1981 District Court ruling in *Palila v. Hawaii Department of Land and Natural Resources* (639 F.2d 495, 9th Cir., 1981) both contributed to making Section 9 "a major force for wildlife conservation and a major headache to the development community" (Thornton 1991, p. 610). Indeed, during the last decade there has been a significant rise in disputes concerning Section 9's application to private property (Thornton 1991).

Perhaps more importantly, the Clinton Administration has made several administrative changes in its ESA policies

that have increased the incentive for landowners to engage in the HCP planning process and led to a dramatic increase in the number of landowners applying for and receiving approval for HCPs (see e.g., FWS 1995). Indeed, in an effort to encourage the broader application of HCPs and to deflate Congressional efforts to weaken the ESA, the Clinton Administration has sought to make Section 10 and HCPs "one of the ESA's most important and innovative conservation programs" (FWS 1995).

The result has been a dramatic increase in the number and scope of HCPs that have been proposed and approved. Prior to 1994 the FWS had approved a total of only 20 HCPs. However, after the Clinton Administration's efforts to streamline the planning process and increase landowner incentives to participate, the FWS approved 174 new plans between 1994 and 1996. At the end of 1996 there were approximately 200 HCPs at some stage of preparation, and the FWS expects to work on as many as 400 during FY 1998 (FWS 1997a, b). In addition, the scale and scope of HCPs have increased dramatically in recent years. The FWS and NMFS report that the majority of HCPs developed prior to 1995 were of less than 1,000 acres in area while HCPs in development in 1996 included 25 that exceed 10,000 acres, 25 that are more

than 100,000 acres, and 18 that exceed 500,000 acres (FWS 1997b). By September 1997, the U. S. Department of Interior expects that more than 18.5 million acres of private land and over 300 species will be covered by HCPs (1997).

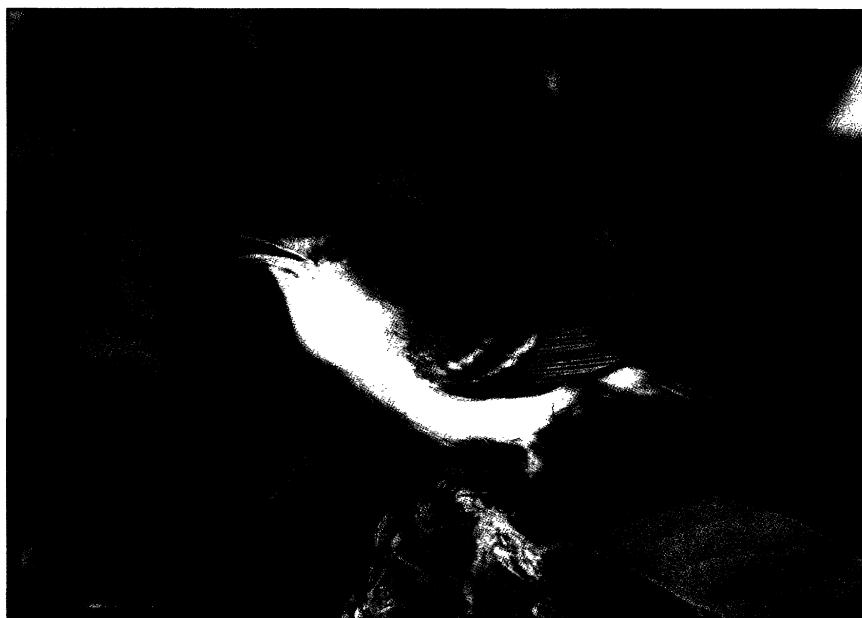
### Administrative changes

The growth of HCPs and the policies that led to this growth raise several controversial issues that are the subject of articles in this issue. Our goal here is to provide background on these issues.

#### *No Surprises policy*

One of the most significant policy changes by the Clinton Administration was its adoption of the so-called No Surprises policy on August 11, 1994 (U.S. Departments of Interior and Commerce 1994). This policy assures landowners that once the agencies have approved an HCP, the landowner will not be required to accept new land-use restrictions or financial commitments beyond those agreed to in the HCP. Thus, if "unforeseen circumstances" reduce the likelihood that a species covered by the HCP will survive over the term of the permit, the agencies agree to bear the sole responsibility—both financial and logistical—of all recovery efforts above and beyond that required by the HCP. The policy further specifies that the agencies bear the burden of proving that unforeseen circumstances exist and that any additional future mitigation not called for in the original HCP be conducted within the geographic confines of the original HCP unless the permittee allows otherwise. Also under the policy, the agencies agree not to impose additional mitigation measures of any type on landowners whose HCPs are designed to have a net positive impact upon a species. Under current agency guidelines, all new HCPs must be consistent with this policy (FWS and NMFS 1996).

Approximately 74 of the HCPs issued after 1994 are thought to contain the No Surprises assurance (see Baur, this issue), although the agencies did not officially publish the No Surprises policy in the Federal Register until May 29, 1997. The agencies agreed to seek



Least Bell's vireo (*Vireo bellii pusillus*). Photograph courtesy of U.S. Department of Defense.

public comment on the policy and on any HCP that contains the No Surprises assurance when they settled a lawsuit filed by environmental groups unhappy with the process used to adopt the policy (62 Federal Register 29091, May 29, 1997).

#### *Other policy changes*

The Clinton Administration has also adopted measures to encourage the development of large-scale, multi-species HCPs and to streamline agency procedures. In November of 1996, the FWS and NMFS released their Habitat Conservation Planning Handbook. While it is "not intended to supersede or alter any aspect of endangered species law or regulation" and serves only as a "guide," the Handbook does contain a number of important procedural changes aimed at expediting permit processing times, reducing the total number of permitting steps, combining required regulatory measures, and increasing coordination earlier in the HCP process. The Handbook focuses on how "to streamline the HCP process to the maximum extent practicable and allowable by law" but does not necessarily focus on how to make HCPs work better for species protection. Agency streamlining has taken a number of forms including "target" permit processing times, creation of a "low effect" category of HCPs that are exempt from full NEPA review, integration of permit and environmental review documents, use of template

language, and concurrent agency review processes.

On June 6, 1997 the FWS and NMFS published regulations regarding prelisting agreements and its Safe Harbors policy (Department of Interior 1997). Prelisting agreements forestall listing of an imperiled species in exchange for landowner conservation efforts. The Safe Harbors policy encourages landowners to improve habitat for listed species on their property and attempts to reverse the incentive that landowners currently have to take endangered species before their land is regulated. Under the policy, the appropriate federal agency determines a habitat baseline condition and any increase in a listed species population above that baseline condition that results from the landowner's voluntary stewardship efforts would not increase their regulatory responsibility or affect future land-use decisions. For example, the FWS and a private landowner might agree to provide habitat for a certain number of red-cockaded woodpeckers (*Picoides borealis*) on the landowner's property. As long as the landowner continues to sustain that habitat and population baseline, he or she can actively log or otherwise manage that land without fear of prosecution under the ESA. The agency has been implementing this policy for some time even though it has not yet been officially approved. Currently, twenty-five Safe Harbor



agreements cover more than 21,000 acres of private land and more than 10 species (Department of Interior 1997). Sixteen more agreements are in progress and are expected to cover another 14,000 acres.

## Key issues

### Recovery

While the overarching goal of the ESA is to recover species to the point at which its protections are no longer needed, the goal of species recovery does not currently drive the HCP planning process. In the Conference report to the 1982 ESA Amendments, Congress required the agencies to base their ITP decisions, in part, on "whether the taking will appreciably reduce the likelihood of the survival and recovery of the species in the wild," a standard very similar to the "jeopardy" standard in Section 7 of the ESA (H.R. Rep. No. 835, 97th Cong., 2nd Sess. 32, 1982. p. 29). Congress also suggested that the agencies consider "the extent to which the conservation plan is likely to enhance the habitat of the listed species or increase the long-term survivability of the species or its ecosystem" (H.R. Rep. No. 835, 97th Cong., 2nd Sess. 32, 1982. p. 31).

However, while encouraging species recovery, current agency policies require only that an HCP ensure the survival of all included listed species. The agency claims that HCPs are not legally required to either contribute to recovery or result in a net benefit to an affected species (see e.g., Taylor 1994; FWS and NMFS 1996). In the Habitat Conservation Planning Handbook, the agencies interpret Section 10(a) to "reflect the fact that HCPs were designed by Congress to authorize incidental take, not to be ... recovery tools" (FWS and NMFS 1996. p. 3-20). However, the Handbook also states: "...contribution to recovery is often an integral product of an HCP...." and "[i]n general, conservation plans that are not consistent with recovery plan objectives should be discouraged" (*Id.*).

### Public involvement and peer review

Congress gave the agencies broad discretion in implementing Section 10(a). The agencies, in turn, have given

a high degree of discretion to landowners in developing the scope, duration, and level of public involvement in the HCP, as well as the number of species covered by the plan (FWS and NMFS 1996). Congress also saw Section 10(a) and its HCP provisions as a means for promoting "creative partnerships between the public and private sectors" (H.R. Rep. No. 835, 97th Cong., 2nd Sess. 32, 1982. p. 30) and suggested that HCPs be "developed jointly between the appropriate federal wildlife agency and the private sector or local or state governmental agencies." It did not, however, explicitly envision an extensive participatory role in the HCP planning process for concerned citizens, independent scientists, or other interested publics. Indeed, the statute requires the agencies only to publish notice of each application and a 30-day comment in the *Federal Register* (16 U.S.C. § 1539(c); 50 C.F.R. § 17.22 (4)(b)(1)). Moreover, since Congress clearly intended its HCP provisions to address "the concerns of private landowners who are faced with having otherwise lawful actions ...prevented by Section 9 prohibitions against taking" (H.R. Rep. No. 835, 97th Cong., 2nd Sess. 32, 1982. p. 29) the extent of public involvement has often been left up to the discretion of the applicants.

In practice, applicants developing HCPs utilize a variety of public participation methods often depending on the type of land ownership(s) involved in the plan and local and state laws. In some cases an HCP may be negotiated directly between the landowner and the agency, with the 30-day comment period as the only public review of the plan. In other cases, outside stakeholders participate on an HCP steering committee and have more influence over the development of the plan.

## Conclusion

As the 105th Congress considers legislation to reauthorize the Endangered Species Act, a number of controversial policy questions surrounding HCPs have not yet been adequately answered. While much has been written about early HCPs, there is a paucity of written material focusing on how

HCPs created pursuant to the Clinton administration's policy changes deal with these questions. Given the tremendous growth in the number and scope of HCPs being implemented today, these questions deserve to be answered quickly—the existence of hundreds of endangered species is at stake.

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# Habitat Conservation Plans and the Incidental Take Permit Planning Process: The U.S. Fish and Wildlife Perspective

Cynthia K. Dohner and E. LaVerne Smith

Prior to 1982, non-federal entities had no recourse under the Endangered Species Act (ESA) to obtain an exemption for undertaking lawful activities that were likely to result in incidental take (e.g., kill, harm, or harass) of a listed species. Based on an innovative habitat conservation planning effort on the San Bruno Mountain near San Francisco, California, Congress amended the ESA in 1982 to establish Section 10(a)(1)(B), which allows for the incidental take of endangered and threatened species by non-federal entities. Incidental take is defined by the ESA as take that is "incidental to, and not the purpose of, the carrying out of an otherwise lawful activity." Habitat conservation plans (HCPs) allow for the conservation of federally listed, proposed, and candidate species, as well as overall biological diversity, while allowing economic development that will not "appreciably reduce the likelihood of the survival and recovery of the species in the wild." The HCP process authorizes incidental take of listed species not the activities that result in take. This paper discusses the role the U.S. Fish and Wildlife Service (FWS) plays in the development and approval of HCPs and their resulting incidental take permits (ITPs).

## The role of the FWS

The HCP process enables the FWS and non-federal entities to reconcile both biological and economic factors associated with development activities. Biologically, the government obtains a legal tool to minimize and mitigate incidental take at the local, range-wide, or ecosystem level. Landowners and local governments receive long-term assurances that their activities will be in compliance with ESA requirements. For both sides, the HCP process promotes negotiation and compromise and provides an alternative to conflict and litigation.

The legislative history indicates that Congress intended this incidental take process to reduce conflicts between listed species and economic development

activities, and to provide a framework to encourage creative partnerships between public and private sectors and state, municipal, and federal agencies in the interests of listed species and habitat conservation. Congress also intended that HCPs could include conservation measures for candidate species, proposed species, and other species not listed under the ESA at the time an HCP is developed and an ITP application is submitted. HCPs can provide early protection for many species, ideally preventing subsequent declines and, in some cases, the need to list such species. This planning process can be a key factor in conservation and recovery efforts for imperiled species because more than half of the listed species have at least 80% of their habitat on private lands (U.S. General Accounting Office 1994).

The FWS works with an applicant to ensure that the minimization and mitigation programs incorporated into HCPs are based on sound biological rationale that will help conserve the covered species, as well as ensure that the program is practicable and commensurate with the project impacts. The FWS also, when possible, provides technical advice to develop mitigation programs that address habitat loss during HCP implementation by establishing suitable mitigation habitat that will be held in perpetuity. The FWS works to keep minimization and mitigation strategies as consistent as possible, subject to the biological differences of the HCPs, for the same species. Additionally, the FWS believes that recovery is an important consideration since HCPs may encompass much or all of a species' range and address crucial biological issues. Applicants are, therefore, encouraged to develop HCPs that produce a net positive effect for the species.

The HCP program has grown rapidly in recent years. By June 1997, 213 ITPs had been issued and approximately 200 HCPs were being developed. The FWS is committed to facilitating cooperative partnerships to conserve and protect imperiled species by participating in all phases of the HCP process, providing

timely assistance to ITP applicants, expeditiously processing permit applications, and generally undertaking all measures necessary to ensure that the Section 10 program is able to meet the growing challenges and opportunities of integrating endangered species protection with economic activities.

One of the strengths of the HCP process is its flexibility. Conservation plans vary enormously in size and scope and in the activities addressed—from half-acre lots to millions of acres, from forestry and agricultural activities to beach development, and from a single species to dozens of species. Another key strength is creativity. The ESA and its implementing regulations establish basic biological standards for HCPs, but otherwise allow the creative potential of HCP participants to flourish. As a result, the HCP program has begun to produce innovative natural resource use and conservation programs.

The FWS does, however, ensure that basic biological standards necessary for a successful HCP are addressed during development of HCPs regardless of the variability in size and scope. One mechanism that has been adopted to strengthen the process is the incorporation of adaptive management into HCPs when there are species covered for which additional scientific information may be useful during implementation. In these cases, the FWS works with applicants to incorporate adaptive management into the strategies designed to mitigate the effects of the HCP. These provisions are especially useful for species whose biology is not fully understood when the HCP is developed and the landowner wants to cover them. These provisions allow the FWS to work with the landowner to reach mutual agreement upon changes in the mitigation strategies if new information about the species, as a result of monitoring, indicates these are needed. Any changes that may occur are discussed upfront with the landowner during the HCP development. In this manner, the permittees are fully aware of any future

uncertainty in the management strategies, and have concurred with the adaptive approaches outlined in the HCP.

### Evolution of HCPs

As of late 1995, most HCPs approved were for planning areas less than 1,000 acres in size. However, of the HCPs initiated in early 1996, approximately 25 exceed 10,000 acres, 25 exceed 100,000 acres, and 18 exceed 500,000 acres. This suggests that HCPs are evolving from a process adopted primarily to address single developments to a broad-based, landscape-level planning tool utilized to achieve long-term biological and regulatory goals. It also suggests that the underlying spirit of the HCP process has begun to take hold.

These large-scale, regional HCPs can significantly reduce the burden of the ESA on small landowners by providing efficient mechanisms for compliance, distributing the economic and logistic impacts of species conservation among the community, and bringing a broad range of landowner activities under the HCP's legal protection. These regional HCPs are providing a larger-scale ecosystem planning process that allows more certainty to landowners by establishing a long-term planning document, and to the species by eliminating the piecemeal approach to conservation. The FWS is also working to streamline measures in the HCP process that will help reduce the burden on small landowners.

The San Diego Multiple Species Conservation Program (MSCP) is a good example of a large-scale regional conservation strategy that will provide benefits to and assist in the recovery of the eighty-five species covered by the plan. The MSCP plan provides a mechanism that utilizes a combination of existing dedicated open-space, previously planned dedications, and additional land allocations to establish a 171,917 acre preserve system that is anticipated to result in the permanent protection of the covered species through large, interconnected habitat blocks. The MSCP will provide the essential tools for preparation of sub-area plans that ensure the healthy, productive, multi-habitat ecosystem is maintained over the long-term.

### Improving the process

Depending on the scope, considerable

FWS resources are required during the stages of HCP development. The FWS's role in the planning process is to provide technical assistance to the permit applicant during the HCP development phase, review the permit application and HCP, and issue the ITP if all requirements have been satisfied. The FWS must also ensure compliance with the National Environmental Policy Act, conduct a Section 7 consultation, and ensure permit compliance and enforcement. Recently, however, the FWS has expanded its role in the development of HCPs because experience has shown that the Section 10 process works best when the FWS is active in all phases. The FWS has increased its involvement by being an active partner in the development and implementation of HCPs.

The challenge of integrating biology and economics is a complex one, but is fundamental to the HCP process. Historically, the process was viewed as procedurally difficult, permit approvals took too long in some cases, and providing long-term regulatory certainty was widely desired by applicants but rarely available. The FWS, along with the National Marine Fisheries Service (NMFS), have made significant improvements in the HCP program by strengthening and streamlining the process. Many innovative and procedural processes, such as improved monitoring programs, adaptive management, long-term regulatory assurances, and increased public participation, are being integrated into the HCP process to improve the benefits provided to the permittees and the species (see Aengst et al., this issue).

One innovation is the No Surprises policy, which provides long-term assurances to an ITP holder that no additional land-use restrictions or financial compensation will be required of the permit holder with respect to species adequately covered by the permit. This assurance remains even if unforeseen circumstances arise indicating that additional mitigation is needed for a given species covered by an ITP after the permit is issued. The FWS believes that it has sufficient authority under the ESA to issue ITPs with long-term regulatory assurances. The FWS also believes in the validity of issued permits, and that these permits adequately minimize and mitigate the impacts of individual projects

described in HCPs. In the unlikely event of any unforeseen circumstances, the FWS will use its authority to manage the circumstances that may arise to ensure that species are not jeopardized as a result of approved HCPs. The FWS continues to include or notify federal or state agencies regarding HCPs that are adjacent to or within lands managed by those agencies. The FWS will work with all other federal and state agencies to help ensure the continued survival and recovery of those species covered by HCPs.

A handbook, which incorporates all these improvements and reflects updated policies and procedures in the HCP program, was issued in 1996. The handbook's purpose is to guide the FWS in processing ITP applications and participating in associated habitat conservation planning efforts. The goals of the handbook are threefold: (1) to ensure that the requirements and goals of the ESA's conservation planning process are realized; (2) to establish clear standards that ensure consistent implementation of the Section 10 program nationwide; and (3) to ensure that FWS and NMFS offices retain the flexibility needed to respond to specific local and regional conditions and a wide array of circumstances.

### Conclusion

The HCP program has been able to bring together federal, state, and local government agencies and private interests to address and resolve many endangered species' conflicts with economic development. State and local governments and private developers increasingly find that they can safely proceed with their planned activities and meet their obligations under the ESA by using this planning tool. Experience has demonstrated that implementation of HCPs can provide the necessary mitigation that balances the adverse impacts of development with measures to foster species conservation.

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# HCPs: The Light of Yesterday?

M. Lynne Corn

From the first habitat conservation plan (HCP) in 1983 for the San Bruno elfin butterfly (*Callophrys mossii bayensis*) near San Francisco to the present, the data concerning implementation and effects of HCPs have consisted of a series of anecdotes. In specific cases, the documentation about a given HCP is extensive; in other cases, barely a folk tale. In still others, there has been enough time to get only a hint about the effects of a new plan. The difference between data and anecdote can be significant when the anecdote "du jour" is being used by various sides to justify major changes, or no changes, in the Endangered Species Act (ESA). Nonetheless, all the yesterdays of HCPs could cast a considerable light of knowledge on how best to develop future HCPs. Otherwise, to paraphrase Macbeth, our selective ignorance may serve only to light listed species the way to dusty death.

For the last three Congresses there have been bills to expand or modify HCPs, and to codify some of the newer innovations from the U. S. Department of the Interior such as the No Surprises policy (see Dohner and Smith, this issue). Because of the paucity of data on current actions and their effects, it is difficult to know what lasting effect such laws might have. To improve the data base, Congressmen Wayne Gilchrest (R-MD) and George Miller (D-CA) submitted a series of questions to the U. S. Fish and Wildlife Service (FWS).

Questions were sent to FWS only, since it has far greater experience with these issues than the National Marine Fisheries Service (NMFS). In addition to a biological focus, questions also explore the incentives that can be provided to non-federal landowners to encourage their participation in the various conservation agreements. This socio-political aspect of HCPs, while an absolutely key component of the HCP-ESA debate, is not described in this more biologically focussed analysis. The responses to these questions from FWS have just come in, and when the analysis is complete, they may shed some light on the approaches that the agencies are taking.

## The need for study of HCPs

The data in the study are needed for several reasons. First, very preliminary information can often lead to incorrect conclusions. Second, it is useful to know what basic strategy FWS is using to address the high risks associated with low population levels. Third, there have been no studies on HCPs as a group, and no one but FWS possesses the extremely scattered and fragmentary data. Indeed, it is unclear whether FWS is collecting any general data on HCPs at all, in terms of either biological, social, or economic efficacy.

### Understanding preliminary data

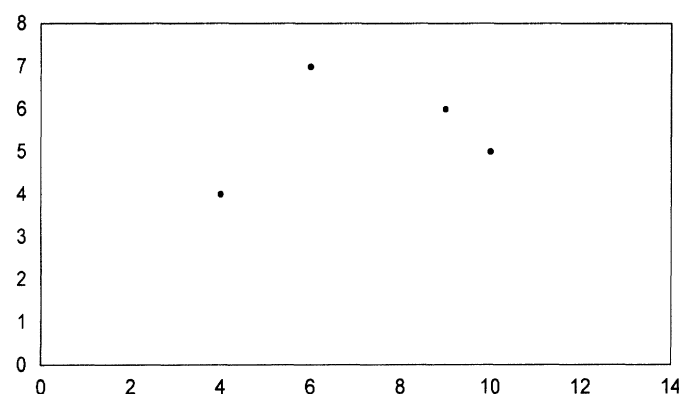
The current condition of scattered HCP data is like the early stages of a test on some hypothetical drug thought to reduce blood pressure. It is tested on mice to see whether the effect holds on mice of all ages. After the initial round of tests, the

results look like those shown in Figure 1. These results are quite scattered, and the researchers cannot even know whether the line that best describes the data is straight or curved. Only after further experiments on more mice of more ages does it become clear that the data are best described by a line sloping down to the right (see Figure 2). Current debate on the advisability of expanding HCPs and related initiatives is more similar to Figure 1 than Figure 2, in that scattered information makes it difficult to know what conclusions to draw.

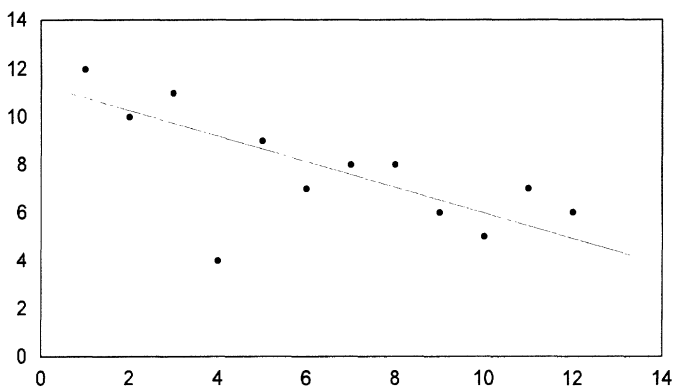
### Public confusion

The public often has a tremendously inflated impression of scientists' information base and theoretical understanding of the natural world. For instance, on hearing of current estimated extinction rates well over 100 times background extinction rates, many people evince an air of shocked disbelief.

There are several reasons for these seemingly unbelievable rates. One is the tremendous diversity among species most people other than specialists never think about. For instance, the range of the estimated number of living species of plants and animals is about 10 million to 100 million. Of these, less than 2 million have been formally described and named by scientists. In contrast to much of the public, most scientists would see an extinction rate of 17,000 species per year as a rather low estimate (see e.g., Pimm 1995).



**Figure 1. Preliminary results of a hypothetical test on mice. The vertical axis represents changes in blood pressure. The horizontal axis represents the ages of tested populations of mice in weeks. The underlying issue is what line best describes the results.**



**Figure 2. Further results of hypothetical test on mice. With more data, it is easier to draw conclusions.**

People also often then ask whether all of these species are important. Importance, however, is largely subjective, and therefore difficult or impossible to measure. Moreover, "importance" and "popularity" are not equivalent. Earthworms may not be among the most popular species, but if all of the earthworms in Indiana were to die tomorrow, Indiana agriculture could well collapse.

#### Stochastic events

For endangered species, another key misunderstanding among non-scientists is the role of stochasticity in populations of species. [A stochastic event is an event in which there is an element of chance influencing the outcome.] Figure 3 shows populations of canvasback ducks in North America from 1955-1996. The population of this relatively abundant native game bird has ranged from 360,200 to 848,500 birds during those years. A wide variety of factors from drought to hunting to loss of wetlands has influenced the population level each year. Yet, because the population level is comparatively large, and the species is widely distributed, it climbs after poor years. Its very large

numbers permit it to withstand the thousand natural shocks that ducks are heir to.

Contrast canvasback ducks with a hypothetical species whose numbers are very low (see Figure 4). In such a species, the natural shock of a storm-felled tree landing on the nest of a single mated pair could be catastrophic: a species whose population level randomly bounces to zero never bounces back. Moreover, Figure 4 optimistically ignores effects such as inbreeding, inability of mates to find each other, or lack of parental guidance in finding migration routes or food sources. Only through herculean human efforts can species (e.g., California condors, whooping cranes) reduced to these levels hold on or gain ground. If, as most scientists are convinced, thousands of species are becoming extinct each year before their existence it is even known, it is difficult for humans to intervene on a scale sufficient to affect the widespread near-death experiences facing so many species, if each species is considered separately.

#### Two options for conservation strategy

What, statistically speaking, are the

implications for conservation planning of a species subsisting at very low population numbers? There are, basically, two options for managers. First might be a "well-insulated conservative strategy" designed to reduce risks as much as possible in whatever manner is appropriate to the biology of that species, to the extent that scientists have such information. Examples of a conservative strategy might be providing ample feeding sites or

host plants, reducing disturbances near breeding sites, responding immediately and specifically in case of predictable but irregular catastrophes (e.g., hurricanes, floods), controlling competing introduced species, artificially spreading of seeds to unoccupied suitable habitat, or supplying water at critical periods. Such efforts might, over time, raise overall population levels, and in the short-term dampen the natural swings faced by any population.

A second option is to provide *ad hoc*, quick responses to crises. In the example shown in Figure 4, as the population begins to drop roughly at the point indicated by the arrow, managers might (1) foresee the continuing drop, (2) recognize its cause, (3) determine a remedy, and (4) carry out effective steps to implement the remedy. In the absence of the first strategy, this option might be effective. However, this strategy carries an element of risk. It assumes that managers can foresee in time the outcome of a drop that might appear to be no different than previous population fluctuations and recognize its cause. [Waiting until they are mathematically certain that the species is headed to extinction almost defies logic, and would certainly be too late to be effective without enormous cost.] If any one of these assumptions is incorrect, the species, due to the greater stochastic threat at low population levels, is at greater risk of extinction.

Simple logic suggests that both strategies together would be even more effective than one alone. In contrast, a conservation plan which simultaneously allows a species to face extinction without ample resource padding, and prevents itself, legally or otherwise, from responding to sudden reductions in population levels seems stochastically doomed.

The above analysis of conservation strategies as a dichotomous choice does not depend on policy preferences or legal foundation. Rather, it is a statement, in layman's terms, about the application of the laws of probability and statistics to the natural world, like the poker player's maxim "don't draw to an inside straight." Over the long haul, the nation loses rare species by simultaneously adopting minimalist strategies and insuring a failure to respond quickly. Society and the political world must then decide whether

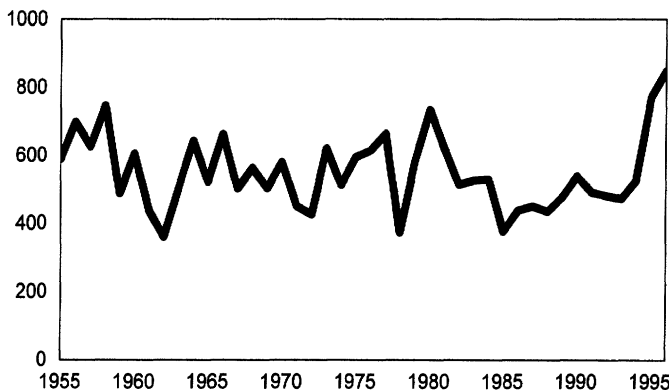


Figure 3. Estimated populations of canvasback ducks 1955-1996 (FWS and Canadian Wildlife Service 1996, p. 39).

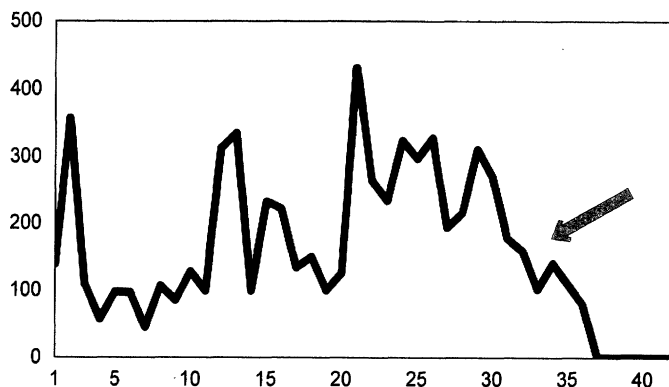


Figure 4. Hypothetical population of an endangered species over 40 years.

to adopt one, both, or neither of these strategies, bearing in mind that choosing neither is to choose an indeterminate number of extinctions.

### **Which strategies are currently used?**

To date there has been no clear information about whether FWS and NMFS have a preference for one of these two strategies over the other, nor have there been comprehensive studies on the efficacy of existing HCPs and related agreements. The prevalence of No Surprises agreements (see Dohner and Smith, this issue) with landowners suggests that the second strategy of quick response is not favored by FWS. These binding agreements with landowners, accompanied by a promise of compensation should new information or developments require additional financial burdens on the landowner to meet conservation goals, would surely reduce the options for responding quickly. If funding is not available, the agreements might preclude effective responses.

Unfortunately, very few data are available to determine whether FWS, in light of the need for landowner assurances (and therefore reduced options for a quick response), has adopted a strategy of an ample margin of safety. While FWS and NMFS have jointly produced an HCP Handbook providing an excellent summary of agency policies (1996), it lacks information on the results of HCPs and related agreements to date. If there is no analysis yet of HCPs, then what information would be useful to determine what strategies the agencies are pursuing, and whether these strategies have been successful?

Here is a sample of some of the questions that might help shed light on current planning approaches.

#### *Quick response*

(1) Do the assurances that FWS gives to landowners vary according to the length of the agreement? Are there limits on these assurances?

(2) Where HCPs cover long periods, how does the agency practice adaptive management when/if new information or monitoring shows that results are worse/better for species than was foreseen.

(3) Are HCPs revisited by FWS or NMFS to determine whether the agreements are being carried out? Do these reviews ever include onsite inspections, and if so, how often for each site? What goals exist for reviewing plans?

(4) Have any agreements actually been amended in light of unforeseen circumstances?

#### *Margin of safety*

(1) What are the criteria for determining whether an agreement is acceptable to FWS or NMFS? Do these HCPs, memoranda, agreements, etc., tend to provide a conservative margin of safety, and reduce the need for quick responses, or are the levels of risk so high that some significant response is likely during the length of the agreement?

(2) In the document approving the HCP, does the Secretary list the actions that the permittee must take to minimize and mitigate, to the maximum extent practicable, the impacts of the permitted take?

#### *Reliability*

(1) Who pays for gathering the relevant scientific data for plans and activities which are not part of an HCP? Who actually gathers it? Who will analyze it—FWS scientists? independent peer review? Are these analyses or reviews made public?

### **Convergence of science and law**

The scientific Capulets and the legal Montagues might be surprised to discover the possibility of a happy wedding in their futures. Scientists and managers have learned, from considerable experience with old growth forests, grazing lands, desert springs, and ocean fisheries, that trying to maintain the health of an ecosystem is to aim for a target both moving and nebulous. In contrast, the specificity of the needs of particular species becomes a measurable surrogate for ecosystem health.

More recently, lawyers also have learned that laws to protect forests and ocean fisheries often fail to provide sufficiently clear standards, especially if long-term benefits face serious current opposition. When particular species are at issue, the lawyers, like the scientists,

find the specificity they need to determine whether the performance of various parties is adequate to protect those species (see e.g., Houck 1997a).

If the specificity of HCPs is great enough, and if the strategies embodied in them are sufficiently insulated from stochastic events, the question of insuring a quick response may not arise.

"A good [HCP] will anticipate surprises and build in the necessary responses. It should include an explicit worst-case analysis, and build up the surprise/response ladder from there. If a plan does this, and includes as well an "extraordinary circumstances" clause that covers stochastic events, I don't see what bases are left uncovered. ...I would much rather try to force an articulated contingency—e.g., the expected nesting success number is not being achieved—than I would the failure of the plan, whatever that may mean. At which point, I don't much care whether . . . No Surprises assurances are offered; they're already in the plan" (Houck 1997b).

Do existing HCPs achieve this standard of worst-case analyses (a sort of back view of the conservative strategy noted above) and the specificity that allows managers to respond quickly to changing conditions? The congressional inquiry noted above may help answer these questions.

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# HCPs and the Embattled Social Utilities of the Endangered Species Act

Zygmunt Plater

The Endangered Species Act (ESA) has been awaiting long-term reauthorization since the end of 1992. Habitat conservation plans (HCPs) have emerged as a focusing issue around which the much larger question is being debated: How, if at all, should the ESA be changed? HCPs may serve as vehicles for improving and fine-tuning protections for species and ecosystems beyond the first-generation terms of the current ESA, or they may be a Trojan Horse designed to overthrow the ESA's remarkable legal protections. Unfortunately, no consensus exists on goals for or how to ask relevant questions about how well the ESA and HCPs are working. Also, basic data about how HCPs have been implemented since the 1982 amendments, particularly over the past four years, is lacking. This contentiousness and indeterminacy may be inevitable as there is a lot more going on here than just science.

This article provides perspective on the forces and issues at play in the habitat conservation planning debates based on lessons harvested from the Tennessee snail darter (*Percina tanasi*) case (see *Tennessee Valley Authority v. Hill*, 437 U.S. 153, 1978). It asserts that endangered species fulfill a basic and embattled civic role—the ESA's utilitarian "canary-in-the-coal mine" social indicator function provides an important backdrop to the promises and perils of HCPs (see Houck 1997).

## The ESA—A statutory anomaly

Today's arguments over HCPs are part of a drastic reassessment process being applied, quite uniquely it seems, to the ESA. The ESA apparently acts as a special societal lightning rod, with statutory functions and a political setting that seem to be more subtle, more controversial, and less secure than for other major environmental statutes.

Throughout the modern course of federal environmental legislation (e.g., Clean Water Act, Resource Conservation and Recovery Act, Clean Air Act), each law has been born in controversy and

bitterly resented by the players (e.g., federal and state agencies, industry) who were forced to accommodate to the newly-enforceable civic values the statutes embodied. Over time, however, public and private establishments have adjusted to most federal environmental statutes, coming to accept the validity and permanence of the laws. During the acceptance stage, a number of trends are notable: (1) away from command-and-control and design standards, toward performance standards; (2) away from end-of-the-pipe solutions, toward prevention, planning, and pre-treatment; and (3) toward stakeholder participation, self-certification, self-auditing, and standards of due diligence. These trends reflect an ability to adopt market-coordinated approaches because of the solid, if grudging, market acceptance of the statutes' basic goals and enforcement.

The ESA, however, is different. Though proposals for the ESA echo the trends toward stakeholder participation, incentives, and the like, they do not seem to share the same strong premises of accomplishing statutory goals that one finds in the pollution statutes. Only the ESA is still regularly subjected to plenary denunciations on the floor of Congress; only the ESA faces serious non-reauthorization initiatives and has sustained amendments undermining its fundamental goal; only the ESA was hit by a sweeping one-year listing moratorium (Pub. Law 104-6). If things go awry, the ESA could be diluted instead of reinforced by the HCP strategy.

What is the difference between the ESA and other federal statutes? Pollution and toxics statutes have come to be accepted by agencies and industry primarily because their direct human utility is intrinsically obvious to the public. The classic false trade-off between environmental protection and a healthy economy has been rebutted by media and public recognition of pollution and toxics as vivid public health hazards. The ESA, on the other hand, was passed into law almost by accident and has never achieved

the same kind of serious systemic acceptance because its societal role and functions are perceived in far less serious utilitarian terms. The societal rationale for endangered species conservation is generally characterized in terms of philosophy, emotions, and aesthetics—heartfelt but not so substantially significant when weighed against the "practical" world of production, payrolls, and profits. Occasionally, a wistful utilitarian reason for species protection sneaks through, such as the suggestion that knowledge or genetic material gained from endangered species will later turn out to "cure cancer." These arguments, however, scarcely dent the dominant mode.

With such a backdrop it is a wonder that the ESA has survived so long, with most of its teeth.

## The snail darter ESA case

The snail darter saga was a protracted, many-layered case from the 1970s that probably launched the modern era in implementation of the ESA. It galvanized the still-continuing political reaction against the ESA, and it still carries some vivid lessons for the current HCP chapter of the ESA's history (Wheeler and McDonald 1986; Plater et al. 1992).

The snail darter is a small perch, highly adapted to feeding in the clean rocky substrates of shallow rapid-flowing big river habitat in the Southeast's western Appalachian piedmont. It was discovered in 1973 in the wide shallow shoalwater at Coytee Spring on the Little Tennessee River.

The snail darter was endangered because of habitat alteration due in large part to dams, which smother the riverbed habitat—crucial for the darter's feeding and reproduction. By 1973 the Tennessee Valley Authority (TVA) had built more than 60 dams, transforming 2,500 linear river miles and leaving only 33 undammed river miles of the Little Tennessee River as the last clean flowing stretch of big river in the region, and its 30,000 snail darters as the last major and then only known population of the species.

The darters' Little Tennessee River habitat was threatened by the TVA's final dam. Since the dam could not be cost-justified for normal dam purposes like power, water supply, or flood control, the Tellico dam was built on a novel justification, as part of a "Regional Economic Demonstration" project. The agency would condemn 340 family farms and sell off the land, at a profit, to the Boeing Company, which would build a model industrial city to be called Timberlake, which could use the dammed river for barge traffic. This program made no sense, and Boeing quickly bowed out when promised subsidies failed to materialize (see e.g., Gramlich 1982). But, backed by the congressional porkbarrel appropriations committees, the TVA rushed construction on the little dam.

Arguing and winning the snail darter case did not require a great lawyer; the facts and law were not difficult. If the agency was jeopardizing a listed species and destroying its habitat, the Supreme Court said ESA Section 7 had to be enforced. If any adjustments were to be made, Congress had to provide the forum for change.

The media's portrayal of the Court's decision caused a public outcry and made the darter a symbol of mindless environmental extremism. In response, Congress created the God Committee with the power to override a species if an accurate overall economic accounting demonstrated a social necessity to do so. The God Committee reviewed the Tellico dam under the 1978 ESA amendments and unanimously decided that in terms of public economics the dam had been an economic joke from the beginning. "Here is a project that is 95% complete," said Chairman Schultz of the Council of Economic Advisors, "and...if one takes just the cost of finishing it...it doesn't pay!" (1979, p. 26). Unfortunately, the media ignored the God Committee's economic vindication of the darter and the ESA.

In the summer of 1979, however, in a stealth rider to an appropriations bill, the ESA was repealed as to Tellico. The reservoir was soon completed, eliminating the known darter habitat. Since then, the reservoir has produced little economic benefit. There have been net recreation losses, a sharp decline in water quality, no

model city, no barge traffic—in sum a wasteful loss of a national resource. As for the snail darter, the existence of several other smaller populations of the darter has been established (several from transplants, several in locations potentially liable to toxic pollution). The species has been down-listed to threatened status, and hopefully will survive the loss of its major relict population.

#### *The ESA's crucial civic function: The canary in the coal mine*

"Apart from biological interest, which I do not challenge," Justice Powell asked during oral argument, "What purpose is served, if any, by those little darters? Are they used for food?... Are they suitable for bait?" (1976, pp. 43-44). Others asked more directly, "Aren't you being hypocritical, misusing the endangered species to fight other battles?" The answer to both ultimately is the same. Species cannot be de-coupled from their habitats; an endangered species by its very endangered existence tends to be an important indicator of threatened human values—as in the old days canaries were carried by miners into the coal seams, because when the sensitive species began to show harm it gave warning that there was serious threat to human health as well, from coal gas.

The fundamental point, missed by the media and in the ESA-HCP debates, is that imperiled species typically fulfill an important utilitarian function as trip-wire indicators of imminent harms, costs, and losses of physical resources to human society, and public and private enterprises. Threatened and endangered species serve to raise important questions that otherwise would be ignored, ultimately to the detriment of humans as well.

#### **The promises and perils of HCPs**

Although the snail darter controversy transpired under ESA Section 7, some of the lessons appear directly relevant to the HCP issues arising under the ESA's Sections 9 and 10.

(1) *Contending forces: marketplace pressures assail species protections.* The dominating reality of the ESA is that by protecting species in their natural habitat the ESA regularly gets in the way of public and private enterprises, attracting fire from some of the biggest guns in the

political system. Beginning with the snail darter, there have been sustained marketplace pressures to undercut the legitimacy of species protection in the agencies, in Congress, and in the press. For example, the National Endangered Species Act Reform Coalition was formed by industry to address current reauthorization efforts. Also, a recent book, *Noah's Choice*, has received widespread attention for its analysis of endangered species issues based on the premise that species protection necessarily requires sacrificing human needs for the sake of biodiversity. This specious argument ignores all possible utilitarian arguments for species protection, including the "canary" function.

Many of the arguments on HCPs and the ESA are not intrinsic, ones that call for modifications that will make the ESA serve its internal statutory objectives better. Rather, they are extrinsic—"The Act must be modified so as to eliminate its obstruction of business profits," or "The Act must be changed now through HCPs to forestall the powerfully anti-conservationist backlash...." It would be naive to ignore the extrinsic arguments, but it is likewise naive not to identify them as separate questions from the intrinsic issues of protecting endangered species, and to recognize that they pose a clear threat to discussions of HCPs.

(2) *The ESA's indicator function.* The darter, on its true merits, should be a reminder that a core function of the ESA has been to provide a mechanism for recognizing and addressing needs for public welfare accounting. Failure to identify the utilitarian indicator function is a major reason why the ESA remains far more vulnerable than other federal environmental laws. It explains why the Tellico dam's irrational economics ultimately rolled over the darter. It likewise threatens to erode the potential benefits of HCPs.

3) *Avoiding pre-emptive capitulation.* Powerful extrinsic pressures can lead to ill-considered, pre-emptive capitulations, both in the agency HCP implementation process and in the ongoing legislative process. There is a real danger that in Washington's hothouse climate the congressional, executive, and citizen defenders of the ESA's societal goals will make unnecessary pre-emptive erosions in the existing statutory framework.



4) *The need for citizen enforceability.* The federal agencies and the marketplace cannot be counted on to enforce the law. The pressures on them are too substantial, constant, and intrusive. The backstop of citizen enforcement under ESA Section 11, as with the pollution statutes, has been a vital credibility factor that drives the bureaucracy's implementation of the law.

It therefore is very troubling that current HCP strategies may tend to limit citizen enforcement. Citizen enforcement suits require clear statutory standards, yet terms and procedures in the 1982 and proposed amendments tend to rely on agency discretion. If the Secretary of the Interior does not choose to see and prosecute violations of HCPs, judicial deference to agency discretion makes it difficult for citizens to prosecute. The FWS itself expressly proposes that the public not be granted the status of third party beneficiaries; this would prevent the public from enforcing HCP agreements contractually (FWS and NMFS 1996). If eligible species are derailed from being listed under the terms of Candidate Conservation Plans, citizen enforcement of the plans or ESA provisions is effectively stymied.

(5) *Intelligent media coverage is crucial to rational national governance, and rare.* To make our legislative process turn on factual merits, the merits must be known to the public through the press. The snail darter case illustrates the point that without press coverage of all legal, scientific, and public economic aspects of a case, politicians often stay with the traditional insider game. Even after the God Committee's unanimous economic verdict, a national story telling the public the news that the supposed extremism of the notorious little darter actually would save and make millions of dollars was never run by the press. Each member of the House of Representatives knew the Tellico dam economics before the ultimate vote overriding the snail darter's protections, but they also knew that American citizens did *not* know the facts—so porkbarrel politics could roll on unobstructed.

The ESA today still has its media problem. The national press largely follows the marketplace framing of issues (e.g., jobs v. environment). To the extent

that the press does not examine the particulars of representative cases, nor explore the actual record of HCPs in practice, the ESA will be vulnerable to marketplace attacks.

(6) *The need for good information.* Just as the darter controversy was hampered by difficulty in getting biological and economic data, the landscape of the HCP debates is further obstructed by the lack of anything but selective anecdotal data on what has actually been going on with HCPs on-the-ground. Both good science and good history are needed (see e.g., Perlman and Adelson 1997; see Corn, this issue). For example, it would be useful to know how, in practice, the FWS is interpreting pivotal phrases in the 1982 HCP amendments: about what measures are "practicable," and how many takes "will not appreciably reduce the likelihood of the survival and recovery of the species in the wild." Also of interest is the issue of whether incidental takes are tending to be "federalized." If a private developer who faces a potential Section 9 take can link the project to a federal agency action or permit, no HCP is required under the Section 7(b) incidental take exemption provisions, and the agency also usually incurs any associated costs.

(7) *The desirability of negotiation and agreements.* It is desirable to try to bring market players and their resources into serious negotiations about resolving species-development conflicts. The darter story affirms that even the alleged most extreme conflicts are likely to be susceptible to good faith accommodations and resolution. If the TVA had been willing to modify its initial project plan, a beneficial balance could have been achieved for all. Time and again the darters' advocates sought constructive mediation with the TVA but were rebuffed by a leadership understandably determined to avoid examining the project's public merits if at all possible. If there is a strong perception that the ESA will be enforced, history shows that rational accommodations of public and private interests can be achieved.

### Summary: Gas masks?

This article, skeptical of the forces arrayed against species protection, sounds a warning that without good enforceable

fences HCPs may make bad neighbors. The ESA reauthorization debates present us in the months ahead with a challenge to craft a process that merges wise planning and species preservation, avoiding the short-term pressures urging pre-emptive capitulation. We need wise and enforceable legal standards, procedural and substantive, and the current ESA with its 1982 HCP amendments falls short of that ideal.

The ESA's social "canary-in-the-coal mine" function often provides a compelling utilitarian argument for species protection laws. We must take care not to risk losing that utilitarian societal function in pragmatic compromises that fail. If the ESA is further modified with an insufficient and impotent HCP process substituted for the enforceability of Section 9, one of many serious consequences will be the loss of the canary function. Developing narrowly-conceived HCPs is somewhat like designing gas masks for our canaries. Given the inexorable pressures, unless all HCPs are held to enforceable high standards, those gas masks are quite likely to leak.

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The author had the mixed honor of being petitioner and lead attorney in the administrative, judicial, congressional, and God Committee perturbations between the snail darter and the TVA Tellico Dam project, over the years between 1973 and 1980. He is currently a professor of Law, Boston College Law School. A fuller version of this article will appear in the Summer 1997 edition of Environmental Law.

# Improving Habitat Conservation Planning Through a Regional Ecosystem-Based Approach

Michael A. O'Connell

No doubt about it, a habitat conservation planning explosion has occurred over the last five years. From less than two dozen habitat conservation plans (HCPs) in 1992 to more than 400 plans completed or in progress as of mid-1997 (see Aengst et al., this issue), use of Section 10(a) of the Endangered Species Act (ESA) to reconcile economic activity and endangered species protection has mushroomed.

Increased use of HCPs around the country appears to have caught many people by surprise, particularly in the environmental community. The on-the-ground outcome of conservation planning—some habitat protected in exchange for loss of other, less critical habitat—has, for many, been a hard pill to swallow. The choice strains our deeply rooted philosophies and emotions about conservation and forces us to make pragmatic, real-world decisions, often in the face of great uncertainty.

In practice, HCPs must tackle some of the most important and difficult issues in contemporary environmental policy: Who is responsible for conserving species? Who bears the risk for the surprises inherent in nature? What role do private lands play in conservation and what is their share of the burden? How can we better protect biodiversity? It is no wonder HCPs have been the subject of growing controversy.

Whether we like it or not, conservation planning is probably here to stay. Some people, including Secretary of Interior Bruce Babbitt, have even argued that the federal ESA remains for the moment relatively intact because of the political pressure relieved through HCPs. Whether conservation planning can be credited with saving the ESA is open to debate. But rather than fighting their existence, the obvious challenge is to fashion a planning paradigm that will result in the highest possible outcome for biodiversity on private lands with a realistic distribution of costs and responsibilities.

From HCPs for single species and habitats to multiple species plans over entire landscapes, implementation of conservation planning has revealed a great deal about what does and does not work. These lessons are important if we are to improve the results of HCPs. With that goal in mind, this article examines the limitations of HCPs, as they have been used to date, for conservationists, private landowners, and local governments. The article offers a conceptual model for improving planning through a regional ecosystem-based approach. It also observes that while ecosystem conservation is occasionally possible under current law, it would be far better to create an explicit framework of policies that defines and enables the key elements of ecosystem-based planning.

## HCPs: Can we do better?

As reflected in the 1982 Congressional conference committee report, the original intent of Section 10(a) was to relieve some of the burden on private landowners stemming from the strict prohibitions of the ESA and to create a planning process that facilitated conservation of species in ways not possible through prohibitions alone (e.g., habitat restoration and management). In practice, this has frequently been possible. Restoration and invasive plant removal from degraded but critical habitat more than offsets the loss of a few highly fragmented, non-viable habitat patches in Southern California and Florida. In

Texas, trapping and removal of cowbirds may have as great an effect on rare songbird abundance as habitat protection itself.

But despite Congressional intent, there is clearly a big missing piece to our national conservation policy. HCPs have rarely been engaged early and broadly enough to get ahead of the extinction crisis and provide incentives and flexibility in conservation options. The environmental community has generally perceived HCPs as undermining the strict protections afforded species under the ESA (even at their best, HCPs are not required to further recovery objectives), while the private sector has complained of costly and uncertain outcomes of the planning process. Many local elected officials have been particularly loath to accept Section 10, at least the way it has historically been implemented, since it has the effect of inserting the U. S. Fish and Wildlife Service (FWS) into the local land-use planning process, with little input from local officials or the community. Clearly, everyone has had something to be concerned about. Table 1 identifies many of the concerns expressed about conservation planning by the private sector and the environmental community.

Regrettably, most of these criticisms are true. About 85 percent of HCPs are for single landowners, single species, and relatively small areas. This project-by-project approach to permitting defines the historical implementation of Section 10 by the FWS. Although the

Environmental Community	Regulated Community
Little funding for plans and No Surprises "Jeopardy" too weak a standard Few public participation opportunities Ineffective management provisions Poor oversight of plan implementation Small ownerships lead to fragmentation Species focus too narrow Lack of credible scientific input	Lack of certainty Unreasonable costs Imbalanced allocation of costs Agreements not reliable Science lacks rigor Planning process not predictable Implementation not streamlined Not enough public funding

Table 1. Expressed concerns of stakeholders regarding Section 10 HCPs.

FWS recently began encouraging large-scale HCPs, such as the Balcones Canyonlands plan for several hundred thousand acres around Austin, Texas, and the Plum Creek Timber plan in Washington for more than 400,000 acres, these have been the exception. Not only is it difficult to demonstrate conservation benefits from plans that encompass a small portion of a species range, but it is almost impossible to attain the standards and goals envisioned by the ESA and the environmental community with a piecemeal approach to protection based on listed species.

Even harder to prove have been the private sector benefits offered by Section 10(a) permits. It is no secret among those who study conservation planning that the guarantees and efficiencies (collectively known as "assurances") promised by HCPs are what brings private landowners to the table and keeps them there (Dwyer et al. 1995). This fact is even beginning to be appreciated among the grassroots environmental community. Yet, most of the assurances under Section 10 are fairly narrow and short-term. For example, the current law only allows take permits for listed species. The FWS currently lists 1,050 United States species as threatened or endangered; including former Category 2 candidates, more than 4,000 species may be listed in the future (FWS 1997). None of these unlisted species is eligible for a take permit under an HCP in the current law. In many areas of the United States, the number of at-risk species is so great that as a plan is completed for one species, more become listed, rekindling the controversy. All these species require conservation action, but the ESA currently offers little incentive or assurances for private landowners to undertake it until the last possible moment.

Local governments who have assumed a coordinating role in an HCP process have often been frustrated as well. For example, Riverside County, California, began a habitat conservation planning process in 1988. When it was finally completed, after nearly seven tumultuous years, it provided land-use planning assurance for a single species, the Stephens' kangaroo rat (*Dipodomys*

*stephensi*). During that time, the Riverside fairy shrimp (*Streptocephalus woottoni*), the California red-legged frog (*Rana aurora draytoni*), and the California gnatcatcher (*Polioptila californica*) were all listed. Despite reaching a solution for the kangaroo rat, Riverside County and its private landowners were left on the hook for these and potentially other species. The process also left many local officials and stakeholders with deep-seated animosity toward federal involvement in the local land-use planning process on private lands under the ESA.

### **A regional ecosystem-based approach to conservation**

Do such stakeholder criticisms mean that conservation planning is unworkable? Should we abandon it in favor of litigation and conflict? From the conservation side, absolutely not. One look at history (or the Los Angeles Basin in California) shows who wins when species protection and economic progress butt heads.

The answer lies instead in the focus of the conservation planning process. It must shift from only listed species to ecosystems, one of the two main goals of the ESA according to the statute's purpose clause. Almost everyone agrees that instead of waiting until the last minute to begin conservation activities in response to the threat of legal action under the ESA, we should focus scarce financial resources on communities of species, the habitats they utilize, and the ecological processes that sustain them to achieve the highest chance of success. Concentrating on ecosystem-based planning, instead of planning for habitat of a species, is the appropriate scale, timing, and approach to the problem. This idea does not mean we should abandon critically imperiled species in favor of a "broad brush" approach to conservation. However, it is partly the effect of having painted with a very narrow brush that has led to many of the conservation crises we now face. A true ecosystem-based model would enable conservation of both species and ecosystem level biodiversity.

Ironically, despite its stated goal of conserving "...the ecosystems upon

which endangered species and threatened species depend...", implementation of the ESA currently offers little towards achieving this purpose. The law contains few incentives to encourage advance planning by private landowners and the threat of additional restrictions may even encourage some to destroy habitat (Wilcove et al. 1996). Those who do plan for species on their land have been frequently "rewarded" by little certainty that their actions will be enough to endure through future species listings. This has led many to oppose listings altogether. Combined with an endangered species program where only the most critically imperiled species receive protection (Wilcove et al. 1993), this approach only intensifies the conflict. Rather than avoiding problems caused by last-ditch efforts to save species, many private stakeholders have turned instead to fighting the entire ESA system. Although this has not been successful yet, it has created a political environment openly hostile to legitimate conservation goals.

### **The benefits of regional ecosystem-based planning**

Basing a private lands conservation strategy entirely on prohibitions and mitigation is inherently limited because the conservation needs are simply too great. In San Diego, California, for example, a reserve system of 172,000 acres was recently identified as the minimum necessary for protection of the natural communities supporting 85 associated rare and rapidly declining species in the region (City of San Diego 1996; see Silver, this issue). Relying on normal project-by-project mitigation of occupied habitat for the 10 listed animals in the planning area (mitigation is not required for listed plants or unoccupied habitat) would protect about 30,000 fragmented acres in dubious conservation management. While other required set-asides, such as for steep slopes or urban open-space, would result in additional acres, these are unlikely to have much conservation value. Public lands, while accounting for 82,000 acres of the minimum reserve system, do not count under the mitigation-only scenario because they are currently unmanaged for

conservation and nothing would be done to change that status.

Regional ecosystem-based conservation planning, however, potentially offers a better way to address the challenges of San Diego, and other rapidly developing landscapes throughout the country (see Table 2). This approach focuses protection efforts on an entire ecosystem rather than exclusively on listed species and, as such, it covers both occupied and essential unoccupied habitat, listed and unlisted plants, and natural processes. Rather than relying on private mitigation as the primary means to conservation, it strategically combines three tools: habitat-based mitigation; public acquisition; and making conservation a primary focus of public lands management. Collectively, these elements can fulfill a conservation need greater than mitigation alone could ever satisfy. In San Diego, the regional conservation strategy identifies 27,000 acres for public purchase, 82,000 acres of public lands to be managed for conservation, and 63,000 acres to be contributed as mitigation through the land development process (mitigation is based on habitat-types, not on occupied habitat for listed animals). Such coordination of the protection and conservation management of entire landscapes with diverse ownerships under a regional strategy

is an outcome nearly impossible under Section 10 HCPs.

From the private landowner perspective, regional ecosystem-based planning has much to offer that HCPs cannot. In exchange for taking a considerably broader approach to habitat protection than the law requires, landowners can rightly expect to receive broader and more secure assurances than those provided under Section 10. Current implementation of the federal No Surprises policy, however, undermines the value of this powerful incentive in regional planning by giving very broad, permanent assurances to Section 10 HCP participants no matter how little their plan contributes to conservation. Regional ecosystem-based planning can also streamline state and federal species regulations into a single package with clear and predictable requirements; landowners, however, would still need to comply with a host of other local non-biological restrictions. And because of wide institutional involvement, the costs of land protection and management can be shared among local, state, federal, and private entities.

For local governments, regional ecosystem-based planning can bring welcome relief from constant federal involvement in land development projects. Resources of the FWS are stretched to the brink reviewing every

project potentially affecting listed species and the FWS has had little success in enforcing ESA prohibitions on habitat take, particularly for essential but unoccupied habitat. Yet, the law currently has no clear means to devolve federal responsibility for enforcement and implementation to the local level. Regional ecosystem-based planning is a politically acceptable way to return land-use control to the local level through a legal contract in whatever way the community wants to implement it, as long as it meets the criteria of the ESA. If performance under the contract is unacceptable, control can be suspended or terminated if necessary.

To date, California is the only place that has experimented with regional ecosystem-based planning under the ESA. Using the Natural Community Conservation Planning (NCCP) program, the state has attempted to cooperate with federal and local governments to create conservation plans for the entire 6,000 square mile range of an ecosystem—coastal sage scrub—and all the species that inhabit it, both rare and common (see Silver, this issue). The NCCP program is supported by a foundation of Conservation Guidelines developed independently by a team of conservation scientists and made regulatory by a federal rule. The state regulations implementing the California

Issue	Section 10(a)	Regional Ecosystem-Based Planning
1. Planning Scope	1. Project-by-project	1. Biological regions
2. Biological Scope	2. Single species or groups of listed species	2. Ecosystems and natural communities
3. Focus of Conservation	3. Highly imperiled species	3. Pre-listing; Preventative
4. Scientific Input	4. Agencies and consultants	4. Independent scientists
5. Institutional Involvement	5. Agencies and applicants	5. Local; State; Federal; Public; Private landowners
6. Public Participation	6. Little or none	6. Workgroups; Hearings; Public comment
7. Use of Agency Resources	7. Processing hundreds of individual permits	7. Servicing and enforcing several large-scale plans
8. Preserve Design	8. Fragmented set asides	8. Large habitat blocks
9. Duration	9. Short-term permits	9. Long-term or perpetual
10. Land Management	10. Relies on permittee	10. Independent; Adaptive; Required by agreement
11. Monitoring/Oversight	11. Passive; Relies on permittee	11. Active by agencies; Oversight by public
12. Landowner Assurances	12. Short-term, narrow	12. Predictable, broad
13. Conservation Standard	13. "Jeopardy"	13. No net loss habitat value; Contribution to recovery

Table 2. Comparison of Section 10(a) and regional ecosystem-based planning concepts.

law authorizing the program identify a conservation standard of "no net loss of habitat value" for completed plans, a considerably higher benchmark than for losses allowed under the "jeopardy" standard by which HCPs are ultimately judged. Public participation is also a key feature of the program and stakeholders at all levels have had numerous opportunities to engage in development of plans. While the results of NCCP are not perfect, it clearly has the potential to achieve far more conservation than Section 10 alone.

### Enabling regional ecosystem-based planning

In comparison to traditional HCPs, a regional ecosystem-based concept is desirable from many angles. How can this type of conservation be enabled? One point is certain: despite its famous purpose clause, the current ESA was not specifically designed for ecosystem protection. California passed its own state law to authorize NCCP. Federal participation was possible only through a special rule issued under Section 4(d) of the ESA when the California gnatcatcher was listed, that creatively stretched Section 10(a) around the framework of ecosystem conservation goals. The ESA allows this regulatory bridge only for threatened species. So while it may be possible to work within the existing federal law in some cases, the full benefits of ecosystem conservation, such as protecting unlisted animals, listed plants, and natural processes, are difficult to realize without a broader, ecosystem-based scope. Rather than testing the outer legal limits of Section 10(a), it would be far better to provide an explicit statutory framework that defines the key elements of ecosystem conservation.

Relying strictly on prohibitive regulation to achieve conservation has left us short of our goals, primarily because it is an inherently reactive and short-sighted approach. What is needed, instead of a broader, more imposing regulatory process, such as the proposed Endangered Natural Heritage Act (see Weiner 1996), is a better, more comprehensive planning tool to complement regulations on take of listed species

under the ESA. Such a program could be designed based on learning from and improving upon the experiences of regional ecosystem-based efforts like California's and would be an advance alternative to the last-ditch prohibitions of the ESA. This new planning tool would not be a substitute for those prohibitions and should not preclude future listings. It was, after all, the threat of listing the California gnatcatcher that brought most parties to the table in NCCP. A strong, clear, yet narrow ESA is an essential component of a comprehensive conservation program. But, unlike Section 10(a), which is both limited and rarely engaged early enough, a new regional ecosystem-based planning provision would give everyone an opportunity to get off the track to extinction before the train wreck while providing far more conservation than possible using prohibitive policies alone. This is the missing piece of conservation policy.

### Conclusion

Does the ecosystem-based approach to conservation have imperfections? Of course. It is far more complex scientifically and politically than species-by-species planning. Changing from the old trench-warfare paradigm is a painful shift for many people. It requires skills in conservation biology and in negotiation that have rarely been developed in the historical litigation- and mitigation-based model. Even more important, while promising to make considerable resources available for conservation, ecosystem-based planning demands new and bigger sources of funding to be successful. This country has provided large amounts of compliance funding for the Clean Water Act and the Clean Air Act, but has yet to offer a similar commitment for the ESA. It is time we do so.

Regional ecosystem-based planning is also not the best solution for every situation. So far it has seemed to work best in urbanizing areas or for resource use that depends on long-term regulatory predictability, like water supply and delivery. Overlaying maps of these economic issues with the location of endangered species hotspots (Dobson et al. 1997; Rodriguez et al. 1997),

however, shows that many contentious private land problems could be addressed by this concept. Despite limited experience, a regional strategic focus for HCPs in "working" landscapes, such as those in timber production, could only improve their conservation outcomes as well.

In the current political climate, any solution that advances conservation aims must also provide answers to the problems faced by private landowners and other stakeholders. Regional ecosystem-based conservation planning offers the ability to achieve significant environmental gains beyond the *status quo* while accommodating the needs of landowners and local governments.

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# Natural Community Conservation Planning: 1997 Interim Report

Dan Silver

The goal of the State of California's Natural Community Conservation Planning (NCCP) Act of 1991 is to resolve environmental-economic conflicts over endangered and threatened species on private lands. Rather than deal with species one at a time, an NCCP effort seeks to meet Endangered Species Act (ESA) standards for multiple species simultaneously. Typically, a mix of listed and unlisted yet declining species are conserved on a habitat or "natural community" basis, while development is facilitated outside the preserve.

The NCCP program began with controversy; it was being marketed by the Wilson Administration as a substitute for listing, under the California ESA, of the California gnatcatcher (*Poliophtila californica*), which is a resident of otherwise highly developable coastal sage scrub (Figure 1). Since participation in the NCCP program was voluntary for all parties, progress was variable and overall insufficient until 1993, when the listing of the gnatcatcher as a threatened species under the federal ESA gave essential backbone and impetus to the program. In fact, the federal listing formally linked itself to the NCCP program via a "special rule"; the incentive of expedited "interim take" of the gnatcatcher was offered to program participants subscribing to a set of

Conservation Guidelines. While it seems clear to most parties that voluntary programs do not obviate the need to list species, this debate has been a continuing source of tension.

Under the NCCP umbrella, seven "subregional" efforts, all with local jurisdictions as lead agencies, are either completed or underway across a largely contiguous 6,000 square mile planning area (see Figure 2). To understand why the NCCP approach has taken off in Southern California, it is necessary to understand what motivates each of the primary participants. For conservationists, a comprehensive plan based upon ESA standards appears the best hope of rescuing a decimated ecosystem. For developers, the assurances an NCCP effort provides against future listings are perceived as vital to a predictable business environment. For local governments, it is a way to retain autonomy over land-use in the face of impending listings and to better balance future growth with natural open-space, which contributes to quality of life. For the wildlife agencies, it is a way to improve upon project-by-project mitigation and a way to avert the regulatory nightmare of a succession of overlapping listings. While the benefits of NCCP are thus quite different for each party—ranging from regulatory efficiency to land

protection—there has been enough common ground to advance a politically difficult process.

## Overview of the plans

### Orange County plans

In Orange County, there are two plans: the Central/Coastal and the Southern NCCP programs. Of these, the Central/Coastal NCCP effort is complete. In this section of Orange County, a single, massive ownership—that of the Irvine Company—allowed a relatively orderly pattern of sprawl to occur. Consequently, apart from two newly constructed toll roads, which bisect the reserve, lands remain relatively unfragmented. The reserve design process involved a gap analysis between already-planned open-space (i.e., exactions obtained through the land-use process and earlier purchases) and maps of overall habitat quality and target species presence. The result—a preserve of 37,378 acres "covering" 39 species—combined the pre-existing open-space with smaller, though important, new additions, about 5,000 acres. There are also connectivity improvements and new management obligations.

Species conservation under the Central/Coastal NCCP effort relies upon umbrella-species methodologies, variable amounts of survey data, and judgements of habitat sufficiency. When planned restoration of agricultural lands is factored in, the result is particularly defensible for coastal sage scrub. As in all plans resulting from the NCCP process, monitoring and adaptive management are major program components.

Another huge Orange County ownership is involved in the Southern NCCP effort. An absence of already-planned land-uses in this area makes it a test case for the NCCP program. This effort is progressing very slowly but has excellent conservation potential.

### San Diego plans

In San Diego, the logistically complex and politically daunting Multiple Species Conservation Program (MSCP) pre-dates the NCCP Act itself, and



Figure 1. Coastal sage scrub habitat covered by California's Natural Community Conservation Planning program. Photograph by Robert L. Ryan.

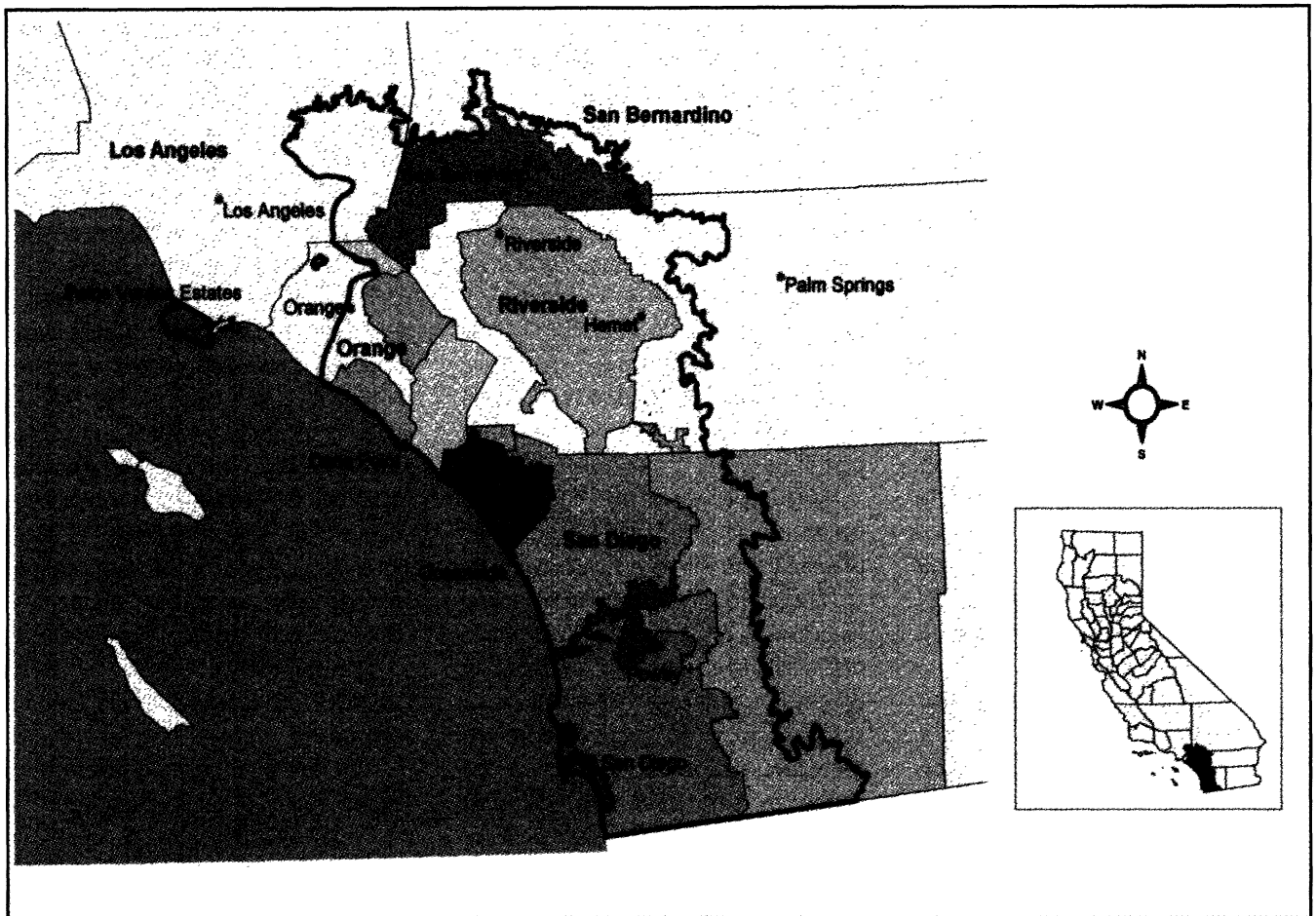


Figure 2. Southern coastal sage scrub NCCP region and subregions. Courtesy of California Department of Fish and Game.

involves multiple jurisdictions and hundreds of landowners. After extensive public participation, a 172,000 acre preserve, "covering" 85 species across a full range of habitats, has been approved at the framework level and by two of the five jurisdictions involved. Included in the preserve are 90,000 acres of currently private lands, two-thirds of which will derive from development exactions and the remainder will be acquired at an estimated cost of \$300,000,000 (to be shared by local, state, and federal sectors). In some jurisdictions, pre-existing Resource Protection Ordinances serve as the underpinning for program implementation.

The preserve design process appropriately began with the compilation of standards and guidelines for preservation of vegetation communities and for maintaining "viable populations" of 90 target species of plants and animals. Due to incomplete survey data, a habitat quality map was prepared using a matrix of indices, and then a map of "biological core areas and linkages" was produced. After adding in local land-use factors, preserve

design alternatives were developed and evaluated for species coverage. Despite this considerable groundwork, the final rationales for species coverage suffer from a disturbing lack of supporting scientific analysis.

The MSCP preserve is weaker in some areas and stronger in others, largely corresponding to pre-existing constraints. All together, about three-quarters of the best remaining habitat is slated for protection, and maintaining connectivity across an already fragmented landscape is a potentially very significant benefit. A new San Diego National Wildlife Refuge will be created in the most intact remaining landscape. Uncertainties in preserve assembly still need resolution. While some preserve areas have "hardlines" derived from project-specific negotiations, others have "softlines" where the preserve is to be assembled over time according to pre-determined criteria.

A companion plan among several cities in northern San Diego County, the Multiple Habitat Conservation Program, is proceeding at a slower

pace. Pre-existing fragmentation has severely restricted preserve design and connectivity options, and the treatment of farming operations also needs resolution.

#### Other plans

In Riverside County, an agreement is nearing completion to begin an NCCP effort. This County is rebounding from what all parties agree was an unsatisfactory experience with a highly regulatory, solely developer-financed single species plan for the Stephens' kangaroo rat (*Dipodomys stephensi*). Incorporated into the new plan will be the combination of SKR reserves and multiple species plans done for major Metropolitan Water District construction projects, totalling about 40,000 acres. Integration of agricultural lands, as buffers for example, may occur in the Riverside plan, but these landowners request not only conservation "incentives" but maintenance of development options. In a rapidly growing region like this, with little previous history of preserving

open-space through the land-use process, an NCCP approach can make a considerable difference.

In the Palos Verdes Peninsula, in Los Angeles County, a smaller NCCP effort is underway. San Bernardino County, facing a possible San Bernardino kangaroo rat listing, is also initiating a "Valley-Wide" program.

## Lessons

A purpose of the ESA is to conserve "the ecosystems upon which . . . species depend." The NCCP program uses the ESA as leverage to apply the principles of conservation biology over a wide area, and is the most realistic option to salvage, connect, and manage the best habitat remaining on private lands within the vast, numbing sprawl of coastal Southern California. But, despite overwhelming practical benefit, controversy still exists over whether there are sufficient scientific grounds to believe the plans will deliver the species protections they promise.

So far, what has been learned from the NCCP experience?

(1) *Listings play an essential role.* Voluntary programs in and of themselves are inadequate substitutes for actual listings, as proven by potentially disastrous project approvals by NCCP-participating jurisdictions, which directly contravened wildlife agency advice. In Southern California, the listing of the California gnatcatcher remains an indispensable driving force demonstrating that the ESA can indeed be parlayed into significant multiple species conservation.

(2) *Public participation must be sought.* Public input is likely to be essential if an acceptable conservation result is to be achieved. "Collaborative" stakeholder groups, as employed in the NCCP program, have made many substantial contributions, particularly in preserve implementation and finance. Consensus is not common, but very powerful when it does occur. For final arbitration of contentious issues, however, the composition of local decision-making bodies remains of utmost importance.

(3) *Partnerships with local government are powerful.* The key advantage of an NCCP approach over the ESA alone

is that local government is an active partner. The application of local land-use authority allows for accomplishments that state or federal agencies could not manage alone. For example, wildlife movement corridors through habitat unoccupied by a listed species can be protected. Also, implementation tools are much more effective when local government steps in. The City of San Diego, for example, uses an "open-space zone," within which development of 25% of a parcel is permitted, to effect part of its plan.

(4) *Assurances are part of the equation.* The trade-off for proactive planning, and, indeed, for the very involvement of local government and landowners, is assurances—assurances that in the event species "covered" by the plan subsequently become listed or suffer unanticipated decline, additional mitigation will not be required on the applicants' part. The most pertinent question is whether the biological robustness of the NCCP preserves is commensurate with the iron-clad assurances. In particular, the policy of "habitat-based" assurances, in which no additional mitigation is required for subsequently listed species if these are dependent upon habitats predetermined to be "sufficiently conserved," exceeds prudent bounds. Admittedly, though, due to the pace of permanent habitat loss, there is less risk of foreclosing future conservation options through these policies in Southern California than in managed landscapes, like North-west forests.

(5) *There is "spill-over" into better planning in general.* The NCCP efforts have allowed local governments to understand the many benefits of natural open-space to their communities. Furthermore, fiscal analyses have demonstrated positive economic effects, not only in terms of regulatory efficiency but also in furthering more compact patterns of development.

(6) *State delegation is unwise.* Authority should not be delegated from federal to state wildlife agencies. The U.S. Fish and Wildlife Service (FWS) has a singular role to play as it is further removed from special interests and represents the national interest.

(7) *Scientific accountability is still insufficient.* Since the dissolution of the early NCCP scientific panel which prepared a general set of Conservation Guidelines, the program has suffered from a serious deficiency of independent scientific input and review. A comparison with the high level of expertise present on an ESA species Recovery Team is instructive. While it should not be inferred that the plans are necessarily unsound, neither are they as yet fully credible. The wildlife agencies themselves have been the biggest obstacle to independent scientific input, due to their aversion to potential delay and to "second-guessing" of decisions. As time goes on, this deficiency is being partially remedied, as the individual efforts are putting in place their own advisory panels. Formal scientific review of the NCCP pilot project would now be appropriate.

A dilemma in regard to the role of science in the NCCP program has been the overarching biological imperative to protect large blocks of habitat quickly, before they disappear, even in the absence of detailed data on a species level. This has forced the use of practical reserve design, habitat-oriented, and umbrella-species methodologies, which urgently need more study and validation.

(8) *Recovery objectives are paramount.* A critical unresolved issue is that of standards. These regional plans must be considered *de facto* species recovery plans, as mandated by the ESA. At a minimum, therefore, they must assure healthy populations across species' ranges, which goes beyond the "not appreciably reduce the likelihood of survival and recovery" standard typically applied to smaller, individual HCPs. [The NCCP Act itself contains no standards, although the Conservation Guidelines specifically prepared for coastal sage scrub call for no net loss of habitat value as defined by viable populations.] The failure to explicitly address the recovery objectives of the ESA is the most cogent conservation criticism of plans resulting from the NCCP efforts to date. In this regard, recent testimony by the Regional Director of the FWS that the San Diego MSCP supported or contributed to the recovery of all covered species establishes a vital policy precedent.





Figure 3. The ESA listing of the California gnatcatcher (*Poliophtila californica*) was a key element in the development of the coastal sage scrub NCCP. Photograph by B. Moose Peterson/WRP.

(9) *Local land-use factors limit program effectiveness.* The specific deficiencies of current plans are often due to irremediable zoning constraints or project entitlement actions by local government. It should be emphasized that the ESA alone cannot undo local General Plans or reverse long-standing, anti-environmental policies. To the contrary, on private lands, the local land-use authorities create the legal and economic parameters within which all other parties operate. Habitat conservation plans, including segments of plans developed through NCCP, are too frequently the result of negotiations in which, figuratively, the wildlife agencies are dealt a pair of deuces and the developer a full house.

(10) *Acquisition funding remains unavailable.* Funding for land acquisition which goes beyond development project exaction is essential for most programs. Sufficient funds are not currently available, and will not be unless the political roadblocks to meaningful funding at both state and federal levels are reversed. The lack of acquisition funds early in the planning process is a huge, truly fatal flaw in achieving recovery objectives. Perhaps setting positive recovery objectives would in and of itself engender greater support for endangered species funding.

be better achieved through land management practices than through creation of preserves.

Even more fundamental is the issue of when use of minimal ESA standards—upon which NCCP efforts are currently based—is appropriate. Coastal Southern California, with highly depleted ecosystems under immediate threat from continued population growth and governed by local jurisdictions unwilling to protect the landscape on their own, is a case in point. There are undoubtedly many other urbanizing areas where NCCP is an appropriate model. But in more intact landscapes, where merely "viable populations" is a low standard, the future balance between conservation and development should be determined otherwise, and the potential of other land-use tools not undermined.

Ideally, the primary land-use tools should remain the traditional ones, growth management and sound local General Plans. From this perspective, natural community conservation (NCC) plans could play individualized roles in creating meaningful conservation elements for General Plans, and thereby also integrate with land-use, housing, open-space, circulation, and agriculture elements. It should be recognized, though, that in Southern

## Conclusion

Safeguards are needed if NCCP is codified into the ESA. Imperative elements are massively increased acquisition funding as well as landowner and tax incentives; independent scientific input; public participation; non-delegation to state agencies; and well-defined recovery objectives.

The most important conclusions about NCCP pertain to context. Rather than viewing the Southern California experience as an off-the-shelf "national model," the role and form of multiple species planning should be individualized to each locale. For example, in less developed areas, species conservation may

California, the biologically-driven NCC plans may, perhaps ironically, stimulate better planning in general. More compact urban forms and agricultural preservation may be facilitated, either indirectly through implementation of the preserve or simply as a result of citizens facing problems they would otherwise have avoided. Indeed, in some areas, a multiple species plan may be the best entrée to improved planning available.

But how to avert a "Southern California solution" in which the ESA steps in as *de facto* land-use planning after a virtual holocaust? As already noted, the strongest tools available (e.g., infrastructure limits, zoning, ordinance) belong to local government. This same political process is also the vehicle whereby communities can create and implement a vision for the future. The development industry regularly commandeers these forces, however, and the environmental community shows little indication of applying itself to the remedy—the hard work of politics and of building coalitions with other constituencies. But let there be no doubt over the legislative potential of local government, so underutilized, to advance natural open-space as part of the public welfare. According to the U.S. Supreme Court (*Berman v. Parker*, 348 U.S. 26, 1954):

The concept of the public welfare is broad and inclusive. . . . The values it represents are spiritual as well as physical, aesthetic as well as monetary. It is within the power of the legislature to determine that the community should be beautiful as well as healthy, spacious as well as clean, well-balanced as well as carefully patrolled.

## Acknowledgments

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Dan Silver is Coordinator for The Endangered Habitats League (EHL), which is an organization of Southern California conservation groups and individuals dedicated to ecosystem protection, improving land-use planning, and collaborative conflict resolution. EHL has participated in the NCCP process for close to 6 years.

# Natural Community Conservation Planning: Preserving Species or Developer Interests?

Tara L. Mueller

As the debate over Endangered Species Act (ESA) reauthorization continues, many are calling for Congress to delegate more responsibility for endangered species protection to state and local governments. This concept is currently being field-tested in California through a pilot Natural Community Conservation Planning (NCCP) program, initiated by Governor Wilson and endorsed by the California Legislature in 1991, to protect the highly endangered coastal sage scrub habitat in the heavily urbanized Southern California region (see Silver, this issue).

The voluntary NCCP program, as codified in the state NCCP Act, is designed to provide for the "regional or areawide protection and perpetuation of natural wildlife diversity, while allowing compatible and appropriate development and [economic] growth" (California Fish & Game Code § 2805(a)). The NCCP Act, while not intended to supersede the requirements of the federal and state ESAs, is supposedly designed to allow for comprehensive, regional multi-species planning in a manner which satisfies the requirements of these endangered species laws. Nevertheless, the NCCP Act, unlike the federal ESA, contains no statutory or regulatory standards for plan approval and implementation. Instead, it authorizes the California Department of Fish and Game (CDFG) to adopt "non-regulatory guidelines" for the development and implementation of natural community conservation (NCC) plans (California Fish & Game Code § 2825; compare 16 U.S.C. § 1539(a)). Further, although an NCC plan must comply generally with the standards for issuance of an incidental take permit under Section 10(a) of the ESA, the U. S. Fish and Wildlife Service (FWS) does not necessarily review individual projects proceeding under an approved NCC plan, either for compliance with the NCCP Act itself or the federal ESA.

More importantly, however, the NCCP program marks a fundamental shift in implementation of the ESA. In contrast to the ESA, the basic purpose of the NCCP program is not to recover endangered and threatened species but to accommodate economic development and regional growth while attempting to protect viable populations of such species. Experience with the program to date reveals that an NCCP approach is primarily a developer driven, large-scale incidental take permit and mitigation plan and only secondarily a species conservation plan.

This is not to say that NCCP is not, in theory at least, a valuable conservation planning tool that can be used to augment existing land-use planning tools in certain areas. NCCP approaches are perhaps most appropriate for areas like Southern California that are already highly urbanized, are continuing to experience intense development pressure, and have highly fragmented and depleted landscapes. Before Congress rushes to codify this program as a "one size fits all" national standard, however, it should carefully evaluate California's experience in implementing the experimental NCCP program to date. This article examines whether, from a legal perspective, the NCCP program actually has achieved a reasonable balance between accommodating development and protecting species and habitat.

## **Getting something for nothing: Where is the *quid pro quo*?**

### *Regulatory assurances under the NCCP program*

The success of the NCCP program as an attempt to reconcile the competing interests of economic development and species preservation cannot be adequately analyzed without first examining the legal effect of the regulatory assurances being provided to local governments and landowners under the program. In other words, one of the

key questions in evaluating the level of species protection anticipated to be achieved by the NCCP program is whether the legal and regulatory assurances given to local governments and landowners are commensurate with the biological assurances provided by the plans. Unfortunately, an examination of the NCCP efforts and accompanying implementing agreements prepared to date reveals that the answer to this question must be an unqualified "no."

To illustrate, the implementing agreement for the southern San Diego County Multiple Species Conservation Program (MSCP) contains the following contractual guarantees for local government signatories and participating landowners. [The Central/Coastal Orange County NCCP contains very similar provisions.] Consistent with the FWS' No Surprises policy for habitat conservation plans (see Dohner and Smith, this volume), the MSCP provides that the local government signatories and the "third party beneficiaries" of the agreement (i.e., developers and others receiving take authorizations) cannot under any circumstances be required to provide additional land or money or be subject to additional land restrictions if they are in compliance with the plan. If the FWS or CDFG subsequently determine that additional measures are necessary to conserve any species "covered" by the plan, the obligation to implement such measures rests exclusively with the federal and state taxpayers.

These regulatory assurances apply to some 85 listed and unlisted species, and may even be applied to additional species in the future if the signatories to the MSCP agree that such species are "adequately conserved" by the MSCP (see discussion below regarding the "adequately conserved" standard). Further, the MSCP not only expressly relieves local governments and landowners in the MSCP area from any future obligation to protect covered species and their

habitats under the federal and state ESAs, but also relieves them from obligations that may be imposed by the FWS and CDFG under the federal Migratory Bird Treaty Act, California Environmental Quality Act, and National Environmental Policy Act. The MSCP also allows for the possibility that compliance with the plan may insulate these local governments and landowners from future wetlands mitigation requirements imposed under Section 404 of the Clean Water Act.

The FWS or CDFG may not even impose new mitigation measures that do not require additional land, land restrictions or money except in "extraordinary circumstances." Extraordinary circumstances are defined as either (1) "a significant, unanticipated adverse change in the population of any covered species or [its] habitat within the MSCP Area"; or (2) "any significant new or additional information . . . that was not anticipated by the [signatories] at the time the MSCP was approved and that would likely result in a significant adverse change in the population of any covered species or [its] habitat within the MSCP area." The FWS and CDFG have the burden of proving, by clear and convincing evidence, that extraordinary circumstances exist.

Even if FWS and CDFG meet their burden of demonstrating that extraordinary circumstances exist, any additional mitigation imposed on the local governments or landowners must "conform to the maximum extent possible to the original terms of the MSCP." These additional measures are limited to modifications to the pre-existing preserve management and/or habitat acquisition programs in the plan. Yet, if the plan has already been shown to be unable to protect covered species, it is highly unlikely that such minor modifications will be effective in preventing further declines.

Even more significantly, a finding of extraordinary circumstances is not grounds for termination, revocation, or suspension of the incidental take permit. The FWS and CDFG can only terminate, revoke or suspend the take permit in the event of a "material breach," which is undefined. The MSCP does not expressly authorize the wildlife agencies to terminate, revoke or suspend the permit if the plan is jeopardizing or otherwise adversely

affecting one or more covered species. Thus, even if there is clear and convincing evidence that the plan is failing and species populations are declining, the MSCP in effect gives local governments and landowners a vested right to proceed with take of species unabated.

Astonishingly, the MSCP also contains significant regulatory assurances for uncovered (e.g., unidentified) unlisted species that have not even been determined to be "adequately conserved" by the plan. If an uncovered, unlisted species is subsequently listed, FWS and CDFG must identify the conservation measures necessary to protect that species and whether they "are beyond those prescribed by the MSCP." If so, the agreement signatories must "cooperatively" develop a set of additional conservation measures so that the species may be added to the list of those subject to incidental take. In developing these additional measures, preference must be given to (1) habitat management practices and enhancement opportunities within the existing reserve area using existing resources; or (2) habitat acquisition through reallocation of existing federal, state, and regional funds for MSCP implementation. Again, however, if these existing resources and funds were adequate, it would not have been necessary to list the species in the first place. Further, reallocation of already limited resources and funds is likely to protect the newly listed species only at the expense of other covered species dependent on these same scarce resources.

If the above options are deemed inadequate to protect the newly listed species, the FWS and CDFG may impose new conservation measures beyond the MSCP on the local governments and landowners in order to authorize the take of such species. However, the wildlife agencies must give preference to those measures "that do not require additional mitigation or dedications of land." Yet, it is entirely unclear what other effective measures, would not require some additional mitigation. Further, for newly listed species dependent upon certain "sufficiently conserved vegetation communities," the FWS and CDFG are solely responsible for conserving, managing, and monitoring these species.

#### *Non-existent biological assurances under the NCCP program*

Given the extensive regulatory assurances provided to local governments and landowners under the MSCP, one would expect that they would be required to make significant up-front mitigation commitments. However, an examination of the MSCP reveals that this is not so.

The MSCP creates a 172,000 acre reserve area for species protection. Unlimited incidental take is permitted outside of this area, while take is restricted, but not absolutely prohibited, within the reserve area. Private landowners are expected to contribute a little over one-third (approximately 37%) of the total reserve area through exactions and land dedications obtained through the environmental review process. Approximately 53% of the reserve area (91,000 acres) is already in public ownership. Much of this land was obtained as mitigation for past environmental damage.

The federal, state, and local governments are responsible for acquiring the remaining 27,000 acres necessary to complete the reserve area at an estimated fair market value of between 260 and 360 million dollars. The participating local governments must pay half of this amount, and the federal and state governments the remaining half. The level of biological protection the plan is expected to provide hinges on public acquisition of these remaining lands. Yet, it is entirely unclear whether and how the government will come up with the funds necessary to do so. In fact, the federal government's acquisition obligations are entirely contingent on the availability of future appropriations. Further, although the MSCP recognizes that federal acquisition funds may never materialize, it simply states that the MSCP will be "reevaluated" in light of the government's failure to come up with the money. There are no provisions requiring or even authorizing revocation of the take permit in this circumstance.

In addition to these front-end acquisition costs, implementation of the MSCP also will involve significant unfunded back-end costs for reserve

management and coordination, and future land acquisition costs if the plan fails to prevent the extinction of covered species.

Even if adequate funds become available, the reserve system still may not be completed because a participating local government can withdraw from the MSCP after only partially fulfilling its mitigation obligations. In addition, the take authorization for projects in compliance with the plan remains valid even if the overall permit is revoked, terminated, or suspended. These provisions place the integrity of the entire reserve system—the only significant mitigation measure provided in exchange for authorized take of covered species—at risk. Successful completion of the reserve system is dependent upon each participating local jurisdiction fulfilling its respective mitigation obligations under the plan.

Even if the reserve is completed, the ultimate biological success of the plan is still very much in doubt. In all, the MSCP will protect only 50% of the remaining natural lands in the MSCP area, which are already highly depleted, and only two-thirds of the remaining highest value habitat. While the plan purports to "cover" (e.g., allow incidental take of) 85 species, there is virtually no scientific basis for these coverage determinations. In some cases, for example, imperiled species are deemed "covered" even if less than 60% of their remaining habitat is protected.

Further, the standards for coverage under the MSCP fail to meet the requirements of the federal ESA. A species is deemed "adequately" conserved (and therefore covered and subject to incidental take) if: (1) "sufficient data" were available to determine that species populations within the MSCP area are "important" to the species' overall survival; (2) "sufficient data" were available to determine that the MSCP would conserve a "significant and necessary" amount of the species' range or habitat; and (3) such habitat will be managed "consistent with the needs of the species."

This "adequately conserved" standard is riddled with vague, undefined and open-ended terms which allow determinations of coverage to be made

without precise information on the MSCP's effect on a particular species, and without a clear method for determining whether and how "adequately conserved" species will be conserved to a level required by the federal ESA. Contrary to the criteria under Sections 7 and 10 of the federal ESA, the adequately conserved criterion does not even consider the effect of the MSCP on the species' recovery as well as survival of the species purportedly covered.

Moreover, the adequately conserved criterion does not require an evaluation of the extent to which the protections in the MSCP will actually protect the species. Rather, it simply indicates whether some "significant" portion of the species' overall populations and habitat is found in the MSCP area and that a "significant and necessary" portion of this fraction will be conserved. This says absolutely nothing about the level of protection that "covered" species will in fact receive and whether this level of protection will satisfy statutory criteria for issuance of take permits. The plan also includes no species-specific management guidelines, so it is impossible to determine whether the third prong of the "adequately conserved" criterion is even being met.

A species is also deemed covered if "insignificantly affected" by the MSCP. This standard likewise does not satisfy the criteria under the federal ESA for incidental take. The MSCP states that "[s]pecies proposed for coverage under this definition generally meet all or at least one of the following criteria: (1) the species' range and major populations/breeding areas exist primarily outside of the MSCP study area; (2) the continued "survival" of the species is not dependent upon the populations or range included in the MSCP study area; (3) the MSCP conserves a substantial amount of habitat that potentially could support or be used by the species; [and/or] (4) the proposed conserved habitat will be managed consistent with the needs of the species."

Again, these criteria only account for the effect of the MSCP on species survival, but not recovery. Further, like the criteria for "adequately conserved" species, these criteria contain

ambiguous and open-ended terms that make it extremely difficult or impossible to determine the actual level of protection covered species will receive, and how this level of protection relates to that which is required by the federal ESA. Moreover, since no comprehensive biological surveys were conducted for the MSCP, there is no way to verify which populations exist inside or outside of the MSCP area, and precisely where they are located.

In addition, though take is permanent and immediate, the mitigation is not. Local jurisdictions can modify protections for species within the reserve area following expiration of the 50-year permit term. Finally, because neither the public nor any particular conservation organization is a signatory or an express third party beneficiary to the MSCP, it is unclear whether they have the right to enforce this contract if any of the parties violate the agreement.

## Conclusion

While the concept of NCCP is a promising one, this promise has not materialized in practice. The fundamental problem with the NCCP program is that the plans' projected success is based on a number of highly speculative and scientifically unsupported assumptions. NCCP efforts, as currently implemented, literally place all the risk of plan failure on species already on the brink of extinction, and virtually none of the risk on those responsible for impacts to those species.

In light of the tremendous biological uncertainty of plans developed through NCCP, the virtually ironclad regulatory certainty being granted to local governments and the development community is wholly unjustified. In order for NCCP to be a model for protecting species in urban areas, let alone a model for the nation, it will need to incorporate far greater biological protections for species and far less regulatory certainty for developers.

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# Habitat Conservation Plans in Industrial Forests of the Pacific Northwest: Mitigation and Public Participation

Tim Cullinan

For the past 50 years, non-federal industrial forests in the Pacific Northwest have been intensively managed for timber. Logging, primarily by clear cutting, occurs every 45 to 60 years and is followed by hand-planting of conifer seedlings and use of herbicides to reduce deciduous competition. Plantations are routinely thinned before final commercial harvest. Road densities are relatively high and forests are highly fragmented. In the past, there have been few attempts at landscape-scale planning to accommodate wildlife, and only recently have regulatory efforts been made to address the cumulative effects of logging and road building. This management has produced a landscape largely unsuitable for species adapted to unfragmented late-seral stage forests, or species adapted to hydrologically mature watersheds.

This paper discusses the use of habitat conservation plans within this fragmented landscape, highlighting the mitigation efforts addressing the conservation needs of northern spotted owls (*Strix occidentalis caurina*), marbled murrelets (*Brachyramphus marmoratus*), and anadromous fish. The level of public involvement is also discussed.

## Use of habitat conservation plans

Habitat conservation plans (HCPs) were virtually unknown in the Pacific Northwest until the early 1990s. However, since 1994, seven HCPs comprising 2.56 million acres have been developed for non-federal industrial forests in Oregon and Washington (see Table 1). An additional seven HCPs, which will add 1.14 million acres, are in various stages of development. Of the 11 million acres of state and private commercial forest land in Washington state, nearly 3 million acres (27 percent) are in HCPs currently existing or under development. These HCPs involve large landscapes, ranging from 7,500 to 1.63 million acres and are long-term—the duration of incidental take permits (ITPs) ranges from 40 to 100 years. All are single landowner plans and there has been limited public participation.

Initially, HCPs in the Northwest were motivated by the desire to avoid Section 9 prohibitions of the Endangered Species Act (ESA) against altering habitat of the northern spotted owl and marbled murrelet. More recently, HCPs have been motivated by a need to address the conservation of anadromous fish, including coastal coho salmon, Columbia River steelhead and Puget Sound salmon.

Most applicants have requested multi-species ITPs to cover many or all listed species on the planning areas. Some HCPs have provisions for automatic amendments to ITPs to cover newly listed species in the future. Under these provisions if a species not currently covered by an ITP becomes listed, the ITP will be extended to that species without requiring additional mitigation.

## Addressing conservation needs

### *Northern spotted owl*

In the absence of HCPs, spotted owls are managed under Section 9 take prohibitions of the ESA. As currently implemented in Oregon and Washington, these prohibitions require that within a specified radius of a spotted owl site center at least 40% of the area must remain suitable habitat. [A site center is the nest tree of a pair of spotted owls or the

primary roost of a non-nesting pair or territorial single owl.] Radii are based on the owls' average home range and vary from 1.2 miles in the Cascade Mountains of Oregon to 2.7 miles on Washington's Olympic Peninsula.

Consensus exists among biologists that this approach is unlikely to be successful over the long-term. An early population modeling effort concluded that a similar approach on national forests was merely "a prescription for the extinction of spotted owls" (Thomas et al. 1990) because it failed to address habitat fragmentation and to provide safe habitat for juveniles dispersing from natal areas. On non-federal land, where the ESA protects only occupied habitat, the shortcomings are even more acute. If the owls move to a new site center, the home range circle is redrawn; any previously protected habitat falling outside the new circle becomes unprotected. Likewise, if the site remains unoccupied for three consecutive years, it loses all Section 9 protection—creating a strong incentive for the owner to log the property and prevent development of new habitat. Thus, while Section 9 prohibitions provide a short-term means of protecting occupied habitat, they also encourage a landscape-scale shell game

HCP	Size (acres)	Species covered by ITP	Duration (years)
Murray Pacific	53,527	all listed species	50
Oregon Dept. of Forestry Elliott State Forest	92,854	spotted owl marbled murrelet	60
Plum Creek Timber Company	169,177	all listed and 285 named vertebrates	50-100
Port Blakely Tree Farms	7,486	all species	50
Washington Dept. of Natural Resources	1,630,000	all species "named and unnamed"	70
Weyerhaeuser Millicoma	209,000	spotted owl	40
Weyerhaeuser Willamette	397,000	all species*	40-80

Table 1. Scope of HCPs in Oregon and Washington. \*As of 7/21/97 the ITP had not been issued for the Weyerhaeuser Willamette HCP.

in which suitable owl habitat will only decrease over time.

HCPs have been promoted as a means to secure more stable habitat protection over the long-term. The assertion is that mitigation under Section 10 will ultimately result in more spotted owl habitat than protection under the Section 9 prohibitions.

Many HCPs define two main types of owl habitat—nesting, roosting, and foraging (NRF), and dispersal—although the exact definition varies among different HCPs. NRF habitat generally consists of forests with a multi-layered canopy dominated by trees 20 to 30 or more inches in diameter, with 60% to 80% canopy closure, numerous large snags or live trees with deformities, and heavy accumulations of fallen trees or woody debris on the ground. Because of their old age and large trees, these forests are the most commercially valuable and are therefore the most expensive on which to defer logging for mitigation purposes. Dispersal habitats are forests old enough to provide 40% to 70% canopy closure and have 15 to 20 feet of clear vertical "flight space" between the top of the understory vegetation and the bottom of the canopy. They can be younger than NRF habitat, with average tree diameters as low as 10 inches. These conditions can often be achieved in forests managed for commercial timber production with only minor adjustments in conventional silviculture. Thus, dispersal habitat is much cheaper for the landowner to provide than NRF habitat.

The current proportion of NRF habitat is low in the managed landscape, ranging from 50% of the total on Oregon's Elliott State Forest HCP (1995) to 0.5% on Weyerhaeuser's Willamette HCP. The high commercial value of NRF habitat, however, is reflected by the fact that the majority of HCPs in Oregon and Washington propose to reduce the amount of NRF habitat by about two-thirds. In some cases, the amount of NRF is projected to rebound toward the end of the permit period, but in no case will it reach or exceed current levels. Mitigation strategies propose to defer logging in one-third of the existing NRF habitat and to maintain dispersal habitat in an upland matrix or in riparian corridors.

The conservation strategy in six of the seven HCPs listed in Table 1 depends upon adjacent federal lands for most of the necessary NRF habitat, and supplements this federal habitat base with the reduced NRF and dispersal habitat retained on non-federal land. For example, in the Washington Department of Natural Resources (WDNR) HCP (1996), the overall proportion of NRF will remain low but mitigation efforts will be aggregated in selected watersheds to support nearby clusters of owls on federal lands. Despite the unpredictable future of current National Forest and Bureau of Land Management plans, the assumption is made that federal lands will provide the foundation for regional spotted owl conservation. This also despite the fact that in some parts of the range substantial numbers of spotted owls use habitat on state and private lands. For example, in Washington in 1993, 636 of 1,028 spotted owl territories (62%) included some non-federal land (Hanson et al. 1993).

#### *Marbled murrelet*

FWS considers a risk of take to occur if habitat is altered within a forest stand occupied by marbled murrelets. ["Stand" is a silvicultural term defined as an area of forest sufficiently uniform in age, species composition, and condition that it is distinguishable from the forest in adjoining areas.] Stand size varies, so there is no specified radius within which habitat is protected under Section 9.

The challenges faced in preventing take of marbled murrelets are similar to those for spotted owls—only stands known to be occupied are protected. Because murrelets are notoriously more difficult to detect than owls, it is likely that only a small fraction of the occupied stands in the Northwest have been detected. When stands become unoccupied, there is an incentive for forest owners to remove the habitat and prevent it from growing back.

In general, mitigation strategies in HCPs defer harvest on occupied sites and propose to defer harvest on potential marbled murrelet habitat until surveys can be completed to determine occupancy status. For example, WDNR will temporarily defer harvest on all occupied sites and on 95% of potentially occupied sites. Upon completion of a habitat

relationships study, WDNR will develop and implement a long-term conservation strategy. Some HCPs will maintain a minimum number of acres in a condition meeting the definition of suitable habitat.

#### *Anadromous fish*

Although concerns about anadromous fish are increasingly important in motivating landowners to develop HCPs, ESA listings have occurred only recently. Consequently, it is not known at this time how Section 9 might be applied. Most HCP applicants, however, included provisions for mitigating the impacts of forest practices on fish habitat, and obtained agreements that ITPs will be amended to include anadromous salmonids if listings occur.

The general approach to mitigation is to conduct a watershed analysis, provide increased protection of riparian zones, or use a combination of the two. Watershed analysis is a process by which watershed conditions are assessed to locate and identify potential hazards to fish-bearing streams. Conditions assessed include the potential for mass wasting, surface erosion, and increased peak flows, and the adequacy of large woody debris recruitment and riparian shading. Risks to fish habitat are evaluated and land management prescriptions are developed to mitigate the potential hazards (see Phillips, this issue).

Increased protection of riparian habitat is generally addressed by expanding the width of buffer zones between fish-bearing streams and adjacent clearcuts. These buffers, ranging from 75 to 160 feet or more in width, are intended to provide shading, bank stability, and large woody debris to enhance stream habitat structure. Several HCPs extend riparian protection to smaller non-fish bearing tributaries.

The potential for effective mitigation varies among plans. HCPs that propose mitigation solely through riparian protection may not have effective provisions for addressing erosion and flooding. The potential for watershed analysis to provide effective mitigation cannot be determined until an analysis is complete and prescriptions are written. Other shortcomings in watershed analysis have recently been identified (Collins and Pess,

in press)—for example, it is based solely on physical features and contains no assessment of biological conditions. Furthermore, there is no mechanism for ensuring that the prescriptions address the needs identified by the watershed assessment.

### Public participation

A distinguishing characteristic of Northwest HCPs has been the low level of public involvement. As noted above, all Northwest plans are single-landowner HCPs, which are regarded by FWS as contracts between the proprietors of the land and the federal government. Consequently, participation by the public or by state government in the development of plans has been very limited.

HCPs in other parts of the United States have used "steering committees" during the development phase. Steering committees are not required, and have not been utilized in any industrial forest HCP in the Northwest.

On HCPs involving public land, informal advisory groups have been utilized. For example, WDNR established an "HCP Citizen Advisory Committee" of five people. The activities of this group, however, did not extend to topics generally addressed by steering committees, such as determining the scope of the HCP, developing mitigation, or providing public input opportunities. In Oregon, a citizen's advisory panel representing various interest groups was appointed to assist in developing a comprehensive management plan for the Elliot State Forest, which later became the blueprint for the HCP. This panel was not active, however, during the development of the HCP.

Despite the federal policy that mitigation standards should be developed in coordination with state wildlife agencies (FWS and NMFS 1996), participation by the Washington Department of Fish and Wildlife (WDFW) has been limited. WDFW has been asked to supply FWS with information about fish and wildlife resources and to suggest mitigation strategies, but there has been no attempt to make WDFW an equal partner in developing mitigation standards. Participation by the Oregon Department of Fish and Wildlife has been virtually non-existent.

FWS and NMFS have taken the position that they can encourage, but not require, applicants to notify interested parties of key elements or issues addressed in HCPs. Opportunities for informal public notification have occurred, ranging from efforts to obtain advice early in the process to public disclosure at the eleventh hour. Plum Creek Timber Company held a series of "town meetings" early in the development of its HCP to explain its intent and obtain public opinion, encouraging attendance through radio and newspaper advertisements. In contrast, Weyerhaeuser offered environmental and community interest groups a two-hour briefing on its Willamette HCP, which occurred two weeks before the scheduled opening of the National Environmental Policy Act (NEPA) public comment period.

Growing evidence suggests that initial landowner apprehension may be giving way to the realization that early public involvement can be beneficial. In three HCPs currently under development in Washington applicants have invited a limited public audience (i.e., state agencies, Indian tribe representatives, and some environmental groups) to periodic briefings. The opportunity for meaningful public input varies among these plans. The common thread in all of these, however, is that the applicant does not relinquish any decision-making authority to outside interests—the FWS and applicant view comments obtained at these briefings as merely advisory.

Thus far, the NEPA process has provided the only guarantee for public participation (see Kostyack, this issue). There are, however, several problems associated with this limited opportunity. First, the public is aware that intensive negotiations between the FWS and the applicant have already occurred prior to submitting an ITP application. Thus, when the plan and NEPA document are released, the common perception is that most decisions have already been made and substantial revisions will not likely occur as a result of public input. This builds a distrust of the process and often colors the response by public interest groups.

Second, there is limited time to respond to an HCP and NEPA document. It is difficult for the public to review,

evaluate, and provide a meaningful response in 60 days to documents that reflect months or years of negotiation and scientific analysis to produce.

A number of suggestions have been offered for improving public disclosure before the opening of the NEPA comment period. One is to formalize the HCP development phase and create checkpoints at which increasing levels of public disclosure would be made. The first checkpoint may be when an HCP is sufficiently complete to allow the preparation of NEPA documents to begin. A second might be when the application is submitted to the FWS Field Office, and a third when the full application is forwarded to the FWS Regional Office.

Other suggestions include requiring periodic public briefings during the development stage or creating incentives for applicants to hold briefings. Greater access to permit documents, perhaps through an on-line data base, would expedite public comment. Finally, all parties would benefit by eliminating duplicate analysis requirements of the Section 10 and NEPA regulations, and by combining HCP and NEPA documents.

### Acknowledgments

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# Adaptive Management and Other Management Efforts: Habitat Conservation Planning in the Pacific Northwest

Joseph B. Buchanan

Under Section 10(a) of the Endangered Species Act (ESA), the U. S. Fish and Wildlife Service (FWS) can issue a permit to landowners that allows "take" of any listed species, such as the spotted owl (*Strix occidentalis*), following approval of a habitat conservation plan (HCP). Nine HCPs have been approved for industrial landowners in the Pacific Northwest since 1992, all of which have come under intense scrutiny (see e.g., Bingham and Noon 1997). Most of the debate revolves around the adequacy or certainty of the management provisions developed as mitigation (see e.g., O'Connell and Johnson 1997).

Two of the concerns about HCPs are first, the need for adaptive management in order to apply new scientific information to forest management situations throughout the life of the plan, and second, the way in which HCPs are linked with other management strategies (e.g., Northwest Forest Plan). This paper discusses these issues as they relate to HCPs in the Pacific Northwest. Although management of spotted owls in Washington state is used as the primary example, the discussion also applies to multi-species planning in this and other states in the region.

## The need for adaptive management

Scientific information is used for many aspects of HCP development and implementation, such as determining species-habitat associations, assessing impacts, making jeopardy determinations, and evaluating species' responses to forest management. Currently, however, many HCPs are not allowing for the best use of scientific information over the long-term because of landowners' desire to lock-in management prescriptions over the life of the HCP. These plans are based on current knowledge, or in some cases a best educated guess, and often result in plans that are static and do not provide opportunities for making mid-course modifications.

A better approach would be to acknowledge uncertainty and develop a process to gather new information and adjust management accordingly. This adaptive management approach can be applied, within limits, to preserve certainty for the landowner while also addressing biological uncertainty.

Adaptive management is defined as a continuing process of hypothesis testing through judicious experimentation and evaluation in the context of management (Holling 1978; Walters 1986). The use of an adaptive management strategy should allow resource managers to more precisely identify the factors relating to positive and negative responses by certain species to changes in the environment. In this sense, experimentation leads directly to new information that can be used for management and that also provides new hypotheses for future consideration (MacNab 1983; Eberhardt 1988). In the context of habitat management for species covered under HCPs, use of adaptive management should enhance refinement of conservation strategies by providing area-specific information on species responses to various environmental modifications and by generally improving the knowledge of a species' habitat needs. Implementation of refined management practices would thus minimize impacts to wildlife.

Adaptive management was discussed in relation to conservation and management of the spotted owl by Thomas et al. (1990). Among the important findings of that group were that (1) an active, rather than passive, adaptive management process should be used; (2) an active process would allow evaluation of policy decisions; (3) research and monitoring were essential for active adaptive management; and (4) a wide variety of issues can be addressed with the process. The northern spotted owl recovery team later incorporated these same concepts into their plan for the recovery strategy, concluding that an objective of adaptive management "is to improve the biological and economic

efficiency of the plan while maintaining or increasing the level of protection for owls over time" (Department of Interior 1992, p. 234). The final draft Spotted Owl Recovery Plan (this document was not approved or released; referred to below as the "draft" recovery plan) included details of the essential requirements and an outline of the adaptive management process as well as a series of key management research questions.

## Adaptive management and Pacific Northwest HCPs

Despite the draft recovery plan's emphasis on adaptive management, and encouragement from within the wood products industry (Irwin et al. 1989), the concept of adaptive management has been little used. Of the nine plans in the Pacific Northwest for which the FWS has issued incidental take permits, four lack an adaptive management component and one states a strong interest in the process but does not make it a required component. Two of the HCPs have adaptive management components designed to create snags, although the extent to which adaptive management will be used in these multi-species plans is either spatially/temporally limited or not defined. The last two HCPs have more substantial components of adaptive management, although one is spatially limited. It is clear that adaptive management is not being applied to the extent that is required to adequately address the biological uncertainty in the plans in this region.

## Relationship to other planning and management efforts

A second current concern in the Pacific Northwest revolves around the relationship between HCPs and other strategies that have already been developed to address conservation of wildlife species associated with late-successional habitats. The sections below address the most significant general issues and illustrate where there is concurrence or potential inconsistency among planning strategies.



The management efforts discussed include the Northwest Forest Plan, the draft Spotted Owl Recovery Plan, Washington State Forest Practices rules for the spotted owl, and other HCPs implemented within the region.

#### *Northwest Forest Plan*

The Northwest Forest Plan (NFP) was designed with an emphasis on long-term management of wildlife species associated with late-seral forests of the Pacific Northwest (Department of Agriculture and Department of Interior 1994). A central component of the NFP was the designation of three general categories of land areas that would be managed to address various goals. Late-successional reserves (LSRs) are areas where habitat will be protected or enhanced for species associated with older forest habitats. Adaptive Management Areas (AMAs) are areas where forests will be experimentally managed to meet a variety of wildlife, social, and economic objectives. Matrix lands include those areas dedicated to harvest of timber. Each of the three area designations contain provisions for riparian management.

Although the locations of the LSRs, AMAs, and Matrix areas are not disputed in the context of HCPs, there has been some disagreement about the objectives of adjacent HCPs. Perhaps the most significant issue revolves around the fact that most HCPs impact wildlife populations primarily in the early part of the plan period in exchange for mitigation provided toward the middle or end of the plan. Although this approach may be appropriate in some cases, many of the LSRs in the Pacific Northwest are currently habitat deficient and support fewer owl pairs than are thought to be needed to maintain viable clusters or subpopulations (Lamberson et al. 1994). As a result, there is little conservation benefit from HCPs in the near-term—when federal lands are not yet functioning to their targeted capacity and when contributions from non-federal lands would provide the greatest conservation benefits.

One of the underpinnings of the NFP was that federal lands would assume the major role in providing conservation benefits to spotted owls

and other species wherever possible. This position is consistent with recommendations from the draft recovery plan for the spotted owl (Department of Interior 1992). There is disagreement, however, over the ecological function of non-federal lands in species conservation. HCPs in this region tend to provide minimal habitat for wildlife management, justifying this approach through claims that the bulk of species conservation will be addressed through management of nearby federal lands—despite the recognized importance of certain non-federal lands.

There may be a practical solution to this predicament. The first step requires that the FWS adopt conservation objectives for the various species and landscapes emphasized in a region. Clearly stated conservation objectives would reduce the confusion about the relationship between management on federal and non-federal lands, thereby clarifying the functional role of non-federal lands. It logically follows that subsequent plans, developed with regard to the conservation objectives, would likely result in provisions for higher quality habitats.

#### *Draft Spotted Owl Recovery Plan*

In terms of recovery objectives and identification of important landscapes, there appears to be general agreement between current HCPs and the draft Spotted Owl Recovery Plan (Department of Interior 1992). Landowners understand that spotted owl populations have been impacted by forest practices and that current planning efforts must address the continuing concern about this species. In addition, the combination of the spotted owl experience and the recent listing of the marbled murrelet (*Brachyramphus marmoratus*; 57 Federal Register 45328-45337, 1992) has created an even greater awareness about the potential for conservation concerns with other species associated with late-seral habitats.



Northern spotted owl (*Strix occidentalis caurina*).  
Photograph by Tracy L. Fleming.

The concept of maintaining clusters or subpopulations of spotted owls within and adjacent to reserved federal lands was presented in the NFP as well as in the draft recovery plan (Department of Interior 1992) and the Interagency Scientific Committee report (Thomas et al. 1990). This concept was also a central focus of attempts to develop State Forest Practices rules for spotted owls in Washington. Perhaps for these reasons, strategies proclaiming to enhance and maintain these population clusters and/or to provide habitats to facilitate dispersal among the clusters have been developed in 8 of the 9 approved HCPs in the Pacific Northwest. For example, the plan for Washington's state-managed timberlands provides nesting, roosting, and foraging habitats in zones adjacent to federal lands and provides regional demographic support (e.g., contributing to the viability of subpopulations; Washington Department of Natural Resource 1996). The Murray Pacific HCP provides a landscape of habitats to facilitate dispersal from the main body of the Gifford Pinchot National Forest to an area known as the Mineral Block, an isolated LSR surrounded by non-federal lands (1993).

Perhaps the greatest disparity among current HCPs and recommendations made in the draft recovery plan is the lack of creative means to manage forests; the importance of developing new methods

to manage forests was repeatedly stressed in the draft recovery plan. Despite the obvious long-term importance of new approaches to forest management, there has been little progress in identifying or adopting new ways to manage forests that are compatible with wildlife needs at a landscape scale. In fact, most management experiments have been proposed or conducted at a very small scale and HCPs generally fail to address alternative management techniques at all. Similarly, adaptive management has played a largely insignificant role in addressing issues of species or habitat management uncertainty.

#### *State Forest Practices rules*

In 1996, the state of Washington adopted new Forest Practices rules for spotted owls (Washington State Forest Practices Board 1996). Among other things, important landscapes were identified where the new conservation rules would apply and suitable habitat for various parts of the spotted owl's range were defined. Since these rules are regulatory, future HCPs will likely be consistent with them. There have been exceptions, however, particularly where ambiguous language allows for a range of interpretations about conservation objectives in some landscapes.

Many HCPs in this region, including some of those currently under negotiation, have used definitions of suitable habitats that were adopted under the new State Forest Practices rules. Those definitions were based on recommendations made by a scientific advisory group (Hanson et al. 1993) that defined a lower threshold of habitat suitability for spotted owls. Unfortunately, this lower limit has become the target level for many HCPs, meaning that definitions of habitat derived from small-scale, stand-level definitions have, in several cases, been applied as a general standard over large-scale, landscape-level planning areas. This mismatch of scales used to determine species-habitat relationships and to plan for their conservation and management has been identified as a problem in other landscape management strategies (Bolger et al. 1997). Such use of lower quality habitats for conservation planning may lead to further impacts on the

species and may also result in greater need for conservation on federal lands.

#### *Other HCPs*

The potential for conflict is obvious when two independent strategies are approved for intermingled or adjacent lands. This appears to have happened only once in the Pacific Northwest. Nonetheless, cumulative impact assessments should be conducted in these situations to ensure that the integrity of the individual plans has not been compromised and that the plans in total are oriented toward the common goal of species maintenance or recovery.

#### **Improving the conservation planning process**

There are several ways to improve how scientific information and other planning efforts are used in the HCP process in the Pacific Northwest. First, the FWS should use the best biological information to develop conservation objectives for species to be covered by the plans. The next step, then, is for the landowner and FWS to determine how the proposed plan will address those conservation objectives. It is important to recognize that landscape planning or ecosystem management will be effective only if the plan provides the individual habitat components important to the species addressed by the plan. Second, plans should contain more than minimal standards for habitat conditions. Lack of agreement on the management methods to meet conservation objectives can be addressed through an adaptive management process. Third, plans should emphasize the use of adaptive management to address information gaps and uncertainty. Using adaptive management, with established bounds on the range of management scenarios to allow certainty for landowners, will allow the risk to be shared more evenly and would likely reduce the risk inherent in No Surprises agreements (see Dohner and Smith, this issue).

An additional improvement to the HCP process would likely result from consideration of both spatial and temporal factors relating to species conservation. Perhaps the most significant example of this is the need to more appropriately emphasize the short-term conservation issues in certain landscapes.

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# Plum Creek's Cascades Habitat Conservation Plan: A Corporate Approach to Ecosystem Management

Lorin L. Hicks

The listing of the northern spotted owl (*Strix occidentalis caurina*) as threatened under the Endangered Species Act (ESA) in 1990 brought many changes to forest management in the Pacific Northwest (Yaffee 1994). Public forests were paralyzed by court-imposed injunctions (Durbin 1996). Communities were "carpet-bombed" with conservation strategies for state and federal forestlands (Thomas et al. 1990; Lujan et al. 1992a, b; National Forest Products Association/American Forest Council 1992). Private landowners got the "wake-up call" that an issue thought to be a "Forest Service problem" had come home to roost on private lands (Dietrich 1992). Private forest managers rapidly found themselves caught on two separate playing fields as both state and federal agencies sought to impose conflicting regulations protecting the spotted owl on non-federal forestlands. To make matters worse, more species such as goshawks (*Accipiter gentilis*) and Pacific salmon stocks (*Oncorhynchus* spp.), were being proposed for federal listing, which posed more concerns and constraints for habitat on private lands. Regulatory predictability for private landowners was becoming as ephemeral as water in a desert pond.

The voluntary habitat conservation planning process, added to the ESA in 1982, has been little understood and seldom used by private landowners until only recently (National Research Council 1995). Increased interest in habitat conservation plans (HCPs) stems in part from the desire to lessen the economic impact resulting from the ESA's prohibition on "take" and in part due to the U. S. Department of Interior's policies offering regulatory incentives. These incentives, including pre-listing agreements, multi-species permits, the No Surprises policy and Safe Harbor agreements

provide valuable regulatory certainty to the private landowner willing to commit the resources to complete an HCP.

Two trends underlie the growth in interest in HCPs. The first is the shift to ecosystem-based planning rather than trying to manage for one species at a time in a piecemeal approach. The second is a recognition that private lands should share the same goal but play a different role in species conservation. While private lands may be needed to aid the conservation of species, the primary obligation should rest on public lands. Scientists have, however,

identified the need for contributions in sensitive areas from non-federal lands (Lujan et al. 1992a, b). Government policy recognizes that the most effective manner to obtain such contributions is to provide voluntary incentives to align the interests of private property with the needs of wildlife. For example, approximately 4.2 million acres of non-federal land within the Northwest Forest Plan area are covered by approved HCPs (C. Dohner, FWS, personal communication).

Plum Creek timberlands in the central Cascades Mountains of Washington

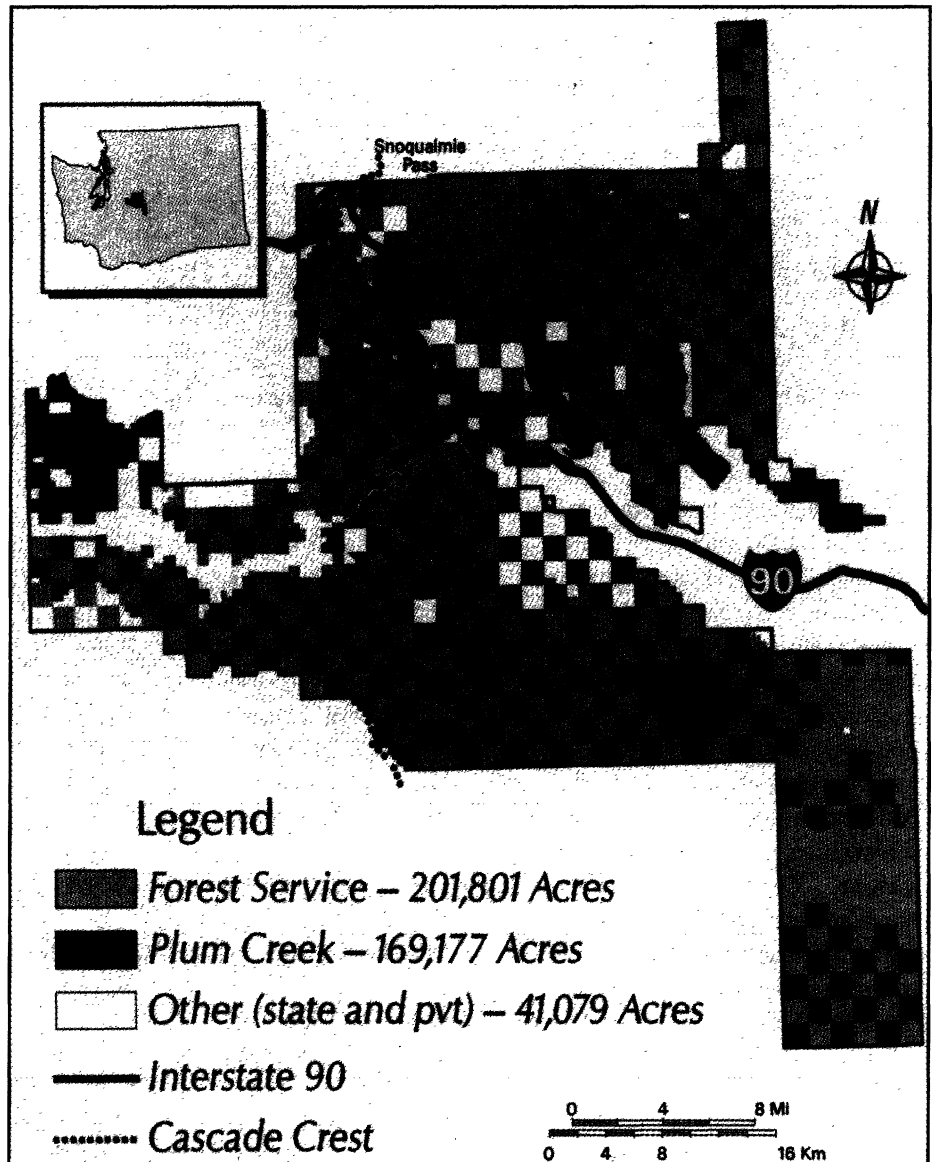


Figure 1. Plum Creek's Cascades HCP Project Area.



Photograph by Joseph B. Buchanan

state offer a perfect case study for these two trends. Dubbed the "I-90 corridor," due to the presence of Interstate 90 over Snoqualmie Pass, the Central Cascades support many important resources and potentially conflicting land-uses, such as roadless and motorized recreation, commercial forestry, agriculture, water storage, highways, powerlines and railroad routes, ski areas, dependent communities, and recreational development. The I-90 corridor is characterized by checkerboard ownership of alternating public and private land. Primary landowners are the U.S. Forest Service and Plum Creek (see Figure 1). The I-90 corridor supports the highest density of spotted owls and habitat on private land in Washington State. Moreover, other federally listed species are also found in the area,

including grizzly bear (*Ursus arctos horribilis*), gray wolf (*Canis lupus*), and marbled murrelet (*Brachyramphus marmoratus*). The I-90 corridor has figured highly as an "area of concern" for wildlife dispersal and distribution in every federal conservation strategy since 1990 (Thomas et al. 1990; Lujan et al. 1992a; Department of Agriculture et al. 1993).

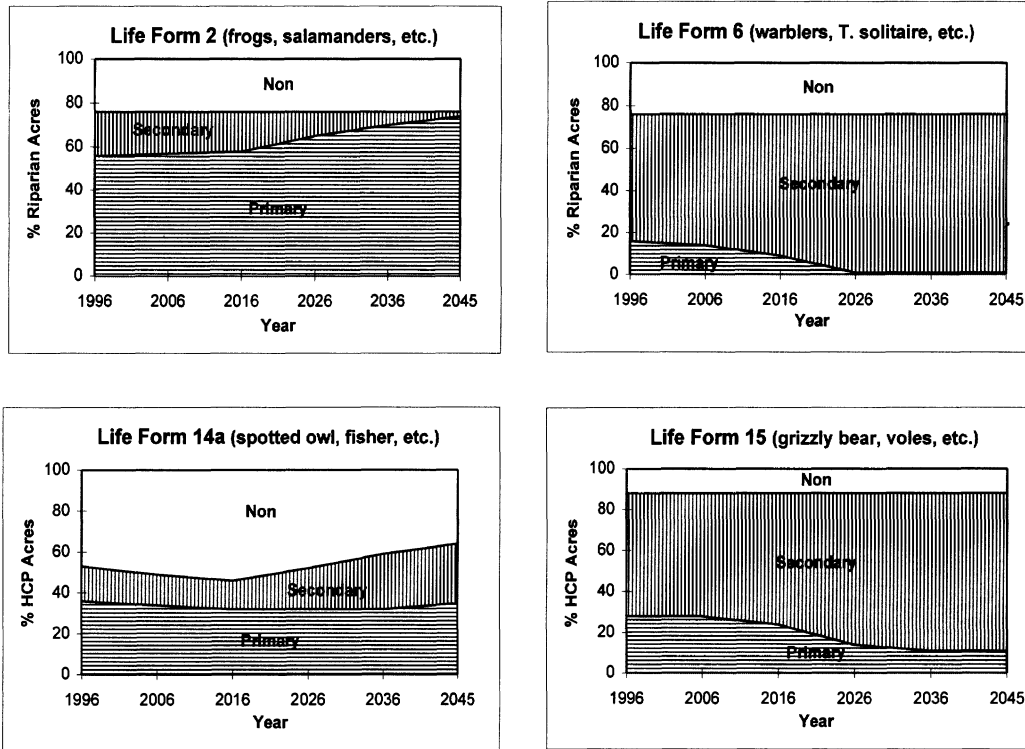
#### **Development of the Plum Creek HCP**

In 1994, Plum Creek began development of the HCP with the U.S. Fish and Wildlife Service (FWS) and the National Marine Fisheries Service (NMFS). The objectives of the HCP were to provide a balance of habitat throughout the ecosystem for all species, and to obtain predictability and

flexibility to manage the company's timberlands economically while contributing to species conservation. The effort spanned over two years and cost Plum Creek approximately \$2 million to prepare. The HCP incorporated an unprecedented level of outside peer review and public involvement. A team of 20 scientists representing wildlife, silviculture, hydrology, fisheries, and computer modeling expertise helped develop the technical foundations. The team produced 13 technical reports, which were reviewed by 47 outside scientists from academia, state and federal agencies, and private organizations. A full review, including an environmental impact statement (EIS) as required under the National Environmental Policy Act, was completed for the HCP. An extended comment period and analysis of over 700 cards and letters were incorporated into the process as well. Copies of the draft HCP and EIS as well as all technical reports were placed in eight public libraries around Washington to facilitate public review. Plum Creek conducted 53 briefings on the HCP for agencies, elected officials, scientists, environmental interests, tribal organizations, and industry groups. Technical information and approaches used to develop the HCP were "downloaded" to non-industrial private landowners and others interested in doing HCPs.

#### **Approaches and strategies**

Under the HCP, Plum Creek will commit to a strict yet flexible 50-year ecosystem management strategy on 169,177 acres of company-owned land. The HCP was designed to complement the Northwest Forest Plan; analysis of habitat conditions and trends extend over a 418,000 acre planning area and includes information and assumptions from the U.S. Forest Service and other ownerships in the planning area. Various protection strategies in the HCP were designed to "dovetail" with strategies on federal lands in late-successional reserves, matrix land and the Snoqualmie Pass Adaptive Management Area designated on U.S. Forest Service land (Department of Agriculture et al. 1993). By incorporating many of the



**Figure 2.** The above graphs depict the trade-offs encountered when managing for the habitat needs for multiple species on a landscape scale. In evaluation of riparian areas, primary habitat for Life Form 2 (frogs, salamanders, etc.) increases through time due to the retention and growth of larger trees within stream buffers. In contrast, primary habitat for Life Form 6 (warblers, Townsend's solitaire, etc.) decreases over time as riparian areas in less complex structural stages decrease. Considering the entire HCP landscape, trade-offs are observed between habitat for spotted owls (Life Form 14a), which prefer the more complex structural stages, and primary habitat for grizzly bears (Life Form 15), which prefer less complex structural stages (e.g., shrub/sapling).

ecological objectives of the Northwest Forest Plan, Plum Creek's HCP not only augments the Northwest Forest Plan but helps ensure its success in a landscape of intermingled ownership.

Another objective of the HCP was to address multiple wildlife species. To achieve that objective, 285 species of vertebrate wildlife were "guilted" into 16 lifeforms based on similarities for breeding and feeding habitats (Thomas 1979; Brown 1985; Lundquist and Hicks 1995). Habitat conditions were mapped and modeled for each lifeform with standards and guidelines established to address specific habitat concerns. Since riparian areas are important to wildlife and fisheries, a riparian management strategy was developed and incorporated into the HCP. Forest health is also a major concern for forest landowners like Plum Creek. To address this concern, Plum Creek worked with forest scientists from the University of Washington to develop models to estimate the potential for excessive fuel loading and fire risk as well as infestation risk from the western spruce budworm

(*Choristoneura occidentalis*; Oliver et al. 1994). A fundamental element in Plum Creek's HCP was to incorporate the techniques and results of "New Forestry" experiments the company had been developing since 1990 (Kohm and Franklin 1997). The purpose of these experiments was to develop economically and ecologically efficient ways to retain habitat components for spotted owls and structural diversity for other wildlife species (Hicks 1991).

The "core" of Plum Creek's HCP are 38 measures to mitigate and minimize impacts of Plum Creek's operations on species, several of which are explained below.

#### Spotted owl related

(1) *Habitat mapping.* A habitat classification system was developed to identify and map nesting/roosting/foraging habitat (NRF), foraging/dispersal (FD) habitat, and non-habitat for spotted owls in the 418,690 acre planning area. Mapping will continue throughout the 50-year permit period.

#### Marbled murrelet related

(1) *Surveys and harvest deferral.* Multi-year surveys to detect presence on 1,110 acres of potential murrelet habitat on Plum Creek and U. S. Forest Service ownership in the planning area will be completed. Timber harvest will be deferred on murrelet habitat until surveys are completed.

(2) *Nest site protection.* Habitat surrounding occupied murrelet sites found during surveys will be maintained, and additional murrelet sites discovered by other surveyors during the Permit period would be protected by deferring harvest within a 0.25 mile radius during the nesting season.

#### Grizzly bear related

(1) *Habitat mapping and assessment.* Road densities, hiding/thermal cover and forage/prey habitat were mapped to evaluate the quantity and quality of grizzly bear habitat in the I-90 Lakes Subunit (115,462 acres) in the planning area; habitat will continue to be assessed throughout the permit period.

(2) *NRF maintenance.* Plum Creek will maintain target percentages for NRF habitat for each decade of the permit period and, at a minimum, maintain 8% (13,500 acres) of its ownership in the planning area as NRF habitat. Harvest will be deferred on 2,600 NRF acres near key spotted owl sites in the planning area for at least 20 years.

(3) *FD corridors.* To facilitate dispersal and linkage to additional habitat on Plum Creek and federal lands, 3,200 acres of current NRF and FD habitat will be retained as FD corridors.

(4) *Riparian habitat areas.* 5,600 acres of forestland adjacent to perennial streams will be maintained as spotted owl habitat during the permit period.



Grizzly bear (*Ursus arctos horribilis*), one of many species covered under Plum Creek's Cascades HCP. Photograph courtesy of U. S. Fish and Wildlife Service.

Creek, without obligating federal funds. A monitoring and reporting schedule was also specified in the plan to provide regular reports on the status of the HCP to the FWS and NMFS.

### Trade-offs inherent in ecosystem management

Ecosystem management does not necessarily mean that habitat for all species can be "maximized" over time and space. Analysis completed in the Plum Creek multi-species HCP provides a graphic example of tradeoffs encountered in habitat for key wildlife species addressed in the plan (see figure 2). Species included in Lifeform 2 (e.g., frogs and salamanders) reproduce in water and feed on the ground, in bushes, or in trees. Similarly, species in Lifeform 6 (e.g., nighthawks, Townsend's solitaire, porcupines) reproduce on the ground and feed in bushes, trees, or in the air. Both Lifeform 2 and Lifeform 6 are strongly associated with riparian habitats, but at different ends of the successional sequence (Lundquist and Hicks 1995). Primary habitat for Lifeform 2 (i.e., mid-aged and late-successional forests) increases over time with protection and retention of larger trees in streamside buffers on Plum Creek and federal lands in the planning area. Conversely, primary habitat for Lifeform 6 (early-successional shrub and young forests) decreases in the planning area, except what may occur due to natural disturbance such as fire, blowdown, or insect infestations. On a landscape basis, habitat for spotted owls, and other late-successional species increases in the HCP areas as a result of habitat protection, reduced harvests, and forest regeneration on Plum Creek and federal lands. On the other hand, primary habitat for the grizzly bear (early-successional grass-forb and shrub vegetation) decreases in the HCP area during the 50-year permit period because of reduced harvest activity and regrowth of areas that were harvested or burned prior to the initiation of the HCP or Northwest Forest Plan. [The reduction in habitat for grizzly bears in forested areas will be offset in part by the contribution of non-forested areas in the HCP area, which also provide

(2) *Best management practices.* Upon approval of the HCP, Plum Creek implemented a series of best management practices (BMPs) within the recovery zone in the I-90 Lakes subunit to facilitate grizzly bear "recolonization" of the planning area. Phase I BMPs include road closures, open road density targets, visual screening, and firearm control for company personnel and contractors. Upon confirmation of grizzly bear residency in the planning area, Phase II will be implemented to reduce potential for death and displacement of resident bears. Phase II BMPs include additional road closures, retention of cover in harvest units, and seasonal timing restrictions on forest management operations.

#### *Other species related*

(1) *Gray wolf den site protection.* Guidelines will be implemented to reduce operations which may disturb wolves, and Plum Creek will defer harvest which may alter habitat around den sites in the planning area.

(2) *Goshawk nest protection.* Plum Creek will defer harvest around habitat supporting all six known goshawk sites on Plum Creek land for at least 20 years; seasonal timing restrictions would be observed around future sites encountered during the permit period.

#### *General habitat related*

(1) *Structural stage diversity.* Plum Creek will maintain a diversity of forest structural stages (stand initiation through old growth) on its lands in the planning area through the permit period to provide primary and secondary habitat for 16 lifeforms in accordance with a schedule of "target" percentages specified in the plan.

(2) *Watershed analysis.* Watershed analysis will be accelerated in 20 watersheds in the planning area and evaluations will be submitted within 5 years following issuance of the permit.

(3) *Riparian habitat areas (RHAs).* 10,900 acres of forest adjacent to perennial streams have been placed in RHAs on Plum Creek's lands in the planning area.

(4) *Harvest deferrals.* Harvest will be deferred in riparian forests adjacent to stream segments listed as water quality limited until completion of watershed analysis.

In addition to measurable criteria, other mitigation measures establish management standards for special habitats such as wetlands, wildlife trees, talus slopes, and caves, and a research and monitoring program to evaluate aquatic resources, theoretical models, and key wildlife guilds during the permit period. The research and monitoring program is funded entirely by Plum

forage for grizzly bears. Non-forested areas (e.g. alpine zones and talus slopes) occupy approximately 12% of the planning area.]

### Adaptive management

The HCP has been designed as a "living document," and will utilize adaptive management (see Buchanan, this issue). The key element is the ability to improve the conservation effort if needed without conflicting with the overall goals of the HCP or the provisions of the No Surprises policy (see Dohner and Smith, this issue). To achieve this balance, Plum Creek voluntarily suspended the No Surprises policy in several specific areas of the HCP: watershed analysis, riparian habitat effectiveness, and spotted owl demography. For instance, aquatic monitoring and watershed analysis may indicate that the HCP buffers are not providing enough shade to maintain low water temperature. In that case, buffer prescriptions will be adjusted to provide more shade. In another example, deviation of observed numbers of spotted owl pair sites of more than 20% of those projected by the model (Irwin and Hicks 1995) would trigger the designation of additional harvest deferrals or extension of the time for existing deferrals. The intent of the adaptive management strategy is to provide the ability to incorporate new information that enhances the effectiveness of habitat protection.

### HCP implementation

Since the HCP was approved by the FWS and NMFS in June 1996, Plum Creek has been implementing procedures, standards, guidelines, and policies specified in the plan. Employees and contractors have been thoroughly briefed on the requirements established in the HCP. Watershed analysis, which Plum Creek was involved in prior to HCP approval, has been initiated or completed in 11 of the 20 watershed units in the planning area. Plum Creek has completed a series of "pre-harvest reviews" of upcoming timber harvest and road construction projects with members of state and federal agencies, tribes and the environmental

community, to give interested people more insight as to how the HCP will be implemented on the ground. The company has begun work with faculty from the University of Washington to design specific research projects in accordance with the research and monitoring program. Finally, biological data, such as sightings, habitat information and survey records, are being shared with state and federal biologists.

### Conclusions

Plum Creek's intent in completing and implementing its Cascades Habitat Conservation Plan is to use a recognized process in the ESA to develop a scientifically credible, legally defensible, and economically feasible ecosystem management plan for a very challenging landscape of conflicting land-uses and checkerboard ownership. For Plum Creek, the HCP is not only a biological plan, but also a business plan, guiding policies, actions, and investments for many years to come. As ambitious as it may seem, the HCP does not resolve all the issues facing resource managers in the I-90 corridor. Complex land management issues in this controversial area will require multiple and coordinated resolution processes. In addition to the HCP, Plum Creek and other stakeholders will be involved in land exchanges, land sales, and access planning to resolve resource management issues in the I-90 corridor.

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# The U.S. Fish and Wildlife's Red-cockaded Woodpecker Private Lands Conservation Strategy: An Evaluation

Ralph Costa

While debate on the role of private lands for conserving listed species continues and policy evolves, there is a critical need to implement and evaluate conservation strategies today. In the case of red-cockaded woodpeckers (*Picoides borealis*; RCWs), not doing so ensures the unremitting loss of birds on private lands. Currently, 969 active clusters are known to exist on private lands in 11 states (Costa and Walker 1995). Many accounts document the long-term decline and extirpation of RCWs on private lands across their range, at least through 1992; statewide reports are available for North Carolina (e.g., Carter et al. 1995b); South Carolina (Cely and Ferral 1995); Georgia (e.g., Baker 1995); Florida (DeLotelle et al. 1995); Arkansas (James and Neal 1989); and Texas (Ortego and Lay 1988). Additional assessments discuss range-wide trends (Thompson 1976; Ligon et al. 1986; James 1995). The loss of RCWs results from a variety of factors, acting independently or cumulatively. These factors include habitat loss (human or natural caused), habitat degradation (e.g., fragmentation, hardwood midstory development), group/population isolation, and perhaps genetic uncertainty (Stangel et al. 1992).

In 1992, the U. S. Fish and Wildlife Service (FWS) acknowledged that the loss of private land RCWs represented significant species viability and recovery problems, and recognized that solutions would require a strategy grounded in avian ecology and involving innovative conservation partnerships (Costa 1995). Subsequently, the FWS developed a private lands conservation strategy which has been aggressively implemented, modified as necessary based on new scientific findings, and regularly evaluated to ensure objectives are being achieved. The objectives of the private lands strategy are to (1) increase the acreage of private land habitat under management conducive to RCWs; (2) maintain or increase the larger existing RCW populations on private lands; (3) rescue RCW groups from

private lands that will be lost as a result of demographic and/or genetic uncertainty; (4) foster and develop cooperative partnerships between and among federal, state, and private parties responsible for and/or interested in RCW recovery; and (5) increase the size of designated recovery and support (private, state or federal) populations, while pursuing objectives 1-4 (Costa 1995).

The initial development of the strategy was based on several premises: (1) delisting the species will be dependent primarily on public lands (FWS 1985); (2) some minimum number of potential breeding pairs is required to maintain even short-term demographically and genetically viable populations (Reed et al. 1988; U.S. Forest Service 1995; Letcher et al., in review); (3) genetic resources being lost with extirpated populations have value (Haig and Nordstrom 1991; Haig et al. 1993; Stangel et al. 1992); and (4) compared to owners of small acreage, landowners with large acreage are more willing and capable of aggressively managing habitat for RCWs (Costa 1995).

In order to achieve its strategic objectives, the FWS has implemented three types of agreements involving private landowners: (1) "No-Take" management plans implemented via Memorandums of Agreement (MOA); (2) Safe Harbor cooperative agreements; and (3) habitat conservation plans (HCPs). No-Take management plans and Safe Harbor agreements directly result in maintaining extant RCW populations and their associated habitat. Additionally, depending on the landowner's objectives, they are frequently designed to result in increases of RCW populations and increases in habitat protection and management. HCPs, authorized under the Endangered Species Act (ESA), offer a variety of mitigation options that may or may not increase RCW habitat on private lands; however, they are always designed to result in at least a "no net loss" of RCW groups. More

detailed descriptions of these programs are provided in the following sections.

## No-Take management plans/Memorandums of Agreement

Memorandums of Agreement (MOA) represent a conservation and legal agreement between the FWS and a corporate landowner. The agreement outlines management and conservation actions by which the corporation can satisfy (and typically exceed) the ESA and FWS private land habitat retention and management guidelines, and meet the corporation's land management and conservation objectives. Corporate actions typically include: (1) population monitoring; (2) management and retention of current and future nesting habitat; (3) production and maintenance of foraging habitat; (4) establishment of mitigation banks; (5) cooperative population/habitat research; (6) internal and external education and outreach initiatives; and (7) serving as a donor population for other populations. Several MOA also include state wildlife agencies or national forests as partners/cooperators.

In exchange for the development and implementation of an acceptable, negotiated RCW management plan, the corporate partner is assured that its legal responsibilities under the ESA are being satisfied. While minimizing ESA compliance risks is valuable to corporations, other motivations include: (1) prestige associated with being the first to establish a unique agreement; (2) satisfaction in promoting and practicing good wildlife stewardship; and (3) simplifying management by consolidating their RCW population (Costa and Edwards, in press).

The first RCW MOA was developed by the Georgia-Pacific Corporation and approved by the FWS in 1992 (Wood and Kleinhofs 1995). This agreement established a framework for a process that the FWS has repeated with 9 (5 approved, 4 pending) other corporate forest landowners. To date, 66,046 acres of habitat (30,246 signed; 35,800



pending) are protected/managed in MOA with the FWS. Under these MOA, at least 280 active clusters (29% of RCW groups known on private land) are being protected and managed.

### Safe Harbor

Under a Safe Harbor cooperative agreement a landowner agrees to actively maintain suitable habitat (i.e., a 'safe harbor') for a number of RCW clusters equal to the number present when the agreement is formulated. In turn, the landowner receives an incidental take permit, authorizing a land management action or change that alters RCW occupied habitat (e.g., a timber sale that results in the loss of), for any additional RCW groups that may occupy the property in the future as a result of voluntary, beneficial land management practices. The Safe Harbor program provides multiple conservation benefits. First, and perhaps most importantly, Safe Harbor agreements result in direct habitat improvement and maintenance for all baseline RCW groups enrolled in a conservation agreement. This habitat management goes beyond what the ESA specifically requires of private landowners. Second, Safe Harbor agreements should result in at least a short-term, but more likely a long-term, increase in the number of RCW groups in the local population. These increases, even though potentially transitory in nature, help to stabilize existing populations, while simultaneously buying time for the investigation and development of other, perhaps more permanent, conservation strategies and measures (FWS 1985). Additionally, Safe Harbor promotes conservation and management of significant local and regional longleaf pine habitat, even if RCWs do not currently occupy the property or habitat enrolled. Costa and Kennedy (1996) provide additional details regarding the application and benefits of the Safe Harbor concept.

The nation's first Safe Harbor permit was issued to the FWS's RCW Recovery Coordinator in April 1995 and covers a 6-county area in the Sandhills of North Carolina. Cantrell et al. (in review) provide details on the development of this first Safe Harbor permit. In the first 22 months of its implementation, 24 landowners had enrolled 21,541 acres in the

program. These landowners currently harbor, in whole or in part, the nesting and foraging habitat of 46 RCW groups and can potentially support in the future an additional 61 groups. Another 13 landowners are currently preparing to enroll in the program. They harbor, in whole or in part, the nesting and foraging habitat for 11 RCW groups, and can potentially support another 21 groups on their 9,002 acres. Most of the existing baseline groups in the agreements (signed and pending) are part of the designated Sandhills of North Carolina RCW recovery popula-



Red-cockaded woodpecker (*Picoides borealis*). Photograph by Jerome Jackson.

tion. Their protection and management, via incorporation into the Safe Harbor program, substantially increases the security of this potential recovery population and therefore the probability that it can reach recovery status. The creation of additional RCW groups under the program will further stabilize this important recovery population.

Because Safe Harbor agreements provide multiple conservation benefits for the RCW, the FWS is promoting and supporting expansion of RCW Safe Harbor initiatives. Safe Harbor programs are currently being developed for incorporation into statewide RCW conservation plans for Alabama, Georgia, Louisiana, South Carolina, and Texas. The FWS

anticipates that as many as 200+ RCW groups will be protected and managed via Safe Harbor agreements under these statewide plans. Currently, North Carolina and Florida are considering similar initiatives.

### Habitat conservation plans

The FWS issued its first RCW HCP incidental take permit in 1995. The permits issued to date have been in response to landowner requests to either harvest timber resources for land management objectives or development projects. Mitigation for RCW HCPs typically requires in-kind (i.e., equivalent breeding status; e.g., potential breeding pair or single bird) replacement of the group. Suitable mitigation is developed on a case-by-case basis and involves decisions on various issues, including number and location of recruitment clusters, monitoring responsibilities, number of birds to translocate, if any, funding and implementation responsibilities, and the number of years needed to achieve mitigation. Currently, three alternatives exist for establishing a new RCW group: (1) creating a recruitment cluster in a secure population; (2) translocating juvenile RCWs to an unoccupied territory; or (3) a combination of strategies 1 and 2.

#### Artificial recruitment clusters

Generally, HCP mitigation recruitment clusters are established in populations containing at least 40 active clusters. Recruitment clusters are located in suitable but unoccupied habitat, and typically consist of at least four artificial cavities or three artificial cavities and two cavity "starts." Recruitment clusters are established by constructing artificial cavities in suitable trees where dispersing RCWs are likely to find them. Artificial cavities can be created using the drilling technique (Copeyon 1990; Taylor and Hooper 1991) or by installing cavity inserts (Allen 1991). Many accounts and various data sources support the conclusion that recruitment clusters are occupied with a high success rate (e.g., Carter et al. 1995a).

To determine the length of time required for recruitment cluster occupancy, the FWS examined all available data sets. Recruitment cluster (n=36) occupancy rates were gathered from all known (n=4) public land subpopulations

or populations ranging in size from 45 to 380 active clusters where (1) breeding status was closely monitored; (2) clusters were in place long enough to provide outcome data (i.e., at least four years); (3) no RCWs were translocated to recruitment clusters; and (4) the majority of recruitment clusters consisted of between two and four artificial cavities and between zero and three starts. After four breeding seasons, 33 of 36 (92%) recruitment clusters were occupied by potential breeding pairs. Based on these data, an HCP applicant choosing to provide only one recruitment cluster for each group identified for incidental take should expect to participate in a four-year mitigation program. Regardless of the number of recruitment clusters an HCP applicant chooses to provide for each group to be incidentally taken, all permits are still issued for at least four years. However, because mitigation is considered successful upon creation of an equivalent RCW group, most landowners choose to mitigate at more than a 1:1 ratio of recruitment clusters to incidental take groups. Doing so essentially guarantees that their efforts will result in a replacement group in less than 4 years while simultaneously increasing the mitigation population by more than 1 occupied territory; a result beneficial to both the landowner and RCW recovery.

#### *Translocations*

Prior to 1986, RCW translocations had met with limited success (Odum 1983; Reinman 1984). However, in 1986, 2 solitary male groups were successfully paired with translocated females; both groups produced and fledged young in 1987 (DeFazio et al. 1987). In 1989, the U.S. Forest Service began using translocations as a standard conservation technique. Since 1989, translocations have been used to successfully augment single bird groups (Allen et al. 1993; Hess and Costa 1995) and to create "new" groups (Rudolph et al. 1992; Allen et al. 1993). Costa and Kennedy (1994) summarized the results of the first 143 translocated RCWs (1989-1994). Based on a liberal interpretation of success, which included successful breeding birds and birds not documented to have bred but that were classified as "pair bonded,"

"paired," etc., 66% (n=44) of juvenile females and 57% (n=7) of juvenile males were successful. Preliminary and more rigorous summaries of translocation data indicate that at least 43% of juvenile females and 27% of juvenile males became breeders. These data were based on a sample of 77 (51 females, 26 males) RCWs translocated between 1989 and 1995; only birds with known outcomes were included in the analyses.

Based on the above translocation success rates and assuming normal sex ratios and fledgling rates, a 4-year mitigation time period typically will be sufficient to establish a replacement potential breeding pair. Although a few HCP participants are using this technique as their primary mitigation method, most utilize either the recruitment cluster option or a combination of recruitment clusters and translocations. Those participants harboring single bird groups only have the recruitment cluster alternative available to them.

#### *HCP summary*

Since 1995, the FWS has processed 8 (7 issued, 1 pending) incidental take permits for existing groups of RCWs on private lands. Under these permits issued to individual landowners, 27 groups (2.8% of known groups on private land) of RCWs have been authorized for incidental take, pending completion of mitigation. The mitigation for the HCP participants harboring the 27 RCW groups (21 potential breeding pairs and 6 solitary males) includes the potential and probable establishment of 51 new groups, at least equivalent in breeding status to the incidental take groups, via the creation of recruitment clusters and/or RCW translocations. This 1:1.9 ratio (incidental take groups:new groups) will result in more RCW groups post-HCPs than pre-HCPs; an increase of 24 groups is possible. Additionally, prior to HCP participants clearing any occupied RCW habitat after completion of mitigation, the FWS must be contacted and offered an opportunity to translocate the resident RCWs to a secure population.

Translocating resident (i.e., groups occupying and defending a territory) RCW groups has met with limited success when evaluated on the basis of the original

group remaining intact at the recipient translocation cluster (Odum et al. 1982; Allen et al. 1993). Carrie et al. (1996) reported that a solitary male demonstrated strong homing behavior when translocated from its territory. However, Carrie et al. (1996) also noted that 4 of 9 (44%) resident RCWs representing 2 different groups, when translocated from their territories, were incorporated into the recipient population as members of breeding pairs. Therefore, in addition to new RCW groups that will become established via required HCP mitigation, it is probable that some percentage of the resident RCWs authorized for incidental take will also contribute to new potential breeding pairs when translocated.

The 51 mitigation clusters for the 8 HCPs are located on federal (n=30; 59%), state (n=12; 23%), and private (n=9; 18%) lands. The FWS always attempts to locate and secure suitable private lands as mitigation sites. However, to achieve a net benefit for the species all mitigation sites must have an approved RCW habitat and population management program/plan and generally be capable of harboring a larger population than the one involved in the HCP. All mitigation sites are either a designated recovery population or a protected support population. While there are no guarantees that all 51 groups will be created (only 27 required to equal a no net loss), there are compelling data to suggest that a high percentage of them will be.

#### **Conclusion**

The realized successes of the private lands strategy to date are founded in (1) consistent application of habitat guidelines; (2) its complementary relationship to the recovery plan; (3) the notion that all landowners do not have equivalent ecological or economic resources to protect and manage RCWs; (4) the reality that all RCW territories do not have equivalent recovery value; (5) implementation of successful mitigation techniques when incidental take is involved; and (6) the biological recognition that while some RCW groups cannot be maintained *in situ*, many can be sustained as long as there is significant landowner commitment to long-term habitat and population maintenance.

During the past 5 years, the FWS has aggressively pursued conservation partnerships with many private landowners harboring RCWs. Though the circumstances of partnerships vary, all rely on a high level of trust between the FWS and the private sector regarding RCW conservation. This increased cooperation among the FWS, state agencies, and the private sector is perhaps best exemplified by the strong, diverse statewide conservation coalitions that have formed to address the complex issues of RCW recovery within their individual states. There is new support among the private sector for working toward RCW recovery. Private landowner participants see the possibility of success at the local level and are therefore willing and anxious to not only support recovery, but to contribute to it. This change in attitude is significant and must not be underestimated for its conservation potential. Following are brief summaries of how the FWS RCW private lands strategy objectives have been met to date.

*Objective 1: Increase the acreage of private land habitat under RCW management.* Since 1992, private landowners have enrolled 96,589 acres (66,046 in MOA; 30,543 in Safe Harbor) of RCW habitat in FWS partnership agreements. This habitat is being protected and managed to maintain and/or increase extant RCW populations. No (0) acres were enrolled in FWS agreements in 1991.

*Objective 2: Maintain or increase the larger existing RCW populations on private lands.* Since 1992, private landowners have protected 349 groups of RCWs (280 in MOA; 69 in Safe Harbor) in FWS agreements; representing 36% of RCWs known on private lands. No (0) RCW groups were protected under FWS agreements in 1991.

*Objective 3: Rescue RCW groups from private lands that will be lost due to demographic uncertainty.* Under approved HCPs, incidental take permits have been authorized for 13 (7 potential breeding pairs and 6 solitary males) demographically isolated groups. Mitigation for the expected eventual loss of these groups includes the establishment of 21 new groups on other lands (10 state, 9 federal, 2 private).

*Objective 4: Foster and develop cooperative partnerships between and among federal, state, and private parties responsible for and/or interested in RCW recovery.* Via MOA and Safe Harbor agreements, long-term partnerships have been developed with national forests, golf courses, state wildlife agencies, mines, industrial forest landowners, horse farms, non-industrial forest landowners, and others. Via HCPs, short-term partnerships have been developed with numerous parties serving as mitigation sites, including national forests, military installations, non-industrial forest landowners, state forests, Nature Conservancy preserves, and others.

*Objective 5: Increase the size of designated recovery and support (private, state or federal) populations, while pursuing objectives 1-4.* Via HCPs, 4 recovery populations and 2 support populations will be increased by a total of 39 active clusters and 8 active clusters, respectively. The above increases assume all HCP mitigation sites will eventually become occupied, a high probability based on existing data. The increases do not include the possibility of additional groups created by translocating the resident groups authorized for incidental take.

The "conservation effect" of the accomplishments (signed or pending) to date (349 RCW groups protected; 96,589 acres enrolled) under the FWS RCW private lands strategy are significant. The majority of RCWs remaining on private land today, and new groups established in the future, can and will play a significant and critical role in reaching and maintaining the recovery objective of 15 viable populations. As noted by Costa and Edwards (in press), key private land habitat and its associated RCW populations can contribute to recovery and support populations by (1) increasing their size and stability; (2) providing corridors of habitat or island populations between or in close proximity to other recovery or support populations; and (3) contributing juveniles to maintain demographic and genetic health and increase population size.

In addition to the conservation programs outlined in this paper, the FWS is interested and/or involved in other RCW conservation strategies, including: (1) land purchase and transfer to public or

protected private ownership; (2) encouragement of increased levels of public (state and federal) land management; and (3) landowner incentive programs. Under the category of landowner incentives, there are multiple programs that have the potential to contribute directly to conservation of private land habitat and RCW territories, including: (1) habitat trading (Bonnie and Bean 1996); (2) tradable endangered species certificates (Kennedy et al. 1996); (3) Safe Harbor (Costa and Kennedy 1996); and (4) tax credits/reforms and conservation easements (The Keystone Center 1995).

Saving the RCW over the short-term requires a conservation strategy that integrates private and public land initiatives with the goal of growing as many of the designated recovery and support populations to as large a size as possible as quickly as possible. The public and private forests are available and can be made suitable, the technologies (artificial cavities and translocations) to grow RCW populations have been tested and proven successful, and the legal responsibility for the public land agencies is clear. Only one RCW population in existence (Apalachicola Ranger District, Apalachicola National Forest, Florida) is currently classified as "recovered;" all others have to be considered at some level of genetic and/or demographic risk. Important areas of private land habitat and critical supplies of RCWs, capable of helping save, maintain, and/or increase recovery and support populations on federal, state, and private lands, are available through Safe Harbor and MOA, and statewide and individual HCPs. Private land birds should and do have a role in species recovery. The FWS is, and will remain, keenly aware of the value of RCWs and their habitat on private lands, our record speaks for itself.

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# Strategies for Conservation of the Endangered Red-cockaded Woodpecker on Private Lands

Robert Bonnie

During the 1980s, it became clear that the U.S. Forest Service's continued reliance on short rotation, intensive forestry was anathema to the habitat needs of the endangered red-cockaded woodpecker (*Picoides borealis*; RCW). Armed with data detailing the decline of the woodpecker on the Texas National Forests, environmentalists went to court to compel the agency to abide by the Endangered Species Act (ESA). In 1988, environmentalists won and forced the U. S. Forest Service to reassess management of its southern pinelands in order to meet the habitat needs of the RCW (McFarlane 1992).

The lesson from this and other lawsuits is that rigorous enforcement of the ESA is a highly effective strategy to protect listed species on public lands. However, one cannot assume that such a strategy will work on private lands, especially with a species such as the RCW that requires proactive habitat management. Private landowners have different legal obligations under the ESA than do public land managers, and face entirely different incentives in managing their lands. A different approach is therefore needed on private lands, one that relies not just on the threat of penalties and enforcement but also on incentives.

When used thoughtfully, habitat conservation planning provides the flexibility to create incentives for private landowners to protect RCW habitat. This paper discusses the limitations of the ESA for RCW conservation on private lands, criticizes the U.S. Fish and Wildlife Service's (FWS) current private lands policy, and offers an alternative strategy utilizing HCPs to benefit both private landowners and RCWs.

## Public versus private land paradigms

Under the ESA, the U. S. Forest Service and other federal land managers are required to manage federal lands to further the conservation of the RCW and other listed species. Doing so means providing the RCW's two basic needs—

old pine trees and fire. Old pines supply nesting and foraging habitat for RCWs, while fire sustains the park-like pine forests the woodpeckers require. Frequent, low intensity fires once swept through the forests of the southeastern and gulf coastal plains, suppressing hardwood undergrowth but doing little or no damage to the fire-resistant pines. With the interruption of the historic fire regime, landowners must periodically and painstakingly set fire to the herbaceous understory beneath their pines to maintain the RCW's habitat.

Unlike federal land managers, private landowners have no legal obligation to utilize fire or any other means to control hardwoods. While the ESA's broad prohibition of actions that "harm" threatened and endangered species prevents private landowners from harvesting the nesting and foraging habitat of RCWs, the law does not require private landowners to engage in affirmative management for listed species. After nearly 25 years of ESA protection, the RCW continues to decline dramatically on private lands (James 1995; Cely and Ferral 1995)—lack of fire is a prime culprit.

Logging has also been a significant cause of habitat loss on private lands (Cely and Ferral 1995; Ortego and Lay 1988). Theoretically, increased enforcement of the ESA on private lands should remedy this threat, but the ESA's strong take prohibition has significant limitations on private lands. The FWS does not know the location of the estimated 700-1,000 RCW groups on private lands, and lacks the resources to monitor these groups to determine if and when the take prohibition has been violated. More importantly, gaining access to private lands for enforcement purposes would be difficult. Finally, a lot of habitat destruction near RCW nests does not immediately result in a dead RCW (see Jackson, this issue). For all these reasons, proving that a prohibited take has occurred in such circumstances would be extremely difficult.

Even if vigorous enforcement were possible, nothing stops private landowners

from simply refusing to set their woods ablaze. Over time, a lack of proactive management (in this case prescribed fire) will lead to a loss of RCWs. Therefore, a conservation strategy that balances the RCW's future on private lands solely on the thin reed of enforcement is a loser.

## The FWS's evolving approach to RCWs

In forging a strategy to protect RCWs on private lands, the FWS first looked to the forest industry to protect remaining RCWs on company lands. In 1992, the FWS signed a Memorandum of Agreement (MOA) with Georgia-Pacific to protect approximately 100 breeding groups in Arkansas. This was the first of eight such MOAs (see Costa, this issue). These MOAs are essentially "no take" agreements under which companies agree both to protect occupied habitat and to undertake management activities such as prescribed fire.

In the last two years, the FWS has turned from these MOAs to HCPs that allow take of existing RCWs by a variety of different landowners, including forest industry, non-industrial private landowners, and developers. These HCPs, both proposed and enacted, have taken two forms: (1) statewide HCPs for "demographically isolated" groups of RCWs; and (2) individual HCPs for landowners seeking to rid themselves of RCW habitat. (A third type of HCP, called Safe Harbor, is discussed below.)

### *Demographic isolation*

In 1996, Secretary of the Interior Bruce Babbitt traveled to Georgia to announce the "first-of-its-kind" statewide HCP for RCWs. The proposed Georgia plan and a more recently proposed Texas HCP would allow landowners with "demographically isolated groups" of RCWs to take these birds in exchange for mitigation on federal lands. The FWS reasons that these HCPs are beneficial because RCWs are being lost as a result of habitat fragmentation and subsequent isolation from larger populations. While

fragmentation of RCW habitat is a serious concern, these proposed HCPs are based on faulty science and could actually further isolate many RCWs on private lands.

The FWS has defined a "demographically isolated group" as being separated from a larger RCW population by 3 to 5 miles of intervening habitat—a standard purportedly based on research from the Texas National Forests. Yet, Dr. Richard Conner, the U. S. Forest Service scientist who performed the research in question, has noted "those distances were developed to deal with specific situations of management triage and subpopulations on national forests; they were not developed as distances to decide what groups should be doomed to extirpation. The use of these distances for the [Texas statewide] HCP is really out of context from what they were initially developed" (Conner 1996).

Ironically, setting a 3 to 5 mile standard for demographic isolation may actually worsen the problem by liquidating a sizable portion of private land habitat and thereby increasing forest fragmentation for remaining groups on private lands. The draft Georgia HCP and the proposed Texas HCP contemplate the loss of 22 to 24 and 2 to 10 known RCW groups, respectively.

There is also the practical problem that neither the FWS nor state agencies know where all RCWs occur on private lands; without that knowledge, establishing the fact of demographic isolation is impossible. Most private landowners are unlikely to provide access for RCW surveys, without which it is impossible to know what is and is not a demographically isolated group. In short, the FWS's approach to demographic isolation is poorly conceived and could result in the unnecessary loss of many RCWs on private lands—the cumulative effects of which could be very damaging.

#### *Individual HCPs*

While proposed statewide HCPs for demographically isolated groups have attracted attention from the media and environmentalists, little noticed have been seven recent HCPs for individual landowners that have permitted the loss of 21 woodpecker groups in exchange for questionable mitigation.

For example, one North Carolina landowner's HCP permits him to take 12 groups of birds occupying some 1,121 acres of his 8,000 acre property. In return, the landowner agreed to mitigate the loss of these 12 groups on his land by paying for the drilling of artificial nesting cavities for an equal number of groups on the Croatan National Forest. The HCP does not require that any new groups actually



**RCW nesting cavity. Photograph by R. Costa.**

become established. Moreover, the mitigation expenses are capped at \$45,000, whether or not this sum is sufficient to establish 12 breeding pairs in four years.

This HCP and several others like it set a very damaging precedent for RCW conservation on private lands. First, by mitigating losses of private land habitat on federal lands, private landowners are essentially paying the U. S. Forest Service to do what it is already required to do under the ESA—recover RCWs. More importantly, because the U. S. Forest Service is already managing national forests for RCWs and thus providing the suitable habitat, mitigation by means of drilling artificial cavities there is very cheap. By allowing mitigation onto federal lands, the FWS is in fact creating a powerful incentive for private landowners to liquidate RCW habitat.

The mitigation criteria in these HCPs are also suspect. To date, of eight approved (plus 1 pending) RCW HCPs permitting the loss of nearly 30 groups on private lands, only one plan, affecting a single group, requires that mitigation result in the establishment of occupied RCW habitat. For 27 groups, mitigation only need be attempted. Again, by cheapening mitigation, the FWS is facilitating the loss of RCWs. Such an approach has the potential to destroy a few groups at a time, a significant proportion of privately owned RCW habitat.

#### **A better way: Safe Harbor**

During the fall of 1996, Hurricane Fran roared through the Sandhills region of North Carolina, knocking down power lines, street lights and pine trees. Following the storm, a private landowner in the Sandhills called the local field office of the FWS to report a fallen RCW cavity tree. If you are familiar with the typical reaction of private landowners to RCWs, then this may strike you as odd. Many landowners would interpret the loss of a cavity tree as a sign of divine intervention and would only be sorry that the storm had not taken every cavity tree. But this private landowner not only reported the loss, he actually requested that the FWS immediately dispense a biologist to drill a replacement cavity! What would cause a private landowner to do such a thing? Answer: the Safe Harbor program.

While there is much to criticize about the FWS's other approaches to RCWs on private lands, the Safe Harbor program has to date been an immense success for both landowners and RCWs. The program was established over two years ago in the six-county Sandhills region, home to a designated RCW recovery population centered around Fort Bragg Army base and the State owned Sandhills Gamelands. However, as in many RCW recovery populations, the public land base is not sufficient to meet the recovery goal. Fort Bragg and the Gamelands are separated by several miles of intervening privately owned habitat that has been declining steadily for years.

Many area landowners were reluctant to use prescribed fire or extended timber rotations for fear of attracting

RCWs. These landowners understood that having more RCWs means more land-use restrictions—a powerful and perverse incentive for landowners to undertake passive or active destruction of potential habitat. It was this dilemma that spawned the Safe Harbor HCP.

The purpose of the Safe Harbor program is to stabilize RCW habitat while eventually increasing occupied habitat on participating properties—something no other RCW HCP has even contemplated. Under the program, landowners agree to protect the baseline habitat conditions (all currently occupied habitat) and to enhance RCW habitat on their property through prescribed fire, mechanical hardwood removal, artificial cavity construction, or other means. In return, the FWS agrees that the landowner will not be liable for further restrictions should the number of RCW groups increase on the property—thus removing any disincentive to habitat restoration.

Since April, 1995, 23,000 acres in the Sandhills have been enrolled in Safe Harbor. On participating lands, landowners are actively managing the habitat of nearly 50 baseline groups—an important advancement given historic annual losses of 4 to 12% of RCWs on private lands in the Sandhills. Moreover, it is possible that populations on enrolled lands could as much as double thanks to the proactive management of participants. In addition, a number of participants, such as the landowner who reported the fallen cavity tree, seem to have developed a genuine affection for their resident woodpeckers.

### Improving Safe Harbor with mitigation markets

Some landowners have little desire even to maintain the woodpeckers they have, much less enter into a Safe Harbor agreement, and will only be satisfied with an incidental take permit. On the other hand, other landowners can live quite comfortably with the RCW. In the case of hunting reserves, golf courses and even some forest products companies, for example, RCWs can be compatible with their desired land-use. These landowners are more likely to be Safe Harbor participants and are, therefore, willing to increase RCW habitat under a Safe Harbor agreement—especially if they are paid to do so.

Rather than mitigate RCW losses through HCPs on public lands, the FWS should take advantage of the fact that Safe Harbor landowners may be willing to increase their RCW populations in exchange for a mitigation fee (Bonnie and Bean 1996). Under this scenario, once new habitat becomes occupied on lands enrolled in the Safe Harbor program, participants could market the rights to newly created groups to those landowners seeking an incidental take permit.

In exchange for a mitigation payment, the Safe Harbor landowner would increase his or her Safe Harbor "baseline" accordingly, thereby placing the newly occupied habitat under the full protection of the ESA. This landowner would benefit financially from the sale of Safe Harbor rights. So too would the mitigating landowner who would be able to choose the cheapest willing seller(s) in the mitigation market.

Safe Harbor mitigation would be a vast improvement over mitigation practices currently used by the FWS. First, it requires that mitigation for loss of privately owned RCW habitat take place on private land rather than on federal land, thereby resulting in no net loss of habitat. Second, Safe Harbor mitigation requires that mitigation actually be successful in that a breeding pair has to be established prior to the trade taking place.

Equally important, a Safe Harbor mitigation market changes the incentives under which landowners now operate. When landowners recognize that an endangered species could actually be a source of income to them, they will be far more willing to enroll in the Safe Harbor program and thereby protect, enhance and expand occupied RCW habitat. Rather than facilitating the loss of RCW habitat on private lands, as most RCW HCPs have done to date, Safe Harbor mitigation would increase the number of private landowners willing to provide RCW habitat.

### Lessons from RCW protection

What are the lessons to be gleaned from recent efforts to conserve RCW habitat on private lands? First, HCPs are not necessarily a positive conservation tool. Indeed, the FWS is expediting the loss of RCW habitat because it fails to understand the perverse incentives

created by some HCPs such as the proposed Georgia plan.

However, carefully crafted HCPs, unlike traditional ESA enforcement, have the potential to address the need for proactive management, such as the vital need for landowners to utilize fire to maintain RCW habitat. For example, the Safe Harbor program, which combines the positive aspects of the ESA's take prohibition with regulatory flexibility, promotes voluntary stewardship by private landowners. Expanding the program to allow landowners to sell RCW mitigation would foster increased conservation.

Significantly, whereas the ESA has often fostered confrontation on private lands, HCPs provide an opportunity to engage landowners in proactive conservation. Such cooperation by private landowners is increasingly critical given the growing recognition that conservation of privately owned habitat is critical to the success of the ESA (Wilcove et al. 1996). For the RCW and many other threatened and endangered species, recovery is impossible without the voluntary stewardship of private landowners.

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# Niche Concepts and Habitat Conservation Planning

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In wildlife management, differences often occur between theory and management, and may result from lack of information transfer, economic costs of implementing new ideas, oversimplification of problems, lack of understanding, or simply resistance to new ideas. When dealing with an endangered species, however, it is particularly important to incorporate the best available information into recovery efforts. In the case of widespread, yet resident endangered species such as the red-cockaded woodpecker (*Picoides borealis*; RCW), an endangered bird of old growth, primarily fire climax, pine forests in the southeastern United States, oversimplification of problems is particularly serious.

This article addresses the problem of oversimplification, using the red-cockaded woodpecker as an example. The article focuses on the lack of consideration of niche concepts and resultant problems with management efforts, such as those associated with management of populations on private lands under Memorandum of Agreement, Safe Harbor, individual habitat conservation plan (HCP), and proposed statewide HCP approaches (see Costa, this issue).

## Niche concepts

The niche of a species is the role it plays within its ecosystem. It is multidimensional, including such things as habitat in the sense that habitat influences what an individual does. The niche is dynamic, varying in time and space in concert with changes in living and non-living components of the species' habitat, interactions among habitat components, the dynamics of the species' population, and the physiological state of the individual. Across the range of the RCW, for example, we know that the nature of its habitat varies from linear strands of

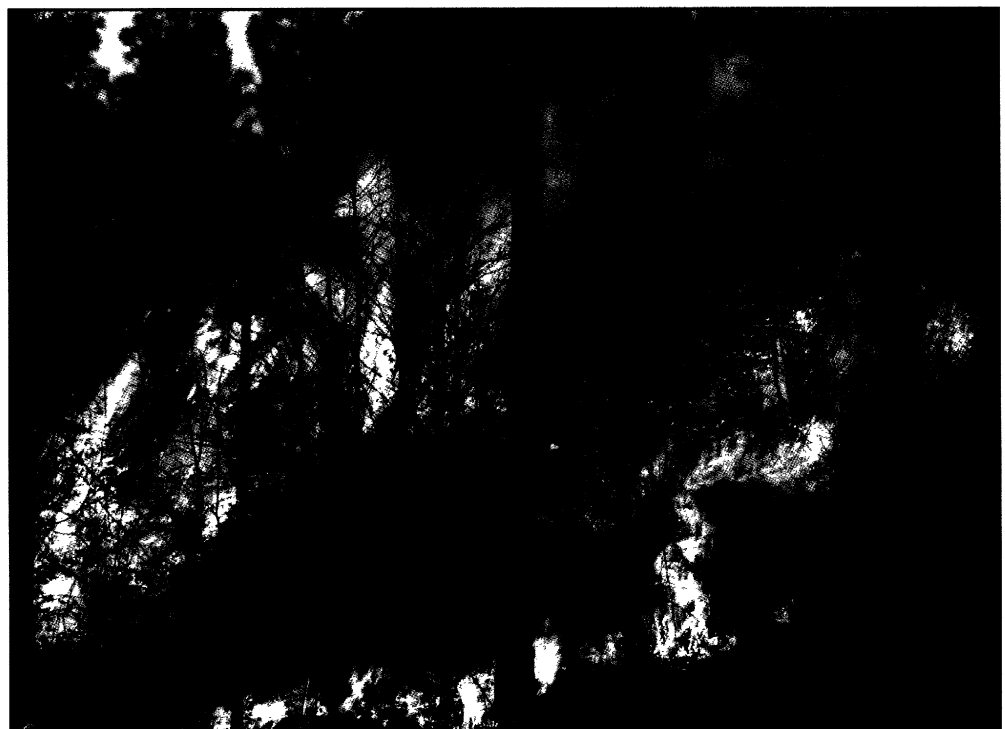
pine-hardwood forest on ridges of the Cumberland Plateau of Kentucky, to extensive shortleaf (*Pinus echinata*) and loblolly (*P. taeda*) pine forests of central Mississippi, to the barrens of longleaf pine (*P. palustris*) flatwoods of central Florida, to the slash pine (*P. elliottii*) islands of south Florida (Jackson 1994). The combination of these and other habitats the species occupies, and the full range of other factors that influence the species, define the RCW's *fundamental niche*—the niche of the species. The breadth of the fundamental niche is important in that it reflects the adaptability of the species and its potential for surviving environmental change. As a result of its resident status and adaptation to local conditions, no population is likely tolerant of the full range of conditions tolerated by the species. The lesser breadth of the niche of the local population or the individual is its *realized niche*.

## Problems with RCW management

The first problem with RCW management is the effort to implement a "one-size-fits-all" recipe for the species.

It does not make ecological sense to say that the RCW needs foraging habitat that includes the same specific number of trees across the bird's range or even within the same pine type. Yet that is what is called for in the Recovery Plan for the species (Lennartz and Henry 1985) and in the U. S. Fish and Wildlife Service's (FWS) private land guidelines (Costa 1992), both of which have been widely implemented, although the latter remains in "draft" form. For example, in coastal South Carolina, longleaf pines can grow to a meter in diameter and nearly 40 meters (m) tall, whereas the same species in the Florida flatwoods may reach less than half a meter in diameter and 13 m tall. The amount of foraging substrate provided by the two extremes is incredibly different. In short, management plans have emphasized, at best, mean habitat requirements for the species based on our knowledge of its fundamental niche, and at worst, the imposition of habitat across the species' range based on our understanding of the realized niche of a local population.

The second problem, and one that exacerbates the first, is that Recovery



Wildfires traditionally maintained the open understory necessary for good red-cockaded woodpecker habitat (at right). Photograph by R. Costa.



Plan recommendations are generally compromises based on minimum rather than optimum requirements (Ligon et al. 1986), and that requirements for private lands (Costa 1992) have been established that are much lower than those suggested in the Recovery Plan. The justification for lowered requirements on private lands has been that private land populations are not considered "recovery populations" and that the intent of management is different. For private lands the intent is to avoid "take" (e.g., kill, harm, or harass) of the species.

"Take" has been defined legally to include habitat destruction. A key component of the RCW's fundamental niche is the incredibly strong tie between adult males and their cavity trees. An adult male will only rarely abandon the cavity tree cluster, even if the surrounding foraging habitat is clearcut and his mate has died or dispersed (Jackson 1994). Therefore, the effect of habitat destruction is not immediately evident in that the cavity cluster remains "active." There is often a lag time of as much as six or seven years between habitat destruction and disappearance of the birds from an area (Jackson and Parris 1995). But in the end, disappearance is as certain as shooting the birds. Studies that have ignored this time

lag have provided faulty science which the authors of the Recovery Plan and private land guidelines have used to justify some management recommendations. For example, Wood et al. (1985), in a much cited paper, claimed compatibility of the RCWs with clearcutting of much surrounding habitat because the birds were still there *less* than a year later.

The lesser habitat requirements on private lands do not assure continued existence of the species. They only slow its demise, making it difficult to draw the connecting line between habitat destruction and extinction. As a specific example, under the habitat management required in the Georgia-Pacific Memorandum of Agreement (Wood and Kleinhofs 1992), at least four groups of birds in Mississippi have been lost and a fifth is now reduced to a lone male.

A third, and also related problem is the assumption that young forests, with trees as small as 10 inches in diameter, can provide adequate foraging habitat for the birds. Here another niche concept comes into play—that of *differential niche use*. This concept refers to the fact that even within a species and within a local population, the niches of individuals can differ, sometimes dramatically, with age or sex.

We have known since 1968, and also as a result of later studies across the range of the species, that male and female RCWs have ecologically and statistically significant differences in where they find food (Ligon 1968; Ramey 1980). Males forage high in pines, while females forage almost exclusively below the lowest branches. Young pines may be able to provide adequate foraging habitat for males, but they provide less than adequate habitat for females (Jackson and Parris 1995). Young pines provide neither the surface area nor the same type of foraging substrate that is provided by old growth pines. Neither the lesser guidelines for private lands nor the Recovery Plan acknowledge or provide for differential niche use by the species.

A fourth problem is the tendency for RCW HCPs to result in movement of birds from private lands to public lands concomitant with the destruction of habitat on the private lands (Bonnie and Bean 1996). Young females can be moved with reasonable success, but the niche of young females differs from that of adult males. Young females naturally disperse, thus preventing inbreeding (Jackson 1994; Walters, Doerr et al. 1988). Adult males are strongly tied to the cavity tree cluster and, will often return repeatedly, at times over long distances, if attempts are made to move them. Such was the case with the Red Oak HCP in Louisiana when three attempts to move the same adult male 16.7, 26.6, and 29.7 km resulted in the bird returning to its original roost tree (Carrie et al. 1996).

## Evaluating management efforts

### HCPs

The test of acceptability of an HCP should always be: "Does it conserve habitat?" Rationale for movement of birds from private lands has been to "save" the birds from demographic isolation, yet the criteria for demographic isolation that are used (8 km [5 mi] for birds separated from another population by suitable habitat, or 4.8 km [3 mi] if separated by



Photograph courtesy of U.S. Forest Service

unsuitable habitat; Costa 1992) are not supported by the scientific evidence. Marked females are known to move long distances (e.g., 287 km, Ferral et al. 1997; 73.6 km, Montague and Bukenhofer 1994; 90 km, Walters, Hanson et al. 1988) across a mosaic of suitable and unsuitable habitat.

Private land populations are valuable to the species in numerous ways. They can provide genetic bridges among major public land populations, as well as opportunities for increasing the breadth of the species fundamental niche, hence its adaptability to our changing world. They also assure that we do not have all of our eggs in too few baskets that are vulnerable to natural and political catastrophes. We need the private land birds, and innovative HCPs that will *truly* maintain them.

#### Safe Harbors

Why would any private landowner want RCWs or other endangered species on their lands? Historically there were no incentives for harboring RCWs on private lands. The incentive currently provided by Safe Harbor agreements is that such an agreement exempts the landowner from the penalties of the Endangered Species Act (ESA) for up to 99 years (R. Costa, FWS, personal communication, July, 11, 1996). This is a guarantee for the landowner, but not necessarily for the species, since at any time the landowner can back out.

Safe Harbor may make sense for places like golf courses and residential neighborhoods. In general the old pines are desired by the landowner simply for aesthetic reasons and they are not likely to be destroyed with or without a Safe Harbor agreement. An agreement, however, should assure that the habitat components of the local population's realized niche will be maintained. For the larger landowner who manages the forest for timber production or who might readily convert it to a shopping mall, exemption from the ESA without guarantees of protection for the bird is unacceptable. Safe Harbor gives us some positive public relations for endangered species—and certainly that is needed. It also gives us the opportunity

to go onto the private land to census the species and carry out some needed management (see Bonnie, this issue).

The Safe Harbor program, however, is an experiment and should be treated as such. It should be closely monitored along with control sites. The scientific method does not begin nor end with an experiment; it begins with observation, and ends with analysis and interpretation of data. Science should come before policy. Before Safe Harbor is proliferated or even codified, we should carefully assemble the data, analyze them, and if necessary redesign the experiment to best protect the species.

#### Conclusion

The bottom line is that there need to be better incentives for private landowners (e.g., tax incentives, direct compensation, land exchanges, or commodity exchanges) and better guarantees for the species. Let the private land owner receive the proceeds from the sale of an equivalent stand of timber from federal lands in return for maintaining endangered species habitat, but make certain that habitat is conserved. Along with these we need strong and uniform support of the ESA from the Agencies responsible for administering it and from the conservation community. Among our greatest needs is a strong, positive educational program focusing on the interconnections in nature, the complexity and variability of species' niches, and the needs for maintenance of biodiversity. This must be proactive and positive. But it must also be immediately responsive to erroneous negative attacks. The front lines in the battle for maintenance of biodiversity begin with endangered species, and the only weapon that can win the war is understanding.

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# Habitat Conservation Planning: Time to Give Conservationists and Other Concerned Citizens a Seat at the Table

John Kostyack

The Clinton Administration has aggressively promoted habitat conservation plans (HCPs) as a tool for addressing conflicts between development activities on state and private lands and the needs of species protected under the Endangered Species Act (ESA). As a result of the Administration's efforts, there has been a marked increase in the use of HCPs, from fourteen plans in 1993 to over 400 completed or in development as of June 1997 (see Aengst et al., this issue).

Many scientists and conservationists, expressing concerns about the adequacy of safeguards for the imperiled species covered under these plans, challenge the Administration's assertions that the plans produce a "win-win" situation for imperiled species and regulated industries. At the same time, many acknowledge that implementation of most HCPs began too recently to enable anyone to pass final judgment on their biological performance (see Corn, this issue).

We can, however, evaluate the process that has been used to develop HCPs. Is the U. S. Fish and Wildlife Service (FWS) at least ensuring that a broad range of ideas and viewpoints are considered as plans are developed and that the best available scientific information is sought out and incorporated?

The unfortunate answer is no. For most HCPs, the FWS makes far-reaching decisions affecting the fate of species without providing meaningful opportunities for input by conservationists, expert scientists, and other concerned citizens (i.e., any individual or organization not associated with the permit applicant or a government agency). Although there are significant exceptions from which we can draw useful lessons for the next generation of HCPs, regulated entities generally negotiate plans with the FWS behind-the-scenes, and citizens are generally given an opportunity to comment only after plans are essentially complete. Congress and the Administration need to adopt a set of rules for HCP development that are

built upon the following four principles: negotiation, fair representation, timeliness, and openness. In addition, Congress and the Administration need to clarify the purpose of HCPs, and both policymakers and conservation groups need to commit financial and other resources toward ensuring effective citizen participation.

## The importance of citizen participation

The modern era of environmental law arguably began in 1969 with the enactment of the National Environmental Policy Act (NEPA), which requires the preparation of an environmental impact statement (EIS) in advance of a major federal activity affecting the environment and provides important opportunities for citizen input throughout the EIS process. In enacting NEPA, Congress helped to empower a generation of citizen activists to begin democratizing environmental decision-making. Since then, conservationists, scientists, and other concerned citizens have steadily increased their role in the implementation of environmental policies and programs.

Two examples from before and after NEPA's enactment show the disastrous results of keeping the public in the dark and the societal benefits of providing citizens with information and meaningful opportunities for input into environmental decision-making. Large portions of the Love Canal region of New York state were rendered uninhabitable several decades ago *because* citizens were kept uninformed about the toxic waste disposal practices of the Hooker Chemical Company in their community. In contrast, successful recycling programs are operating in most major U. S. cities *because* citizens became involved in NEPA and related decision-making processes concerning municipal solid waste in their communities and then followed through to help implement the programs they launched. Our experience with recycling illustrates

that allowing citizens to become involved in the implementation of an environmental initiative not only increases agency accountability, it also creates the potential for the kind of broad public support that such an initiative usually needs in order to succeed.

These examples suggest the importance of ensuring that citizens have a meaningful role in decision-making concerning pollution. Is ensuring such a role likewise justified in decision-making concerning HCPs? Certain property rights proponents might argue for a lesser role for citizens in this arena because habitat-disturbing activities authorized under HCPs arguably do not pose direct threats to public health or safety. However, such a distinction between decisions concerning air or water and those concerning wildlife is not justified—all are public trust resources and every citizen has a legitimate stake in how they are managed. Moreover, public health and safety issues are very much at stake when decisions are made about HCPs (see Plater, this issue). For some HCPs, the potential threats to health and safety are direct: for example, if an HCP authorizes inappropriate timber harvesting, surrounding communities may need to cope with flooding, mudslides, and loss of fisheries. In other HCPs, health and safety issues are equally significant, but less obvious. As with other ESA-related decisions, agency decisions on HCPs determine whether our society will continue to countenance the decline of its species and ecosystems or whether we will attempt to restore them. At stake is the health of our life-support systems. Policymakers thus should not move forward with HCPs that lock in management decisions over the long term without first obtaining the best available scientific information and considering the perspectives of all interested individuals and organizations.

Substantial citizen participation is also important because conservationists,

scientists, and other concerned citizens have much to contribute. They represent an essential source of information and ideas concerning the design of the HCP and, if their legitimate concerns are addressed, they potentially can help build the public support that HCP processes need to succeed. On-the-ground agency staff know this from experience; a recent study by Yaffee et al. (1996) of ecosystem management efforts across the United States finds that 61 percent of managers are using increased stakeholder involvement as a main strategy for achieving their goals.

### **Past approaches to citizen participation in HCPs**

Despite the importance of meaningful citizen participation in the HCP development process, neither Congress nor the Administration has yet seriously attempted to ensure such participation. Since the ESA amendments governing HCPs were enacted in 1982, Congress and the Administration have merely required that the Secretary publish notice of permit applications in the Federal Register and provide a minimum 30-day comment period. In practice, three approaches have been followed by the FWS and permit applicants: (1) limiting participation to the minimum required by the ESA; (2) incorporating NEPA processes; and (3) inviting stakeholders to help develop the HCP.

#### *The minimal-effort approach*

The vast majority of HCPs are developed with minimal effort to elicit citizen participation, with the FWS and permit applicant doing nothing more than providing the 30-day comment period. Under this approach, citizens are typically informed that an HCP is being developed only after negotiations over its terms have essentially been completed. Notification about the proposed final HCP is then provided through the Federal Register, a publication that few citizens are able to monitor.

The minimal-effort approach does not usually elicit meaningful citizen participation. Due at least in part to the late and inadequate notice, the number of citizens filing comments on most HCPs is fairly low. For example, only two

individuals and organizations filed comments on the proposed Cone's Folly HCP in North Carolina (1996), even though that HCP has since come under serious criticism from conservationists and scientists. Another problem is that citizens are often handicapped in their ability to make an effective presentation because they have not been privy to the discussions that led to the inclusion of key terms and they do not have all of the data on which key assumptions rest. Their chances of getting significant changes to an HCP are further weakened by the fact that significant changes would potentially unravel agreements reached between the FWS and the permit applicant.

An example of how a certain level of closure is reached before bringing in the public is the experience with the emerging HCP governing over 600,000 acres of Oregon state forestland, known as the Tillamook HCP. In response to a request by the National Wildlife Federation for access to the HCP development process, the Oregon Department of Forestry (ODF) wrote that "the USFWS and ODF should be at a point of agreement [in late July 1997] on several components of the plan, which can be shared with you at this time." Such an exclusionary approach effectively undermines subsequent citizen participation because the result appears to be pre-ordained, making participation seem futile.

#### *Using NEPA procedures*

The second approach to elicit citizen participation is to follow NEPA procedures. NEPA requires the preparation of an EIS whenever the FWS finds that the HCP will likely have a significant impact on the environment. As a preliminary step, the FWS must undertake a "scoping" process, in which citizens are invited to help identify, either through written comments or hearings or both, the scope of issues that the EIS will need to address. After this process is completed, the FWS prepares a draft EIS, usually in coordination with the permit applicant, and concurrently with the applicant's preparation of a draft HCP and Implementation Agreement. All of this documentation is then

made available to the public in a notice-and-comment period.

When HCPs have been developed using the NEPA approach, the amount and quality of citizen participation has been far better than with the minimal-effort approach. For example, in developing the Washington Department of Natural Resources (WDNR) HCP (1997), the FWS, National Marine Fisheries Service (NMFS), and the permit applicant held numerous hearings, meetings and workshops, receiving extensive citizen feedback on the proposed HCP during both the scoping process and the comment period on the draft EIS. As a result, some significant citizen concerns were addressed in the final HCP. Although the final WDNR HCP has come under strong criticism from many conservationists and scientists, citizens who participated in the NEPA process can at least point to tangible conservation gains that resulted from their involvement.

Disturbingly, at around the same time the WDNR HCP process concluded, the FWS and NMFS stated in their Habitat Conservation Planning Handbook that NEPA's scoping and EIS processes "normally" should not be followed in developing HCPs, and that a 30-day notice-and-comment for a combined HCP and Environmental Assessment would both satisfy NEPA and save "paperwork and time" (1996). Such a statement, which will effectively reduce the level of citizen input in HCP processes, is particularly troubling considering that the Administration acknowledges elsewhere in the Handbook the need for expanded participation.

Although the NEPA process is far better than the minimal-effort approach, it is nonetheless inadequate for eliciting meaningful citizen participation in the development of large-scale HCPs. Even under NEPA, HCPs are developed behind-the-scenes between the permit applicant and the FWS, and conservationists, scientists, and other concerned citizens are denied the opportunity to participate. A group of leading scientists who recently assembled at Stanford University to analyze HCPs noted that one of the problems with this closed-door approach is that many HCPs are "developed without adequate scientific

guidance." As a result, "there is growing criticism from the scientific community that HCPs have the potential to become habitat give-aways that contribute to, rather than alleviate, threats to listed species and their habitats" (Brussard et al. 1997).

### *Incorporating stakeholders*

Fortunately, a process for developing large-scale HCPs has already been established that allows for meaningful participation. Known as a "steering committee" or "stakeholder" process, this method is designed to ensure that a diversity of viewpoints is represented when important negotiations take place. Congress implicitly approved this method in 1982, when it added HCP provisions to the ESA and cited as its model the San Bruno HCP in northern California—an HCP developed by a steering committee of developers, conservationists, independent scientists, and government agency staff. Although Congress did not attempt to legislate the steering committee approach, over the next 15 years this approach was adopted on an *ad hoc* basis for a significant number of large-scale HCPs. While rules have yet to be created for the use of steering committees—a problem that needs to be addressed—certain generalizations can be made about how this process works.

Steering committees are usually formed by one or more local governments that intend to apply for a Section 10(a) permit. Like any other applicant, these government entities are required to submit an HCP that satisfies the Section 10(a) application criteria. However, unlike private companies applying for a permit, they have legal obligations to keep citizens of their communities apprised of their significant environment-related decisions and to provide opportunities for involvement. Led by politicians accountable to the public, these local government agencies also have a keen interest in building public support for the HCP being developed. Recognizing that public support will depend on at least the appearance of balance, they often assemble steering committees comprised of representatives of key stakeholders (i.e., organizations with interests affected by the HCP) as well as staff for key government agencies.

These steering committees are charged with developing a plan that they can recommend for adoption by the local government and approval by the FWS.

One particularly noteworthy stakeholder process is the one being used to develop the San Diego Multiple Species Conservation Plan (MSCP) in California (see Silver, this issue). Several regional and national conservation groups, such as the Endangered Habitats League and the San Diego chapter of the Sierra Club, have participated along with development interests and government agency staff on a "working group" charged with developing a plan to protect the California gnatcatcher (*Polioptila californica*) and 84 other listed and unlisted species while also accommodating development.

The MSCP process has benefited from the leadership asserted by the City of San Diego and other local government agencies. Because these agencies needed broad public support to move forward with plan implementation (e.g., changes in local ordinances, voter approval of funding for land acquisition) and because they were governed by open meeting laws, the agencies ensured that the working group reflected a balance between development and conservation interests and that all meetings of the committee were open to the public. Citizens sat at the table from the outset of negotiations over the plan; everyone received draft planning documents at the same time and had equal access to information. Although there is debate within the environment community about the merits of the final plan, few if any environmentalists would dispute that the plan provides far greater benefits to imperiled species as a result of the active citizen involvement in its development.

Like all stakeholder processes used to develop HCPs, the MSCP process has had its flaws. For example, insufficient effort has been devoted toward soliciting the views of independent scientists and incorporating these into the plan. None of these flaws, however, suggest any fundamental problems with the stakeholder approach. Instead, they should prompt Congress and the Administration to consider establishing certain rules for large-scale HCP development processes—and to fund such processes—so

that negative experiences can be avoided in the future and positive experiences can be built upon.

### **Proposed framework for broadening citizen participation**

With hundreds of HCPs in the early stages of development, Congress and the Administration have an historic opportunity to ensure that large-scale HCPs are designed with a fair process that brings in the full spectrum of ideas and opinion and ensures that the best available science is incorporated. Drawing from the lessons of prior HCPs and other areas of environmental law, these policymakers should elicit citizen participation by promoting four principles: negotiation, fair representation, timeliness, and openness.

#### *Negotiation*

Citizens should be allowed to participate along with the permit applicant and the FWS in negotiations over large-scale HCPs. By bringing in the perspectives of conservationists, scientists, and other concerned citizens, the FWS would create important opportunities for traditional adversaries to work together to develop mutually acceptable, science-based solutions to HCP issues.

The alternative approach, whereby the FWS negotiates with the permit applicant behind closed doors and then presents the proposed HCP to citizens for their reaction, denies citizens a meaningful opportunity to provide input into decisions likely to have a significant impact on the fate of the public's wildlife resources. It also undermines the FWS' ability to ensure that its decisions are broadly-supported and based on the best available scientific information. Although the stakeholder approach may be more costly, difficult, and time-consuming than the minimal-effort approach, it is far more likely to produce a plan that is politically acceptable and truly conserves species.

Broad political support will help ensure not only that the plan gets approved, but that it gets implemented. By promoting the use of stakeholder groups for HCP development, the FWS creates opportunities for building collaborative relationships that continue beyond the date of HCP approval. For example, in Clark County, Nevada, the members of

the steering committee that designed the regional HCP for the desert tortoise (*Gopherus agassizii*; 1995) now participate on monitoring and implementation committees. Relationships formed in the HCP stakeholder process may also become valuable for other planning and conservation efforts, such as ones designed to prevent the decline of species to the point where they need to be listed.

The various stakeholders will not necessarily agree on every issue that arises during the course of HCP development. However, the absence of consensus is not a weakness of the stakeholder process. Even where consensus is not achieved, the dialogue among stakeholders ensures that issues are crystallized before they are presented to the FWS to make the final judgment.

#### *Fair representation*

Safeguards should be established to ensure that viewpoints of all parties affected by the HCP are fully represented. Balanced composition of the stakeholder group will be essential to ensure the quality and credibility of its work product. For example, in setting up the stakeholder group for the Texas red-cockaded woodpecker (*Picoides borealis*; RCW) HCP (1997), the FWS failed to ensure that conservation groups were fairly represented; the group consisted of six timber industry representatives, several like-minded state agency representatives, and one local conservation group representative. Not coincidentally, the draft HCP was subject to a barrage of criticisms from national and local conservation organizations.

To ensure that the differing viewpoints are proportionately represented, the FWS should be required to ensure that an equal number of seats on the stakeholder group are made available for resource user and non-user interests. Additional seats should be made available for federal, state, and local agency staff, who provide essential input and support for the plan.

A precedent for requiring fair representation on stakeholder groups is in the Marine Mammal Protection Act (MMPA), which requires the Secretary of Commerce to establish stakeholder groups, called "take reduction teams,"

to develop plans to reduce the harm to strategic fish stocks resulting from commercial fishing. Under the MMPA, stakeholder groups must "to the maximum extent practicable, consist of an equitable balance among representatives of resource user interests and nonuser interests" (16 U.S.C. § 1387(f)(6)).

Another important precedent is the Federal Land Policy and Management Act grazing regulations issued in 1995, which direct the Bureau of Land Management (BLM) to set up Resource Advisory Councils to advise the Secretary of Interior on management of rangeland ecosystems. The regulations provide detailed procedures on how BLM should achieve "balanced and broad" representation from within each of three different categories of interests: resource user, conservation/recreation, and government/science (43 C.F.R. § 1784, 6-1(d)).

As these examples illustrate, both Congress and the Administration have recognized the usefulness of establishing stakeholder groups and have written rules to ensure that membership on stakeholder groups is carefully balanced among competing perspectives.

#### *Timeliness*

To ensure a meaningful role, citizens need to participate in the HCP negotiating process from the moment that the FWS begins working on an HCP. This will ensure that the ideas and perspectives of citizens are heard before the FWS and permit applicant become locked into their own positions. Early involvement by citizens will also help ensure that issues are identified and dealt with while a variety of management options remain open.

Stakeholder processes are probably appropriate only for large-scale HCPs. These processes are likely to be unduly burdensome for small landowners and unlikely to attract citizens interested in making a contribution where they are most needed. Timely citizen input does, however, apply to small-scale as much as large-scale plans. The FWS, rather than awaiting the comment period on a proposed small-scale HCP, should create opportunities for citizen input into the broad policy decisions concerning

how small-scale HCPs will be handled across the species' range.

Unfortunately, this has not always been the approach. A series of relatively small-scale HCPs, such as the Red Oak Timber Company HCP in Louisiana (1996), have been approved to allow take of RCWs without any significant mitigation. These controversial HCPs have gone forward pursuant to the FWS's draft RCW Procedures Manual for Private Lands (1992), a policy guidance that was never subjected to public comment. Early input from citizens into such policy documents will help ensure that small-scale plans are not approved when the cumulative impacts of such plans would undermine species recovery.

#### *Openness*

Finally, the FWS needs to ensure that all meetings of stakeholder groups are open and that all documents generated are available to the public. If the business of the stakeholder group is done outside public scrutiny, there likely will be little faith in the outcome. And without broad public support for the outcome, few large-scale HCPs can succeed—as shown by the example of the Balcones Canyonlands Conservation Plan (1996), where voters rejected a referendum authorizing the use of public funds to help pay for the plan's wildlife preserve.

Considering the complexity involved in developing large-scale HCPs, providing the public with access is a significant challenge. The FWS has often failed to rise to that challenge. For example, for a significant period of time, copies of the Plum Creek Cascades HCP (1996), one of the first large-scale timber HCPs to be approved, could not be obtained by making requests to the FWS's field office. Instead, citizens were instructed that they would need to purchase the relevant documents, at significant cost, from Plum Creek itself. Another example is the failure by the FWS to develop an official log identifying HCPs that have been completed or are in development across the country.

Many of these deficiencies could be cured by placing all HCP-related documents, including draft HCPs and

progress logs, on the World Wide Web for public inspection. A useful model for such information-sharing is the Toxic Release Inventory (TRI) computer database established by EPA pursuant to the Emergency Planning and Community Right-to-Know Act (42 U.S.C. § 11001, *et seq.*), which places information on industry releases of toxic pollution into the hands of affected citizens. The Administration has recently proposed expanding the TRI program. It should make a similar commitment to openness and information-sharing concerning the development of HCPs.

### Removing practical obstacles

In addition to setting up a framework of rules and guidelines for successful citizen participation, policymakers will need to address some of the practical issues that limit the willingness of both conservationists and industry groups to participate in HCP stakeholder processes. Two of the most serious issues are a lack of clear goals and a lack of sufficient resources.

The goal of the HCP process varies depending on who is asked. Most conservationists believe that HCPs must contribute to the ESA's goal of recovering listed species. They find support in their arguments from the legislative history of the ESA's 1982 Amendments, on-the-record statements by key Administration officials (e.g., Spear 1997), and the very language of Section 10, which requires "conservation" plans. Industry representatives, on the other hand, argue that HCPs are designed to allow development harmful to listed species, so long as the activities do not jeopardize the existence of the species. They find support for this statement in Section 10's ambiguous approval standard and in the Habitat Conservation Planning Handbook (FWS and NMFS 1996), which states that HCPs need not help recover species and need not even benefit them.

Until the purpose of HCPs is clarified, many conservationists will question whether they are being invited to participate in an exercise designed to undermine the very purpose of the ESA. To encourage conservationists' participation in and support of HCPs, the

Administration should clarify that HCPs will only be approved if they are consistent with the recovery of listed species.

A second issue is the limited resources that many citizens have to contribute. Professional conservationists, academic scientists, and especially volunteer citizens may find participation in the HCP development process to be prohibitively expensive and time-consuming. Congress and the Administration need to address this problem by defraying the out-of-pocket expenses of those in financial need. Many precedents in environmental law already exist for encouraging of participation. In fact, the FWS routinely covers the travel costs of members of the teams who prepare recovery plans under the ESA; it makes sense to apply this same policy to members of stakeholder groups.

Of course, federal subsidies alone will not fully resolve the problem of inadequate resources. To achieve meaningful citizen participation, conservation groups need to commit more of their own limited resources to HCP development processes. Although some conservation gains can be achieved by improving HCP standards through litigation and lobbying, this approach alone will not protect biodiversity on non-federal lands. Even if HCP standards are improved and successfully enforced, agencies will always retain the discretion to make important judgment calls concerning the design of HCPs. By ensuring that conservationists, scientists, and other concerned citizens are at the table—and are properly trained to be effective negotiators—conservation groups will help ensure that these judgment calls are informed by the best available science and reflect the public's strong desire to conserve imperiled species and habitats.

### Conclusion

Conservationists, independent scientists, and other citizens have not been given a fair opportunity to participate meaningfully in the development of HCPs. Congress and the Administration should follow four principles in crafting procedures to address this problem: negotiation, fair representation,

timeliness, and openness. These federal policymakers also need to clarify that the goal of HCPs is to support the recovery of imperiled species, not undermine recovery, so that more conservationists will step forward to assist in HCP development and implementation. Finally, both the federal government and conservation groups need to devote greater resources toward citizen participation in HCPs, so that more people become equipped to engage in the important work of protecting imperiled species on non-federal lands.

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# Effective Outside Participation in the HCP Process: Lessons from Watershed Analysis

Cassie Phillips

Imagine private landowners asking independent scientists to point out environmental problems on their lands, then directing their employees to solve the problems. Imagine landowners inviting environmentalists, tribal members, and others to join in as full partners in crafting solutions, at the table, from the first day of the process. Then, imagine that although this process is entirely voluntary, the landowners submit the resulting plans to the government to enforce them.

Are we imagining the ideal private habitat conservation plan (HCP)? Perhaps, but under the Endangered Species Act (ESA), it exists today only in a utopian fantasy. For better or for worse, most private HCPs are prepared by scientists working for the government and the applicant, and the involvement of interested members of the public comes closer to the end of the process, during the review and comment period.

The more collaborative model described above does exist, however. Washington state has developed a process called watershed analysis, which is being implemented by private forest landowners both in Washington and elsewhere in the Pacific Northwest. This paper describes watershed analysis as one example of how to engage independent scientists and the public in environmental decisions by private landowners. It also provides a cautionary lesson on why it is difficult to accomplish the same goals in HCPs.

## Watershed analysis

Watershed analysis was developed to address the effects of multiple forest practices over time and space (i.e., cumulative effects) on water quality and fish habitat. A diverse group of stakeholders in Washington, including large and small forest landowners, tribes, environmentalists, and federal, state, and local government agencies, designed the process in 1992. They act through Timber/Fish/Wildlife (TFW), an unofficial, although well established, consensus-based organization consisting of a policy-making

body, a field organization, and a scientific committee, known as Cooperative Monitoring, Evaluation, and Research (CMER).

### *How watershed analysis works*

Watershed analysis consists of two major parts: assessment and prescription. In the assessment process, scientific teams look at the current condition of water-related resources in the basin and assess their vulnerability to problems caused by forest practices. The assessment is organized around eight "modules," which correspond to four major watershed processes—mass wasting (landslides), surface erosion, hydrology (peak and low flows), and riparian function—and four public resources to be protected—channel conditions, fish habitat, water quality, and public works (Washington Forest Practices Board 1995). Using these modules as a basis, the scientists establish cause-and-effect relationships linking the watershed processes to the water, wood, sediment, and chemistry that the processes influence, and identify specific fish habitat and water quality conditions that may result from these influences (see Figure 1). Using a synthesis approach, the assessment team also examines the synergistic effects of the interacting watershed processes.

Detailed written reports and maps, based on the assessment process, identify areas in the watershed that are especially sensitive to forest practices. The reports describe the cause-and-effect relationships; the maps indicate spawning, rearing, and migration habitat for salmon and other anadromous and resident fish in the basin. Maps also identify, among other things, areas of unstable soils, areas prone to increases in peak flows, and stream reaches where riparian forest conditions may be inadequate to provide shade or large wood to the stream in the short- or long-term.

These products are then used by a team of managers to develop prescriptions for each of the sensitive areas. Outside of these sensitive areas, forest practices must still comply with the best management

practices required by the conventional forest practices rules.

A watershed analysis manual spells out in detail the modules, the methods for conducting the assessment, and the requirements of the prescription process. The governing rules spell out the scientific and technical disciplines that must be represented on the assessment (e.g., hydrologist, geologist, fish biologist) and prescription (e.g., forester, engineer, fish biologist) teams. The state Department of Natural Resources (DNR) defines the necessary credentials for members of the assessment and prescription teams. In addition to requiring a relatively high level of scientific and technical expertise, the DNR requires completion of a one-week course it conducts before deeming a participant qualified to participate officially in the process.

### *Private landowner sponsorship*

Watershed analysis in Washington is a unique blend of voluntary and regulatory processes. It is regulatory, in that it must be conducted according to the standards established in the rules and the manual. Also, the resulting restrictions are binding—they become permanent, site-specific requirements for operations in the watershed, enforced through the forest practices permitting process.

The initiation of a watershed analysis, however, is voluntary. Private owners of 10% or more of the land in a given watershed can sponsor the process, paying the costs of the analysis and producing the documentation for review and approval by the state DNR. [The DNR also can initiate the process.] Once approved, the resulting restrictions are binding on all non-federal forest landowners in the watershed, regardless of who initiated and sponsored the analysis.

Despite the high cost of the analysis, and the resulting increase in restrictions, private landowners have sponsored a surprising number of analyses. Since 1993, over 75 of the more than 800 DNR



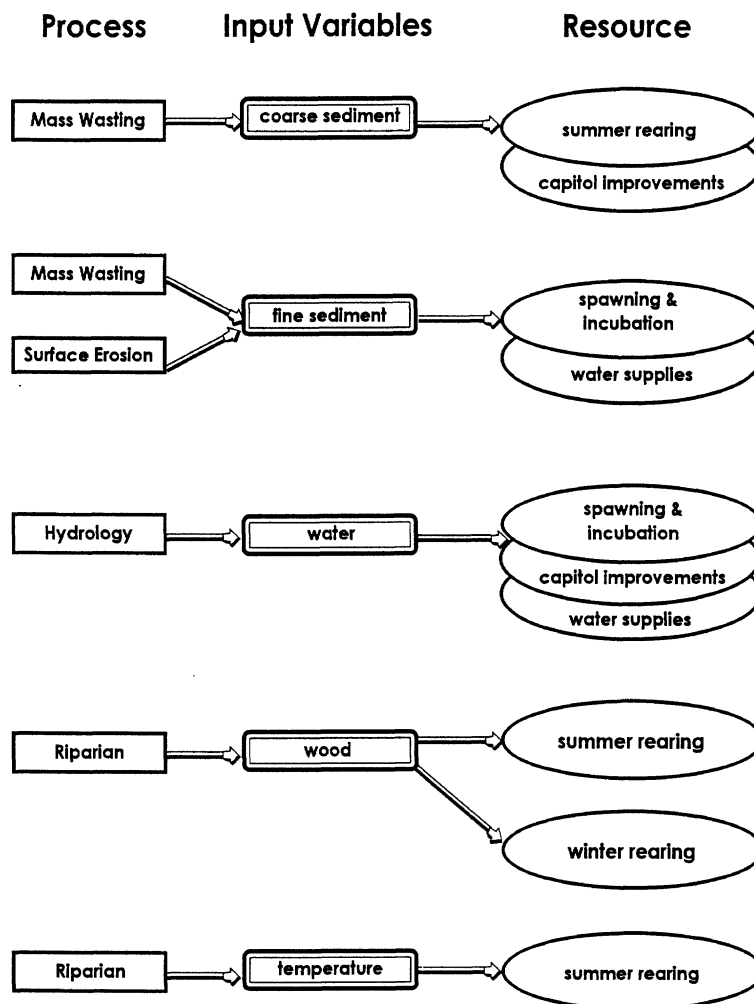


Figure 1. Relationships among watershed processes, input variables, and effects on public resources (from Watershed Analysis Manual, p. xv).

defined watersheds in Washington state, of which approximately 600 contain some private forest land, have been completed or are in progress; approximately two-thirds of these analyses have been sponsored by private landowners. One of the principle motivations for private landowners is to gain long-term certainty and a more predictable regulatory environment (Milstein 1997).

#### Results of watershed analysis

Watershed analysis has vastly increased the information available to forest managers in the basins studied. Based on this information, and the goal of solving problems, managers have changed their operations significantly. Given the short period of time the program has been in effect some of these changes are subtle and not readily apparent to the eye. However, to the on-the-ground managers, there is a striking difference between their approach to problems pre- and post-implementation of watershed analysis.

Management of riparian areas is a good example. Without watershed analysis, standard forest practice rules dictate the width of buffers to be left along streams after logging. When these buffers are applied on the ground, they are sometimes adequate, sometimes inadequate, and sometimes excessive. Neither landowners nor regulators have the information or any real incentive (or authority) to adapt these requirements to site-specific circumstances.

In contrast, watershed analysis helps achieve variable width buffers adapted to the site (see Figure 2). Buffers are increased to cover areas with unstable slopes, or slopes prone to surface erosion. They are managed to grow larger conifers to improve the long-term recruitment of wood to streams. They may also be selectively harvested to replace hardwoods with conifer to improve stream shading over time.

On average, buffer widths dictated by watershed analysis may not greatly

exceed buffers dictated by standard forest practices rules, leading some to suggest that the process is not producing much change (Collins and Pess 1996). This misses the point of the program, however. Managers can produce better environmental protection more efficiently by focusing on desired results and making decisions based on knowledge of actual conditions, rather than by applying "cookie cutter" prescriptions designed to address either average or worst case conditions.

In addition to producing site-specific solutions, watershed analysis has helped motivate and organize solutions to basin-wide problems that are difficult to regulate on a permit-by-permit basis. The best example is road plans. Given the century-long history of logging in the Pacific Northwest, there is a legacy of old roads built before modern standards that need to be upgraded and, in some cases, removed. Every watershed analysis has produced detailed plans for road construction, maintenance, abandonment, and restoration. Legally, the DNR already has authority to require similar plans; watershed analysis, however, is serving as a catalyst, pulling together the information needed to make the plans effective and allowing landowners to develop them cooperatively, across ownership boundaries.

#### Outside participation

Independent scientists and the public participate in watershed analysis in several ways. First, scientists write and update the watershed analysis manual. This is accomplished through CMER, which consists of scientists and non-scientist representatives from state and federal agencies, tribes, environmental groups, and forest landowners. There is considerable ongoing debate among the scientists involved in CMER about the state of the science in the manual, which has resulted in annual revisions. As one can expect from healthy scientific inquiries, the issues are never entirely resolved, but the hypotheses are focusing on narrower issues over time.

CMER also maintains an active research program, and there is an increasing trend to use that research to address unresolved issues in the manual. For example, CMER recently conducted a survey of all TFW participants to identify needed

improvements in the process (Currie, Sullivan, and Sturhan, Washington DNR, personal communication). The current hydrology module registered one of the higher levels of dissatisfaction. In response, CMER added a project to its workplan to update this module to reflect advances in research on the relationship between forestry and peak and low stream flows.

The second opportunity for outside involvement is in the analyses themselves. The process allows a certain amount of flexibility in this area, and one study showed that this is important in maintaining landowner support (Milstein 1997). Nevertheless, sponsors must involve qualified representatives of affected Native American tribes and other forest landowners in the basin. In addition, the DNR must review the results with other state agencies (e.g., Department of Fish and Wildlife, Department of Ecology). The DNR has also established an informal peer review of each analysis to advise the agency on its technical merits. There is, finally, a formal public comment period on each analysis before the DNR approves or disapproves it.

This, then, is the minimum public involvement in watershed analyses. Many forest landowners have gone a step further and opened the process to additional stakeholders. Some invite members of local environmental groups who are known to have an active interest in the basin. Others open the process up entirely, inviting anyone who is interested to participate, regardless of formal qualifications or affiliations.

Weyerhaeuser, for example, took the latter approach on the first full-scale watershed analysis conducted in Washington, on the Tolt River watershed east of the Seattle area. Over 30 people turned up to work on the analysis, representing a diverse group of interests (e.g., the Tulalip Tribe, Washington Trout, Seattle City Water Department, King County). The participants rolled up their sleeves and went to work, producing a consensus set of prescriptions for the watershed. To be sure, the process proved to be a growth experience in facilitation skills for the managers responsible for the outcome. However, the extra work was worth it; a recent survey of participants in watershed

analysis confirmed that there is a higher level of stakeholder satisfaction in these open processes than in the more closed ones (Milstein 1997). Because the primary incentive for landowners to sponsor the process is to gain regulatory stability, one can expect a trend toward more open processes if these sentiments remain true.

### Participation and HCPs

It is not an accident that private landowners are willing to invite fairly open outside participation in watershed analysis, but favor more formal processes in HCPs. There are four essential elements in watershed analysis that make this openness possible. Many of these are missing from the HCP process.

(1) *Agreed-upon objectives.* The first, and most important, element is agreed-upon objectives. Watershed analysis was developed largely within the umbrella of the TFW agreement, in which landowners recognized their responsibility to protect the environment, and other stakeholders recognized the value of a viable forest products industry. Starting within this framework of common goals, landowners agreed at the outset that the objective of watershed analysis should be to avoid harm to fish habitat and water quality. At the same time, other stakeholders agreed that this would be accomplished through practicable, best management practices.

This is not to say that there are no disagreements among the TFW stakeholders about environmental objectives.

These debates, however, take place outside of individual watershed analyses. Thus, landowners who undertake the process feel relatively comfortable that their management objectives for their land are accepted as legitimate and the discussion is over how best to accomplish these objectives without environmental harm.

In contrast, in many HCPs it is difficult to reach agreement on the objectives. The standards for the process itself—to minimize and mitigate take to the maximum extent practicable and avoid jeopardy—do not provide enough direction to avoid major debates within each HCP. Within an individual HCP, it is difficult to convert these standards into workable biological and economic goals, and agreement often comes at the end of the process, rather than the beginning. As more HCPs are developed over time, clearer and more satisfactory objectives can be expected to emerge. Efforts by environmentalists to impose an even higher recovery standard, however, will slow this progress, making private landowners less likely to enter into HCPs, and less willing to involve outside participants if they do.

(2) *Clearly defined roles and processes.* The second essential element supporting an open watershed analysis process is the clear definition of roles and processes. There were a number of significant policy decisions that had to be resolved up-front in developing watershed analysis. Some changes in these

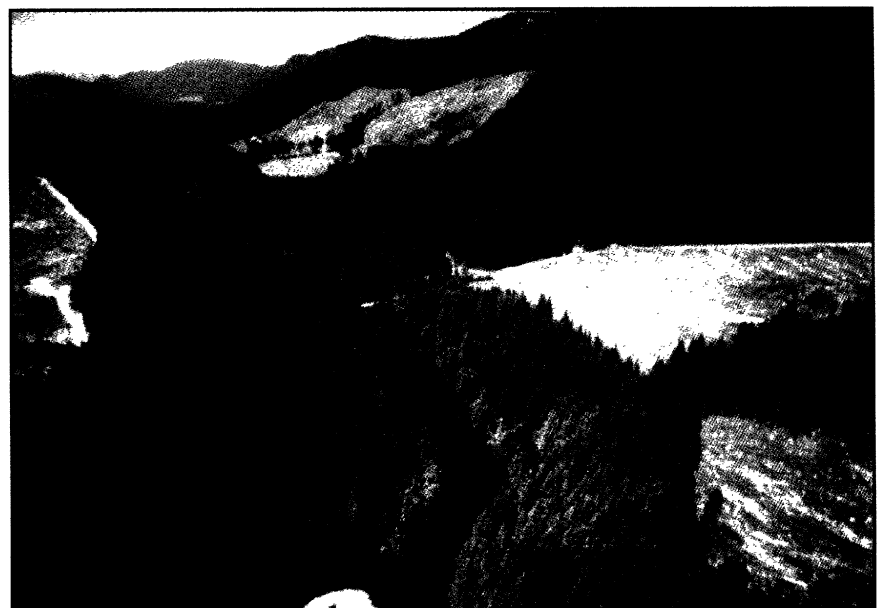


Figure 2. After watershed analysis, buffers vary in width depending on stream function. Photograph courtesy of Weyerhaeuser Company.

policies continue to occur, but these discussions take place in TFW and the rulemaking process and are not reopened in each watershed analysis.

Examples of these policy decisions include the scope of the process; the size of watersheds to be analyzed; the roles, identity, qualifications, and training of participants; deadlines for phases of the process and decisions; accountability for approval of the analyses; and the standards and processes to be applied. In addition to the details in the rules, the watershed analysis manual describes quite specifically the analytical approach to be taken, including the work products and how uncertainty is addressed.

There is no doubt that this level of detail makes the process more cumbersome, expensive, and time-consuming than it needs to be to accomplish its objectives. Nevertheless, in developing the program, it was clear that this much detail was needed to satisfy the diverse set of stakeholders.

In HCPs, the roles of participants other than the applicant and the federal agencies are not well defined, nor is the process itself. There is nothing to prevent additional participants in the process from, for example, expanding or shrinking the scope, advocating different objectives and analytical frameworks, or disagreeing on interpretations of risk. This increases the risk of delays and uncertainty, already one of the principal criticisms of the process. If outside participation in HCPs is to increase, then the roles and processes will have to be defined much more clearly than they are currently.

(3) *Separation of science and management.* The third essential element in watershed analysis is the separation of responsibility for science and management. This principle is applied in two ways. First, echoing a theme of the first two elements, significant scientific debates occur "off-line" through revisions to the manual, which is applied as the best science in each watershed. Second, in the analyses themselves, the scientists do the scientific assessment, which defines the problems in the watershed. They then hand the problems off to the managers, who decide how to solve them. Solutions include balancing risks

and weighing costs and benefits as well as applying technical expertise.

The result is less pressure on the scientists to interpret the science favorably to one side or the other, and little opportunity on the managers' side to ignore or second-guess the science. This produces a truly "bottom up" process, with some predictable benefits: education and training for the managers; creative solutions crafted by those closest to the problems; and ownership of both the process and solutions.

In comparison, the HCP process often does not separate science from management. In some HCPs, participants assume that scientists should both define the problems and craft the solutions. Scientists are also sometimes asked to fill policy roles as well, when, for example, they are asked to make explicit or implicit decisions about risk, or to set objectives. The roles of scientists and managers in HCPs should be clearly separated, especially if more participation by independent scientists is desired.

(4) *Adaptive management.* The fourth essential element is adaptive management (see Buchanan, this issue). Watershed analysis includes adaptive management through revisions to the manual, to reflect the best science available. In addition, each completed analysis may be reviewed and updated at least every five years.

Why do landowners accept these potential changes when regulatory stability is one of their goals? The answer lies in the other three elements discussed above. Stability comes from the process itself, which landowners appear to view as reliable and predictable, precisely because there are agreed-upon objectives, the process and roles are well defined, and science and management responsibilities are separated.

Two other elements are important to the acceptance of adaptive management. First, changes to the watershed analysis process are developed in the consensus TFW forum. Second, the technical and administrative aspects of watershed analysis are not unduly burdensome for most larger landowners, although that is not the case for smaller landowners.

Adaptive management is difficult in the HCP process, however, largely

because it is lacking in the three previous elements. It is not an attractive prospect to reopen the debate about objectives, or to agree to repeat an undefined process in which the roles of science and management are mixed. The HCP process is costly and cumbersome as well, especially with the overlay of the National Environmental Policy Act, making reopening the process an even tougher sell.

True adaptive management is attractive to most HCP participants, and the difficulty of incorporating it into the agreements should be viewed not as a problem in itself, but more as a symptom of the deeper problems described above.

## Conclusion

It is possible for independent scientists and the public to be effectively involved in decisions by private landowners on environmental issues. Washington's watershed analysis process provides one example. There is also no question that diverse participation in these decisions adds value, both by improving the decisions themselves and by increasing the regulatory stability that is the motivation for landowners to participate in the process.

Major gaps exist in HCP policies and processes, however, compared to the more successful model of watershed analysis. To fill these gaps and resolve the issues, there needs to be a far more open debate about the problems, among a truly diverse group of stakeholders.

It is the thesis of this paper that before significant changes can occur on individual HCPs, changes must occur at the programmatic level. Thus far, the highly polarized debate over ESA reauthorization provides little hope that the climate to support these changes exists.

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# Expanding the Participation of Academic Scientists in the HCP Planning Process

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and Michael P. Senatore

Habitat conservation plans (HCPs), established in 1982 under Section 10(a)(1)(B) of the Endangered Species Act (ESA), have been touted as a method to "...reduce conflicts between listed species and economic use or development activities" (FWS and NMFS 1996). The HCP process was used sparingly until the beginning of 1992 when several changes occurred in the number and characteristics of HCPs that were being developed. First, the number of HCPs has increased—from fewer than 20 in the first 10 years to over 170 approved plans between 1994 and 1996 (FWS and NMFS 1996; see Aengst et al., this issue). Second, HCPs are covering larger planning areas, ranging in size to upwards of 500,000 acres (FWS and NMFS 1996; see Aengst et al.; Dohner and Smith, this issue). Third, the duration of permits has increased to as long as 100 years. Finally, as the scope of HCPs is broadened, so too is the number of species that are covered by any single HCP (e.g., one multi-species HCP purported to cover 285 species).

As HCPs get larger, last longer, and cover more species, the complexity of planning and biological information necessary for that planning increases. These HCPs will increasingly require herculean efforts to assemble available data and conduct additional field surveys, utilize state-of-the-art tools for planning (e.g., geographical information system), and make sure that the ecological information and management techniques are used in the best way possible. While it is incumbent upon the landowner and U. S. Fish and Wildlife Service (FWS) biologists to accomplish these scientifically-oriented tasks, one of the major concerns for all interests (agency, private, and environmental) is that these plans are being developed with very little independent peer review. The FWS often argues that it is capable of

reviewing these planning documents and that it has appropriate staff to handle the review in a scientifically credible manner. Private companies often argue that they have spent large sums of money to hire competent consulting firms, which also boast of scientifically credible staff, and that the FWS's review of planning documents is already excessive. Environmental organizations argue that current HCPs are simply negotiated documents that often reflect what is in the best economic interest of the permit applicant, and not the species covered in such documents. A system of independent, academic peer review of HCP documents would serve all interests, most importantly the interests of the species and habitats that are affected by these documents.

In developing the scientific aspects of incidental take and mitigation, the only biologists who currently have a formal role in the development and approval of the HCP are FWS biologists and, occasionally, the landowner's biologists (either on staff or from an environmental consulting firm). There is no specified role for independent academic scientists in conservation planning, nor is there a general consensus about whether and how to involve them. Nevertheless, within the context of plan development, there is no doubt that independent academic scientists who have expertise in the species and habitats of concern could lend important data and advice on management and preserve design. Despite the lack of a formal role in HCPs, independent academic scientists have been consulted, informally, for review or to contribute data in some plans (e.g., the Multiple Species Conservation Program in California).

It is obvious that the amount of influence that permitted HCPs, as well as HCPs in the development stage, will have on the ultimate fate of numerous species is enormous. It is also clear, after one has read several of these

planning documents, that the amount of time, effort, and biological information contained in these documents can vary dramatically. While scientists will not be able to determine the political decisions that are made as a result of HCPs, it is critical that independent academic scientists have a role in reviewing the biological information and discussing the implications of particular conservation strategies in HCPs. Companies conduct careful economic analyses to determine the economic impacts of HCPs; it would be remiss to approve plans without a similar careful analysis of the impacts to biodiversity. The only real reason not to include independent academic scientists in the HCP process is that some form of enticement and financial reward would be required for academic peer reviewers to become involved, given all of their regular time commitments. There are, however, many reasons to include academic peer review. This paper discusses the positive aspects of including academic peer review in the HCP process and a potential method for accomplishing this goal.

## Why academic scientists?

Independent peer review of any scientific manuscript is a given, whether it be a proposal for research, a thesis or dissertation, or a manuscript for publication in a scholarly journal. There is nothing magical about an academician's review (versus another expert's review) other than the premise that with an academic position comes some level of academic freedom in which to express one's opinion, regardless of the public's perception of that opinion. Indeed, the premise of tenure is to allow academic freedom to express the opinion of the person speaking, with no retribution from the employee's institution. In contrast, in private industry opinions of employees reflect on the institution and often the public assumes, whether correctly or incorrectly, that the opinion

expressed is that of the organization. This is why academic peer review is preferred over "independent" peer review. "Independent" peer review could mean an individual who has no apparent connection to the exact project being reviewed could express his/her assessment. Unfortunately, it is all too often the case that an individual who appears to be unrelated to a project can get pressure to taint his/her real assessment based on the perceived notion that whatever may be expressed today could ultimately hurt the reviewer's organization in the future.

This is not to say that this cannot happen with academicians. Nevertheless, the majority of the general public seems willing to accept the assessment of academicians who appear to have very little to gain from slanting their opinion, and conversely, everything to lose if they "sell" their expertise and reputation to one side of any debate.

### Review criteria for HCPs

With 200 HCPs in the development stage, and the size of HCPs varying from less than one acre to more than one million acres, there must be some criteria for determining which HCPs require academic peer review. For this problem, there are several possible solutions. First, HCPs could be selected based on the size of the planning area. If peer review were required for all HCPs greater than 100 acres, then between 1 September 1994 and 1 September 1995, 15 of 47 (32%) HCPs would have required peer review, and 18 of 59 (31%) HCPs would have required peer review during the same period 1995 to 1996. A second alternative is to set up a system whereby the most affected resources addressed in an HCP are compared to the total remaining amount of that resource. For example, if an HCP is developed with the primary species of concern being the northern spotted owl (*Strix occidentalis caurina*) and the baseline amount of resource that can be affected is set at 10% of the remaining habitat, and the HCP in question covers 15% of the remaining habitat for spotted owls, then that HCP would require peer review. A third scenario is to adopt the FWS dichotomy for HCPs, low-effect

versus all others (FWS and NMFS 1996). Low-effect HCPs would be exempt from being peer-reviewed, whereas all others would require peer review. If this dichotomy appears to be politically influenced, it could be alleviated by passing the determination of which HCPs require peer review to another entity (e.g., National Academy of Science; NAS), whereby they could define which HCPs require academic peer review. The NAS assessment might or might not agree with the FWS dichotomy.

### Selecting academic reviewers

Given the wide array of species and habitats that HCPs cover, this system will require a large collection of experts from many fields within the biological sciences. Often, the most knowledgeable experts have the least free time for a task such as peer review of an HCP. Thus, what is needed is a coordinated effort by several of the large scientific societies (e.g., Society for Conservation Biology, American Society of Mammalogists, Ecological Society of America) to maintain a working database of leading experts. In addition to habitat or species of expertise, the database should include the geographic area that the researcher generally studies. Once each participating scientific society has established an initial list, a central repository for the "master database" could be established; the most obvious choice is with the NAS. Once established, each participating group would be responsible for notifying the NAS of any changes to their expert list.

Thus, when an HCP process has reached a stage appropriate for establishment of an academic peer review panel, the FWS could determine the species or habitats that are of major importance, contact the NAS, and request experts for the HCP academic peer review panel. The onus would then be on the NAS to contact and secure the appropriate reviewers for the document. This system would allow the FWS and the permittee to avoid "hand-picking" peer reviewers who are likely to provide, or appear to provide, a biased assessment. In fact, the reviewers could remain anonymous to both the FWS and

the permittee, guaranteeing an unbiased assessment of the HCP.

### The academic peer review process

This academic peer review would be different in several aspects from a normal review of a manuscript for publication. For a scholarly journal peer review, the reviewers spend a short amount of time reading and commenting on the entirety of the manuscript. This review is done when the manuscript has been submitted in a final draft and typically consists of comments on the style as well as the content of the research that is described. Often, the main determination of whether or not the manuscript is publishable is based on the answer to the question: Does this work advance science? Reviewers almost always control the fate of a manuscript they are asked to review.

For HCPs, it is impractical to have a scientific review only near the end of the process, just before the FWS issues the incidental take permit (ITP). Landowners and the FWS are legitimately concerned that this evaluation could second-guess the expertise of the FWS biologists and could be a bomb that sends people, who have been developing the plan for months or years, back to the drawing board. Including a panel review process at multiple stages avoids this problem and reflects the proper role of academic science peer review in conservation planning. Typical HCP reviews would involve an assessment of some or all of the following: the adequacy of biological information; preliminary plan recommendations; draft(s) and the final HCP; monitoring and adaptive management plans; and monitoring reports as the HCP is being implemented. Reviewers will not determine whether or not the FWS approves and issues an ITP as a result of an HCP. Reviewers will also not comment on the HCP in terms of scientific writing. The review will be solely of the adequacy of the scientific information contained in the HCP as it relates to species or habitat conservation and the implications of a conservation strategy for that species and habitat.

## Compensation for reviewers

Academicians do scholarly journal manuscript reviews out of a desire to be a part of the system in which they publish. It is a system of repayment through mutual efforts. In other words, if an author publishes a paper in a scholarly journal, it is expected that he/she will serve as a reviewer of papers in the future for that same journal. Unfortunately, no such repayment system can work similarly with HCPs. The majority of academicians (and, notably, the most likely to be desired for peer review of HCPs) have a tremendous workload, with teaching, advising graduate students, writing grant proposals, publishing scholarly articles, and providing other university related services. If there is no incentive for spending what will often be many hours of their time (time which can often be billed in consulting work at \$75 or more per hour), there is very little hope of attracting the type of peer review and expert assessment that is sorely needed in this process. Thus, whatever time is spent on a peer review of these documents must be reimbursed, even if it is at a fraction of the cost that the peer reviewer may be able to secure in the consulting world.

It may be reasonable to assume that most peer reviewers could be encouraged to participate for somewhere between \$1,000 and \$2,000. Many academician researchers are realizing that much of their work is published in scholarly journals that are never seen by the majority of policy makers. These same researchers are starting to realize that the best way to affect the resources they study is by mixing their scientific expertise with policy-makers to affect natural resources policy. On the other hand, many private companies are suggesting that there is no room for more money to be spent on HCPs from the private side, nor is the FWS swimming in excess money that could be used to pay for academician expertise. However, if one assumes that, on average, there may be 20 to 30 HCPs per year that require academic peer review, and, on average, three academic experts would be required for each review, then the total amount of money needed to fund

such a system would be \$60,000 to \$180,000 per year. To put this cost in perspective, individual HCPs, without peer review, can cost more than one million dollars to prepare. These funds could come from a combination of money from the permittee(s) and from the collaborating professional societies.

## An example

If it is accepted that academic peer review is required in the process, then a quick example might illustrate how the system could work. A private firm wants to develop an HCP covering 150,000 acres in the Southwest. The HCP will cover four endangered species and a host of unlisted species. The FWS notifies the NAS that this HCP will require three academic peer reviewers and that the species of concern are the desert tortoise (*Gopherus agassizii*), desert pupfish (*Cyprinodon macularius*), peregrine falcon (*Falco peregrinus anatum*), and Stephens' kangaroo rat (*Dipodomys stephensi*). The NAS utilizes the database supplied by the Society for Conservation Biology to produce the names of three desert ecologists, the database provided by the American Ornithologists Union to produce the names of three peregrine falcon experts, and the database supplied by the American Society of Mammalogists for the names of three kangaroo rat experts. The NAS contacts several of these experts, secures contracts with three of them (one from each field), and then sends each reviewer a copy of the HCP with review deadlines and HCP section assignments. Each reviewer submits his/her review back to the NAS, which in turn submits them (perhaps anonymously) to the FWS. The FWS assesses these reviews, makes recommendations to the HCP permittee based on these reviews, FWS biologists reviews, and public comment as to how to improve the HCP, and then makes a final determination of acceptance or rejection of the final HCP.

## Conclusion

HCPs are increasingly being utilized in an attempt to reduce wildlife/private land conflicts. This process, however, is in its infancy and the lack of

review by independent academic scientists has led many people to question the scientific validity of HCPs. Including a scientific peer review throughout the HCP process would enhance the scientific aspects of HCPs. While the review process would likely not be binding, it is important that reviews are made public (while respecting the rights of the reviewers to be anonymous). It is also necessary to have an appropriate system to ensure that suggestions by review panels be incorporated into HCPs. The concept of including independent academic peer review of some subset of all HCPs is paramount to advancing the program in a scientifically credible way. With the above described system, the FWS can more successfully work with private landowners, through the HCP process, in their attempt to conserve wildlife species.

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# The No Surprises Policy: Stepping Away from Sound Bites and Getting Down to Business

Donald C. Baur

"No Surprises" entered the lexicon of the Endangered Species Act (ESA) in August 1994 when Secretary of the Interior Bruce Babbitt and Secretary of Commerce Ron Brown issued a press release announcing the No Surprises policy (FWS and NMFS 1994). It made a big splash, but in actuality the press release only dusted off and then held out for full application an element of the habitat conservation plan (HCP) process recognized by Congress twelve years earlier.

The Conference Report on the 1982 ESA Amendments indicates that habitat conservation plans should be used to "provide long-term commitments regarding the conservation of listed as well as unlisted species and long-term assurances to the proponent of the conservation plan that the terms of the plan will be adhered to and that further mitigation will only be imposed in accordance with the terms of the plan" (H.R. Rep. No. 835, 97th Cong., 2d Sess., 32 1982, p. 30-31). Congress recognized that, for the goals of the ESA to be achieved, it is necessary to enlist non-federal entities in proactive habitat conservation. Because these plans are voluntary, Congress recognized, assurances must be provided to plan participants.

The No Surprises policy quickly became one of the featured acts on the Clinton Administration's stage of ESA reforms and innovations. It was part and parcel of the Administration's drive to prove that the ESA could work to protect species without stifling resource utilization and development.

The result was dramatic. Between 1982 and 1994, only 39 HCPs had been approved (FWS 1997). Since the policy was announced, 212 HCPs and incidental take permits have been approved (see Dohner and Smith, this issue). According to a review of HCPs done for this paper, in 1997, of those approved, approximately 74 include No Surprises assurances. The new policy also plays a key role in many of the more than 200 HCPs now under development.

The No Surprises policy also played an important role in muting the criticism that the ESA is unworkable and too stringent. At a time when the ESA was under strong attack, the No Surprises policy and the HCP process it facilitated gave rise to a constituency of regulated entities who, although still not enthusiastic about the law, at least were willing to say it is possible to balance conservation with development and resource use.

Having helped usher in the "Era of the HCP," the No Surprises policy also inspired a host of new ESA sound bites. "No Surprises," "A deal is a deal," and the call for ever-increasing degrees of regulatory "certainty" became rallying cries for many regulated entities. Environmental groups opposed to the No Surprises policy counterattacked, alleging that "Nature is full of surprises," and "species need certainty too."

As a result, much of the debate swirling around the No Surprises policy has become nothing more than a battle of catchy phrases. This has polarized the issue. As is true of so many controversies under the ESA, there is a middle ground.

## Fundamental principles

To reach this middle ground, four fundamental principles must be accepted. First, long-term, multi-species, large-scale HCPs that include provisions to protect unlisted species must be considered worthwhile. If these plans are considered desirable, then the No Surprises policy is essential. Without the No Surprises policy, these plans will not be developed.

Second, the fact that No Surprises assurances are contract terms must be recognized. The precise content of those assurances for a specific HCP will be determined by the negotiating positions of the applicant, the agencies, and public participation.

Third, although nature is full of surprises, HCPs with assurances can be developed to provide the means to respond to the changes of nature without

imposing unfair burdens on the landowner. Most HCP applicants agree at the outset to have their plans adjusted to meet new problems; what they will not accept is subsequent unilateral decision-making by the federal government.

Fourth, the No Surprises policy itself must be understood. Rather than giving away the store on species conservation, it simply makes the promise that the government will abide by the terms of the negotiated deal. It makes this commitment on two levels.

On the first level, the No Surprises policy provides that no land or financial compensation beyond what was agreed to in the HCP will be required, as long as the HCP is "properly functioning." These assurances also apply only to species that are "adequately covered." And other forms of mitigation can be sought when "extraordinary circumstances" occur.

At first blush, this sounds like a great deal for permit holders. But when the guidance on the meaning of "extraordinary circumstances" is considered, the degree of certainty bestowed by the No Surprises policy itself becomes far more questionable. "Extraordinary circumstances" is defined broadly enough to cover a wide range of biological problems (FWS and NMFS 1996). Thus, to obtain meaningful assurances under the first level of the No Surprises policy, the permit holder needs to spell out those guarantees in the HCP.

The second level of the No Surprises policy goes a step further and provides that no additional mitigation of any type will be imposed when the HCP has a "net positive impact" on the species. Thus, to be fully protected from additional mitigation, the permit holder must develop a plan that actually makes the species better off.

## No Surprises is workable

To demonstrate why the No Surprises policy is workable, reference is made to the position paper on ESA reauthorization issued recently by a group of scientists (Brussard et al. 1997). This paper listed five areas of concern with

the No Surprises policy. Each of these concerns is addressed below.

(1) *It must be possible to amend HCPs based on new information; it should not require extraordinary circumstances to do so.* An HCP does not have to be "amended" to deal with new problems. Many plans have built-in flexibility and provide for adaptive management. If subsequent monitoring reveals that biological conditions are different from those originally estimated for the HCP, models can be refined and management practices modified under the adaptive management provisions built into a plan (see Buchanan, this issue). For example, one HCP stipulates that, should monitoring determine that biological conditions are outside the "bounds" estimated in the HCP, the permit holder and the U. S. Fish and Wildlife Service will review the assumptions, refine models and modify management (Plum Creek Timber Company 1996; see Hicks, this issue). Another plan calls for regularly scheduled assessment of management practices under the HCP. This will be based on input from monitoring and research, and management will be adjusted as necessary (Oregon Department of Forestry 1995). Thus, the parties have agreed that a change in circumstances or the discovery of new information may warrant changes to the HCP that would increase or change the level of mitigation required.

The terms of the plan therefore can provide for ongoing adjustments and changes to HCPs to respond to new information developed over the course of the plan implementation. However, those situations where additional mitigation will be required should be spelled out. Beyond the management measures expressly stipulated, other amendments can also occur—subject to the consent of both sides.

(2) *There must be a source of adequate funding to underwrite program changes when parties other than the landowners request them.* For sure, a reliable, adequate funding source is desirable. One of the few issues virtually all parties to the ESA debate agree upon is the need to secure such a funding source. In any case, the key point is that HCPs can themselves be designed to respond to most of the problems that give rise to the need for remedial action. Furthermore, there is a

lot the federal government can do with existing funds or programs. Thus, although all parties with an interest in HCPs should work together to establish an adequate funding source, it would be a serious mistake to forego current opportunities to develop these beneficial plans for the sake of awaiting an insurance policy that may rarely or never be drawn against.

(3) *There must be mechanisms to ensure that long-term conservation plans will be monitored adequately. Monitoring should focus on target species, and new information derived should be incorporated into management.* These are contractual terms that can be negotiated as suitable to the plan involved. Many HCPs include monitoring and adaptive management to respond to identified problems. Under the terms of one HCP, the permit holder is obligated to monitor, submit reports annually on the progress of the HCP, conduct regularly scheduled meetings to discuss the progress of the HCP, and review any necessary refinements or revisions (Murray Pacific Corporation 1995).

(4) *HCPs must clearly articulate measurable biological goals and demonstrate how these goals will be attained.* Section 10 of the ESA requires the Secretary to determine that the measures included in the conservation plan will be met. Many HCPs articulate such goals. Under one HCP, for example, goals are spelled out for spotted owl numbers. Modifications may be required should the estimate of owl-carrying capacity be revised to be less than 80% of the initially predicted level, based on monitoring data and a peer-reviewed opinion that the problem was due to conditions caused by the HCP or miscalculations of owl response to the habitat provided (Plum Creek Timber Company 1996).

(5) *Assurances should only be extended for those targeted species for which the plan articulates species-specific goals that further conservation in a regional context.* This statement is unclear. If it would require species-specific goals for every species subject to a multi-species or ecosystem-based plan, then it defeats the use of indicator species and should be rejected. If, however, this principle means that such goals should be established for indicator species or some similar method of determining HCP success, then it is

realistic and achievable. "Regional conservation" has the best chance of succeeding if the No Surprises policy is made readily available. By extending assurances, incentive exists for large-scale, ecosystem-wide HCPs that "further conservation in a regional context."

## Conclusion

If these five principles are to be the criteria for determining whether the No Surprises policy can work for species, then the answer is yes. The bottom line is that the No Surprises policy stands for one basic proposition—if the applicant develops a plan that meets all of the relevant criteria for approval and requests a commitment of regulatory certainty, assurances will be provided. The content of those assurances, however, will be determined by negotiation, by public comment, and by federal decision-making based on the record. None of these No Surprises HCP provisions are preordained. And because these terms are open to bargaining and public review, there is every reason to believe that, given the proper level of scrutiny, the HCPs which are ultimately approved will meet the needs of species and the expectations of landowners.

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# The No Surprises Policy is Essential to Attract Private Dollars for the Protection of Biodiversity

Robert D. Thornton

Much of the commentary on habitat conservation plans (HCPs) involves a recitation of the respective positions of the environmental and regulated communities concerning the No Surprises (or as I think it should be called, the Assurances) policy. The environmental community states an incontrovertible fact—life and natural systems are full of surprises. The regulated community explains, quite logically, that positive incentives, in the form of regulatory certainty and predictability, are necessary if private landowners are to participate in landscape-level habitat planning that will inevitably lead to significant, uncompensated, restrictions on the use of private property. What is largely missing from this debate is any discussion concerning the important relationship between the No Surprises policy and the funding of ecosystem planning efforts.

Debate has focused on the consistency of the No Surprises policy with the Endangered Species Act (ESA), the perceived need for improved scientific review of HCPs, and the adequacy of the existing public participation process under Section 10(a). All of these topics are important and have been addressed at length elsewhere (Thornton 1991). I will not restate the sound legal bases for the No Surprises policy, except to say that as one who was involved in the original debate over HCPs and the No Surprises policy in 1982, one wonders what else Congress could have had in mind when it said in the Conference Report to the 1982 ESA Amendments:

"The Committee intends that the Secretary may utilize this provision to approve conservation plans which provide long-term commitments regarding the conservation of listed as well as unlisted species and *long-term assurances to the proponent of the conservation plan that the terms of the plan will be adhered to and*

*that further mitigation requirements will only be imposed in accordance with the terms of the plan"* (emphasis added, H.R. Rep. No. 835, 97th Cong., 2d Sess. 30).

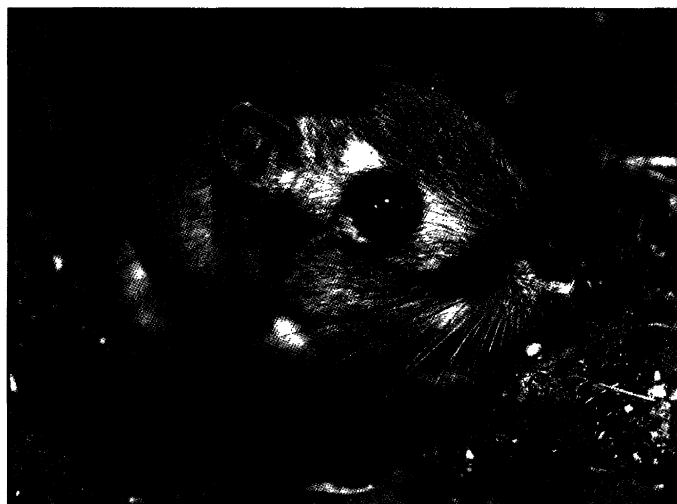
The debate concerning the No Surprises policy should not be about whether or not surprises can be expected; it should be about defining the proper allocation of risks to achieve the national goals set by the ESA. How much should the private landowner be required to pay, and how much risk should be borne by the public at-large? The public at-large, and their consumptive behavior, is ultimately the cause of our predicament (Parenteau 1997). The public at-large is also the beneficiary of the solutions. But, under our existing regulatory system, the public at-large is asked to contribute precious little to the protection of endangered species. Instead, the burden of the protection of endangered species habitat on private land falls disproportionately on the owners of the remaining undeveloped habitat—despite the fact that in most cases the species at issue became endangered because of decisions made by all levels of government for the benefit of society as a whole.

## Addressing surprises

It is surprising to me that, with all of the sophistication within the environmental and regulated communities, no one has asked how these problems are addressed in other contexts. After all, biological systems are not the only forces that are difficult to pre-

dict. For example, how does the financial community and the construction industry deal with the risk of a major seismic event in the financing of billion dollar transportation systems? As I have learned in my role as general counsel to two regional transportation agencies in Orange County that are building projects worth \$3 billion (without a single federal construction dollar), the answer is that a variety of complex legal mechanisms have been developed to provide the necessary certainty required by the capital markets. These mechanisms include insurance of various forms, debt service coverage ratios, horizontal and vertical risk allocation provisions of construction contracts, secondary credit markets, letters of credit, lines of credit, loan guarantees, stipulated damages, force majeure clauses (i.e., events not able to be controlled by either party; e.g., civil disobedience, acts of God). Enforceable rules of law apply to all of the foregoing.

In the construction context, the construction contractors, project owners, and lenders do not argue about the need to provide reasonable certainty—or whether or not major construction projects involve "surprises." They know from experience that surprises are to be expected. Instead, the lenders, owners, and contractors figure out how



Stephens' kangaroo rat (*Dipodomys stephensi*). Photograph by B. Moose Peterson/WRP.

to minimize the risks and provide sufficient security to get the lender "comfortable" so that the lender will finance the project.

### Providing certainty

Why is it in the interest of biodiversity to provide certainty and predictability to landowners? Because, as the regulated community has often stated, landowners will not irrevocably restrict the use of their land through deeds and easements without a bankable understanding that more land or more money will not be required on the whim and caprice of the regulatory agencies—especially when the additional requirements derive from events completely outside of the control of the landowner. As Oliver Houck so concisely stated, "Why otherwise would anyone agree to set aside a reserve area predicated on the needs of non-endangered, indicator species" (1997). Why indeed.

The basic dilemma is that there is *no* uncertainty associated with the conveyance of land. When a seller executes the grant deed, we know for certain that his property rights are transferred. This kind of certainty is not currently available in the federal regulatory environment (even with the No Surprises policy). Indeed, respected representatives of the environmental community believe that it is reasonable public policy to require landowners to convey away their property only to have the government come back later (for reasons completely unrelated to the landowners performance of his obligations) and say "surprise—we need more land!"

There is another reason for the environmental community to support the No Surprises policy—it is central to obtaining the kind of financing that is necessary to adequately fund the implementation of plans that protect biodiversity. In the post-Proposition 13 era, funding at the local level for con-

servation planning is likely to come increasingly from the development community and user-fee projects financed by the capital markets. The funding will not be provided if lenders, landowners, and project owners are required to take unlimited risks of new restrictions arising out of "unforeseen circumstances." Certainly, lenders will not provide funding without a cap on their potential liability.

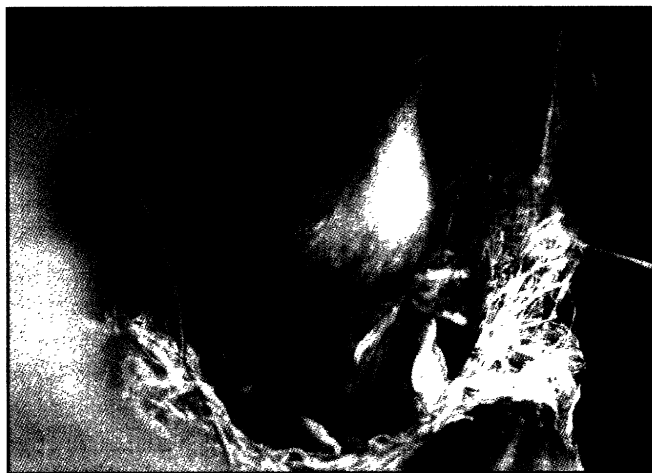
To deal with the regulatory uncertainties of the existing regulatory environment, lenders are protecting themselves by imposing enormous additional financing charges—in the case of one of the transportation projects in Orange County, California, \$100 million dollars more—solely to protect against environmental regulatory uncertainty. This money was not put to any productive use. It was set aside in a fund to pay interest on the debt in the event of delays in the project. Would it not have been better if some component of these funds could have been committed to the protection of biodiversity—in return for protection for the investors and owner against additional regulation?

The No Surprises policy is absolutely essential if we have any hope of attracting significant investment by the private capital markets in ecosystem planning. Many novel approaches for attracting private capital are under way including mitigation banks, conservation banks, and tradable habitat credits (Thornton 1993). These efforts are likely to fail in the absence of the No Surprises policy.

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# Why HCPs Must Not Undermine Recovery

Victor M. Sher and Heather L. Weiner

Under the current practices of the U. S. Department of the Interior (DOI), HCPs not only fail to move species towards recovery, they unnecessarily interfere with efforts to prevent extinction. This is the result of two fundamental flaws in DOI's approach to HCPs. First, DOI has lost sight of the link between HCPs and the recovery goals of the Endangered Species Act (ESA). Second, the current generation of HCPs are improperly heavy on mitigation and light on minimization. The current emphasis on "certainty" in HCPs intensifies these flaws.

## Recovery is the guiding light for HCPs

The link between HCPs and recovery of species in the ESA is direct and clear (see e.g., Cheever 1996). First, the fundamental purpose of the ESA is "to provide a means whereby the ecosystems upon which endangered and threatened species depend may be conserved..." (16 U.S.C. § 2(b)). The ESA defines "conservation" as the "use of all methods and procedures which are necessary to bring any endangered species or threatened species to the point at which the measures provided pursuant to [the ESA] are no longer

necessary" (*Id.* § 3(3)). All federal agencies must "seek to conserve endangered and threatened species and shall utilize their authorities in furtherance of" the conservation policies of the ESA (*Id.* § 2(c)).

Section 10, which authorizes incidental take permits upon completion of HCPs, prohibits FWS from approving an HCP unless it makes the explicit finding that "the taking will not appreciably reduce the likelihood of the survival and recovery of the species in the wild." The legislative history of this provision explains that in deciding whether to issue an incidental take permit, the Secretary of Interior "should consider the extent to which the conservation plan is likely to enhance the habitat of the listed species or increase the long-term survivability of the species or its ecosystem" (H.R. Rep. No. 835, 97th Cong., 2nd Sess. 32, 1982. p. 29).

## Recovery not part of current HCP practice

As a first step and at a minimum, HCPs should be guided and judged by the overarching goals set out in good final recovery plans. This is not as easy as it sounds. For an HCP to be consistent with the recovery goal of the ESA,

one arguably needs a recovery plan to follow. A good recovery plan details species' distribution, population demographics, abundance, and dynamics, as well as site-specific goals for achieving a long-term viable populations. Although few recovery plans meet these criteria or escape politicization, the scientific scrutiny and thought behind them is invaluable. Unfortunately, 40% of listed species lack final recovery plans. As of January 31, 1997, the FWS was responsible for 1,071 domestically listed species, but only 644 had approved recovery plans (FWS 1997).

There are two reasons for this backlog. First, there is no deadline for the completion of recovery plans. The FWS has internally sought a recovery outline 60 days after listing, a draft plan one year after listing, and a complete plan after 2.5 years, but this timetable is rarely fulfilled (FWS 1992). Second, funds for recovery plans are often earmarked by Congress for high-profile species, leaving less charismatic species to decline (Defenders of Wildlife 1995). Additionally, the FWS is constrained by an inadequate budget, limited staff, and political pressure (*Id.*). This situation is becoming even more serious as recovery funding is used for

Species Name	Date Listed	Population Status	Recovery Plan Stage	HCP Name(s)
California red-legged frog	5-96	D	U	Pacific Gas and Electric
Key Largo woodrat	8-84	S	D	Driscoll Properties; Nicholas/Hendrix/Post
marbled murrelet	10-92	D	D	Millacoma Tree Farm; Port Blakely; Coast Range Conifers; Murray Pacific; Regli Estate; Elliott State Forest
Mexican spotted owl	3-93	U	U	Heritage Arts; Washington County Mojave Desert Tortoise
western snowy plover	3-93	S	U	Millacoma Tree Farm
giant kangaroo rat	1-87	D	U	Chevron Pipeline; Metropolitan Bakersfield
razorback sucker	10-91	D	U	Clark County Long Term Desert Conservation

Table 1. Examples of species authorized for take under HCPs before final recovery plan in place. Population status D=declining; S=stable; U=uncertain. Recovery plan stage D=draft; U=under development.

HCP implementation rather than for recovery plan implementation.

Under political pressure to produce take permits, FWS is authorizing HCPs for many species without recovery plans. For example, large-scale HCPs have been approved for the marbled murrelet (*Brachyramphus marmoratus*), Mexican spotted owl (*Strix occidentalis*), western snowy plover (*Charadrius alexandrinus tenuirostris*), giant kangaroo rat (*Dipodomys ingens*), and razorback sucker (*Xyrauchen texanus*), and yet none of these species has a completed recovery plan (see Table 1). Final recovery plans for these species would give guidance to a FWS staff person reviewing permits for approval.

Candidate species pose a special problem. HCPs with the No Surprises (see Dohner and Smith, this issue) clause often cover many unlisted species. Once a species makes it to the candidate list, there is usually scientific information about the species' biology and threats to its survival, but no strategy to achieve recovery. Under the No Surprises policy, an HCP may preclude changes to land management plans for up to 100 years. A subsequent listing decision will be rendered ineffective by a bad large-scale HCP. The flexibility and range of recovery options for a newly listed species will be limited by a long-term No Surprises clause in a bad HCP.

For this reason, No Surprises clauses should not apply to candidate or unlisted species. A good illustration is the 100-year Plum Creek HCP in Washington's Cascade Mountains (1996; see Hicks, this issue). This HCP allows the take of four species currently protected by the ESA: northern spotted owl (*Strix occidentalis caurina*), marbled murrelet, grizzly bear (*Ursus arctos horribilis*), and gray wolf (*Canis lupus*). The HCP also addresses another 281 unlisted vertebrate fish and wildlife species; the planning area of about 419,000 acres provides habitat for 77 mammal, 178 bird, 13 reptile, 13 amphibian, and 4 fish species. While Plum Creek's measures to benefit these species include greater riparian buffers and wetland protection than now required under state or federal law, we may be confined to these commitments



Red legged frog (*Rana aurora draytoni*). Photograph by B. Moose Peterson/WRP.

years from now if one or even many of these species need further protection. A newly listed species will have few options for improvement on Plum Creek's property.

Recovery plans should be the guiding lights for HCPs, but even the good ones are not making it into the HCP planning process. The Alabama beach mouse (*Peromyscus polionotus ammobates*) HCPs, currently being challenged in court by the Sierra Club and others, are good illustrations (*Fort Morgan Civic Association v. Babbitt*, 97-00773, D.C. District Court). When the mouse was listed as endangered in 1985, fewer than 900 individuals occupied less than 350 acres of habitat. The recovery plan for the mouse, which resides in beach dunes along the Alabama coast, calls for maintenance and improvement of all remaining beach mouse habitat. Four HCPs have been issued since then, authorizing permanent destruction of about 10% of the remaining habitat. The two new HCPs now being challenged would destroy another 44.5 acres (13%) of beach mouse habitat. In exchange, the permit recipients will put up signs, restore some of the dunes damaged during construction, and contribute funds to one of several mitigation options, including FWS's conservation research. Neither the construction nor the mitigation is consistent with the recovery strategy to improve all existing habitat, yet these permits were issued

by the same agency that approved the beach mouse recovery plan.

### Heavy on mitigation, light on minimization

The ESA mandates both mitigation and minimization to prevent HCPs from undermining recovery. Section 10 says HCPs must "to the maximum extent practicable, minimize and mitigate the impacts" on affected species. Current HCPs are usually lopsided—heavy on mitigation and light on minimization.

Incidental take permittees must consider a range of alternatives for their actions, yet those alternatives are usually given little more than a cursory review. Efforts to minimize the impact of development on the existing habitat are usually ignored due to "economic circumstances."

Without minimization, the future is completely predetermined with the first roar of the bulldozer. When FWS approved the blacktop for all 24-acres of a "Super" Wal-mart site on Florida scrub jay (*Aphelocoma coerulescens coerulescens*) habitat, the agency included a No Surprises clause in the permit contract language (Wal-mart 1993). The irony is that once the habitat was cleared, there was no uncertainty left. Everyone knew full well what the impacts on the species were. Yet no minimization or serious consideration of alternatives to avoid take was attempted. Wal-mart paid a mitigation

fee for habitat acquisition elsewhere, the company was assured that no additional mitigation fee would be required, and construction continued.

Even with some cursory minimization, more and more HCPs are starting to look like the bald eagle (*Haliaeetus leucocephalus*) HCP in Florida. A 30-house residential development in Osceola county, Florida has been permitted by an HCP which lasts for the next 100 years (Gross 1996). This HCP allows for the construction of 14 homes and related infrastructure inside a 250-foot buffer zone around an inhabited bald eagle nesting tree. For minimization the developer is merely required to monitor the nesting site, keep chainsaw noise to a minimum, and pay a small fee. Although a larger habitat acquisition fee will be collected as mitigation if the eagles abandon the site, the developer need do nothing else to protect the threatened birds or their young.

In many cases, the FWS is depending on translocation of individuals from the permitted development area to a larger, federally owned "reserve." For example, in Washington County, Utah, all Mojave Desert tortoises (*Gopherus agassizii*) in the county are being moved to a fenced-off Bureau of Land Management (BLM) cattle grazing area. Ironically, the FWS admits that translocation is rarely successful for the species (Washington County 1996). Under this scenario, there is little chance for tortoise population expansion and recovery within their BLM-managed zoo. Similarly, the red-cockaded woodpecker (*Picoides borealis*) HCPs in the southeastern United States depend heavily on translocation of live birds to artificial cavities on federally managed forests, despite a dismal translocation success rate for adult birds (see e.g., Top of the World 1997; see Jackson, this issue).

### Recovery is no longer certain

The Alabama beach mouse HCPs and the Mojave Desert tortoise HCP illustrate a trend towards HCPs that undermine, rather than enhance, recovery. Yet many HCPs have No Surprises clauses that close off the options for modifications to these plans, if and when problems arise. By providing "certainty"

to permit holders through the No Surprises policy, FWS is rendering recovery goals obsolete and irrelevant.

This is a fundamental mistake. Uncertainty occurs in every context of financial planning, and the cost of that uncertainty is generally borne by the marketplace. Unfortunately, by making an artificial regulatory shift away from the marketplace, the FWS places responsibility for recovery completely on the shoulders of the taxpayers, while subsidizing further development of essential habitat. Assuming Congress becomes no more generous in its allocation of funds for endangered species conservation, the promise to recover endangered species will never be fulfilled. [For fiscal year 1997, Congress appropriated a mere \$67.395 million for DOI's endangered species program.]

This policy also has dangerous implications for other environmental laws such as the Clean Water Act and the Clean Air Act. We would not allow polluters to be protected from new information indicating that a discharged pollutant is a poison. Similarly, we should not allow developers to be protected from new information indicating that certain habitat management techniques interfere with recovery.

### Conclusion

More and more ecologically vital habitat is being authorized for development through biologically weak plans. We must utilize the existing ESA to improve the approval standards for HCPs, and refocus the HCP review and approval process on the needs of imperiled species. This means reorienting HCPs toward the recovery goals of the ESA, as originally intended by Congress. Until that happens, HCPs will do more to preclude recovery than to ensure it.

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# Concluding Comments

Katherine N. Irvine and John F. Watson

Our goal with this issue is not so much to advance the collective knowledge on habitat conservation plans (HCPs) as to provide, in one location, a concise discussion of the current state of understanding. From the outset, we hoped to provide information beneficial for people just becoming familiar with HCPs as well as to present multiple sides of the debate for people closely involved in species recovery. The breadth of viewpoints within this Special Issue makes clear that concerns surrounding HCPs are controversial, data are lacking, and interpretations differ even when discussing the same topic. We also see a number of important recurring themes regarding the appropriate use of HCPs, which we highlight below.

*Gaining a new conservation tool.* HCPs create a new level of management possibilities, allowing recovery efforts to move beyond the limits of prescriptions under the pre-HCP Endangered Species Act (ESA). For example, the ESA traditionally could not compel landowners to maintain fire-dependent habitat or control invasive species; under HCPs these approaches have successfully been incorporated into land management practices. HCPs also appear to offer a way to address the question of landscape-level management and pro-active planning for communities and their surroundings.

*Addressing assurances and uncertainty through adaptive management.* There is an inevitable trade-off between the uncertainty inherent in natural systems and the assurances that private landowners need in order to invest in species conservation. The No Surprises policy will likely continue to be a lightning rod of controversy. The question may ultimately be whether HCPs can be designed well enough to provide economic certainty for landowners and a biological safety net for species. Adaptive management will have to play a role in order to achieve this goal. Incorporating avenues through which HCPs can be modified as new information is

learned is paramount to successful species conservation and may be the necessary counterpart to assurances.

*Role of independent scientists and others concerned citizens.* This is a tricky issue. On the one hand, involving individuals and organizations not formally involved in the HCP process makes the process longer and more costly, and may be perceived as infringing on landowners' property rights. On the other hand, the involvement of concerned parties may provide new information and necessary scrutiny that can result in thorough, creative solutions to species protection on private lands. The remaining question is whether the benefits of citizen involvement can be incorporated in a way that will minimize the increase in costs to private landowners.

*Role of federal land.* The majority of HCPs are for lands under private ownership. Identifying and implementing appropriate conservation strategies for private lands located near federal lands, however, is difficult as long as the role of the federal land in species conservation remains unclear. The development of long-term management plans for federal land, that will exist despite changes in political or economic winds, is critical for determining effective roles for private lands.

*Determining HCP goals.* Is the goal of habitat conservation planning the recovery of the species covered? Or is the goal only survival? The issue of what HCPs are actually supposed to do has been and will likely continue to be a central point of discussion, with good arguments made for either goal. Currently this debate centers on interpretations of statute, emphasizing terminology of the ESA and intent of Congress. It is vital that we consider this issue from the biological perspective as well—what is needed, biologically, for either species survival or recovery.

*Need for good data.* A far better understanding of already implemented HCPs is sorely needed in order to evalu-

ate those that are currently being developed and those that will be conceived in the future. Identifying ways to comprehensively evaluate HCPs, and incorporating these methods into the plans themselves, would improve both development and implementation of new plans.

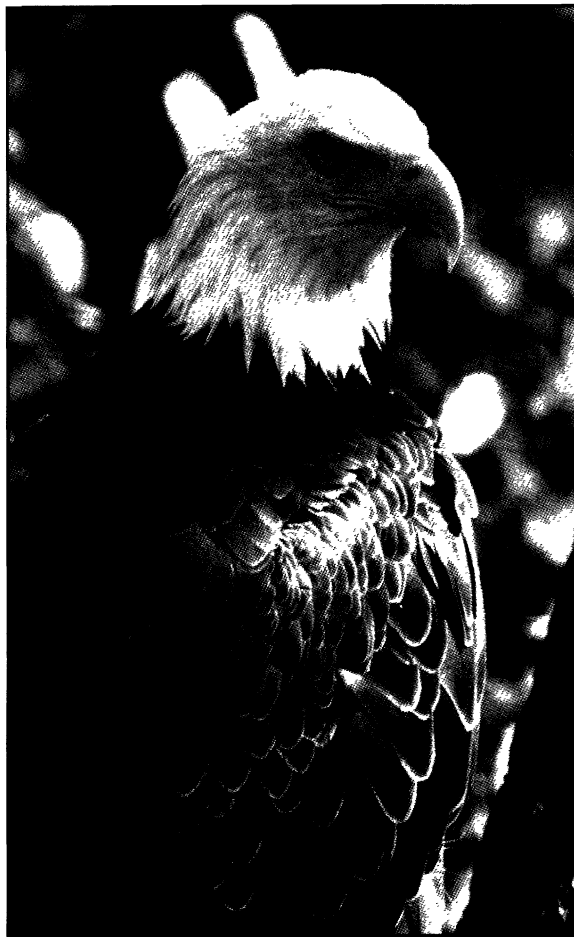
*Need for funding.* Successful creation and implementation of HCPs will undoubtedly require a greater level of funding than currently exists for species conservation. In some cases landowners can provide funding. In other cases, however, increased public funding will be necessary to allow, for example, greater scientific review, citizen participation, and acquisition of vital habitat that otherwise would not be protected.

## Conclusion

The articles in this Special Issue illustrate that the landscapes covered by HCPs are ecologically and economically diverse. In southern California the landscape is highly developed and fragmented. In the Pacific Northwest a mix of industrial and more natural forests is at issue. In the southeastern states land is primarily in private ownership. The former two landscapes provide venues for testing different approaches to multi-species conservation for large landscapes over extended periods of time. By contrast, the Southeast furnishes a landscape in which HCPs focus on conservation of a single species, the red-cockaded woodpecker (*Picoides borealis*). These three geographic examples clearly illustrate that a "one-size-fits-all" approach to the design of HCPs will not work. As results gleaned from current HCPs are considered for inclusion into a reauthorized ESA, we need to ensure that lessons from one geographic region are not being improperly applied to another, or to species conservation as a whole.

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Photograph by B. Moose Peterson/WRP

## About the Endangered Species UPDATE

In 1976, the U. S. Fish and Wildlife Service Office of Endangered Species began publishing the Endangered Species Bulletin to keep agencies, private organizations, industry, and concerned individuals abreast of developments in the federal endangered species program. In 1981 federal budget cuts forced the Fish and Wildlife Service to limit distribution to federal employees and official contacts of the endangered species program. This meant that the public could no longer receive up-to-date information on the listing, recovery, and status of endangered species and related federal actions and programs.

In response to the cutbacks, the School of Natural Resources and Environment at The University of Michigan initiated a reprint program in 1983. Since then, the UPDATE has grown into a unique forum for ideas and information on endangered species protection. Regular issues of the UPDATE, published bimonthly, combine two publications in one: a reprint of the Endangered Species Bulletin and a cover section of 16 pages produced by the School of Natural Resources and Environment, including articles on science, policy, and management issues written by professionals from a variety of government agencies, law firms and universities, and private non-profit organizations.

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