

Where Property Rights and Biodiversity Converge: Lessons From Experience in Habitat Conservation Planning

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INTRODUCTION

The Conflict between Biodiversity Protection and Private Property Rights

Harvard professor Edward O. Wilson predicts that at current extinction rates our world could lose, forever, a fifth or more of its plant and animal species by the year 2020.¹ That is 1,000 to 10,000 times the natural extinction rate. The consequences are real: for example, in the United States, 16% of mammals, 14% of birds, and an alarming 37% of freshwater fishes are extinct, imperiled or vulnerable.² Each of these species is a unique adaptive experiment never to be repeated while this planet endures, a once-only chemical laboratory, a bit of wonder and learning never again to emerge. We are, in effect, throwing away the science books before they can be written. The overwhelming cause is loss of habitat.

The overarching goal of the federal Endangered Species Act (ESA) is to conserve species and the ecosystems upon which they depend.³ For a quarter century, the ESA has served as the safety net between peril and extinction for the thousands of species that have been listed for protection. However, during that time, the ESA has not kept pace with the emerging biodiversity crisis.⁴ In the years since the Act's passage, only a handful of species have been delisted, signaling the recovery of the species to a stable population level.⁵ Less than a tenth of all listed species are actually improving in status, while nearly four times that number is declining.⁶

Among the daunting challenges that conservationists will face in the next era of biodiversity protection, the potential conflict between private property rights and the public interest in preserving biodiversity is posed to become an increasingly contentious issue. According to the U.S. Fish and Wildlife Service, half of all federally listed species do not occur on federal lands, and more than half of listed species have at least 80% of their habitat on nonfederal lands.⁷ The only hope for preserving species over time is by maintaining or restoring viable populations of species that are adequately distributed in healthy ecosystems.⁸ Yet, for those species whose habitat is mainly or exclusively on private lands, intact ecosystems are increasingly rare.

The potential conflict between habitat conservation and private development rights has several dimensions. There is a practical consideration: Because property rights include the right to restrict access, destruction of habitat—even if illegal—is difficult to monitor and enforce. There is a federalism consideration: Land (and water) use planning has long been regarded as the province of local units of government rather than the national government, which administers the ESA. And there is an equity consideration: Where other areas of environmental protection require those who cause the problem to pay for the solution, endangered habitat protection visits the conservation burden on the hapless few who happen to own the remnant tracts while those who have destroyed the original habitat are by that very act immune to regulation. For all of these reasons, conservation of habitats subject to private rights requires a degree of cooperation by those property owners, which is uncommon in the field of environmental law.

¹ Edward O. Wilson. *The Diversity of Life*. W.W. Norton & Co., New York. 346 (1992).

² The Nature Conservancy. *1997 Species Report Card: The State of U.S. Plants and Animals* 10-11 (1997).

³ 16 U.S.C. § 1531(b).

⁴ Biodiversity is a shorthand expression for the "full richness of life on earth," and encompasses at least three levels of diversity: genetic diversity, species diversity, and community or ecosystem diversity. Noss, R.F. & A. Cooperrider, *Saving Nature's Legacy: Protecting and Restoring Biodiversity*. Defenders of Wildlife and Island Press, Washington DC. 3-13 (1994).

⁵ Flaws in the ESA significantly contribute to its ineffectiveness in conserving biodiversity. Rohlf, Daniel J. Six Biological Reasons Why the Endangered Species Act Doesn't Work—And What To Do About It. *5 Conservation Biology* 273, 274 (1991).

⁶ U.S. Fish and Wildlife Service. *Report to Congress: Recovery Program, Endangered and Threatened Species*. Washington, D.C. (1994) as quoted in Environmental Defense Fund. *Rebuilding the Ark: Toward a More Effective Endangered Species Act for Private Land* 1 (1996).

⁷ Defenders of Wildlife. *Frayed Safety Nets: Conservation Planning Under the Endangered Species Act* 1 (1998).

⁸ Cheever, Federico. The Road to Recovery: A New Way of Thinking About the Endangered Species Act. *23 Ecology Law Quarterly* 1, 4 (1996).

Habitat Conservation Plans: A Possible Solution

When it was enacted in 1973, the ESA simply prohibited any “take” of endangered species, and that prohibition has since been extended by the U.S. Supreme Court to include destruction of a species’ critical habitat.⁹ However, an absolute ban on the development of endangered species habitat proved unworkable. Habitat Conservation Plans (HCPs) are Congress’ solution. The Act was amended in 1982 to authorize the U.S. Fish and Wildlife Service and the National Marine Fisheries Service (the “Services”) to permit take incidental to development when approved as part of a habitat conservation plan prepared by the land or water rights holder.¹⁰ These HCPs are essentially negotiated settlements of regulatory liabilities, designed to foster economic development free of the risks associated with the occurrence of endangered species on private lands. HCPs must include species conservation and mitigation measures sufficient for the Services to find that the take will not appreciably reduce the likelihood of survival or recovery of the species.¹¹ The landowner then receives an assurance—called the “no surprises” guarantee—that the Services will not increase the conservation measures or other requirements without the landowner’s consent, no matter how successful or unsuccessful these may ultimately prove to be. The “no surprises” arrangement has ignited a veritable explosion in HCPs. As of this writing, some 400 such plans are in various stages of development, approval or implementation nationwide.

Controversial Features and Imperatives for Reform

Several features of HCPs have stirred controversy. First, HCPs allow the Services to permit development activities that will have some measure of adverse impact on species and habitats that are already severely depleted, as long as these activities do not *appreciably* reduce the prospects for the survival and recovery of the species. What these species need, however, is a net improvement in their survival prospects. They need a recovery strategy. Indications of this mismatch between statutory and conservation requirements can be seen on the ground: 62% of listed species are declining in areas where they are covered by an HCP and 4% of these species are declining so rapidly that extinction is possible within the next 20 years.¹² As long as HCPs are seen as instruments to “nickel-and-dime” species toward extinction, the HCP process will never be satisfactory to conservation interests, just as it will never be satisfactory to private rights holders as long as habitat conservation represents a permanent cloud over the exercise of development rights.

Second, the “no surprises” regulatory assurance provides landowners with important incentives to participate in the development and implementation of HCPs. But it does so by shifting to the vulnerable species the risks incident to incomplete and uncertain understanding of how abundance levels will respond to particular conservation strategies. Neither investments in private development nor the survival of species are secure under this arrangement. The modern understanding is that ecosystems are in a constant state of flux, usually without long-term stability, affected by a series of human and other, often stochastic, factors, many originating outside the ecosystems themselves.¹³ As 150 prominent conservation scientists stated to the U.S. Congress, assurances to landowners that the conservation obligations in their HCP will remain immutable “does not reflect ecological reality and rejects the best scientific judgment of our era. It proposes a world of certainty that does not, has not, and will never exist.”¹⁴ Should the rigidity of the “no surprises” guarantee so hobble the ability of the Services to take action that a listed species is extirpated, this entire artifice is likely to crash in the political firestorm that would ensue.

Finally, conservation interests and local communities are often excluded from the balancing of biodiversity protection and local economic development that occurs in the HCP negotiations. As a consequence, the process often does not garner the support of these interests or generate confidence in the scientific bases of the resulting conservation program.

⁹ *Babbitt v. Sweet Home Chapter of Communities*, 115 S.Ct. 2407 (1995).

¹⁰ 16 U.S.C. §1539.

¹¹ 16 U.S.C. § 1539(a)(2)(B).

¹² Kareiva, Peter, *et al. Using Science in Habitat Conservation Plans*. National Center for Ecological Analysis and Synthesis (NCEAS), Univ. of California, Santa Barbara, and American Institute of Biological Sciences, Washington, D.C. (1999) (hereinafter cited as “NCEAS”).

¹³ Williams, John G. Notes on Adaptive Management, Prepared for the Ag-Urban Ecosystem Restoration Team 3, reprinted in *Comments Of The Natural Heritage Institute Regarding The CALFED Bay-Delta Program Draft Ecosystem Restoration Plan* (Nov. 1997).

¹⁴ Meffe, Gary K, and 78 other scientists. *Letter to U.S. Senator John Chaffee and Congressman James Saxton* (July 23, 1996).

Guidelines for HCP Reform

Nearly 250 HCPs are now in operation with another batch of similar size in gestation. There can be no clearer guide to what is working and what is not in HCPs than a critical, empirical review of the performance of these plans against the goals of the national endangered species program. This paper synthesizes the several empirically based performance reviews that have been conducted by academic researchers, conservationists, and practicing conservation biologists. It also reflects scholarly analyses by a wide range of commentators and the findings and conclusions of a structured workshop of many of these performance reviewers.¹⁵ The objective of this paper is to distill from these sources the essential factors that explain why the HCP process has failed to recover vulnerable and depleted species over the past 15 years and what can be done to improve the performance of this conservation tool. This evaluation necessarily considers the regulatory and economic environment in which HCPs operate.¹⁶ This paper will present the major conclusions from these performance reviews and the recommendations for reform, which emerge from them.

RECOMMENDATIONS FOR IMPROVEMENT

HCPS MUST BE DEVELOPED WITHIN THE CONTEXT OF LANDSCAPE-SCALE CONSERVATION STRATEGIES

The Choice of Planning Scales

The sizes of land or water right-specific HCPs are extraordinarily diverse, spanning six orders of magnitude. The smallest approved plan protects the Florida scrub jay on just 0.4 acres. The largest plan to date covers over 1.6 million acres of forest managed by the Washington Department of Natural Resources. Despite this extraordinary range of sizes, most HCPs are relatively small. The medium size is less than 24 acres, and 74% of HCPs cover fewer than 240 acres.¹⁷

Although the fundamental purpose of biodiversity conservation is the protection of ecosystems, the ESA's regulatory mechanisms are species-specific and are only triggered by the listing of individual species.¹⁸ Conservation biologists argue that the single-species focus of the ESA has not been especially successful in protecting functioning ecosystems and is imprudent because species do not exist independently from one another and the broader landscape context.¹⁹ Because the needs of species are "specific", single-species plans for the same area can conflict if not closely coordinated. The extent to which HCPs take into account multiple species and the ecosystem as a whole is important to their ultimate success.²⁰

Only recently has multi-parcel, multi-species habitat conservation planning emerged. Units of local government generally conduct these plans, covering a community of both currently listed and potentially listable species. Multi-species, multi-parcel conservation planning is a promising evolutionary step, for reasons discussed in subsequent sections of this paper.

¹⁵ The workshop was convened by the Natural Heritage Institute in San Francisco in June of 1998, and included representatives of an eight-campus study by the American Institute of Biological Science (AIBS) and the National Center for Ecological Analysis and Synthesis (NCEAS), several of the most prominent conservation biologists that have been involved in crafting HCPs, university faculties, and representatives from leading conservation organizations.

The workshop findings and recommendations reflected herein subsequently received the peer review and concurrence of Dr. Gary Meffe of the Journal of Conservation Biology and Dr. Reed Noss of the Conservation Biology Institute, Natural Heritage Institute. *A Summary of Key Findings and Conclusions of the Participants of the Workshop – Optimizing Habitat Conservation Planning for Non-Federal Lands and Waters: Harvesting Performance Reviews to Chart a Course for Improvement* 13 (June 1998) (hereinafter cited as "Workshop Findings & Conclusions").

¹⁶ Admittedly, the resulting portrait of how to improve habitat conservation planning is somewhat idealized in that it is unalloyed by the practical realities that drive the process from the viewpoint of the actual negotiators – the Services, HCP applicants and, to a lesser extent, units of local government that have been involved. These perspectives are also valid and important.

¹⁷ The duration of HCPs is also diverse. The length of time that an HCP is to be maintained is tied to the duration of the ITP for which the plan was developed. Plan duration ranges from 7 months for a plan in Travis County, Texas, to 100 years for an HCP implemented by Murray Pacific Company in Washington. Over time, the duration of approved HCPs has exhibited no significant directional trend. NCEAS, *supra* note 12, pp. 14-15.

¹⁸ Thornton, Robert D. Searching for consensus and predictability: Habitat conservation planning under the Endangered Species Act of 1973. 21 *Environmental Law* 605, 642 (1991).

¹⁹ Noss, Reed; Michael A. O'Connell, & Dennis Murphy. *The Science of Conservation Planning: Habitat Conservation Under the Endangered Species Act* 76. Island Press: Washington, D.C. (1997).

²⁰ *Ibid.*

Yet, the Services are concerned that attempts to cover many land uses or species in a single plan can be frustrated by gaps in biological information and lack of consensus among HCP participants.²¹ Indeed, the empirical reviews do not support the notion that larger plans are better plans. Neither the HCPs covering very large areas nor those covering very small areas perform best.²² Instead, the intermediate-sized planning areas have produced the best plans. It seems that planning at a small scale is impaired by limited resources to conduct careful analyses of the impacts of development (particularly cumulative impacts) or of conservation alternatives. Conversely, very large HCPs also appear to result in relatively poor analyses, probably due to the difficulty of forecasting impacts and planning mitigation and monitoring over very large areas.

The Preference for Bioregional Planning

Consensus is emerging among conservation scientists and commentators that the optimal planning unit for habitat conservation is not the individual land holding or water diversion, and the optimal focus is not individually listed species. Rather, there are benefits for both ecosystems and property rights holders when planning is conducted at a landscape scale, where habitat conservation strategies are developed for a “bio-region” covering entire ecosystems and their communities of species.²³ Furthermore, there is indirect evidence that multi-species plans are scientifically superior to single-species plans, especially with respect to mitigation and monitoring.²⁴

Rescaling conservation planning and permitting in this manner can address many of the perceived problems with HCPs. Potential advantages of landscape-scale, multi-party HCPs include the following points identified by experts in the June 1998 workshop:

- 1) **Providing a biological basis for allocating responsibility among rights holders.** Landscape-scale planning can specify the overall conservation effort that is needed to protect communities of species, thereby providing a basis for determining what share of the burden an individual property owner should bear in an HCP. Currently, the ESA affords no mechanism for allocating the conservation burden between multiple private landowners or between private rights holders and public lands. In theory, those who get their approvals earliest get the best deal, with larger burdens reserved for latecomers.²⁵ Landscape-scale planning provides a mechanism for the public to shoulder some of the burden of conservation. Thus, rights holders and protected species can both benefit from landscape-scale planning.
- 2) **Fostering species recovery.** At the landscape scale, it is possible to calibrate habitat conservation planning to the objective of *recovering* the listed species and preventing harm to other vulnerable species. This objective is harder to advance at the level of landholding-specific HCPs, which tend to aim for mitigation or, at best, avoidance of impacts on listed species.
- 3) **Promoting economies of scale.** Since good science is expensive, gathering and interpreting the necessary data can be an onerous burden for individual rights holders seeking development permits. Rescaling shifts an appreciable degree of this burden from individual property owners applying for incidental take permits to the public agencies and the broader constellation of rights holders that have interests and responsibilities in the eco-region.
- 4) **Facilitating adaptive management.** Because adaptive management requires that some part of the development plan covered by an HCP remain contingent, it is more feasible to engage in adaptive management at the landscape scale.
- 5) **Strengthening public participation.** The degree and quality of public participation is generally higher with a broader scale of planning that includes multiple parties. This correlation is especially evident if a unit of local government mediates the HCP process by applying for the federal permit and then issuing sub-permits to individual landholders. Such local agencies routinely include the public in similar land use planning processes. By contrast, case studies show that public participation has not been superior in cases where a single landowner prepares a large landscape-scale HCP, as is exemplified by many HCPs developed by timber companies.

²¹ *Id.*

²² NCEAS, *supra* note 12, pg. 29.

²³ All HCPs affect multiple species, whether they result in incidental take permits for multiple species or not. Defenders of Wildlife, *supra* note 7, pg. 20.

²⁴ NCEAS, *supra* note 12, pp. 36-38.

²⁵ Thornton, Robert D. The No Surprises Policy is Essential to Attract Private Dollars for the Protection of Biodiversity. *Endangered Species Update: Habitat Conservation Planning* 65 University of Michigan (July/Aug. 1997).

The idea that landholding-specific or water right-specific conservation requirements should be determined by reference to broader conservation objectives is hardly radical. It is rather analogous to the way permits are issued for new major emitting facilities within airsheds that are already violating national ambient air quality standards. A zero growth policy is unacceptable, yet growth cannot be allowed to occur at the expense of exacerbating pollution levels that are already harmful to human health. The solution under the Clean Air Act is to condition permits for such new facilities upon achieving a net reduction in emissions of the subject pollutants. In the biodiversity arena, new incursions on critical habitat should be subject to a similar condition of achieving a net contribution to the landscape-scale objective of recovery of the imperiled species.

If landscape-scale planning offers superior prospects for species conservation and ultimately recovery, then it is necessary to ask what kinds of incentives, inducements, and cost-sharing arrangements will encourage the development of HCPs at this level. Part of the answer lies in reallocating a portion of the habitat conservation burden that now falls to private rights holders onto the federal land and water managers. Under a landscape-scale approach to conservation, federal agencies that manage public lands and waters (and their commodity users) may shoulder a larger share of the conservation burden and may be held to the higher standard of recovery of the protected species. If private lands are managed to the ESA's "jeopardy" standard,²⁶ there is no margin of safety left for vulnerable species. It is especially critical that federal resource managers undertake a "fair share" of the conservation burden in areas within a matrix of federal and private lands, for example, lands included in the checkerboard pattern of private and federal lands found in many western states.

Recovery Plans as Vehicles for Bioregional Planning

One potential vehicle for landscape-scale planning could be the recovery plans that the Services are required to develop for listed species. Recovery plans can provide much needed scientific background on a species as well as an ecosystem context for the activities proposed under a landholding-specific HCP.²⁷ Studies show that, when recovery plans exist, HCPs do rely on them extensively. In several cases, HCPs have borrowed language and specific mitigation techniques directly from recovery plans.²⁸ However, there are several problems with using recovery plans as a basis for the development of HCPs:

- ◆ Recovery plans currently lag years behind the listing of a species. The Services have completed recovery plans for only 40% of listed species.²⁹
- ◆ Historically, recovery plans have been of poor quality and often are not biologically defensible.
- ◆ Recovery plans have often inappropriately subordinated the biological objective to economic considerations.
- ◆ Recovery plans are not intended to be binding on or enforceable against the nonfederal lands that are encompassed in the range of a species. Efforts to make them binding or enforceable would be viewed in the political sphere as tantamount to land use planning by the federal government, which is historically a state and local prerogative.
- ◆ Recovery is a species-based concept and, thus, recovery plans do not necessarily improve the health of the ecosystem as a whole, or its processes or functions. However, there is no obvious reason why recovery plans could not also be written as bioregional, multi-species conservation strategies.

Natural Communities Conservation Plans as Vehicles for Bioregional Planning

The land use planning functions of state and local governments can also be harnessed to undertake the type of bioregional conservation planning that could improve landholding-specific HCPs. Since these entities already play the predominant role in local land use planning, economies of scale and consistency of conservation objectives can be achieved by using them for HCP development. In the model that is emerging, units of state and local government prepare regional conservation plans, submit them to the Services for approval as master HCPs under a special rule under § 4(d) of the ESA,

²⁶ The jeopardy standard means avoiding actions that could directly or indirectly reduce the likelihood that a species will survive and recover in the wild. 50 C.F. R. §404.02.

²⁷ NCEAS, *supra* note 12, pg. 33 citing U.S. Fish & Wildlife Service and National Marine Fisheries Service. *Endangered Species: Habitat Conservation Planning Handbook* 3-11 (1996).

²⁸ NCEAS, *supra* note 12, pp. 35-36.

²⁹ Sher, Victor M, and Heather L. Weiner. Why HCPs Must Not Undermine Recovery. *Endangered Species Update: Habitat Conservation Planning*. 67 University of Michigan (July/August 1997).

and administer take allowances to individual property owners through sub-permits. An outstanding example of such a bioregional planning program is the California Natural Communities Conservation Program (NCCP).³⁰ The NCCP is a regional, ecosystem-wide, multi-species program that encourages landowners to voluntarily plan for habitat protection before species are listed. A typical plan might cover a mix of listed and unlisted but declining species and their shared habitats, while still accommodating development outside the areas set aside as preserves. A particular virtue of NCCPs is their potential to address the conservation requirements of unlisted species before they decline to a level requiring ESA protection.

The NCCP is meant to be a voluntary program, but the local landowners did not view it as such in the case of the California gnatcatcher. With the 1993 listing of the gnatcatcher, Secretary of State Bruce Babbitt proposed a “special rule” under Section 4(d) of the ESA that would exempt landowners participating in the state NCCP program from the ESA’s prohibition on the incidental take of a threatened species.³¹ The special rule expanded the bounds of the ESA’s incidental take exemption to all areas covered by an NCCP plan. The agency thereby had a means to encourage participation in the NCCP. At the same time, the rule retained the ESA’s prohibition against take for developers who elected not to participate. Those landowners had to negotiate their own HCP with the Fish and Wildlife Service, aware that the agency did not intend to approve any HCPs that did not conform to the NCCP guidelines.³²

These dynamics help explain why the NCCP process was, in general, favorably received in Southern California. For conservationists, comprehensive state planning based upon federal ESA standards appeared to offer the best hope for rescuing devastated coastal sage ecosystems. Developers valued the regulatory assurances they were provided in the event of future listings. Local governments were pleased to retain autonomy over land use decisions in the face of federal listings and the prerogative to strike the appropriate balance between development and open space in their communities. The state and federal wildlife agencies saw the NCCP process as a means to transcend the limitations on project-by-project mitigation. Although each stakeholder perceived the benefits of participating in the NCCP process differently, enough mutual benefits and common ground were found to advance a politically difficult process.³³

The NCCP process is specifically authorized in California by an act of the legislature.³⁴ This type of vehicle could be propagated in other jurisdictions to serve as a nationwide vehicle for bioregional planning either through state-by-state enactments or through federal authorization in a reauthorized Endangered Species Act. Through either avenue, lessons can be drawn from California’s early experimentation with NCCPs that could lead to an improved nationwide model.

A variation on the NCCP theme is arising in some states. So-called “programmatic HCPs” are a relatively new concept, now primarily utilized by state and county governments.³⁵ They differ from NCCP-type or habitat-based HCPs in that their boundaries are based on jurisdictional rather than ecological parameters. For example, the U.S. Fish and Wildlife Service and the State of Georgia have developed a programmatic “state-wide” HCP for the red-cockaded woodpecker, and Texas is currently embarking on a similar project for the same species.³⁶ The programmatic HCP allows numerous landowners to participate through “Certificates of Inclusion” or “Participation Certificates,” which convey take authorizations. The Services support such plans on grounds that a programmatic HCP can be used to address a group of actions as a whole, rather than one action at a time in separate HCPs.³⁷

And yet, the Services acknowledge that programmatic HCPs may pose problems.³⁸ First, biologists eschew political boundaries in favor of using watersheds or discrete ecosystems to delineate conservation planning areas. Second,

³⁰ California encourages regional/ecosystem-based conservation planning since its 1991 adoption of the Natural Community Conservation Planning (NCCP) Act. Silver, Dan. *Natural Community Conservation Planning: 1997 Interim Report*. 14 *Endangered Species Update: Habitat Conservation Planning* 22. University of Michigan (July/August 1997).

³¹ Welner, Jon. *Natural communities conservation planning: An ecosystem approach to protecting endangered species*. 47 *Stanford Law Review* 319, 338 (1995).

³² *Ibid.*, pp. 344-345.

³³ Silver, *supra* note 30, pg. 22.

³⁴ Natural Communities Conservation Planning Act, Cal. Fish and Game Code §2800 et seq. (1991).

³⁵ U.S. Fish & Wildlife Service and National Marine Fisheries Service. *Endangered Species: Habitat Conservation Planning Handbook* 3-39 (1996) (hereinafter cited as “FWS & NMFS”).

³⁶ Bonnie, Robert. *Strategies for Conservation of the Endangered Red-cockaded Woodpecker on Private Lands*. *Endangered Species Update: Habitat Conservation Planning* 45 University of Michigan (July/Aug. 1997).

³⁷ FWS & NMFS, *supra* note 35.

³⁸ *Ibid.*

applicants may lack sufficient information to determine and evaluate impacts when the specific number and scope of development actions is still undetermined. Such HCPs are more likely to succeed where the activities are well defined, similar in nature, and occur within a discrete geographical area and timeframe.³⁹ Despite their shortcomings, programmatic HCPs are likely to increase during the next era of biodiversity conservation.

Promulgation of Programmatic Conservation Standards as Vehicles for Bioregional Planning

A third potential vehicle for landscape-scale conservation planning is the promulgation of programmatic standards or guidelines for multi-species conservation by federal land and water managers. For example, the recent adoption by NMFS of programmatic guidelines for logging on anadromous fish-bearing streams in the Pacific Northwest may prove to be a useful model in other contexts. Such programmatic guidelines can apply standards for riparian buffers and acceptable levels of sedimentation to entire watersheds or other ecologically significant planning units. Similarly, the Aquatic Conservation Strategy component of the President's Forest Plan provides a multi-layered planning approach intended to result in ecosystem-wide forest management.

Bioregional Conservation Planning Demands a Larger Governmental Role

Whatever the vehicle, it is clear that landscape-scale habitat conservation planning will require either the Services, or state and local units of government in the case of NCCP-type plans, to play a more proactive role in marshalling the necessary biological information and developing conservation strategies that cover multiple parcels, both private and public. This will entail a sharp departure from their traditional roles and will require a substantial increase in resources—both financial and professional.

The Services' role in HCP development is not well defined, but Congress apparently intended the Services to do more than just exercise regulatory oversight by also providing technical assistance to applicants.⁴⁰ The HCP Handbook states that large-scale HCPs should be developed jointly by the applicant, the Services, the private sector, and local, state, and federal agencies, with the Services acting as technical advisors. In addition, the Handbook recommends that the Services be actively involved during HCP development in advising on mitigation measures, monitoring protocols, and reserve designs; providing timely review of draft documents; helping find solutions to contentious issues; and generally assisting in HCP development.⁴¹

Notwithstanding these expectations, the Services simply do not have the resources to provide the degree of scientific and technical guidance that Congress intended in the ESA's 1982 amendments.⁴² In practice, HCPs are often negotiated with only minimal guidance as to content or biological objectives.⁴³ This "hands off" attitude might also be due in part to the Services' policy of promoting plan flexibility and innovation. In any case, the Services have not translated the expectations of the Act into technical performance standards to which an HCP can be designed.⁴⁴

This lack of guidance often results in HCP applicants simply following precedents established in earlier HCPs. Consequently, HCPs that were developed before principles of conservation biology were properly applied have nonetheless set a *de facto* standard of quality. The importance of precedent in light of unclear agency guidelines is illustrated by a comment from a participant in the development of the Clark County HCP: "[The preparers of HCPs that are] still in the early stages...are going to look out there for the weakest [HCP to use] as an example. We should be real concerned over setting precedents for the minimum standard."⁴⁵

³⁹ *Id.*

⁴⁰ *Id.* pg. 3-1 citing H.R. Conf. Rep. No. 835, 97th Cong., 2d Sess. 29, 1982 U.S.C.C.A.N. 2807.

⁴¹ *Id.* pg. 6-24.

⁴² NCEAS, *supra* note 12, pg. 48.

⁴³ Aengst, Peter, *et al. Balancing Public Trust and Private Interest: An Investigation of Public Participation in Habitat Conservation Planning*. University of Michigan (1998) (hereinafter cited as "Univ. of Michigan").

⁴⁴ Applicants often find the ESA's legal standards such as "minimize and mitigate" take to the "maximum extent practicable", and authorized taking that will not "appreciably reduce the likelihood of survival and recovery of the species in the wild" too nebulous. *Ibid.* pg. 8-6.

⁴⁵ *Id.* pg. 7-8.

CALIBRATE HABITAT CONSERVATION PLANNING TO BIOLOGICALLY DEFENSIBLE GOALS

The Recovery Standard

There is an emerging consensus among conservation scientists that the only defensible biological goal for habitat conservation is the recovery of the species. Indeed, this precept is too obvious for serious debate unless the ESA and the HCP processes are to be taken as merely a set of procedures for slowing the process of extinction. HCPs will be viewed as contributing to the biodiversity problem rather than the solution unless they are designed to advance a restoration strategy, that is, unless they *confer a net survival benefit to the species*. Otherwise, the Services are running a hospital in which the patients will never be taken off life support.

What constitutes biological recovery is far from straightforward, however, and a determination of whether a given HCP meets that standard is difficult for a number of reasons. As noted previously, many HCPs are approved before the Services have completed draft recovery plans for the species. Where recovery plans do exist, they are often obsolete for current planning.⁴⁶ And, recovery planning itself is a highly politicized process wherein biological factors can be compromised by economic and social considerations.⁴⁷

The objectives of ecosystem conservation and recovery of species are explicit in the ESA,⁴⁸ but the means to achieve these goals are not made clear. Indeed, the approval standard for HCPs is not necessarily consistent with the statutory recovery goal.⁴⁹ Plans may be approved under the Section 10 criteria, as long they do not appreciably *reduce* the chance of survival and recovery of the covered species. Certainly, this criterion does not impose on permittees an obligation to improve the survival prospects for the listed species.⁵⁰ Thus, HCPs may and usually do degrade the *status quo*.

The approval of HCPs under this standard can only be squared with the ultimate objective of recovery and delisting under the assumption that some other custodian of actual or potential habitat will undertake countervailing measures. That is a heroic assumption where the federal lands and waters are also managed to a “non-jeopardy” standard, and where funds to purchase, preserve, and restore high-quality habitat are neither a precondition to the approval of HCPs nor generally available. This mismatch between biological objectives and statutory requirements is a serious problem for both developers and conservationists because it raises the stakes in the negotiation of HCPs and creates political fault lines that leave both development and conservation interests insecure.

Congress has so far shown reluctance to amend the ESA to recalibrate the HCP approval criteria to require a net benefit to listed species. Yet, nothing less will square HCPs with the explicit objective of the ESA or stem the impending biodiversity crisis. It may be possible to resolve this political impasse if the issue is restated so that it is not about biodiversity requisites but about how the financial burdens of meeting them will be allocated. The costs of avoidance, minimization, and mitigation of adverse impacts on habitat are as much as the developers of nonfederal lands and waters are willing to shoulder to meet national biodiversity conservation goals, and—more to the point—as much as the political process has been willing to impose. The measures necessary to bridge the gap between survival and recovery, such as the purchase of habitat preserves and the rehabilitation of restorable habitats on nonfederal lands, can be defrayed by the public—instead of land and water rights holders—if both developers and conservationists join in making that arrangement politically feasible.

The remaining issue is whether compensated conservation measures should be voluntary on the part of the private rights holder, as some recent ESA reauthorization bills would provide,⁵¹ or mandatory at the behest of the Services. This issue is politically controversial because allowing the Services to mandate habitat conservation measures that bear no proportionate nexus to a development project, such as creating preserves, even on a compensated basis, is tantamount to

⁴⁶ Sher and Weiner, *supra* note 29, pg. 68.

⁴⁷ Defenders of Wildlife, *supra* note 7, pg. 54. Sher and Weiner point out that funds for recovery plans are often earmarked by Congress for high-profile species, leaving less charismatic species to decline. In addition, the Services are chronically constrained by inadequate budgets, limited staff, and political pressure. Sher and Weiner, *supra* note 29, pg. 67.

⁴⁸ 16 U.S.C. § 1531(b), 1532(3).

⁴⁹ Much of the criticism lodged against the HCP process stems from the Services’ treatment of HCPs as a permitting process, rather than a conservation strategy. Noss, *et al.*, *supra* note 19, pg. 111.

⁵⁰ FWS & NMFS, *supra* note 35, pg. 3-20.

⁵¹ One example is the Chafee-Kempthorne bill, S. 1181, introduced in the 105th Congress.

conferring eminent domain authority on the Services. As discussed below, one solution might be to reward private rights holders who accept mandatory measures deemed necessary to achieve a recovery standard of performance with a higher level of regulatory assurances in their HCPs.

Incentives to Recover Species

Getting the incentives right is essential to making the HCP program work. Enforcement of the “take” prohibition under Section 9 creates an incentive for private rights holders to seek incidental take permits, for which HCPs are a prerequisite. As the enforcement of the take prohibition becomes more vigorous, the incentive to develop high-quality HCPs increases. However, the practical difficulties in enforcing the take prohibition limit its value as an incentive. The Services find enforcement of the take prohibition difficult because they cannot enter private lands without permission and because they face budget limitations. For some species, the data are not sufficient to determine what actions constitute a take (e.g., mussels), while for other species, the Services do not know where they occur on private lands. Because the Services have shown reluctance to enforce the take prohibition, the main incentive for HCP development today is the fear of citizen suits and the attendant insulation from prosecution that an HCP can provide.⁵² Under these realities, enforcement of the take prohibition, though an essential incentive for rights holders to develop HCPs, cannot substitute for habitat conservation planning.

The ESA does not mandate that HCPs confer a net survival benefit on species, but neither does the Act mandate that the Services issue guarantees to permittees against further “take” restrictions. It seems likely that the Services can induce HCP proponents to contribute to recovery of a listed species by correlating their regulatory assurances to the extent of biological benefit conferred in an HCP. For instance, plans that contribute to recovery might receive assurances for a longer term than those that merely avoid jeopardy. Similarly, plans based on highly adequate data and analyses might be entitled to more extensive guarantees.

In some cases, shifting a larger share of the costs of conserving a listed species to the federal land management agencies would also make recovery achievable without increasing the burdens on private rights holders. Yet, at present, the prevention of jeopardy of extinction is the aiming point for most management decisions on federal land. This low standard of management for the public lands should concern the property rights community as much as the conservation community because the practical consequence is that a higher burden of species conservation may be apportioned to the private rights holders if recovery is to be achieved.⁵³

INCORPORATE INDEPENDENT SCIENCE AND PUBLIC PARTICIPATION TO IMPROVE HCP CONSERVATION MEASURES

Many performance reviewers agree that HCPs would be improved if state-of-the-art, independent biological expertise was utilized and if meaningful opportunities were afforded local communities and conservation interests to participate in the development of HCPs. These two recommendations merge under the premise that the most efficacious way to advance the public’s interest in effective conservation planning is for HCPs to be based on the best available science.

In a March 1997 letter to the Administration and Congress, a number of prominent conservation biologists warned that many HCPs “have been developed without adequate scientific guidance”⁵⁴ in the form of independent peer review. They argued that, as a consequence, these plans seem to contribute to, rather than alleviate, threats to listed species. The scientists recommended that the data, analyses, and interpretations regarding species status, take, impact, mitigation, and monitoring should be reviewed to ensure that the scientific foundations of the plans are sound.⁵⁵

⁵² Some commentators confirm that landowners are preparing HCPs because capital markets insist upon HCPs before they will lend project development funds. Capital markets place a high value on assurances that future restrictions will not impede development. This may not apply to “commodity” lands where take detection and enforcement is problematic.

⁵³ Of course, holding the public lands to a higher standard of performance in habitat conservation would not advance recovery in regions of the country where there is little or no federal land, or where existing federal land is unsuitable to support the species in question.

⁵⁴ Murphy, Dennis, *et al.* *A Statement on Proposed Private Lands Initiatives and Reauthorization of the Endangered Species Act from the Meeting of Scientists at Stanford University* (March 31, 1997).

⁵⁵ *Ibid.*

Why There is a Need for Independent Science in Habitat Conservation Planning

Independent science would be useful in the HCP process because neither the consultants retained by the HCP proponent nor the Services' staff scientists necessarily have the time, information, or incentive to represent the state-of-the-art.

In the general process of developing an HCP, biologists in the proponent's employ submit a plan to the Services, sometimes working informally with the Services' biologists in the process.⁵⁶ Typically, relatively little detailed information concerning a listed species' habitat exists at the time of listing, in which case, the first requisite in preparing an adequate HCP is to gather this information.⁵⁷ This process can be labor-intensive and expensive. As HCPs grow in geographic scope, last longer, and cover more species, the complexity of biological planning grows. These larger HCPs require Herculean efforts to assemble available data and conduct additional field surveys, utilize state-of-the-art tools for planning (e.g., GIS), and make sure that available ecological information and management techniques are used in the best way possible.⁵⁸

Performance reviews of HCPs reveal that information pertinent to the design of HCP conservation strategies is frequently under-researched by the HCP preparers. Of particular concern are the data omissions regarding cumulative impacts of development activities on other parcels or river reaches.⁵⁹ Even when a fair amount of information is known about a species, it is still difficult to efficiently incorporate biological data into conservation strategy decisions because no well-accepted model exists.⁶⁰ Yet, all in all, the scientific quality of HCPs has been improving.⁶¹

The Services have the responsibility to ensure that applicants use adequate scientific information to develop HCPs and the Services acknowledge that the availability of up-to-date biological information is crucial to any HCP. Yet, the Handbook leaves data collection exclusively to the applicant,⁶² as well as the threshold decision on whether the available biological information is adequate to proceed with planning. Only if the applicant conveys to the agencies that additional data is needed will the Services make recommendations on research and collection of biological information.⁶³ But the applicants have little motivation to activate the Services in this way. Their primary concern is for speedy, cost-efficient plan development and they loath to engage in resource- and time-intensive studies unless the Services require them for the approval of the HCP.

Conservation biology is the discipline implicated in designing optimal habitat conservation strategies. Yet, the performance reviews of HCPs revealed that the statutory command to "minimize and mitigate project impacts to the maximum extent practicable" has often caused HCP negotiations to be driven by considerations of economic feasibility. The operative facts have become the applicant's assertions regarding the effects of mitigation alternatives on profit margins, rather than the scientists' assertions regarding biological imperatives. This has led some scientists to criticize HCPs as discretionary measures based mainly on political and economic considerations rather than on empirical scientific data regarding the ecological requirements of a species.⁶⁴ While economics is certainly relevant to deciding on the allocation of responsibilities among property holders, both public and private, in achieving the conservation goals of the plan, economic considerations should not be allowed to intrude into the choice of conservation strategies.

The Role of Independent Scientists

Apart from the influence of economics and politics, a spectrum of scientific opinion may exist as to whether the conservation strategy adopted in an HCP is adequate to meet the biological objectives. Establishing an independent scientific review may help arbitrate the differences in professional judgment and help assure that survival and recovery of the species are attained. Independent review is also important to foster public confidence in the process. The concurrence

⁵⁶ Defenders of Wildlife, *supra* note 7, pg. 37.

⁵⁷ FWS & NMFS, *supra* note 35, pg. 3-12.

⁵⁸ Hosack, Dennis A., Laura Hood, and Michael P. Senatore. Expanding the Participation of Academic Scientists in the HCP Planning Process. *Endangered Species Conservation Planning* 60 University of Michigan (July/August 1997).

⁵⁹ For example, in 23% of the cases surveyed, information on cumulative impacts suggested that a different assessment of status or impacts of take should have been made. NCEAS, *supra* note 12, pg. 38.

⁶⁰ Thornton, *supra* note 18, pg. 651.

⁶¹ *Ibid.*

⁶² FWS & NMFS, *supra* note 35, pg. 3-12.

⁶³ *Ibid.*

⁶⁴ Bingham, B.B., and B.R. Noon. Mitigation of Habitat "Take": Application to Habitat Conservation Planning. 11 *Conservation Biology* 127-139 (1997).

of the broader scientific community confers an *imprimatur* of technical excellence that can garner public acceptance for controversial HCPs.

Under current practice, independent scientists may become involved in the development of HCPs through informal consultation or by serving on a scientific review panel. However, these opportunities generally come only after the HCP has been developed or implemented.⁶⁵ In addition, even this limited involvement often arises only at the behest of the outside scientist, not as a result of solicited peer review. Thus, independent scientists are generally involved only and to the extent they volunteer their services, not as part of routine practice in the formulation of a habitat conservation plan.⁶⁶

Such *post hoc* peer review of completed plans is not enough. It is important to get scientists involved as scientists, providing data and analyses, not just as reviewers reacting to someone else's data and analyses. The input must come at the formative stage when first principles of the application of conservation science are being established for the reserve design or mitigation strategy. These decisions are made as the HCP is negotiated, not at the final stage when the Service issues the incidental take permit. Assessments of completed plans during public commenting periods come at the least useful stage when the chances for changing elements of the plan are slim. Late scientific analysis relegates science to the role of an adversarial interest at the approval stage rather than a shaping influence at the foundational stage.⁶⁷

Access Barriers for Independent Science

Notwithstanding the pivotal importance of state-of-the-art biological information, the Services defer to the applicant regarding admission of others to the HCP negotiation process. In the role of "gatekeeper", applicants typically do not wish to involve interested scientists who are not agency staff or part of the applicant's coterie of paid consultants. Applicants argue that they spend large sums of money to hire competent consulting firms and that the Services' reviews are already excessive.⁶⁸

The Services' deference to the applicants on public participation reflects their view of the HCP as a permit application over which the applicant should exercise final substantive control. However, an HCP is for all intents and purposes a negotiated settlement of an applicant's regulatory liability under the ESA. The plan determines the terms and conditions under which a discretionary permit will be issued to engage in otherwise forbidden acts, namely the taking of protected species.

The recommendation that the Services, rather than the HCP applicants, act as the gatekeeper of HCP negotiations does not mean that the Services must admit to the table everyone who knocks on the door. Demonstrated ability to contribute substantively to the issues on the table without undue delay may be made the price of admission. We simply urge that the Services themselves assume the role of making these decisions and not leave them to the permit applicant who has a vested interest in moving the negotiation process forward with a minimum of process and scrutiny.

The Value of Public Participation in Habitat Conservation Planning

It must be recognized that the public does have a significant stake in the HCP process because wildlife is a public resource, both legally and in the court of public opinion. And, whatever conservation responsibilities or risks are not borne by the HCP applicant will either be borne by the species or be shifted to other landowners or to the public lands, usually at public expense. An HCP that authorizes land disturbances that can cause flooding, mudslides or loss of fisheries directly affects the welfare of the local community.⁶⁹ Equally important, public participation in the development of an HCP can enhance the quality of information on which HCP decisions are based, improve understanding and relationships among stakeholders, heighten public and political support for an HCP, and enhance the plan's long-term viability. Indeed, the degree of public acceptance of an HCP is strongly related to the degree of public participation in the development of the plan.

⁶⁵ Defenders of Wildlife, *supra* note 7, pg. 37. Currently few professional or financial incentives exist for independent scientists to participate in HCP development, while many disincentives to their involvement exist. Univ. of Michigan, *supra* note 43, pg. 10-0.

⁶⁶ The University of Michigan study found that fewer than a third of applicants submitted all or portions of their HCP for peer review to non-applicant and non-agency scientists, and the researchers were unsuccessful at finding a single HCP that had undergone formal peer review. Univ. of Michigan, *supra* note 43, pg. 10-3.

⁶⁷ Noss *et al.*, *supra* note 19, pg. 124.

⁶⁸ Hosack, *et al.*, *supra* note 58, pg. 60.

⁶⁹ Kostyack, John. Habitat Conservation Planning: Time to Give Conservationists and Other Concerned Citizens a Seat at the Table. *Endangered Species Update: Habitat Conservation Planning* 51 University of Michigan (July/Aug. 1997).

Where a unit of local government applies for the federal approvals and then issues development permits, the process is easier to access by the local community and general public, and the participation issues largely dissipate. HCPs that include some form of public land, whether federal, state, or local, tend to provide more public participation than HCPs that strictly involve private land. The public usually becomes involved earlier and more actively compared to HCPs on private land.⁷⁰

However, public participation is usually extremely limited when private rights holders initiate the HCP process. And, the Services have offered little in the way of guidance on fostering public participation. HCP guidelines merely instruct the agencies to encourage applicants to involve appropriate parties and hold informational meetings during public comment periods.⁷¹ The Services have taken a “satisfied customer” approach to HCPs wherein the agencies view the applicant rather than the public as the “customer” to satisfy.⁷²

Public Participation Under the National Environmental Policy Act

Issuance of an incidental take permit is a federal action subject to the National Environmental Policy Act (NEPA).⁷³ NEPA goes beyond Section 10 of the ESA in considering the impacts of a federal action on non-wildlife resources.⁷⁴ But, like NEPA, the ESA requires a description of “alternative actions to such taking.”⁷⁵ To satisfy this requirement, applicants commonly analyze just two alternatives⁷⁶ but must explain why alternatives were rejected. The Services do not have the authority to impose a choice among the alternatives analyzed in the HCP; their role during development is to simply advise the applicant in developing an acceptable plan.⁷⁷

NEPA’s comment periods and disclosure requirements often provide the only opportunity for the interested public to review and comment on an HCP before it is approved. But, NEPA’s usefulness as a participation and communications device is limited because the HCP negotiations tend to solidify a particular approach before public environmental review can influence them.⁷⁸ Effective public involvement requires access to the process before the draft impact statement is issued for review. Performance reviewers have therefore recommended that the Services implement “trigger points” or points between scoping and the comment period when negotiators would be required to disclose agreements in early drafts and seek public comments on those documents.⁷⁹

Tools for Facilitating Effective Participation by Independent Scientists and Local Communities

The HCP Resource Center

Local communities and conservation organizations that are interested in upgrading the scientific competence of HCPs generally do not have access to the requisite expertise or the means to procure it. To meet this apparent need, the Natural Heritage Institute is working with other national conservation organizations to create a pool of resources—both intellectual and financial—to enable independent scientific expertise to be brought into HCP negotiations on behalf of conservation interests and local communities. The HCP Resource Center comprises a nationwide network of conservation scientists, resource economists, and wildlife law experts representing the full range of relevant sub-specialties from universities, private consulting organizations, and the nonprofit sphere. Teams tailored to the requisites of particular HCPs will be assembled to engage directly and effectively with the agency’s and the applicant’s team of scientists and negotiators. Creation of the HCP Resource Center is currently in the planning and fundraising stages.

⁷⁰ The University of Michigan study provides several explanations for these different levels of participation. Univ. of Michigan, *supra* note 43, pp. 5-18 - 5-20.

⁷¹ FWS & NMFS, *supra* note 35, pg. 6-22.

⁷² Univ. of Michigan, *supra* note 43, pg. 8-2.

⁷³ FWS & NMFS, *supra* note 35, pg. 1-6.

⁷⁴ 42 U.S.C. § 4321 et seq (1969).

⁷⁵ 16 U.S.C. § 1539(a)(2)(A)(iii).

⁷⁶ FWS & NMFS, *supra* note 35, pg. 3-35.

⁷⁷ FWS & NMFS, *supra* note 35, pg. 3-36.

⁷⁸ Univ. of Michigan, *supra* note 43, pg. 7-1, 8-3.

⁷⁹ *Ibid.*

National Databank for HCP Materials

As a means of facilitating public involvement in the preparation of HCPs, several experts have recommended that the Services maintain a comprehensive, publicly accessible databank of HCPs.⁸⁰ The databank should include sufficient details to assist landowners in matching their conditions to previously approved HCPs. This capacity would allow applicants to model their plans after the successful efforts of others and would allow the public and nonprofit conservation organizations to track and monitor the implementation of individual HCPs. Because there is currently no central repository of completed plans and no log of HCPs under development, the public has not been able to follow the implementation of the ESA through HCPs as closely as some would like.⁸¹ At present, information on individual plans can only be found by calling government field offices and asking the overworked biologists. The databank would help both the public and the Services track the overall performance of approved plans.⁸² The financial cost of maintaining such a databank would be relatively modest because it would utilize information already compiled by the Services.

INCORPORATE ADAPTIVE MANAGEMENT AND THE PRECAUTIONARY PRINCIPLE INTO HCP DESIGN

Because our understanding of the biological world is incomplete, uncertainties are endemic to conservation planning. The biological information available on species and ecosystems—and their interaction with habitat—is always, to some degree, imperfect or ambiguous. The performance reviews recommend two interrelated tools for dealing with critical uncertainties: adaptive management and the precautionary principle. Adaptive management is a technique that tests the response of biological systems to conservation measures and adjusts conservation strategies as warranted on an ongoing basis. The precautionary principle resolves critical uncertainties in favor of greater protection for the species until and unless better information counsels otherwise.

Applying Adaptive Management Principles to HCP Design

Adaptive management is a strategy for coping with the uncertainties inherent in predicting how ecosystems will respond to human interventions. Adaptive management is an essential feature of habitat conservation planning because it responds realistically to ignorance about the ecosystem by monitoring the results of management efforts so that adjustments can be made as needed.⁸³ Under adaptive management, HCPs are acknowledged to be mere working hypotheses, predicated upon assumptions about how species and their ecological processes and functions respond to changes in habitat size, location, configuration, quality, etc. These assumptions, uncertainties, and knowledge gaps are made explicit, and the conservation strategy includes concrete plans and funding for a program of hypothesis-testing against specified, measurable performance goals.

At its core, an effective adaptive management program must include a method for evaluating the performance of the HCP and must specify the alternative conservation measures that will be triggered automatically in the event that performance fails to meet conservation goals. Under such a program, it might be necessary for the permittee to implement development activity in phases so that permission to begin a later phase is contingent upon the Services verifying that the performance standards in the prior phase have been met. This kind of phased development is more easily accomplished in larger landscape-scale plans that are implemented over time.

From the Services' perspective, property rights holders are already successfully incorporating adaptive management into HCPs. However, in both the existing Handbook and the proposed addendum, the practice of adaptive management is limited to circumstances where "significant uncertainty exists," and, even then, only to circumstances where the applicant accedes to its utilization.⁸⁴ In current practice, the range of conservation measures that might be required as a result of evolving information is negotiated as a term of the initial HCP.⁸⁵ Yet, many conservation biologists agree that "significant

⁸⁰ Lin, Albert C. Participants' Experiences with Habitat Conservation Plans and Suggestions for Streamlining the Process, 23 *Ecology Law Quarterly* 369, 416 (1996); Univ. of Michigan, *supra* note 43, pg. 14-8; NCEAS, *supra* note 12, pg. 47.

⁸¹ The lack of public scrutiny and involvement when HCPs were launched would later be characterized by the administration as a "quiet revolution." Kostyack, John. Surprise! *The Environmental Forum* 19 (March/April 1998).

⁸² NCEAS, *supra* note 12, pg. 47.

⁸³ Noss, *et al.*, *supra* note 19, pg. 133.

⁸⁴ *Ibid.* pg. 3-24. The Draft Addendum to the Handbook does nothing to expand the use of adaptive management, since the Draft recommends adaptive management only for plans containing "significant data gaps." 64 Fed. Reg. at 11486.

⁸⁵ FWS & NMFS, *supra* note 35, pg. 3-25.

uncertainty” may not become apparent until after the HCP has been approved. They advocate for including adaptive management practices in virtually every plan, making it the rule rather than the exception.

Conservation biologists have identified five steps to develop an HCP that utilizes adaptive management practices:⁸⁶

- 1) Identify explicit and quantifiable biological goals;
- 2) Characterize the human-induced stressors of the ecosystem that must be overcome or counteracted to achieve those goals, including an explicit acknowledgement of the critical uncertainties regarding the stressor-response relationships;
- 3) Specify high-probability measures to minimize, mitigate or offset these stressors or otherwise achieve the biological goals;
- 4) Monitor biological indices by developing a statistically valid sampling protocol; and
- 5) Develop mechanisms to translate data into needed plan adjustments.

The choice of conservation measures in Step 3 is crucial to the success of an HCP. These mitigation measures must represent the “best guess” based on the best available data. Once in place, these measures constitute the initial working hypotheses that the adaptive management regimen tests, monitors, and adjusts to as necessary to reach the biological goals.

Measures to Reduce the Risks of Unsuccessful Mitigation

The most frequently used mitigation strategies consist of measures to minimize or avoid development impacts on the listed species.⁸⁷ While these are usually the easiest and least costly procedures to implement, the sufficiency of these measures can only be tested over time and in relation to how the target species responds in the real world. To maximize prospects for successful mitigation, measures should be based on the best science available and the mitigation strategy must be allowed to evolve over time as monitoring progresses. As to the scientific adequacy of HCPs to date, researchers have found that in most cases the mitigation procedures do address the primary threat to the survival of the species, but only about half of mitigation plans adequately ameliorate that threat.⁸⁸

There are several techniques that can reduce the risks to the species associated with unsuccessful mitigation strategies. In general, the Services recommend that mitigation habitat should be as close as possible to the area of impact. Also, the habitat should include similar habitat types and support the same species affected by the development covered by the HCP.⁸⁹ The Handbook recommends that habitats be “banked” through the use of conservation easements or other means before development occurs.⁹⁰ The “mitigation credit” system is a variant of this scheme. Under this system, newly created habitat receives a credit (usually on a per acre basis) that can then be used or sold to other parties requiring mitigation lands. This allows landowners to pay mitigation fees into habitat acquisition funds in lieu of conserving habitat on their own lands.

Mitigation banking can achieve habitat goals in an economically efficient manner and can reconfigure habitat in ways that traditional HCPs cannot. Because spatial considerations are critical in conservation, mitigation banking has the potential to result in “no net loss” of habitat and to enhance population stability by exchanging fragmented habitats for non-fragmented habitats. Assuring that mitigation banks do not result in a net reduction in the extent or quality of habitat is particularly essential for already endangered or threatened species.

However, it is often difficult to establish a “common currency” for valuing the habitat that is banked or sacrificed. There may not be much “biological content” to the offset credits assigned. Since habitat value is site- and detail-specific, there are no unsigned biological bearer bonds. That is to say, the amount of habitat credit appropriate to a mitigation scheme is not fungible, but highly dependent upon the specifics of the exchange. Generic criteria will quickly break down. What is needed is a process for valuation, not fixed criteria.

⁸⁶ *Workshop Findings and Conclusions*, *supra* note 15.

⁸⁷ NCEAS, *supra* note 12, pg. 24.

⁸⁸ *Ibid.* pg. 25.

⁸⁹ FWS & NMFS, *supra* note 35, pp. 3-21 – 3-22.

⁹⁰ *Ibid.* pg. 3-21.

The success of mitigation measures depends on their timely implementation. To increase the probability that unsuccessful mitigation procedures can be detected and corrected, implementation should occur before the listed species are impacted by the permitted development activities. If most of the take occurs before mitigation measures are implemented, the chance of adapting the conservation strategy to correct unsuccessful conservation measures is substantially reduced. This also applies to plans covering multiple species, both listed and unlisted.⁹¹ Also, if take is permitted before the permittee implements mitigation measures, the incentive to mitigate effectively is reduced. In general, the Services recommend that the mitigation habitat should be available before the applicant's activities commence. However, in some cases, the Services will allow the HCP applicant to conduct activities before the time when replacement habitat can be provided. The Services find this acceptable so long as the HCP provides legal or financial assurances that the permittee will fulfill HCP obligations. For example, this assurance can be provided through letters of credit controlled by the government until the permittee establishes the mitigation lands.⁹²

Because mitigation can be one of the most expensive steps in the development and execution of an HCP, the Services and applicants must determine early in the development of the HCP the cost of the proposed measures, the source of funding, and the time period over which these funds will be available. HCPs generally satisfy these criteria.⁹³

The Importance of Monitoring

While the choice of mitigation measures is crucial for an effective program of adaptive management, biological monitoring is at the heart of adaptive management practices. HCPs that do not include a monitoring program cannot be scientifically evaluated. As previously stated, adaptive management treats all HCPs as "learning laboratories" in which the underlying conservation hypotheses are tested against actual responses in the species population. Monitoring of these responses in order to adjust conservation strategies is indispensable. In addition, a precise trigger for mitigation adjustments needs to be spelled out in the HCP agreement, as well as procedures for accomplishing the indicated adjustment. The mere existence of monitoring is not a solution to data shortage unless it includes a quantitative decision-making process that links monitoring data to adjustments in management.

An adequate monitoring program requires the use of quantifiable indicators, placed in a hypothesis-testing framework with a valid experimental design. The principal criteria for determining the adequacy of a monitoring program should be its ability to evaluate the success of mitigation measures and the consequent effect on protected species. Monitoring data should be incorporated into centralized databases to facilitate access to information on the overall status of species, and to facilitate assessment of cumulative impacts for specific plans.⁹⁴

Reviewers found that few HCPs have well-developed and statistically valid monitoring programs,⁹⁵ and the Services typically offer little help to an applicant in constructing a scientifically defensible monitoring program.⁹⁶ Fewer HCPs still have actually monitored their results adequately over a period of years so that trends can be detected. When monitoring is deficient, the essential goal of learning from experience is much harder to accomplish. Fortunately, the Services' Draft Handbook Addendum does propose to improve upon current compliance monitoring by requiring permittees to monitor both their success in implementing mitigation measures and their effectiveness in achieving the conservation goals.⁹⁷

The Services require the applicant to demonstrate funds sufficient to carry out the activities under the HCP including conservation measures, plan administration, and biological monitoring.⁹⁸ However, reviewers have found that many HCPs do not commit sufficient funds to properly monitor species and habitat and identify problems. Without funding for the kind

⁹¹ For example, the San Diego MSCP and the Plum Creek HCP cover 53 and 281 unlisted species, respectively, and 32 and 4 listed species, respectively, but there is no requirement that mitigation must occur before unlisted species can be taken. Monroe, Jud, *Habitat Conservation Plans Assurances and Assurance Mechanisms: A Preliminary Review of Approaches to Mutual Assurances in Several Milestone Habitat Conservation Plans* 3. Prepared for the Metropolitan Water District of Southern California (1997) (hereinafter cited as "MWD").

⁹² FWS & NMFS, *supra* note 35, pg. 3-22.

⁹³ NCEAS found that 98% of the HCPs identified in advance the sources of funding for the mitigation proposed; however, only 77% had significant funds set aside to pay for mitigation at the onset of the HCP. NCEAS, *supra* note 12, pg. 28.

⁹⁴ NCEAS, *supra* note 12, pg. 44.

⁹⁵ NCEAS, *supra* note 12, pp. 28-29.

⁹⁶ FWS & NMFS, *supra* note 35, pp. 3-26 – 3-27.

⁹⁷ 64 Fed. Reg. pg. 11488-89.

⁹⁸ 16 U.S.C. § 1539(a)(2)(B)(iii).

of thorough biological monitoring that makes adaptive management possible, plans cannot be implemented in a scientifically credible manner.⁹⁹ The conservation organization Defenders of Wildlife recommends that applicants be required to post a performance bond or other financial security before they are granted an incidental take permit, ensuring that funds will be available if a permit is revoked or additional mitigation measures become necessary. Such measures would also protect the public if landowners become insolvent or otherwise terminate the agreement before mitigation steps are completed.¹⁰⁰ Other commentators recommend establishing a federal trust to provide supplemental support in the event that landowners comply with the plan but additional measures are needed to meet biological goals.

Applying the Precautionary Principle to HCP Design

Inadequate information regarding the status of a species or its habitat and the type and magnitude of take that will occur during development activities appears to be endemic in the preparation of HCPs. For 25% of species covered by HCPs in one study, the researchers could not determine whether enough habitat currently exists to sustain the species.¹⁰¹ For only one-third of the species analyzed in that study were there enough data to evaluate what proportion of the population would be impacted by the proposed development.¹⁰² The data limitations make it difficult to determine the impacts of future losses or alterations of habitat on the listed species.

When data are sparse, as they often are for listed species and usually are for other species covered by an HCP, it is difficult to confidently design an effective and efficient conservation strategy. This is why conservation biologists believe that optimal HCP development should be guided by the traditional scientific method of using experiments to prove or disprove a testable hypothesis concerning available conservation strategies.¹⁰³

The precautionary principle is one method for coping with incomplete or inadequate information pertinent to habitat conservation planning. The precautionary principle is used in many fields of environmental management, as well as fields as diverse as engineering and economics, where decisions must be made despite uncertainty. The principle holds that, in the face of poor information or great uncertainty, managers should adopt risk-adverse practices.¹⁰⁴

In the HCP arena, applying the precautionary principle means dealing with data deficiencies in a manner that does not place the target species at risk due to irreversible loss of habitat but also does not make development impossible. The first step is to assess the sufficiency of available data. An inventory of available data and acknowledgement of gaps should be a routine requirement in the development of every HCP. Where necessary data are not available and cannot be practicably obtained, the planning process should proceed with caution commensurate with the anticipated risks and uncertainties. In extreme cases, an HCP should not be initiated or approved, for it would be wrong to call the HCP process scientific, or even rational, if it were not an option to halt the process in the absence of crucial information.¹⁰⁵ In general, the precautionary principle counsels that:¹⁰⁶

- ◆ **The greater the impact of a plan, the fewer gaps in critical data should be tolerated.**
- ◆ **A scarcity of data on impacts of take should be handled by assuming a worst-case scenario** when determining whether approval criteria have been satisfied.
- ◆ **Take should be quantitatively assessed** for large HCPs covering vast expanses of land.
- ◆ **Mitigation measures should be implemented and assessed before take occurs** where there is a scarcity of information to validate the effectiveness of mitigation.

⁹⁹ Defenders of Wildlife, *supra* note 7, pg. 82.

¹⁰⁰ *Ibid.*

¹⁰¹ NCEAS, *supra* note 12, pg. 18.

¹⁰² When available data were used in preparing an HCP, the NCEAS researchers found a varying level of quality of their use. For analysis of status, take, impact, population sizes and habitat availability, the overall quality of data use was fairly high. However, the use of existing data regarding extrinsic factors (anticipated human population growth, likely future pressures on species) was poor, which could undermine otherwise effective mitigation covered by the HCP. *Id.* pg. 19.

¹⁰³ Williams, *supra* note 13.

¹⁰⁴ *Id.* pg. 40.

¹⁰⁵ *Workshop Findings and Conclusions*, *supra* note 15.

¹⁰⁶ These points are based on recommendations by NCEAS, *supra* note 12, pg. 41.

- ◆ **Monitoring needs to be very well designed** in cases where the success of mitigation is unproven.
- ◆ **Adaptive management needs to be a part of every HCP** predicated on substantial data shortages, not just to deal with “unforeseen circumstances.”

In sum, where critical information is scarce or uncertain, application of the precautionary principle counsels that resulting plans should 1) be shorter in duration, 2) cover a smaller area, 3) avoid irreversible impacts, 4) require that mitigation measures be accomplished before take is allowed, 5) include contingencies, and 6) have adequate monitoring.

Review and analysis of HCPs to date has found that these corollaries of the precautionary principle have not been well applied in habitat conservation planning. In particular, HCPs based on less information or less certain information tend to be as long in duration as those based on more adequate information. The degree of impact avoidance or minimization has not correlated with the sufficiency of data needed to determine the impacts of the proposed development activities. Finally, researchers have found that HCPs based on poor information tend to be *more* likely to include irreversible impacts.¹⁰⁷ These results suggest that HCPs are not generally structured to be more cautious in cases where applicants are working with large data gaps.

ALIGN REGULATORY ASSURANCES WITH ADAPTIVE MANAGEMENT AND THE CONSERVATION PERFORMANCE OF AN HCP

Regulatory Assurances: Controversial but Necessary

The Services are convinced that legal assurances are necessary to induce private rights holders to develop HCPs and to implement the conservation measures obligated therein.¹⁰⁸ The increase in HCP activity in response to such assurances seems to confirm this assumption. Implicit in this belief is the fear that, unless owners of nonfederal lands and waters are induced to make conservation commitments, endangered species habitats will be surreptitiously destroyed or degraded as such properties are developed. While such take may be prohibited by the ESA, its occurrence can readily overwhelm the detection and enforcement capabilities of the Services. In essence, regulatory assurances provide the necessary inducement for habitat conservation planning by exempting development activities from new or additional mitigation requirements beyond those committed in the HCP.¹⁰⁹ The major concern of the HCP performance reviewers is that such regulatory assurances can introduce rigidity in the conservation strategy that inhibits or precludes adaptive management.

Assurances are also controversial because they tend to shift to the species, which can ill afford them, the risks associated with our imperfect knowledge about how complex biological systems respond to human interventions. Those risks are exacerbated by the practice of conferring assurances without regard to the quality or duration of the conservation plan.¹¹⁰ The property rights holder typically seeks to be absolved of further responsibility for the conservation of the species in exchange for the development concessions made in the HCP, irrespective of the future population trends for the covered species.

Currently, the form of regulatory assurance provided by the Services is the “no surprises” guarantee.¹¹¹ The policy can be traced back to a House of Representatives Committee Report on the 1982 Amendments to the Endangered Species Act.¹¹² The Report stated that, in the event an unlisted species is listed after permit issuance, “no further mitigation requirements should be imposed if the [HCP] addressed the conservation of the species and its habitat as if the species were listed pursuant to the Act.”¹¹³

The Report also stated that “circumstances and information may change over time” and that the original plan might need to be revised. To address this situation, the Committee “expect[ed] that any plan approved for a long-term permit [would] contain a procedure by which the parties will deal with unforeseen circumstances.” Finally, the Report specified that the

¹⁰⁷ NCEAS, *supra* note 12, pg. 41.

¹⁰⁸ Thornton, *supra* note 18, pg. 655-656.

¹⁰⁹ Dept. of the Interior and Dept. of Commerce. Final Rule, Habitat Conservation Plan Assurances (“No Surprises”), 63 Fed. Reg. 8859-8860 (Feb. 23, 1998) (hereinafter cited as “DOI & DOC”).

¹¹⁰ The landowners’ desire to reduce risks associated with economic projections typically determines how long plans apply. Defenders of Wildlife, *supra* note 7, pg. 83.

¹¹¹ Thornton, *supra* note 25, pg. 66.

¹¹² H.R. Rep. No. 97-835, 97th Cong., 2d Sess. 30, reprinted in 1982 *U.S. Code Cong. & Admin. News* 2860, 2871-2872.

¹¹³ *Ibid.*

Services may “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 . . .”¹¹⁴

Today, the “unforeseen circumstances” clause is interpreted to mean that landowners are not responsible for the decline of listed species covered by their plan if that decline is attributable to events that the landowner could not have foreseen at the time the plan was approved.¹¹⁵ The Services formally adopted the policy as an agency rule on February 23, 1998.¹¹⁶

The “no surprises” policy has had a dramatic effect on the public perception of the ESA. It has muted political concern that the ESA is unworkable and too stringent.¹¹⁷ Yet, the policy has no shortage of critics, conservation biologists among the harshest. Some of the outstanding issues that biologists find problematic include:

- ◆ ***Unforeseen circumstances.*** The rule distinguishes between “unforeseen circumstances,” which are events that could not reasonably have been anticipated, and “reasonably foreseeable changes in circumstances,” including natural catastrophes that normally occur in the area. HCPs need address only the latter. In the event of a finding of “unforeseen circumstances,” the Services are free to take additional actions at their own expense to protect the species, provided that they have the financial means appropriated by Congress to do so, and provided that the affected landowners agree to cooperate. Curiously, in an era where the Services are only able to meet a fraction of their statutory responsibilities,¹¹⁸ the Services maintain that they have “significant resources” to provide additional protection for listed species subject to an HCP.¹¹⁹ The Services also have expressed confidence that many landowners would willingly consider additional conservation on a voluntary basis.¹²⁰ However, given the wealth of evidence to the contrary, further explanation of this assumption is warranted.
- ◆ ***Adaptive management.*** Conservation biologists worry that the “no surprises” policy falsely assumes that we can predict all the consequences of implementing a particular HCP. The current rule does not deal with the situation where new data from a monitoring program or another source indicate that achievement of the conservation goals will require a change in the conservation strategy. The ability to require such modifications is what we mean by “adaptive management.” If modification of plans in response to new information is precluded by the “no surprises” policy, failures to attain biological goals are inevitable.¹²¹
- ◆ ***Regulatory assurances for conservation measures covering unlisted species.*** While the ESA does not require landowners to protect unlisted but declining species on their lands, the Services encourage landowners to “address” any unlisted species in an HCP by conferring additional regulatory guarantees that further mitigation will not be required if such species is later listed.¹²²

A good example of the risks posed to unlisted species that are included in an HCP can be found in the Plum Creek timber plan. The Plum Creek plan allows the take of four species currently protected by the ESA: northern spotted owl, marbled murrelet, grizzly bear, and gray wolf.¹²³ The HCP also addresses another 281 unlisted vertebrate fish and wildlife species. The planning area of 419,000 acres provides habitat for 77 mammal, 178

¹¹⁴ *Id.*

¹¹⁵ FWS & NMFS, *supra* note 35, pg. 3-29.

¹¹⁶ The policy was informally adopted in 1994 and included in the HCP Handbook in 1996. *Ibid.* Because the policy was adopted without benefit of public review or comment, conservationists sued the Services in 1997. *Spirit of the Sage Council v. Babbitt*, Civ. No. 96-cv02503 (Dist. D.C. 1997). To resolve the lawsuit, the Services adopted the policy a formal rule. DOI & DOC, *supra* note 109, pg. 8860.

¹¹⁷ Baur, Donald C. The No Surprises Policy: Stepping Away from Sound Bites and Getting Down to Business. 14 *Endangered Species Update: Habitat Conservation Planning* 63 University of Michigan (July/Aug. 1997).

¹¹⁸ Environmental Defense Fund, *supra* note 6, pg. 6.

¹¹⁹ DOI & DOC, *supra* note 109, pp. 8862, 8869.

¹²⁰ *Ibid.*

¹²¹ Noss, *et al.*, *supra* note 19, pg. 134.

¹²² Assurances are only extended to measures covering an unlisted species if the HCP meets the section 10(a)(2)(B) standards for the species. DOI & DOC, *supra* note 109, pg. 8867. This is consistent with the assurances contemplated in the ESA’s 1982 amendments. H.R. Rep. No. 97-835, 97th Cong., 2d Sess. 30, Reprinted in 1982 U.S. Code Cong. & Admin. News 2860, 2871-2872; Habitat Conservation Planning Assurances (No Surprises Rule) 63 F.R. 8859 (Feb. 23, 1998).

¹²³ Plum Creek Multi-Species Habitat Conservation Plan on Forestlands owned by Plum Creek Timber Company in the I-90 Corridor of the Central Cascades Mountain Range (June 1996).

bird, 13 reptile, 13 amphibian, and 4 fish species.¹²⁴ While Plum Creek's measures to benefit these species include greater riparian buffers and wetland protection than would be required under existing state law, the public is likely to be bound to these commitments if, in 100 years, one or many of these species need further protection.

If adequately addressed in an HCP, unlisted species could be protected from further decline so as to avoid a listing, thereby guaranteeing that the landowner will not be subject to further mitigation.¹²⁵ Unfortunately, establishing conservation requirements for unlisted species is difficult since little is generally known about the requirements of the species. As a result, an applicant must be willing to invest in further biological studies to ensure that the HCP adequately covers unlisted species. In this case, a critical issue in HCP development is the early identification of those species or biological communities that the plan is to cover¹²⁶ and a determination by the Services that enough is known about the species so that HCP proponents can construct an effective conservation plan.

Reforming Assurances

Given the importance of regulatory assurances to create an environment in which nonfederal property rights holders will make commitments to conserve habitat, we must explore options that do not shift to the vulnerable species the risks inherent in uncertain and untested conservation strategies. Adaptive management permits a flexible response that improves as results are monitored. However, adaptive management requires a fundamental change in the way the regulatory assurances are structured so that HCPs remain flexible and contingent rather than immutable, as they are now. One solution lies in converting the assurance package from regulatory immunity to regulatory indemnity. A policy of regulatory indemnity would mean that, if the monitoring program indicates that the species will continue to decline unless additional restrictions are imposed or additional mitigation measures are applied, these could be implemented without the consent of the property rights holder but also without economic costs to that entity. Instead, the biological risks would be absorbed by a compensation fund.

The use of regulatory indemnity in the HCP process is analogous to risk insurance in that it converts the problem of how to allocate the risks associated with the biological uncertainties of HCPs to the problem of how to allocate the costs of funding the indemnity pool and how to determine eligibility for compensation. The compensation pool could be funded from "premiums" contributed by the "beneficiaries," a category that includes both HCP applicants and the public at large. Indeed, most commentators recognize that some, perhaps most, of the costs of managing adaptively will have to be borne by the public at large. This is already beginning to happen in the California Central Valley water system, the Everglades, and other aquatic ecosystems.¹²⁷

One commentator notes that biological risks to economic development are not different in kind from the myriad of other risk factors for which the construction industry has found insurance coverage to provide the necessary certainty required by capital markets.¹²⁸ In the construction context, parties do not argue about the need to provide certainty since they know from experience that surprises are to be expected; instead, they figure out how to minimize the risks and provide sufficient security to afford the lender comfort to finance the project.¹²⁹ Carried to its logical conclusion, reducing the financial risks associated with land development under the ESA should lead to more favorable interest rates for development loans. Thus, potential also exists to fund a portion of the compensation pool through reductions in the cost of debt service for covered development projects on the premise that an indemnity arrangement does reduce the risks to development under the ESA.

As discussed above, another suggested reform in regulatory assurances would calibrate the duration or rigor of the assurance to the quality or expected performance of the HCP's conservation strategy. Under this approach, the scope or duration of the regulatory assurance would depend on the magnitude of the HCP's contribution to the recovery of the target species. Plans that confer a net survival benefit would get longer and more comprehensive guarantees than those

¹²⁴ *Ibid.*

¹²⁵ FWS & NMFS, *supra* note 35, pg. 4-2.

¹²⁶ Thornton, *supra* note 18, pg. 640.

¹²⁷ Solving the issue of how to determine compensated loss in a manner that satisfies the private rights holder is simpler in the aquatic context than in the terrestrial because lost water supply reliability is both relatively easy to measure and to compensate for.

¹²⁸ Thornton, *supra* note 25, pg. 65.

¹²⁹ *Ibid.* pp. 65-66.

that simply maintain the current population level or allow some decrease. Similarly, plans for which the underlying data and analyses are judged to be superior would be entitled to superior guarantees.

CONCLUSION

Empirical reviews of the performance of the habitat conservation planning experience during its first 15 years reveal substantial opportunities to restructure the process to improve the prospects for successful outcomes from the vantage points of both imperiled species and nonfederal property rights holders. These benefits can be accomplished without amending the statutory framework, although a modest “tune-up” of the Endangered Species Act would help enable these reforms. A marked change in the federal administration of this program and a substantial increase in federal investments in habitat conservation are the indispensable ingredients.

In sum, these reforms would entail:

- ⇒ **Shaping individual HCPs to contribute to a landscape-scale, bioregional conservation strategy.** Responsibility for developing bioregional conservation strategies would fall to either the federal Services or units of government at the state or local level. Increased involvement of government would shift much of the burden of gathering adequate scientific data onto the public sector as well as allow for more involvement by independent scientists and the interested public. The creation of landscape-scale HCPs would define objectives and strategies to which conservation efforts on nonfederal lands would be expected to conform. And it would provide necessary guidance as to the contribution toward those conservation goals that is needed from each parcel-specific HCP within the ecoregional planning unit. In addition, ecoregional planning would facilitate a more equitable distribution of responsibility for conservation between federal and nonfederal rights holders.
- ⇒ **Aiming bioregional conservation strategies at species recovery.** The federal government can advance recovery by managing public lands and waters to a higher conservation standard than the legal *minima*. Recovery would also be advanced incrementally by habitat acquisitions or restoration actions that more than offset the habitat losses (i.e., mitigation measures that create a net biological benefit). Where species recovery requires a greater conservation effort by the individual rights holders than is imposed by the current legal standard of avoiding jeopardy, federal resources may be necessary to close the gap. This may often take the form of purchases of the highest-value habitats from willing owners. Occasionally, it may also entail involuntary, but fully compensated, acquisitions should federal condemnation authority be eventually conferred.
- ⇒ **Reserving the decision on participation in the HCP negotiations for the Services rather than the permit applicants.** If the Services act as “gatekeeper” to the HCP negotiations, highly qualified independent scientists and other representatives of the public interest can be included in what is now often a closed process. Scientific experts should be allowed to “intervene” in HCP negotiations on behalf of local communities and conservation interests to help shape a conservation program from its formative stages. Habitat conservation plans developed with independent scientific input are more likely to succeed in their conservation goals, thus diminishing the chances that the Services will need to revise development permits. Through innovative tools such as the HCP Resource Center, all stakeholders can all enjoy the benefits of expert scientific input in the HCP negotiation process without the proponent absorbing the cost.
- ⇒ **Incorporating adaptive management routinely in HCPs.** This entails including in the chosen conservation strategy a process for structured learning and adjustment. This, again, will improve the prospects for success of the conservation venture. If coupled with an insurance arrangement, necessary adjustments can be accomplished without financial risk to the permit holder. This would reduce regulatory risk more effectively than the current “no surprises” assurance, which, in any event, is legally infirm in the event of imminent extinction of a target species.

Habitat conservation planning must be made to work better in the interest of all stakeholders. For preventable extinctions in the course of developing private lands will not long be tolerated by a people who have affirmed time and again in the political crucible the mandate that the web of life on which human welfare itself depends shall be conserved. Experience to date illuminates some of the pathways for better performance. It is time to harness these lessons and chart a more certain course.
