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**BIODIVERSITY CONSERVATION AND
THE EVER-EXPANDING WEB OF
FEDERAL LAWS REGULATING
NONFEDERAL LANDS: TIME FOR
SOMETHING COMPLETELY DIFFERENT?**

J.B. RUHL*

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Our recent experiences with federal agencies and their ham-handed approach causes me serious concern about taking action that increases their authority in local matters. The possibility of greater federal involvement in state or local management or interference with economic development is unacceptable. Frankly, the unilateral actions of federal agencies without consultation with state or local government impedes rather than facilitates progress and I have had enough. Members of Congress agree that their good intentions to protect the environment become an open door for agencies to run amuck.¹

The long-held notion that the federal government is not in the business of attempting to influence the outcome of state, local, and private land use decisions is no longer even remotely tenable.² To be sure, local zoning practices continue to dictate

1. Letter from Ann Richards, Governor, State of Texas, to John Hall, Chairman, Texas Natural Resources Conservation Commission 1 (July 25, 1994) (on file with author) (advising Chairman Hall that his agency should not support efforts to designate Barton Creek, located in Austin, Texas, a protected watershed under the Clean Water Act).

2. In 1988 I claimed that “the local grip on land planning has remained tight” and “[t]he federal role . . . has been largely passive.” J.B. Ruhl, *Interstate Pollution Control and Resource Development Planning: Outmoded Approaches or Outmoded Politics?*, 28 NAT. RESOURCES J. 293, 309 (1988). Another commentator posited in 1991 that “[t]he federal government, for the most part, has been reluctant to intrude on state and local land use decisionmaking [sic] authority.” Holly Doremus, *Patching the Ark: Improving Legal Protection of Biological Diversity*, 18 ECOLOGY L.Q. 265, 289 (1991). Times change. In fairness to myself and others (there are more than two of us) who have uttered similar words, however, it is true that the federal government has not flirted with involving itself directly in local land use decision-making since the failed efforts to do so of the

the basic color of land use controls in most areas of the nation, but increasingly it is an amorphous body of federal regulation that decides the shades. Chief among these federal themes of land use control is the unwieldy concept of "biodiversity conservation." With its cousin the "ecosystem approach," biodiversity conservation has exploded into the vast network of federal environmental regulation in ways which, though trumpeted as primarily national in dimension, in practice have had profound effects at the state, local, and private land use levels. Although the term biodiversity was barely in use in scientific or legal literature prior to 1990—practically all of the governmental documents, policy analyses, scientific papers, and legal commentaries cited in this article with respect to biodiversity conservation were written after 1990—today it is a watchword in many corners of federal environmental policy. Perhaps because of its Big Bang emergence, however, the development of federal biodiversity conservation policy has been disorganized, heavy handed, and offensive to state, local, and private autonomy.³ A completely different approach is needed if the federal government expects to be influential in shaping this nation's response to one of its most critical long term environmental issues. This article suggests such an approach.

early 1970s. For a review of those initiatives, see EVA H. HANKS ET AL., *CASES AND MATERIALS ON ENVIRONMENTAL LAW AND POLICY* 643-57 (1974).

3. Professor Dan Tarlock's thorough exploration of the role of local governments in biodiversity conservation provides a level of analysis which is complementary to the federal policy focus of this article. A. Dan Tarlock, *Local Government Protection of Biodiversity: What Is Its Niche?*, 60 U. CHI. L. REV. 555 (1993). Professor Tarlock's analysis, however, rests largely on the premises that "[b]iodiversity protection . . . is becoming more decentralized and site-specific," *id.* at 557, and that "federal and state land use managers are extremely deferential to local concerns." *Id.* at 557 n.10. If only that were so! Rather, although Professor Tarlock anticipated that "[l]ocal government biodiversity programs are in danger of being squeezed out through state and federal preemption," *id.* at 603, he underestimated, as I and no doubt many others did, how quickly and decisively that pernicious effect would come about. In the short time since his article was published, events have overtaken his premises. It is no longer true that "[f]ederal law is not organized around the construct of biodiversity protection because the idea is so new." *Id.* at 569. The idea caught on too fast! The thesis of this article is not only that federal biodiversity conservation policy has now become an organizing principle of federal policy, but that it embarked on exactly the wrong direction in terms of its relation to local concerns. A complete about-face is needed, and needed fast, if we expect to achieve the paradigm of local influence that Professor Tarlock so eloquently describes.

INTRODUCTION

The notion of biodiversity conservation is at the same time potentially one of the most elegant and most dangerous concepts to emerge in federal environmental law and policy in decades. Biodiversity conservation is elegant for the way in which it captures the interdependent and dynamic qualities of the environment and melds them into a very simple message. At its most fundamental level, biodiversity conservation means simply promoting the full range of "variety and variability among living organisms and the ecological complexes in which they occur."⁴ The basic objective of biodiversity conservation is to "maintain naturally occurring ecosystems, communities, and native species."⁵ Those words appeal to strong aspirational goals, held by many in society, to ensure that humans exist harmoniously within the "balance" of nature. Few would challenge the notion of biodiversity conservation when expressed at that platitudinal level.

But scratch the surface of biodiversity conservation and the simple message dissolves into an abstract, unwieldy set of principles and debates over what the *policy* of biodiversity conservation should be. The notion of biodiversity lends itself to misuse because it is so scientifically nascent and "sufficiently complex that almost any population biology study, with almost any conclusion, can be framed as an effort to measure or conserve biodiversity."⁶ For that reason, many people fear biodiversity conservation, not as a concept but as a policy, when put in the hands of federal regulators. Thus, proponents of "more" biodiversity, in their call to tap into the potent federal regulatory network, have unwittingly contributed to the unraveling of decades of value consensus building experienced under the major federal environmental statutes encompassing biodiversity goals. Until very recently, for example, the

4. OFFICE OF TECHNOLOGY ASSESSMENT, CONGRESS OF THE U.S., *TECHNOLOGIES TO MAINTAIN BIOLOGICAL DIVERSITY* 3 (1987) [hereinafter *TECHNOLOGIES*].

5. COUNCIL ON ENVTL. QUALITY, EXECUTIVE OFF. OF THE PRESIDENT, *INCORPORATING BIODIVERSITY CONSIDERATIONS INTO ENVIRONMENTAL IMPACT ANALYSIS UNDER THE NATIONAL ENVIRONMENTAL POLICY ACT* 5 (1993) [hereinafter *BIODIVERSITY CONSIDERATIONS*].

6. Gordon H. Rodda, *How to Lie with Biodiversity*, 7 *CONSERVATION BIOLOGY* 959 (1993).

Endangered Species Act⁷ had been sacrosanct in Congress, as virtually no credibility was given to anyone advocating "less" species protection.⁸ Today, however, the Endangered Species Act comes under heavy barrage in Congress, is attacked by many state and local governments, and is a rallying point for the so-called "wise use" movement, an amalgamation of extreme private property rights advocates calling for a massive rethinking of federal land use controls.⁹

Indeed, the federal government's ownership and control of hundreds of millions of acres of domestic land¹⁰ and its poten-

7. Pub. L. No. 93-205, 87 Stat. 884 (codified as amended at 16 U.S.C. §§ 1531-1544 (1988 & Supp. V 1993)). For a detailed discussion of the role of the Endangered Species Act in federal biodiversity policy, see *infra* part I.B.1.

8. All efforts in the 1980s to weaken the Endangered Species Act met crushing defeats. See generally Donald J. Barry, *Amending the ESA: The Ransom of Red Chief, and Other Related Topics*, 21 ENVTL. L. 587 (1991).

9. For a description of the backlash the Endangered Species Act has suffered in recent years in Congress, state and local forums, and under criticism by wise use advocates, see *infra* text accompanying notes 73-75 and 263-66.

10. The federal government owns or controls over 650 million acres in the United States, or about 30% of the nation's total land mass, with 627 million of those under the jurisdiction of four federal agencies—the National Park Service, the Bureau of Land Management, the Fish and Wildlife Service, and the Forest Service. U.S. GEN. ACCT. OFF., PUB. NO. GAO/RCED-94-111, ECOSYSTEM MANAGEMENT: ADDITIONAL ACTIONS NEEDED TO ADEQUATELY TEST A PROMISING APPROACH 12 (1994) [hereinafter ECOSYSTEM MANAGEMENT]. Most of those acres are located in Alaska and the western states. *Id.* at 14-15. Through the National Park System, National Wildlife Refuges, National Wilderness Preservation System, and similar federal programs for protected areas, over 170 million acres of federally owned domestic territory are in protected status. UNITED NATIONS CONFERENCE ON ENV'T & DEV., UNITED STATES OF AMERICA NATIONAL REPORT 301 (1992) [hereinafter NATIONAL REPORT]. One of the most significant additions to those federally owned preserve lands was made in 1994 with the enactment of the California desert bill, which designated over 7.5 million acres of California desert as a wilderness area and established the Death Valley and Joshua Tree National Parks and the Mojave National Preserve. California Desert Protection Act of 1994, Pub. L. No. 103-433, 108 Stat. 4471 (to be codified at 16 U.S.C. §§ 410aaa to 410aaa-83). Additional efforts the federal government could and should expend on lands it owns to advance biodiversity conservation are beyond the scope of this article. For comprehensive discussions of that topic, see COUNCIL ON ENVTL. QUALITY, LINKING ECOSYSTEMS AND BIODIVERSITY 146-51 (1992), reprinted from COUNCIL ON ENVTL. QUALITY, 21ST ANNUAL REPORT ON ENVIRONMENTAL QUALITY (1990) [hereinafter LINKING ECOSYSTEMS]; Scott W. Hardt, *Federal Land Management in the Twenty-First Century: From Wise Use to Wise Stewardship*, 18 HARV. ENVTL. L. REV. (1994); Jon D. Holst, *The Unforseeability Factor: Federal Lands, Managing for Uncertainty, and the Preservation of Biological Diversity*, 13 PUB. LAND L. REV. 113 (1992); Robert B. Keiter, *Beyond the Boundary Line: Constructing a Law of Ecosystem Management*, 65 U. COLO. L. REV. 293 (1994); Robert B. Keiter, *Conservation Biology and the Law: Assessing Challenges Ahead*, 69 CHI.-KENT L. REV. 911 (1994); James A. Siemans, *A "Hard Look" at Biodiversity*

tially strong influence in matters of international environmental protection and economic development¹¹ present vast opportunities for the federal government to protect and enhance biological resources. It is appropriate for the federal government to develop biodiversity conservation policies for those lands. The focus of federal involvement, however, increasingly has been to establish a regime of biodiversity *regulation* through environmental controls of development actions on *nonfederal* lands. The emphasis on regulation of nonfederal lands is not entirely misdirected, as much of our nation's biological resources reside there.¹² The approach for dealing with such areas, however,

and the National Forest Management Act, 6 TUL. ENVTL. L.J. 157 (1992); Rebecca W. Thomson, "Ecosystem Management," *Great Idea, But What Is It, Will It Work, and Who Will Pay?*, NAT. RESOURCES & ENV'T, Winter 1995, at 42; Jeb Boyd, Comment, *Struggling to Protect Ecosystems and Biodiversity Under NEPA and NFMA: The Ancient Forests of the Pacific Northwest and the Northern Spotted Owl*, 10 PACE ENVTL. L. REV. 1009 (1993).

11. The most significant recent international statement of commitment to biodiversity conservation occurred with the approval, on June 5, 1992, of the Convention on Biological Diversity at the United Nations Conference on Environment and Development in Rio de Janeiro. 31 I.L.M. 818 (1992) [hereinafter Convention on Biological Diversity]. Over 37 other international treaties and conventions deal with issues of species protection and other biodiversity goals. See TECHNOLOGIES, *supra* note 4, at 258. The United States is a leader among industrialized nations in terms of maintaining species diversity and protecting endangered and threatened species, achieving one of the highest species diversity indexes of animal species and one of the lowest rates of endangered and threatened animal species. *Id.* at 72. The United States is also a major participant in the United Nations' Man and Biosphere program, under which the State Department oversees administration of 46 designated outstanding natural areas in the United States totalling 17 million acres. See LINKING ECOSYSTEMS, *supra* note 10, at 166. Additional efforts the United States could and should take in the international setting to influence biodiversity conservation in other industrialized and developing nations are beyond the scope of this article. For comprehensive discussions of that topic, see JEFFREY A. MCNEELY ET AL., CONSERVING THE WORLD'S BIODIVERSITY (1990); TECHNOLOGIES, *supra* note 4, at 23-32; William M. Flevares, *Ecosystems, Economics, and Ethics: Protecting Biological Diversity at Home and Abroad*, 65 S. CAL. L. REV. 2039 (1992); William J. Snape, III, *What Will Happen to the Critters: NAFTA's Potential Impact on Wildlife Protection*, 33 NAT. RESOURCES J. 1077 (1993).

12. According to a 1994 United States General Accounting Office study, over 90% of the species currently listed under the Endangered Species Act as endangered or threatened have some or all of their habitat on nonfederal lands—73% have over 60% of their habitat on nonfederal lands, and 37% are completely dependent on nonfederal lands. U.S. GEN. ACCT. OFF., PUB. NO. GAO/RCED-95-16, ENDANGERED SPECIES ACT: INFORMATION ON SPECIES PROTECTION ON NONFEDERAL LANDS 4-5 (1994) [hereinafter SPECIES PROTECTION ON NONFEDERAL LANDS]. Moreover, almost 80% of endangered and threatened species rely on nonfederal lands for some of the habitat considered critical to the

has been to inject the federal regulatory scheme into the heart of the most basic of state, local, and private land use decisions, often to the sharp resentment of state and local jurisdictions and private interests.

This article examines the scope and depth of that trend and explores the alternative approaches the federal government might take with respect to biodiversity policy. On the one hand, federal policy could continue on its present course of patchwork federal regulation glued together by the gestalt-like theme of biodiversity. Alternatively, this article demonstrates that a more effective policy would come from melding the disorganized system of federal biodiversity conservation regulation into a single law designed principally to promote biodiversity conservation in a framework sufficiently flexible to accommodate state, local, and private interests.

One point upon which this article does not dwell is the question of whether biodiversity conservation is an important national policy goal. As a general proposition, just like cleaner air and water, most people would vote in favor of improved biodiversity conservation, and with sound scientific and policy justifications. In recent years no serious, credible scientific commentary has suggested that humans and the environment would benefit by reduced biodiversity. Likewise, most scientific and legal commentary on the subject has posited strong utilitarian, aesthetic, and ethical grounds for promoting biodiversity conservation.¹³ As shown in this article, federal

species' survival, and for 40% of the species 80% of such critical habitat is on nonfederal land. *Id.* at 6. For additional analysis of the role nonfederal land plays in connection with endangered species habitat, see Jim McKinney et al., *Economic Incentives to Preserve Endangered Species Habitat and Biodiversity on Private Lands*, in BUILDING ECONOMIC INCENTIVES INTO THE ENDANGERED SPECIES ACT 2 (Defenders of Wildlife ed., 1993) [hereinafter BUILDING ECONOMIC INCENTIVES]; CENTER FOR THE STUDY OF AM. BUSINESS, WASHINGTON UNIV. IN ST. LOUIS, THE ENDANGERED SPECIES ACT: TIME FOR A CHANGE 30-33 (1994). Of course, federal and nonfederal lands are not neatly separated—ecosystems know no political boundaries. Factors such as these have led “[m]any agency officials, scientists, and policy analysts [to] agree that ecosystem management will generally fall short of its goal if it is limited to activities on federal lands.” ECOSYSTEM MANAGEMENT, *supra* note 10, at 57.

13. See generally BALANCING ON THE BRINK OF EXTINCTION: THE ENDANGERED SPECIES ACT AND LESSONS FOR THE FUTURE (Kathryn A. Kohm ed., 1991); LINKING ECOSYSTEMS, *supra* note 10, at 146-51; THE PRESERVATION OF SPECIES: THE VALUE OF BIOLOGICAL DIVERSITY (Bryan G. Norton ed., 1986); TECHNOLOGIES, *supra* note 4, at 3-8; EDWARD O. WILSON, THE DIVERSITY OF LIFE (1992); Doremus, *supra* note 2, at 269-86; James Drodzowski, *Saving an*

regulatory policy has already responded with significant measures directed towards strengthening biodiversity conservation.¹⁴ But it is all too easy to say more of a good thing is better and leave it at that. Many of our legal institutions have embraced the broad goal of biodiversity conservation, and now are faced with the truly difficult policy questions—who, what, when, how, and how much. The backlash which the Endangered Species Act has experienced in recent years suggests that, when it comes to regulation of nonfederal lands, the federal government should be focusing more attention on nitty-gritty details and less on the promotion of biodiversity conservation as an abstract goal.

Indeed, there is by no means unanimous support that the federal government should have *any* meaningful role in shaping national biodiversity policy. For example, the Cato Institute advocates a federal biodiversity policy relying on maximum use of “noncoercive market processes.”¹⁵ That policy proposal,

Endangered Act: The Case for a Biodiversity Approach to ESA Conservation Efforts, 45 CASE W. RES. L. REV. 553, 556-62 (1995); Flevaris, *supra* note 11, at 2041-52; James L. Huffman, *Do Species and Nature Have Rights?*, 13 PUB. LAND L. REV. 51 (1992); Tarlock, *supra* note 3, at 563-67.

14. For a summary of the biodiversity conservation policy formulation initiatives of 18 federal agencies, see CONGRESSIONAL RESEARCH SERV., PUB. NO. 94-339 ENR, ECOSYSTEM MANAGEMENT: FEDERAL AGENCY ACTIVITIES (1994) [hereinafter FEDERAL AGENCY ACTIVITIES]. Although this collection of policy statements evidences the breadth with which biodiversity conservation has taken hold within the federal environmental and land use management agencies, the report also illustrates the multitude of different agencies and approaches involved, leading to dispersed federal policy-making and ad hoc relations with state, local, and private interests. One commentator has noted the irony of the intensity of the federal agencies' biodiversity efforts at a time of budget constraints and downsizing. See Thomas C. Jackson & Joshua S. Wyner, *The New Hot Doctrine: Ecosystem Management*, NAT'L L.J., Nov. 28, 1994, at C6.

15. Allan K. Fitzsimmons, *Federal Ecosystem Management: A "Train Wreck" in the Making*, POLICY ANALYSIS (Cato Inst., Wash., D.C.), Oct. 26, 1994, at 1, 23. Fitzsimmons' policy analysis does not propose any particular “noncoercive market processes” or methods of implementing whatever they might be. It is unclear, therefore, whether he posits that the federal government (or all government?) simply step aside and let whatever the so-called free market produces be our national biodiversity policy result, or that the federal and other levels of government actively shape the market through noncoercive forms of regulation so as to promote a particular biodiversity goal. Because Fitzsimmons at no point in his analysis states what the national biodiversity goals should be were it the latter approach he is advocating, it is difficult to conclude anything other than that he is advocating the former approach—a complete hands-off federal policy. In any event, regardless of whether and how Fitzsimmons believes “noncoercive market processes” are to be shaped, I show herein that the premises leading him to propose those processes as the exclusive federal policy tool are unsound.

which has appeared to galvanize those who lean against an active federal role, is premised on a trio of assertions: that "[t]he ecosystem concept . . . is inappropriate for use as a geographic guide for public policies," that "[f]ederal management of ecosystems would significantly expand federal control of the use of privately owned land," and that "greater reliance on market forces, rather than further movement toward coercive federal regulations . . . should guide federal actions."¹⁶ Although the second of those propositions accurately defines the central defect of federal policy at present, this article demonstrates that the first and last of those premises are, at best, half true, and thus do not lead us in the direction of a passive federal policy role. Hence, as much as this article demonstrates that federal biodiversity policy thus far has been excessively coercive, it also demonstrates that a "no action" policy at the federal level is not a viable policy alternative. The question is what the federal government's proper role should be.

As the starting point for analysis of those challenging policy questions, Part I of this article examines the genesis of biodiversity conservation from its roots in biological research to its emergence in the fractured world of federal environmental regulation of nonfederal lands. Biodiversity is an elusive concept in science and in law. Scientifically, an "ecosystem" could reasonably be defined as anything "from a drop of water to the North American continent to the entire biosphere."¹⁷

16. *Id.* at 1.

17. U.S. FISH & WILDLIFE SERV., AN ECOSYSTEM APPROACH TO FISH AND WILDLIFE CONSERVATION: AN APPROACH TO MORE EFFECTIVELY CONSERVE THE NATION'S BIODIVERSITY 6 (1994) [hereinafter ECOSYSTEM APPROACH]. An ecosystem can be thought of as "[t]he organisms living in a particular environment, such as a lake or forest (or, increasing in scale, an ocean or the whole planet), and the physical part of the environment that impinges upon them." WILSON, *supra* note 13, at 396; *see also* Convention on Biological Diversity, *supra* note 11, at 824 (noting that an ecosystem is "a dynamic complex of plant, animal and micro-organism communities and their non-living environment interacting as a functional unit"). These rather imprecise definitions suggest that perhaps, in the words of Bruce Babbitt testifying as Secretary of the Department of the Interior, an "ecosystem is in the eye of the beholder." *The National Biological Survey Act of 1993: Joint Hearing on H.R. 1845 Before the Subcomm. on Environment and Natural Resources of the House Comm. on Merchant Marine and Fisheries, and the Subcomm. on National Parks, Forests, and Public Lands of the House Comm. on Natural Resources*, 103d Cong., 1st Sess. 15 (1994). Perhaps the most thoughtful description is that "[a]n ecosystem is a process. . . . You never step into the same ecosystem twice." JACK COHEN & IAN STEWART, *THE COLLAPSE OF CHAOS: DISCOVERING SIMPLICITY IN A COMPLEX WORLD* 367 (1994). The Fish and

Determining the diversity of biological resources needed to keep any particular ecosystem "healthy" is a matter subject to intense debate and imprecision given the existing limits on scientific knowledge. It is no wonder that, given the uncertainty of the scientific community about what biodiversity is, environmental law has charted no clear directions either. No single federal law purports to encompass all that is meant by biodiversity conservation; rather, a handful of different statutes addresses particular facets of biological resource protection on nonfederal lands. Gluing those laws together without any clear unifying principles has not created an effective, flexible system of biodiversity conservation.

Part II of this article explores which models could be used to advance federal biodiversity conservation policy from its present adolescence to a mature, cohesive regulatory framework. Federal regulation of nonfederal land use decisions has generally followed three models with respect to relations between federal, state, and local jurisdictions—coercion, coordination, and cooperation.¹⁸ Statutes built on the coercion theme involve federal dictates to state and local jurisdictions as to the regulatory standards and proscriptions, leaving little room for state and local autonomy. Statutes with no overt substantive goals and standards, relying instead on the federal government acting as a facilitator of procedural and informational requirements, define the coordination approach. The cooperation approach is characteristic of statutes containing a regulatory framework for states and local jurisdictions to adapt and use, in cooperation with the federal authority as needed, to achieve all or some of a federally-defined substantive goal. Federal biodiversity regulation, though favoring the coercion theme, appears in statutes fitting each of the models. As shown by examples from the existing laws dealing with biodiversity conservation, however, their dispersed and varied approaches

Wildlife Service has amplified this thought in recent ecosystem approach literature, claiming the agency "is increasing its efforts to think and act in terms of systems, relationships, and processes to recognize that, in some way, all things are connected." Denise Henne, *Taking an Ecosystem Approach*, ENDANGERED SPECIES BULL. (U.S. Dep't of Interior/Fish & Wildlife Serv., Wash., D.C.), Jan.-Feb. 1995, at 6 (emphasis added).

18. I have previously described and applied the three models of federal approaches to regulation of state and local interests in the context of interstate pollution. See Ruhl, *supra* note 2.

and legal authorities have resulted in confused and ineffective biodiversity conservation policies at the federal level.

As detailed in Part III of this article, many other legal commentators have concluded that the issue of biodiversity conservation cries out for a unified federal law to correct the deficiencies of the fractured existing framework. Most of those other commentators, however, have focused their options principally on the seemingly irresistible impulse to protect biological resources through *more* coercive regulation, without due regard to the regulatory and political fallout such a policy approach is bound to cause. As shown in this article, one of the main obstacles a broadly accepted program of biodiversity conservation has faced thus far is the opposition of state and local jurisdictions and private interests to additional layers of coercive federal regulation. Combining and strengthening the existing web of coercive regulations into a new federal mega-statute will only further alienate the nonfederal interests; yet, those are precisely the constituencies which must be brought into the biodiversity conservation game if it is to succeed.

Where federal biodiversity goals intersect with state, local, and private development goals, therefore, more force-fed regulation is not the solution. Most of the existing federal laws touching on biodiversity conservation, however, contain little in the way of flexibility to vary protective levels within defined ecosystems. Those who would perpetuate or, worse, strengthen that approach are simply asking for trouble. Rather, where nonfederal land and resource use goals might conflict with federal biodiversity objectives, the twin elements of state and local involvement in the solution and flexibility in federal policy regarding the outcome will yield greater participation in and endorsement of the system by state, local, and private interests.

A balanced solution, therefore, may rest in an approach of regulation through cooperation, under which the federal government would adopt a unified, free-standing statute dealing with biodiversity conservation as its principal goal, thus freeing other federal environmental laws from the burden of having to squeeze biodiversity values into pre-existing frameworks not meant to work that broadly or flexibly. A federal initiative based on the cooperation model would balance the flexibility needed to respond to state, local, and private concerns with the uniformity of approach needed to ensure that national goals are met.

The central elements of such a statute are outlined in Part IV of this article. Modeled around the Coastal Zone Management Act, which allows states to establish coastal zone management plans to coordinate federal, state, and local land and resource use decisions affecting coastal resources,¹⁹ the Biological Resources Zone Management Act proposed in this article would replace the coercive, confused present system of federal regulation with a unified federal-state cooperation system. States opting to designate Biological Resource Zones—areas of biological resource sensitivity appropriate for tailored, managed protection strategies—would present a management plan for each such area to the federal government for approval. In return for agreeing to manage and enforce the plan for the particular area, the state and affected local jurisdictions would be authorized to supplant the existing federal biodiversity regulatory scheme with the approved management strategy for all federal, state, and local land use decisions, including decisions with respect to private projects. Hence, the reward to nonfederal interests for engaging in biodiversity conservation would be freedom from the obsolete federal regulatory web. Based on the experience to date, only through sacrificing some degree of its potentially coercive power through measures like the one proposed in this article can the federal government expect in the long run to retain a large degree of influence over national biodiversity conservation policy.

I. BIODIVERSITY IN LAW AND SCIENCE—FROM BIRTH TO ADOLESCENCE

[T]he Fish and Wildlife Service's approach to implementing the [Endangered Species] Act in Texas has become so overreaching that it undermines public support for protecting our wildlife. During the past decade, the agency's efforts to enforce the law and protect wildlife have created enormous problems for landowners The Department of Interior, with leadership from your office, should initiate a thorough review of the Fish and Wildlife Service's overall

19. See *infra* part I.B.4.

*approach to implementing the Endangered Species Act in Texas.*²⁰

One source of the fear many segments of society harbor towards biodiversity conservation efforts is the concern that "a pervasive federal program to conserve 'biological diversity' " will be implemented "before it is known what specifically constitutes biological diversity; what impacts human activities have on biological diversity; and what cost-effective methods can be employed to conserve biological diversity."²¹ Although there may be disagreement over the extent to which "[t]he federal strategy to conserve biological communities should also take into account the strategy's impact on people, their livelihood and their standard of living,"²² the federal strategy will be politically doomed if the human impacts are not substantially justified on the basis of demonstrable scientific necessity. As one federal regulator and scientist has put it, "for scientists to combine partial data with advocacy is counterproductive in the long run."²³

The scientific understanding of biodiversity, however, is simply not to the point of allowing that level of public confidence. There remain too many ways to "bend" biodiversity data, making it "easier to add up the ways in which the concept of biodiversity can be misused than it is to present a simple solution to the extremely complex problem of measuring and maintaining biological diversity."²⁴ The danger is that the very credibility of biodiversity conservation and ecosystem management policies will be put at risk when they are "em-

20. Letter from Ann Richards, Governor, State of Texas, to Bruce Babbitt, Secretary, United States Department of Interior (Sept. 12, 1994) (on file with author) (emphasis added).

21. DISSENTING VIEWS ON H.R. 585, NATIONAL BIOLOGICAL DIVERSITY CONSERVATION AND ENVIRONMENTAL RESEARCH ACT, H.R. REP. NO. 259, 102d Cong., 1st Sess. 34 (1991). As a discrete scientific discipline, biodiversity conservation, or conservation biology, is relatively new, dating back not much before 1985. See R. Edward Grumbine, *What Is Ecosystem Management?*, 8 CONSERVATION BIOLOGY 27, 28-29 (1994). There is a legitimate concern, therefore, that the law and policy not hurtle forward ahead of the formation of well-developed scientific foundations. For an excellent bibliography of the scientific literature dealing with biodiversity policy, see DEBORAH J. FORESTER ET AL., NATIONAL PARK SERV./NAT'L BIOLOGICAL SURVEY COOP. PARK STUDIES UNIT, SOCIOECONOMIC FACTORS AND BIODIVERSITY: A WORKING BIBLIOGRAPHY (1994).

22. H.R. REP. NO. 259, *supra* note 21, at 35.

23. Rodda, *supra* note 6, at 960.

24. *Id.*

ployed as manipulative and confusing slogans²⁵ to justify whatever underlying land use policy the federal government happens to be advancing. Hence, it is essential for the federal government, if it wishes to be in the business of regulating nonfederal lands for the purpose of biodiversity conservation with the support of nonfederal land owners, to establish a comprehensive knowledge base from which to mold biodiversity conservation policy around the known rather than the unknown. Although significant strides have been made in the past decade, both the science and the policy of biodiversity conservation remain in their adolescent stages, and without proper management could both lead to wholesale delinquency.

A. *Biodiversity—What It Is and How to Conserve It*

In its recent comprehensive assessment of “ecosystem management” policies the federal government should adopt, the General Accounting Office (“GAO”) concluded that the science side of biodiversity presents significant barriers to formulating and implementing the policy side:

For example, understanding the ecology of an ecosystem will require collecting and linking large volumes of scientific data. In addition, large volumes of socioeconomic data must be collected, organized, and analyzed to identify important relationships between human activities and ecological conditions and trends and to make necessary or desired trade-offs among ecological and socioeconomic values and concerns. However, available data are often not comparable, and large gaps in information exist. Furthermore, there is still much uncertainty about how ecosystems function—uncertainty that contributes to strong differences in the interpretation of scientific evidence.²⁶

Hence, to a large extent, the direction and success of federal biodiversity conservation policy for nonfederal lands will depend on how well-defined the scientific bases of ecosystem management are and how the chosen implementing land use controls are demonstrated to relate to that scientific underpinning.

25. William Goldfarb, *Watershed Management: Slogan or Solution*, 21 B.C. ENVTL. AFF. L. REV. 483, 483 (1994).

26. ECOSYSTEM MANAGEMENT, *supra* note 10, at 7.

1. Defining Biodiversity in Science

Most definitions offered for biological diversity—biodiversity for short—are similar to the terms Congress chose in the often proposed, never passed National Biological Diversity, Conservation, and Environmental Research Act: “the full range of variability among living organisms and the natural communities in which they occur.”²⁷ Biodiversity in that sense is generally thought of as having four hierarchical components: regional ecosystem diversity; local ecosystem diversity; species diversity; and genetic diversity.²⁸ Regional ecosystem diversity encompasses the pattern of local ecosystems across the landscape. Local ecosystem diversity—the real building block of biodiversity conservation—involves the diversity of all living and nonliving components within a given area and their interrelationships. Local ecosystems are the critical biological operating units in nature. Species diversity describes the variety of individual species within a local ecosystem. Genetic diversity refers to the variations within a species, providing a measure of the species’ ability to adapt to changing environments. The four components interrelate in that “[r]egional ecosystem patterns form the basic matrix for, and thus have important influences on, local ecosystems. Local ecosystems, in turn, form the matrix for species and genetic diversity, which can in turn affect ecosystem and regional patterns.”²⁹ Hence, the four components of biodiversity are “not a series of unconnected elements,” but rather are believed to describe a continuum in which “reduction of diversity at any level will have effects at the other levels.”³⁰ Therefore, “[a] focus on any *one*

27. H.R. 305, 103d Cong., 1st Sess. §3(1) (1993); *see also* Convention on Biological Diversity, *supra* note 11, at 823 (noting that biological diversity is “the variability among living organisms . . . includ[ing] within species, between species, and of ecosystems”); U.S. ENVTL. PROTECTION AGENCY, THREATS TO BIOLOGICAL DIVERSITY IN THE UNITED STATES 10 (1990) [hereinafter THREATS TO BIODIVERSITY] (defining biological diversity as “the variety of life on all levels of organization, represented by the number and relative frequencies of items”).

28. BIODIVERSITY CONSIDERATIONS, *supra* note 5, at 1. Several early surveys of the science of biodiversity collapse the local and regional ecosystem components into one category. *See, e.g.*, THREATS TO BIODIVERSITY, *supra* note 27, at 10. More recent scientific commentaries emphasize the importance of the local ecosystem concept by dividing the hierarchy into the four categories discussed in this article. *See, e.g.*, Grumbine, *supra* note 21, at 29.

29. BIODIVERSITY CONSIDERATIONS, *supra* note 5, at 1.

30. *Id.*

level of the biodiversity hierarchy . . . is not sufficient."³¹ To the extent that humans depend on healthy, functioning ecosystems for fulfillment of commercial, recreational, aesthetic, ethical, and cultural values, conserving diversity at *every* level of the hierarchy is an important policy goal.

Conserving biodiversity involves, among other things, identifying and managing the factors that contribute to the decline of biodiversity. Direct physical alteration resulting from resource development and changing land use is perceived as the most pervasive cause of biodiversity loss.³² The physical impacts of development on habitat areas can destroy, simplify, or fragment an ecosystem and thereby reduce the diversity within and made available by the ecosystem. But there are other significant contributors to biodiversity impairment, including pollution, which may indirectly degrade habitat through acidification or prove directly lethal to species exposed to pollutants,³³ and overharvesting of species.³⁴ Indeed, some factors contributing to biodiversity losses do not readily appear as such, or may initially appear as actually contributing to increased biodiversity. For example, the introduction of non-native species to an ecosystem may initially appear to increase species biodiversity, but over time may result in depletion of native species through predation, competition, genetic modification, and disease transmission.³⁵ Similarly, resource management activities such as fire suppression, predator removal, and stream flow controls may initially boost ecosystem diversity, yet later may lead to ecosystem collapse by facilitating catastrophic fires or species overpopulation.³⁶ And some factors which are believed to contribute to biodiversity decline, such as global climate change, do so gradually, almost imperceptibly, over time.³⁷ Hence, biodiversity conservation is not just about regulating changing land use, though clearly that is the most visible cause of biodiversity decline.³⁸

31. Grumbine, *supra* note 21, at 29 (emphasis added).

32. BIODIVERSITY CONSIDERATIONS, *supra* note 5, at 2; *see also* LINKING ECOSYSTEMS, *supra* note 10, at 151-54.

33. BIODIVERSITY CONSIDERATIONS, *supra* note 5, at 2.

34. *Id.*

35. *Id.*

36. *Id.* at 2-3.

37. *Id.* at 3.

38. For a comprehensive discussion of the proximate causes of anthropogenically-driven biodiversity loss, *see* THREATS TO BIODIVERSITY, *supra* note 27, at 25-

2. The Principles of Biodiversity Management

Based on the components of biodiversity and the factors identified as contributing to biodiversity decline, the fundamental goal of biodiversity conservation is fairly evident: "to maintain naturally occurring ecosystems, communities, and native species."³⁹ The Council on Environmental Quality ("CEQ") has identified general management principles designed to promote that basic objective⁴⁰ by embracing several broad themes. First, successful biodiversity management depends on recognizing the hierarchy of biodiversity components and the importance of ecosystems as the basic unit of operation. Hence, the geographic scale of biodiversity conservation policy must be

36. In close accord with the Council on Environmental Quality's identification of factors, the Environmental Protection Agency focuses on six major headings: (1) direct population reduction (intentional and incidental taking); (2) physical alteration; (3) chemical pollution and solid waste; (4) global atmospheric change; (5) alien species; and (6) synergistic effects of the interactions of those factors. *Id.*

39. BIODIVERSITY CONSIDERATIONS, *supra* note 5, at 5; *see also* Grumbine, *supra* note 21, at 31 (including goals to "[m]aintain viable populations of all native species in situ" and to "[r]epresent . . . all native ecosystem types across their natural range of variation"). Biodiversity conservation finds a strong parallel in the concept of "sustainable use," the goal of which has been described as "the use of components of biological diversity in a way and at a rate that does not lead to the long-term decline of biological diversity, thereby maintaining its potential to meet the needs and aspirations of present and future generations." Convention on Biological Diversity, *supra* note 11, at 824; *see also* WHITE HOUSE INTERAGENCY ECOSYSTEM MGMT. TASK FORCE, ECOSYSTEM MANAGEMENT INITIATIVE OVERVIEW 1 (1994), *reprinted in* U.S. GEN. ACCT. OFF., PUB. NO. GAO/RCED-94-111, ECOSYSTEM MANAGEMENT: ADDITIONAL ACTIONS NEEDED TO ADEQUATELY TEST A PROMISING APPROACH 70 (1994) [hereinafter INITIATIVE OVERVIEW] ("The goal of ecosystem management is to restore and maintain the health, sustainability, and biological diversity of ecosystems while supporting sustainable societies and economies."). *See generally* James P. Karp, *Sustainable Development: Toward a New Vision*, 13 VA. ENVTL. L.J. 239 (1994); Mark Mininberg et al., *Promoting Economic Growth and Environmental Protection: The Institute for Sustainable Development*, 9 CONN. J. INT'L L. 69 (1993); Edith B. Weiss, *Environmentally Sustainable Competitiveness: A Comment*, 102 YALE L.J. 2123 (1993).

40. CEQ's eleven principles of ecosystem management are: (1) take a "big picture" or ecosystem view; (2) protect communities and ecosystems; (3) minimize fragmentation and promote the natural pattern and connectivity of habitats; (4) promote native species and avoid introducing non-native species; (5) protect rare and ecologically important species; (6) protect unique or sensitive environments; (7) maintain or mimic natural ecosystem processes; (8) maintain or mimic naturally occurring structural diversity; (9) protect genetic diversity; (10) restore ecosystems, communities and species; (11) monitor for biodiversity impacts, acknowledge uncertainty, and be flexible. BIODIVERSITY CONSIDERATIONS, *supra* note 5, at 6-8.

commensurate with the scale of the systems that sustain biological diversity. Second, CEQ's principles adopt a three-tiered preference of management approaches that is already familiar in federal land use regulation—avoid, minimize, and mitigate. That is, the preference is to avoid disruption to the biodiversity components where practicable; however, where human activity requires intrusion into an ecosystem, sound management policy is to minimize impacts to the extent practicable and to mitigate for those impacts which are not practicably avoided. Third, CEQ's principles encompass a prioritization system to direct resources and attention to the biodiversity components most in need of protection and preservation. Many species and ecosystems are not threatened or do not require human assistance to thrive, and the reality of limited financial resources requires that biodiversity conservation policy identify the components that are the most threatened or require the most attention and to direct resources first to them. Finally, CEQ recognizes that information gaps and the inherent complexity and uncertainty of biological systems requires a continual research and monitoring program and an acknowledgement that uncertainty remains more the norm than the exception at this time. To the extent that biodiversity conservation policy portrays itself as based on certainty and depends on inflexible regulatory programs for its implementation, it may do more harm than good in the long run.

3. Initiatives for Biodiversity Studies

The CEQ's biodiversity management principles provide a good start for defining the body of knowledge necessary for shaping an effective federal biodiversity conservation policy. A major component of any policy, therefore, will be authorizing and defining a program for what E.O. Wilson calls "biodiversity studies," which is "[t]he systematic examination of the full array of different kinds of organisms, together with a consideration of the technology by which the diversity can be maintained and used for the benefit of humanity."⁴¹ There is a broad consensus that "[e]cosystem management requires more

41. WILSON, *supra* note 13, at 393.

research and data collection . . . as well as better management and use of existing data."⁴²

Fortunately, several states have initiated successful "biodiversity inventory" research programs to better understand the locations and conditions of their biological resources.⁴³ Following that lead, in September 1993, Secretary of Interior Bruce Babbitt established the National Biological Survey, now known as the National Biological Service ("NBS"), as a new bureau within the Department of Interior.⁴⁴ Modeled after the U.S. Geological Survey, NBS's mission is to serve as the non-regulatory, non-managerial, non-advocacy biological research arm of the Department of Interior and to gather, analyze, and disseminate "the biological information necessary to support the sound management of the Nation's natural resources."⁴⁵ The

42. Grumbine, *supra* note 21, at 31. The methods most often mentioned as critical to the data collection process include "gap analysis," which entails focused research to fill the holes in scientific knowledge regarding ecosystem dynamics, and the Geographic Information System ("GIS") method, which involves plotting all known ecosystem physical and biological characteristics on one "map" so as to better understand their interrelations. See FEDERAL AGENCY ACTIVITIES, *supra* note 14 (summarizing the ecosystem research programs referencing gap analysis, or GIS methods, or both, of each of 18 federal agencies).

43. All 50 states participate in the Natural Heritage Program, which was started by the Nature Conservancy and serves to identify and catalogue species and natural communities within each state. See LINKING ECOSYSTEMS, *supra* note 10, at 182 n.7; William Stolzenburg, *The Heritage Network: Detectives of Diversity*, NATURE CONSERVANCY, Jan.-Feb. 1992, at 23. Many states, however, are initiating more intensive study programs to assess the state of biodiversity within their boundaries. For example, the State of Missouri initiated a Biodiversity Task Force, representing the Missouri Department of Conservation, the United States Forest Service, and three research universities, to inventory the status of biological resources in the state. The report of the task force provides extensive information about the locations and conditions of important biological resources in the state. See BIODIVERSITY TASK FORCE, MISSOURI DEPT OF CONSERVATION, THE BIODIVERSITY OF MISSOURI: DEFINITION, STATUS, AND RECOMMENDATIONS FOR ITS CONSERVATION (1992). The Missouri effort has led to the initiation of a state-wide program, known as Coordinated Resource Management, through which seven state and federal agencies will work with public and private landowners to guide biodiversity conservation. See *Partners in CRM*, COORDINATED RESOURCE MANAGEMENT (Missouri Dep't of Conservation, Jefferson City, Mo.), Jan. 1995, at 1, 3 (1995). For an overview of other state biodiversity inventory efforts, see BIODIVERSITY CONSIDERATIONS, *supra* note 5, at 11-13.

44. NATIONAL BIOLOGICAL SURVEY, U.S. DEPT OF INTERIOR, PUB. NO. 940420, FACT SHEET 1 (1994) [hereinafter FACT SHEET].

45. *Id.* For example, NBS recently released a study demonstrating the amount and rate of habitat losses in the United States. NATIONAL BIOLOGICAL SERV., U.S. DEPT OF INTERIOR, BIOLOGICAL REPORT NO. 28, ENDANGERED ECOSYSTEMS OF THE UNITED STATES: A PRELIMINARY ASSESSMENT OF LOSS AND DEGRADATION (1995).

baseline scientific data NBS supplies will be used within the federal government and shared with the states to improve decisions regarding biodiversity conservation.⁴⁶ The NBS effort will help substantially to improve the data gap and incomparability problems GAO identified as impediments to formulating biodiversity conservation policy.

Other efforts underway at the federal level are directed towards the more problematic issue GAO identified—the inadequacy of information on how ecosystems function and how human activities affect those functions—which may be addressed in a series of pilot studies initiated by the Clinton Administration's recently formed Interagency Ecosystem Management Task Force ("Task Force"). The Task Force is charged with developing "a proactive approach to ensuring a sustainable economy and a sustainable environment through ecosystem management."⁴⁷ The Task Force has proposed identifying several pilot study ecosystems, based on a variety of criteria relevant to biodiversity conservation policy implementa-

46. For example, in March 1994, NBS and the State of California entered into an agreement under which NBS will support the California Environmental Resources Evaluation System (CERES), a statewide effort directed at collecting, integrating, and distributing biological data pertinent to resource management and conservation decisions. National Biological Survey, U.S. Dep't of Interior, News Release: National Biological Survey and State Launch Initiatives to Gather Data for Multi-Species Planning 1, 1 (Mar. 4, 1994) (unpublished document, on file with author). NBS has entered into agreements with many other state biological survey agencies and private organizations, such as The Nature Conservancy, to provide research grants and to develop national standards for biological data reporting. *Joint Hearing on Fiscal Year 1995 Budget Requests for the National Marine Fisheries Service, the U.S. Fish and Wildlife Service, and the National Biological Survey*, 103d Cong., 2d Sess. (1994) (statement of F. Eugene Hester, Deputy Director, National Biological Survey) (transcript on file with author). The agency has requested funding to continue research of the South Florida Everglades ecosystem, the Pacific Northwest salmon ecosystem, and similar ecosystem-wide research efforts. *Id.* at 6-7. NBS now has a budget of over \$170 million, over 1800 employees, 4 regional offices, 13 research centers and 100 field stations. FACT SHEET, *supra* note 44. For further descriptions of NBS's program, see FEDERAL AGENCY ACTIVITIES, *supra* note 14, at 85 (presenting NBS's summary of its ecosystem research initiatives).

47. See INITIATIVE OVERVIEW, *supra* note 39, at 1. The Task Force was formed on the recommendation of Vice President Gore's National Performance Review. *Id.* It is chaired by the director of the White House Office on Environmental Policy and consists of one assistant secretary from each of 12 federal departments and agencies, as well as one representative each from the Office of Management and Budget and the Office of Science and Technology. *Id.*

tion, and using them to test policy initiatives and generate data and experience to transport more widely to other ecosystems.⁴⁸

The federal government's biodiversity studies efforts, however, are not without their critics. Perhaps acting on the maxim that information is power, groups such as the Cato Institute have posited that all efforts to formulate policy around the concept of an ecosystem management approach will ultimately crumble because of the inherent difficulties in mapping the boundaries of any ecosystem.⁴⁹ That familiar mantra has been used in other contexts in an attempt to defer federal action by requiring that any policy choice be based on a level of knowledge approaching omniscience rather than allowing decisions based on sound judgment in the face of some scientific uncertainty.⁵⁰ The net result of the former approach

48. The Task Force's ecosystem selection criteria are: (1) ongoing interagency and intergovernmental management activities; (2) a mix of resource management and infrastructure agency involvement; (3) a mix of geographic scales and efforts in various stages of development; (4) availability and accessibility of data on the ecosystem; (5) environmental importance of the area; (6) a variety of environmental, economic, and social issues; (7) public and private support of, and interest in, the ecosystem; (8) agency support for the selection; and (9) geographic distribution. *Id.* at 2. The Task Force intends to identify ecosystems of two varieties: those in which a mature interagency ecosystem management strategy exists, but is in need of support, and those in which no such strategy exists and where introduction of a new approach holds promise. *Id.* The Task Force currently has identified four pilot study ecosystems and their study issues: restoring old-growth forests of the Pacific Northwest; restoring natural resources damages caused by the Exxon Valdez oil spill in Alaska's Prince William Sound; restoring the ecological health of the South Florida ecosystem, including the Everglades; and restoring the health of the Anacostia River in Maryland and the District of Columbia. ECOSYSTEM MANAGEMENT, *supra* note 10, at 36. The Task Force expects its initial report summarizing its findings from the four case studies to be published in 1995. Telephone Interviews with Michael Sweeny, Assistant to the Assistant Secretary for Policy, Management and Budget, United States Department of the Interior (Nov. 2, 1994 and Feb. 13, 1995). The approach of the Task Force has been embraced by at least one legislative proposal in Congress, in the form of the Ecosystem Management Act of 1995, which would establish an Ecosystem Management Study Commission to examine several case studies of ongoing federal land ecosystem management approaches in order to better understand what ecosystem management policy goals and approaches should be for federally managed lands. S. 93, 104th Cong., 1st Sess. (1995). Another Task Force ecosystem study effort can be found in the 1994 amendments to the Marine Mammal Protection Act creating two ecosystem workshops to study the Gulf of Maine and the Bering Sea. See Marine Mammal Protection Act Amendments of 1994, Pub. L. No. 103-238, § 110(c), 108 Stat. 532, 560-61.

49. Fitzsimmons, *supra* note 15, at 9-16; see also John H. Cushman, Jr., *Timber! A New Idea Is Crashing*, N.Y. TIMES, Jan. 22, 1995, § 4, at 5.

50. For example, although we seldom know with absolute certainty whether a chemical agent causes cancer in humans, we have long ago abandoned the notion

is policy paralysis, as we will never achieve the knowledge necessary to delineate precisely the biological bounds of any ecosystem. Indeed, there probably is no such thing as a discrete ecosystem.⁵¹ The notion of "ecosystem" is purely an invention of humans to help simplify for our comprehension the utterly complex dynamics of the biological world.⁵² Yet, we draw artificial geographic lines to delineate complex systems all the time as a policy tool. Consider, for example, our notions of such political units as states, metropolitan areas, and enterprise zones—who can say with absolute socioeconomic certainty where those begin and end, except purely as political creatures conceived to allow policy to be formed and implemented? Yet, we know that differences exist between cities and between states, that New York has a different "feel" than Los Angeles, and that people from Maine are "different" than people from Florida. Similarly, we can conclude with some reasonable degree of certainty that Death Valley is not the Rocky Mountains, the California coast is not the Mississippi River, and the Everglades are not the Great Lakes. They are different "ecosystems." They are interrelated at some level, just as the economies and cultures of New York and Los Angeles are, but the species within these different ecosystems unquestionably are of a different mix, and the systems will often respond differently to the same stimuli. The more we know about the dynamics taking place within different ecosystems and affecting them from without, the better we will be able to understand

that we must possess that level of scientific knowledge before regulating chemical substances. See, e.g., *AFL-CIO v. American Petroleum Inst.*, 448 U.S. 607 (1980). In establishing worker chemical exposure safety regulations, the federal government "is not required to support its findings that a significant risk exists with anything approaching scientific certainty." *Id.* at 656.

51. Ecosystems unquestionably "tend to overlap; or, more accurately, the edges between them are blurred; more accurately still, there aren't any well-defined edges." COHEN & STEWART, *supra* note 17, at 383.

52. To advance our understanding of biological systems beyond mysticism, it has become necessary for us "to evolve quick-and-dirty feature-recognition systems in order for us to survive in a hostile world." *Id.* at 433. Those "mental models of nature are not so much faithful reflections of reality as cut-down models that focus on certain essential features" of the biological world. Basing policy decisions on those imprecise mental models, like "ecosystems," however, is not only necessary as the only choice we have, but also reflective of the fact that "[o]ur brains do not just invent patterns at will." *Id.* at 435. Rather, "[t]he patterns that our brains perceive are accurate representations of large chunks of reality, because our brains and sense organs evolved that way." *Id.* In other words, we know an ecosystem when we see one.

how humans affect them and how to manage those effects. To consciously decide not to study those boundaries and effects simply because we will never know *everything* there is to know about them is to remain *Homo ignoramus*.

Hence, as it should, the federal government has taken a significant step through efforts like NBS and the Task Force towards leading the scientific inquiries necessary for making sound biodiversity conservation policy decisions. That function, perhaps, is the most important biodiversity conservation role for the federal presence to fill because of the umbrella the federal government can provide in terms of compatible standards of research and analysis and centralized data collection. Of equal importance, however, is how that information is used and the legal framework for translating scientific data into policy implementation.

B. *Threads of Biodiversity in the Federal Environmental Regulation Web*

No single federal law can reasonably be portrayed as encompassing all the goals of biodiversity conservation and the authorities needed to carry them out. Rather, even before scientific knowledge had broadly demonstrated the importance of biodiversity conservation, a myriad of federal laws regulating state, local, and private land development had slowly emerged to form a "web" of substantive constraints and procedural requirements. To be sure, some of those laws ostensibly include notions of ecological protection within their policy justifications; however, only by patching the laws together could any comprehensive biodiversity conservation policy begin to emerge. That web of regulations, therefore, has served as a convenient, albeit cumbersome, vehicle for the federal government initially to address biodiversity concerns on nonfederal lands.⁵³ This

53. Existing somewhere outside the ambit of federal statutory environmental laws, but closely related to it, is the judicially-devised "public trust doctrine," which posits that the states, and possibly the federal government, hold the air, water, and publicly owned land resources as trustees for the public benefit, and therefore may not redistribute those public "goods" from the public use domain to the private interest domain in ways which violate that trust. See ZYGMUNT J.B. PLATER ET AL., ENVIRONMENTAL LAW AND POLICY: A COURSEBOOK ON NATURE, LAW, AND SOCIETY 365-412 (1992); Joseph L. Sax, *The Public Trust Doctrine in Natural Resource Law: Effective Judicial Intervention*, 68 MICH. L. REV. 471 (1970). Some proposals regarding biodiversity conservation policy suggest that the public trust doctrine would provide a source of authority for imposing biodiversity

section reviews the four major components of that existing structure as it relates to state, local, and private lands—the Endangered Species Act, the Clean Water Act section 404, the National Environmental Policy Act, and the Coastal Zone Management Act.⁵⁴

1. The Endangered Species Act

The Endangered Species Act of 1973 (“ESA”)⁵⁵ is without question the center point of the federal biodiversity regulation web. As the nation’s principal wildlife protection law since its enactment in 1973, the ESA has become a focal point of federal biodiversity conservation policy. In that respect, it has been maligned by biodiversity conservation proponents and opponents alike, either as not doing enough or as running ramshackle over private property rights. The truth is that the ESA is probably faring about as best as can be expected given its broad goals and limited powers.⁵⁶

values in the management of public trust resources, including state and local lands. *See, e.g.*, JACK A. ARCHER ET AL., *THE PUBLIC TRUST DOCTRINE AND THE MANAGEMENT OF AMERICA’S COASTS* 124-32 (1994). Even in that context, however, the public trust doctrine would not provide a source of authority with respect to private lands, and, because of its judicially-devised origins and state level of application, would not provide a unifying national theme for the role of biodiversity values on all nonfederal lands. The focus of this article thus remains on federal statutory environmental law authorities.

54. It is not the purpose of this article to provide a comprehensive overview of all features of all the federal laws that relate in some way to biodiversity conservation. Over 35 federal laws contain authorities that are either expressly directed at biodiversity conservation or could be implemented with that goal in mind. *See* NATIONAL REPORT, *supra* note 10, at 300; *see also* TECHNOLOGIES, *supra* note 4, at 223. Many of those laws, however, apply exclusively on federal lands, which is not the subject of this article. Moreover, many of the laws that apply to nonfederal lands, such as the principal federal pollution control laws, have a primary purpose far more narrow than biodiversity conservation, and could be said to contribute to that goal only tangentially. *But see infra* part III.A.1 (discussing proposals to link administration of all such laws together under the unifying theme of biodiversity conservation). By contrast, the four laws discussed herein are the only federal laws that apply to nonfederal lands and have as their principal objectives some or all of the core features of biodiversity conservation management principles. The four laws are analyzed primarily with their biodiversity conservation features and impacts in mind; references are supplied to alert the reader to sources which can supply more detailed analysis of the basic statutory framework and issues for each of the laws.

55. Pub. L. No. 93-205, 87 Stat. 884 (codified as amended at 16 U.S.C. §§ 1531-1544 (1988 & Supp. V 1993)).

56. For a comprehensive overview of the ESA’s history, implementation, and impacts, see MICHAEL J. BEAN, *THE EVOLUTION OF NATIONAL WILDLIFE LAW*

*a. Basic Goals and Structure Pertaining to
Biodiversity*

The ESA expressly acknowledges that "species of fish, wildlife, and plants are of aesthetic, ecological, educational, historical, and scientific value to the Nation and its people"⁵⁷ and pledges "to provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved."⁵⁸ It is curious, therefore, that Congress paid so little attention to the ecosystem side of the equation in the basic structure of the law.

Section 4 of the ESA authorizes the Secretaries of Commerce and the Interior to designate species which are endangered or threatened with extinction and to define their critical habitat areas.⁵⁹ Those functions have been assigned to the United States Fish and Wildlife Service ("FWS") of the Department of Interior and to the National Marine Fisheries Service ("NMFS") of the Department of Commerce. Once so designated, or "listed," species are protected in several ways. Under section 4 of the Act, FWS or NMFS usually must prepare and implement a plan for the conservation and survival of the species, known as a recovery plan.⁶⁰ To ensure that FWS and NMFS do not act alone in that respect, section 9 of the act prohibits all persons from committing or attempting to commit a "take" of listed species in specified circumstances.⁶¹

(1983); see also RICHARD LITTELL, *ENDANGERED AND OTHER PROTECTED SPECIES: FEDERAL LAW AND REGULATION* (1992); DANIEL J. ROHLF, *THE ENDANGERED SPECIES ACT: A GUIDE TO ITS PROTECTIONS AND IMPLEMENTATION* (1989); Oliver A. Houck, *The Endangered Species Act and Its Implementation by the U.S. Departments of Interior and Commerce*, 64 U. COLO. L. REV. 277 (1993); James C. Kilbourne, *The Endangered Species Act Under the Microscope: A Closeup Look From a Litigator's Perspective*, 21 ENVTL. L. 499 (1991); Andrew A. Smith, et al., *The Endangered Species Act at Twenty: An Analytical Survey of Federal Endangered Species Protection*, 33 NAT. RESOURCES J. 1027 (1993).

57. ESA § 2(a)(3), 16 U.S.C. § 1531(a)(3). For an overview of the definitions and procedures used for listing species and designating their critical habitat, see J.B. Ruhl, *Section 4 of the ESA—The Cornerstone of Species Protection Law*, NAT. RESOURCES & ENV'T, Summer 1993, at 26; see also Houck, *supra* note 56, at 280-315; James Salzman, *Evolution and Application of Critical Habitat Under the Endangered Species Act*, 14 HARV. ENVTL. L. REV. 311 (1992).

58. ESA § 2(b), 16 U.S.C. § 1531(b).

59. ESA § 4(a)-(c), 16 U.S.C. § 1533(a)-(c).

60. ESA § 4(f), 16 U.S.C. § 1533(f). For a comprehensive overview of the recovery planning function, see Houck, *supra* note 56, at 344-51.

61. ESA § 9(a), 16 U.S.C. § 1538(a).

In the case of species of fish and wildlife listed as endangered, the take prohibition is automatic and absolute—the prohibition applies by statute to all persons and places subject to United States jurisdiction.⁶² Section 7 of the ESA imposes additional duties on federal agencies to consult with FWS and NMFS to ensure that their programs promote conservation—defined to include species recovery—of all listed species⁶³ and that actions which the agencies carry out, fund, or authorize do not jeopardize the continued existence of listed species or destroy or adversely modify their critical habitat.⁶⁴

The ESA establishes two procedures whereby a prohibited take of a listed species may nonetheless be authorized if the take will be incidental to an otherwise lawful activity. Section 7 allows federal agencies to obtain an incidental take statement from the FWS or NMFS in connection with the consultation on jeopardy and critical habitat.⁶⁵ As many state, local, and private actions involve no federal funding, authorization, or other involvement, section 10(a) of the act extends the incidental take authorization procedure to those actions when based on an approved habitat conservation plan.⁶⁶ These procedures allow FWS and NMFS to impose habitat conservation measures designed to protect the ecosystem in which the species exists.⁶⁷

62. ESA § 9(a)(1); 16 U.S.C. § 1538(a)(1). For a comprehensive overview of the scope and impact of the § 9 take prohibition, see Frederico Cheever, *An Introduction to the Prohibition Against Takings in Section 9 of the Endangered Species Act of 1973: Learning to Live with a Powerful Species Preservation Law*, 62 U. COLO. L. REV. 109 (1991); Albert Gidari, *The Endangered Species Act: Impact of Section 9 on Private Landowners*, 24 ENVTL. L. 419 (1994); Steven P. Quarles et al., *The Unsettled Law of ESA Takings*, NAT. RESOURCES & ENV'T, Summer 1993, at 10. Much of the law of § 9, however, is in question at this writing pending the Supreme Court's decision in *Sweet Home Chapter of Communities for a Great Oregon v. Babbitt*, 17 F.3d 1463 (D.C. Cir. 1994), cert. granted, 115 S. Ct. 714 (1995), in which the scope of the take prohibition is in issue. See *infra* text accompanying notes 80-83.

63. 16 U.S.C. § 1536(a)(1). For further discussion of the duty of federal agencies to conserve listed species, see Kilbourne, *supra* note 56, at 564-72.

64. 16 U.S.C. § 1536(a)(2). For a comprehensive overview of the duty of federal agencies to consult regarding impacts on listed species and critical habitat, see Houck, *supra* note 56, at 315-29.

65. 16 U.S.C. § 1536(b)(4).

66. *Id.* § 1539(a)(1)(B).

67. An incidental take statement prepared in connection with an interagency consultation under § 7(a)(2) of the ESA between FWS or NMFS and a federal action agency may prescribe mandatory "reasonable and prudent measures that the Secretary considers necessary or appropriate to minimize such impact [of taking] . . . [and] the terms and conditions . . . that must be complied with by the

FWS and NMFS can implement more direct habitat conservation measures through their authority under section 5 of the ESA to "establish and implement a program to conserve fish, wildlife, and plants, including those which are listed as endangered species or threatened species," principally by acquiring land and waters containing the species' habitat.⁶⁸ Also, states may seek to enter into cooperative agreements with FWS and NMFS under section 6 of the ESA, through which states may receive federal funding for, among other things, "acquisition of land or aquatic habitat . . . for the conservation of resident endangered or threatened species of fish or wildlife."⁶⁹

b. Biodiversity Strengths and Shortcomings

The ESA on its face contains the seeds for some potentially strong biodiversity conservation initiatives. The critical habitat designation procedure could promote identification and protection of important habitat areas, albeit tied to listed species. Similarly, a section 4 recovery plan designed to bring a listed species back to health by preserving its habitat would promote the viability of other species residing in the habitat area as well. Also, the habitat conservation measures derived from section 7 consultations with federal agencies and section 10(a) permitting of nonfederal actions could produce meaningful preserve areas in which biodiversity is promoted as an ancillary benefit. Most importantly, the direct habitat acquisition

Federal agency or applicant (if any), or both, to implement the [reasonable and prudent] measures." 16 U.S.C. § 1536(b)(4)(C)(ii), (iv). An incidental take permit issued under § 10(a) of the ESA to a project not subject to the § 7 consultation requirement can include as part of the required habitat conservation plan measures "to minimize and mitigate such impacts [of the taking] . . . [and] such other measures that the Secretary may require as being necessary or appropriate for purposes of the plan." *Id.* § 1539(a)(2)(A)(ii), (iv). FWS has often required the applicant in both contexts to establish or contribute to the establishment of habitat preserve areas as a mitigation measure. *See, e.g.,* Letter from Thomas A. Grahl, Acting Field Supervisor, U.S. Fish & Wildlife Serv., to Wayne A. Lea, Chief of the Permits Section, Dep't of the Army (Jan. 7, 1992) (on file with author) (requiring development project applicant to deed restrict over 200 acres as a reasonable and prudent measure for the elimination of about 23 acres of endangered species habitat); Proposed Lake Point Development Notice, 58 Fed. Reg. 45,353 (1993) (announcing proposed approval of a habitat conservation plan involving deed restriction of 142 acres in mitigation of the elimination of 80 acres of occupied or potentially occupiable endangered species territory).

68. 16 U.S.C. § 1534(a).

69. 16 U.S.C. § 1535(c)(1)(D).

authorities in sections 5 and 6 of the act provide the federal and state governments with a powerful habitat preservation tool, albeit limited by budgetary constraints. In the case of the federal authority under section 5, moreover, that tool is not limited to listed species' habitat.⁷⁰ Overall, then, the ESA could serve as an important base for biodiversity conservation policy.

Indeed, the sheer power of the ESA to influence nonfederal land use decisions cannot be underestimated. The section 9 take prohibition and federal agencies' section 7 consultation duties have been construed broadly and applied on many occasions to alter the plans of state, local, and private interests.⁷¹ Even where the act is used principally with respect

70. Section 5 extends to "fish, wildlife, and plants, *including* those which are listed as endangered species or threatened species . . ." 16 U.S.C. § 1534(a) (emphasis added).

71. Some commentators have pointed to the relatively low rate of jeopardy opinions—issued when the FWS or NMFS determines that the proposed action would put an endangered or threatened species at risk of extinction, 16 U.S.C. § 1536(b)—as evidence that the ESA does not significantly impede development. See Michael J. Bean, *Taking Stock: The Endangered Species Act in the Eye of a Growing Storm*, 13 PUB. LAND L. REV. 77, 80-81 (1992); Houck, *supra* note 56, at 318-19. One study demonstrated that only about 0.02% of the over 70,000 § 7(a)(2) consultations conducted in the study period from 1988 through 1993 resulted in a jeopardy opinion. *Id.* at 318. However, one must bear in mind that a jeopardy opinion may only be issued when an *entire species* would be eradicated as a result of the proposed action, and thus is not a finding that should be expected to be made routinely. Also, over 95% of the total number of consultations cited in the study period were so-called "informal" consultations in which the FWS or NMFS confirmed either that no endangered species were present in the project area or the project posed no possible threat to any such species. The relevant denominator for determining the prevalence of jeopardy opinions is the number of formal consultations initiated upon a finding that the project may adversely affect an endangered or threatened species, which was 2,000 in the study period. The percentage of jeopardy opinions under that analysis is close to 6.5%. Moreover, even those statistics would not account for the projects which, because of the expense, time, and difficulties posed by ESA compliance requirements, either were abandoned before a § 7 consultation or § 10(a) permit application was initiated, were abandoned during consultation or permit processing because of the delay associated with agency review, or were substantially altered in design because of the reasonable and prudent measures or habitat conservation plan conditions the FWS imposed. For example, in the Austin, Texas area, where dozens of formal consultations and habitat conservation plans have been initiated in the past five years given the presence of nine endangered animal species in the metropolitan area, projects that the FWS has approved under § 7(a)(2) or § 10(a) have on average faced over \$9,000 in additional costs per acre of development as a result of ESA compliance. George W. Gau & James E. Jarrett, *Economic Impact Study: Balcones Canyonlands Conservation Plan* (June 5, 1992) (unpublished preliminary draft, on file with author). Many projects proposed for location in the Austin

only to federal lands, as in the case of national forest lands housing endangered species, the economic implications of the restrictions imposed can be felt immensely by nonfederal interests.⁷² The ESA has been the subject of intense criticism by self-anointed defenders of private property rights,⁷³ and on many recent occasions state and local jurisdictions have sought relief from the economic impacts of ESA policies through litigation.⁷⁴ In Congress, the ESA for the first time in decades is the subject of a substantial movement to reform its authorities; indeed, there appears to be no one left in Congress willing to step forward in defense of the present statutory scheme.⁷⁵

metropolitan area over the past five years were either abandoned or, more commonly, modified dramatically once the potential impact and cost of ESA compliance were fully explored by the project developer. Telephone Interview with Joe Beal, Secretary, Real Estate Council of Austin, Tex. (Nov. 17, 1994); see also Kim Tyson, *Developer's Purchases Stalled: Investment Slowed by Uncertainties About Endangered Species*, AUSTIN AM.-STATESMAN, Sept. 21, 1991, at E1.

72. For example, although the listing of the northern spotted owl as an endangered species affected mainly federal lands, the impacts of restricted private logging practices on those lands caused a private sector furor. See Elizabeth A. Foley, *The Tarnishing of an Environmental Jewel: The Endangered Species Act and the Northern Spotted Owl*, 8 J. LAND USE & ENVTL. L. 253 (1992); Gidari, *supra* note 62, at 427-43.

73. For a discussion of the so-called "wise use" movement, see *infra* notes 263-66 and accompanying text.

74. See *Williamson County Comm'rs Court v. Babbitt*, No. A-94-CA-219-SS (W.D. Tex. Dec. 7, 1994), *appeal filed*, No. 95-50034 (5th Cir. Dec. 30, 1994) (on file with author) (challenging listing status of three cave invertebrate species); Memorandum in Support for a Motion for Partial Summary Judgment and Summary Judgment, *Texas v. Babbitt*, No. W-94-CA-271 (W.D. Tex. Nov. 22, 1994) (on file with author) (challenging FWS's ESA program generally as implemented in Texas); Board of County Comm'rs v. United States Fish & Wildlife Serv., No. 93-730-HB (D.N.M. Oct. 13, 1994) (memorandum opinion) (on file with author) (challenging critical habitat designation); Complaint for Declaratory and Injunctive Relief, *Coalition of Ariz./N.M. Counties v. United States Fish & Wildlife Serv.*, No. 94-1058-MV (D.N.M. Sept. 19, 1994) (on file with author) (challenging listing status of Mexican spotted owl); *Douglas County v. Lujan*, 810 F. Supp. 1470 (D. Or. 1992) (challenging critical habitat designation), *aff'd in part, rev'd in part sub nom. Douglas County v. Babbitt*, 48 F.3d 1495 (9th Cir. 1995).

75. Thus far in the 104th Congress, the ESA has suffered a nearly daily barrage of criticism. See, e.g., 141 CONG. REC. S1289, S1290 (daily ed. Jan 20, 1995) (statement of Sen. Craig) (calling for immediate action on the ESA to "make sure that these kinds of silly bureaucratic activities can no longer go on"); 141 CONG. REC. E134 (daily ed. Jan. 19, 1995) (statement of Rep. Bonilla) (proposing species listing moratorium to bring "sanity and common sense to the ESA process"); 141 CONG. REC. S825 (daily ed. Jan. 12, 1995) (statement of Sen. Packwood) (calling for reform of the ESA "to reflect the needs of people as well as bugs and plants"); 141 CONG. REC. S790 (daily ed. Jan. 11, 1995) (statement of Sen. Hutchison) (introducing species listing moratorium bill as a measure necessary to

One would think from that raucousness that the ESA is being used potently to carry out federal biodiversity conservation policies on nonfederal lands.

It is ironic, then, to find strong criticism of the ESA coming also from interests identified with "environmentalism," complaining that the law does not go far enough to promote biodiversity.⁷⁶ The principal criticism is that the ESA protects only species on the brink of extinction, and does so only on a species-specific basis. Biodiversity conservation, by contrast, epitomizes protection of healthy ecosystems and all the species within them whether endangered or not. The one ESA authority that could be used to address this deficiency—the section 5(a) authority to acquire habitat for *any* species—is woefully underfunded and shows no signs of changing in that respect.⁷⁷ Hence, the ESA is left to parlay biodiversity conser-

"make the real effect of the Endangered Species Act clear to the rulemakers in Washington"). In a review of the *Congressional Record* for the first two months of the 104th Congress's action, I found not a single utterance that could fairly be described as a defense of the current structure and implementation of the ESA, albeit no comprehensive reform bills had yet been introduced to focus the debate. Senator Gorton's introduction of an aggressive ESA reform bill on May 9, 1995, see S. 768, 104th Cong., 1st Sess. (1995), should test the resolve of ESA supporters in Congress. For a discussion of the leading competing reform measures in the 103rd Congress, see Nancy K. Kubasek et al., *The Endangered Species Act: Time for a New Approach?*, 24 ENVTL. L. 329 (1994); Nancy K. Kubasek & M. Neil Brown, *The Endangered Species Act: An Evaluation of Alternative Approaches*, 3 DICK. J. ENVTL. L. & POL'Y 1 (1994); Ike C. Sugg, *Caught in the Act: Evaluating the Endangered Species Act, Its Effects on Man and Prospects for Reform*, 24 CUMB. L. REV. 1 (1993-1994). As reauthorization of the ESA has grown increasingly contentious, many bills have gone so far as to propose a moratorium on new species listings until the reauthorization process is complete. See S. 191, 104th Cong., 1st Sess. (1995); H.R. 490, 104th Cong., 1st Sess. (1995); S. 2451, 103d Cong., 2d Sess. (1994); H.R. 5073, 103d Cong., 2d Sess. (1994). One such measure which has been enacted found its way as an amendment into a defense appropriations and rescission bill, imposing a listing moratorium through September 30, 1995. See H.R. 889, 104th Cong., 1st Sess. (1995) (enacted). Although such measures may be more symbolic than anything else, the fact that they have been proposed and now enacted evidences a new era for the ESA in Congress. Similar erosion of the consensus in favor of endangered species protection is also being witnessed in the states. See, e.g., Cal. A.B. 137, Reg. Sess. (1995) (proposing to amend the state endangered species law so as to require economic impact analyses prior to any listing and to require legislative enactment of all species listing decisions).

76. See, e.g., Doremus, *supra* note 2, at 304-17; Drodzdowski, *supra* note 13, at 567-85; Smith, *supra* note 56, at 1069-72.

77. From 1967 through 1993, the FWS spent \$238,457,238 to acquire 349,405 acres of land pursuant to § 5(a) of the ESA and its predecessors. U.S. Fish & Wildlife Serv., Department of Interior, Land and Water Conservation

vation out of a species-by-species triage approach. The narrow focus of the ESA on harm to and recovery of listed species limits the agencies' abilities to address broader objectives. Indeed, a myopic focus on saving a single species could lead to decisions adverse to biodiversity.⁷⁸

The regulatory authorities which FWS and NMFS can use even in the limited context of the ESA are themselves constrained by the structure of the Act as well as by administrative self-restraint in implementation. For example, the only significance of critical habitat designation is with respect to federal agency actions regulated under section 7. Nonfederal actions are not expressly restricted anywhere in the ESA from adversely modifying critical habitat, though FWS and NMFS have imposed policies duplicating the restriction in the section 10(a) permitting context.⁷⁹ Also, the take prohibition is often a clumsy tool for habitat protection. Of the components in the statutory definition of take, only the term "harm" does not

Fund: Land Purchase Obligations FY 1967 Through 1993, at 1, 1 (1994) (unpublished document, on file with author). Increased funding does not appear to be forthcoming. The agency's budget requests for § 5(a) habitat acquisition for fiscal years 1992-1994 were \$34.5 million, \$18.5 million, and \$7.7 million, respectively. See OFFICE OF MGMT. & BUDGET, BUDGET OF THE UNITED STATES GOVERNMENT: FISCAL YEAR 1994, at 715 (1993). The FWS's appropriations for implementing all of the agency's ESA programs has been just over \$40 million per year since 1988. See Smith, *supra* note 56, at 1043-45.

78. For example, in the summer of 1991, the FWS circulated a draft recovery plan for the endangered black-capped vireo, a songbird found in central Texas, which included a recommendation that "hundreds of millions, perhaps even several billion cowbirds" would have to be exterminated in order to promote recovery of the vireo. Joseph A. Grzybowski, U.S. Fish & Wildlife Serv., Black-capped Vireo Recovery Plan 56 (Alisa M. Shull ed., May 14, 1991) (unpublished draft, on file with author). The cowbird lays its eggs in vireo nests and the cowbird's young hatch sooner than do the vireo's, compete more successfully for food, and often suffocate the vireo hatchlings. *Id.* at 29-35. FWS abandoned the proposal after public outcry. Bill Collier, *Winds Shift for Cowbird: Plans for Massive Slaughter Rejected*, AUSTIN AM.-STATESMAN, Dec. 26, 1991, at B1. Although the cowbird elimination proposal may have benefitted the vireo, no attention was given to its possible implication on overall species diversity of the relevant ecosystem.

79. The FWS takes the position that its issuance of a § 10(a) permit is in itself a federal authorization action triggering the duty to consult under § 7(a)(2) of the ESA, thereby requiring the FWS to consult with itself. See Endangered and Threatened Wildlife and Plants; Prohibitions and Permits, 50 Fed. Reg. 39,681, 39,683-84 (1985) (to be codified at 50 C.F.R. §§ 13, 17). Hence, even though a nonfederal project has no duty to avoid critical habitat separate from the duty to avoid take, the applicant in a § 10(a) permit context effectively inherits all of the additional § 7 consultation requirements under the FWS's policy.

expressly convey the notion of direct application of physical force or effect.⁸⁰ FWS and NMFS have defined harm to include habitat modification that results in actual death or injury to a listed species individual.⁸¹ Courts have focused narrowly on the requirement of actual death or injury to deny many claims for injunctive relief based on alleged habitat modification,⁸² and at least one court has determined, in litigation that is before the United States Supreme Court at the time of this writing, that the notion that habitat modification alone can constitute take is beyond the scope of congressional intent.⁸³

Even if the take prohibition extends to habitat modification, other constraints exist on the scope of ESA programs and their usefulness in unifying federal biodiversity policy. For example, the procedure found in many federal environmental laws for delegation to the states of statutory permitting and enforcement authority potentially limits the reach of the federal agencies' section 7 duty to consult regarding the impacts of their actions on protected species, as states acting under such delegation authority arguably are not required to consult with FWS or NMFS as their federal counterparts would when taking the same action.⁸⁴ For a variety of reasons, moreover, the section

80. Take is defined as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." 16 U.S.C. § 1532(19) (1988).

81. 50 C.F.R. § 17.3 (1992).

82. Several cases have held that the requirement in the harm definition that the action cause "actual death or injury" must be established through evidence which is neither speculative nor based on tenuous causation theories. *See, e.g., National Wildlife Fed'n v. Burlington N.R.R.*, 23 F.3d 1508 (9th Cir. 1994); *American Bald Eagle v. Bhatti*, 9 F.3d 163 (1st Cir. 1993); *Morrill v. Lujan*, 802 F. Supp. 424 (S.D. Ala. 1992); *Swan View Coalition, Inc. v. Turner*, 824 F. Supp. 923 (D. Mont. 1992).

83. *Sweet Home Chapter of Communities for a Great Or. v. Babbitt*, 17 F.3d 1463 (D.C. Cir. 1994), *cert. granted*, 115 S. Ct. 714 (1995). For a description of the administrative and judicial developments leading up to and culminating in the *Sweet Home* case, see Steven G. Davison, *Alteration of Wildlife Habitat as a Prohibited Taking Under the Endangered Species Act*, 10 J. LAND USE & ENVTL. L. 155 (1995); *Gidari, supra* note 62.

84. *See* Draft Agreement Among the Environmental Protection Agency, Fish and Wildlife Service, and National Marine Fisheries Service Regarding Enhanced Protection and Recovery of Threatened and Endangered Species Under Section 303(c), 304(a), and 402 of the Clean Water Act (Oct. 20, 1993) (unpublished document, on file with author); *see also* John W. Steiger, *The Consultation Provision of Section 7(a)(2) of the Endangered Species Act and Its Application to Delegable Federal Programs*, 21 *ECOLOGY L.Q.* 243 (1994).

7 jeopardy finding is rarely invoked,⁸⁵ and there is absolutely no clear meaning or scope given to the duty of federal agencies under section 7(a)(1) of the ESA to promote conservation of listed species.⁸⁶ Finally, like the habitat acquisition program under section 5, recovery plans are dramatically underfunded, leaving them truly as plans only.⁸⁷

Hence, as presently structured, implemented, and funded, the ESA simply does not get where biodiversity conservation policy says we should be headed, and has failed to get even as far as it has in a manner acceptable to the broad spectrum of interests. Those criticizing the ESA as too potent are responding to the blunt axe of regulation that often falls on a localized basis when a species is listed. In the case of fish and wildlife species listed as endangered, aggressive FWS and NMFS

85. See *supra* note 71.

86. Few cases have commented meaningfully on the scope of the conservation duty, none with respect to the extent to which § 7(a)(1) imposes *affirmative* duties. See *Pyramid Lake Paiute Tribe of Indians v. United States Dep't of Navy*, 898 F.2d 1410, 1416-19 (9th Cir. 1990) (agency properly exercised its discretion under § 7(a)(1) in leasing land with water rights); *Carson-Truckee Water Conservancy Dist. v. Clark*, 741 F. 2d 257 (9th Cir. 1984), *cert. denied*, 470 U.S. 1083 (1985) (agency could justify decision not to sell reservoir water to private consumer based on impacts to endangered fish); *National Wildlife Fed'n v. Hodel*, 23 Env't. Rep. Cas. (BNA) 1089 (E.D. Cal. 1985) (agency could not allow bird hunters to continue using lead shot because of impact on bald eagle); *Connor v. Andrus*, 453 F. Supp. 1037 (W.D. Tex. 1978) (agency could not restrict hunting under § 7(a)(1) where no evidence of harm to listed species was present); *Defenders of Wildlife v. Andrus*, 428 F. Supp. 167 (D.D.C. 1977) (agency could not allow sport hunting of migratory game birds at times when endangered species might accidentally also be killed). FWS and NMFS recently entered into an agreement with several other federal agencies in which each agency confirmed that it has the duty to "[u]se its authorities to further the purposes of the ESA by carrying out programs for the conservation of Federally listed species," but without specifying anything about the scope or timing of that duty. *Memorandum of Understanding Between Federal Agencies on Implementation of the Endangered Species Act*, Signed Sept. 28, 1994, [July-Dec.] Daily Env't Report (BNA) No. 188, at E-1 (Sept. 30, 1994).

87. Just over half of the listed endangered and threatened species are covered by a recovery plan. See *Box Score*, ENDANGERED SPECIES BULL. (U.S. Dep't of Interior/Fish & Wildlife Serv., Wash., D.C.), Jan.-Feb. 1995, at 24. FWS estimates it would cost over \$4.6 billion to bring all currently listed species to recovery, whereas annual funding for such efforts is less than one percent of that amount. LINKING ECOSYSTEMS, *supra* note 10, at 156. A study of the line item quantified expenditure estimates made in the 306 recovery plans approved by 1993, which by no means reflect full recovery costs, showed total quantified estimated costs of \$884,164,000, whereas FWS requested a fiscal year 1995 budget of \$84,411,000 for that purpose and is unlikely ever to receive even that amount. NATIONAL WILDERNESS INST., GOING BROKE?: COSTS OF THE ENDANGERED SPECIES ACT AS REVEALED IN ENDANGERED SPECIES RECOVERY PLANS (1994).

implementation of the strict take prohibition can put a strangle hold on nonfederal land uses in the affected area. Those calling for an expanded statutory authority, however, are responding to the fact that the blunt axe often falls too narrowly to translate into an effective biodiversity conservation tool. The ESA applies only where a listed species resides or its habitat is found, and only to protect that species, not the species around it unless incidentally. The ESA thus is too inflexible both in substantive effect and biological scope to provide a comprehensive, broadly accepted approach to biodiversity conservation policy.⁸⁸

c. *ESA Biodiversity Initiatives*

Despite the ESA's limitations as a source of biodiversity conservation policy, FWS and NMFS have instituted several measures directed expressly at promoting biodiversity. In some

88. Congress has attempted on one occasion to patch the ESA's shortcomings and balance all the competing economic and biological interests in a specific ecosystem context. In 1980 Congress enacted the Pacific Northwest Electric Power Planning and Conservation Act to address the issues of declining salmon populations and increasing hydroelectric power, logging, fishery, and other resource uses in the Columbia River Basin. Pub. L. No. 96-501, 94 Stat. 2697 (codified at 16 U.S.C. §§ 839-839h (1988)). The act, which was implemented through a congressionally authorized interstate compact agency, was premised on the notion of placing fish and wildlife resources in the basin on a par with hydropower in terms of regional conservation and resource use decision-making. The act's main objective was to avoid future listings of the salmon populations under the ESA, which was perceived as a substantial threat to hydropower interests. So-called parity between the competing interests was to be achieved by requiring electric power consumers to fund, through the Bonneville Power Administration, a program "to protect, mitigate, and enhance fish and wildlife to the extent affected by the development and operation of any hydroelectric project of the Columbia River and its tributaries." 16 U.S.C. § 839b(h)(10)(A) (1988). The initiative also required maintenance of mainstream "flows . . . between such facilities to improve production, migration, and survival" of the anadromous species. *Id.* § 839b(h)(6)(E)(ii). For a background of Congress's objectives in passing the law, see generally Michael C. Blumm & Brad L. Johnson, *Promising a Process for Parity: The Pacific Northwest Electric Power Planning and Conservation Act and Anadromous Fish Protection*, 11 ENVTL. L. 497 (1981). Despite Congress's innovative approach, several of the salmon species have been listed under the ESA, though differences of opinion preside over whether those listings represent a failure of the program and, if so, what caused the failure. Compare Michael C. Blumm & Andy Simrin, *The Unraveling of the Parity Promise: Hydropower, Salmon, and Endangered Species in the Columbia Basin*, 21 ENVTL. L. 657 (1991) with Kai N. Lee, *Rebuilding Confidence: Salmon, Science, and Law in the Columbia Basin*, 21 ENVTL. L. 745 (1991). In any event, there have been no serious proposals to transport the Columbia River Basin approach elsewhere in the nation.

cases these measures have taken full advantage of the ESA structure; in other cases FWS and NMFS have probably stretched the ESA too far beyond its species-by-species focus and may find their initiatives subject to serious challenge.

In March 1994, FWS issued its omnibus policy statement on biodiversity, ambitiously titled *An Ecosystem Approach to Fish and Wildlife Conservation: An Approach to More Effectively Conserve the Nation's Biodiversity*.⁸⁹ FWS defined the ecosystem approach as "protecting or restoring the function, structure, and species composition of an ecosystem while providing for its sustainable socioeconomic use."⁹⁰ FWS described its "partners" in that effort as "the other federal agencies, states, tribes, local communities, corporate and individual landowners, and other organizations,"⁹¹ and promised that "[t]hrough an integrated ecosystem approach, the [FWS], with its partners, can protect and restore fish and wildlife habitats through holistic management strategies using a wide variety of tools and techniques."⁹² To shape that "partnership" and process, FWS has divided the nation into fifty-two watershed based units⁹³ and declared nine "Ecosystem Approach Principles" ostensibly geared towards regulatory flexibility and cooperation among the "partners."⁹⁴

89. ECOSYSTEM APPROACH, *supra* note 17.

90. *Id.* at 1.

91. *Id.* For the agency's further elaboration on the "partnership" theme, see Ira M. Heyman, *Property Rights and the Endangered Species Act: A Renascent Assault On Land Use Regulation*, 25 PAC. L.J. 157 (1994) (Assistant to the Secretary of the Interior discusses the Department's desire to include local input in ESA policy); Ron Crete, *Partnerships for Habitat on Private Land*, ENDANGERED SPECIES BULL. (U.S. Dep't of Interior/Fish & Wildlife Serv., Wash., D.C.), Jan.-Feb. 1995, at 12 (discussing FWS's Partners for Wildlife program, under which FWS has assisted land owners voluntarily in restoring wetlands and other species habitat).

92. ECOSYSTEM APPROACH, *supra* note 17, at 3.

93. *Id.* at 6; see also Henne, *supra* note 17, at 8.

94. ECOSYSTEM APPROACH, *supra* note 17, at 5. Though laden with vague terms and standards, the nine principles are: (1) an ecosystem approach is a critically important tool in promoting conservation of biological diversity and an environmentally sustainable level of development; (2) environmental and socioeconomic factors and interests are considered; (3) natural resource goals must be established on an ecosystem-wide basis; (4) full participation of all partners (federal, state, local, tribal, public, and private) in setting and achieving resource goals is imperative; (5) service resources and tools must be integrated within FWS and leveraged with those of our partners to achieve greater resource results; (6) strategies and implementation actions must be based on the best available science; (7) efforts must be focused on discrete units of the landscape, of varying but

In reality, however, FWS has had little success convincing its hoped for "partners" that something other than a shotgun marriage is involved in the so-called ecosystem approach. The four principal initiatives implementing the broad ecosystem approach policy thus far have been indicator species listings, large-scale critical habitat designations, multi-species recovery planning, and regional habitat conservation planning. Each has had dramatic consequences for state, local, and private interests and has turned many of them off of, rather than on to, biodiversity conservation.

i. Indicator and Keystone Species

Although the single species focus of the ESA can prove limiting in terms of biodiversity protection, some species may serve as a surrogate for biodiversity values. Thus, "indicator species" are those whose population levels and fluctuations correlate with the health of the ecosystems in which they exist,⁹⁵ and "keystone species" are those whose continued presence in an ecosystem is crucial for the ecosystem's normal ongoing functioning.⁹⁶ Protecting indicator and keystone species may indirectly result in the protection of whole ecosystems in which they exist, and consequently the biodiversity values of the ecosystems. Hence, ESA listing actions could be directed towards biodiversity conservation as a very prominent secondary goal of the listing.

Indeed, as an adjunct to the omnibus ecosystem approach policy, FWS and NMFS recently issued a joint policy statement describing their use of the ecosystem approach to specified ESA programs, including particularly the species listing function.⁹⁷

manageable size and with similar resource issues, to promote local action and involvement; (8) the FWS must encourage flexibility and innovation to achieve greater resource results; and (9) decisions must be delegated to the lowest appropriate level and FWS employees must be given the maximum possible authority. *Id.*

95. See Peter B. Landres et al., *Ecological Uses of Vertebrate Indicator Species: A Critique*, 2 CONSERVATION BIOLOGY 316, 317 (1988).

96. See WILSON, *supra* note 13, at 164-65.

97. Notice of Interagency Cooperative Policy for the Ecosystem Approach to the Endangered Species Act, 59 Fed. Reg. 34,273 (1994). The agencies' policy focuses on the ESA goal of conserving ecosystems and posits that

[s]uccess of ecosystem management will depend on the cooperation of partners (federal, state, and private) Species will be conserved best not by a species-by-species approach but by an ecosystem conservation strategy that transcends individual species. The future for endangered

The agencies announced that they would “group listing decisions on a geographic, taxonomic, or ecosystem basis where possible.”⁹⁸ Listing of a species based on ecosystem factors does not itself impose biodiversity regulation. Where the listing rule focuses on habitat values as the prime reason for listing, however, the broad “harm” definition, which prohibits habitat modification, provides an effective regulatory tool for managing the species’ habitat. Also, recovery planning efforts for such species can more directly focus on the habitat management policies. Any measures taken to protect the species’ habitat necessarily accrue to other species depending on that habitat, as well as to the habitat itself.⁹⁹

Several examples of this approach have emerged from recent listing actions that focus on loss or impairment of habitat as the principal reason for the listing. Many recent proposed and final listings of this variety involve invertebrate or otherwise “nonglamorous” species whose direct value to humans may be minimal, but which serve as indicator or keystone species for unique or specialized ecosystems.¹⁰⁰ Other recent

and threatened species will be determined by how well the agencies integrate ecosystem conservation with the growing need for resource use. *Id.* at 34,274.

98. *Id.*

99. FWS has also developed a policy for conservation of “candidate species”—species considered candidates for future listing but which are not protected under the ESA—designed to “recover these species and their ecosystems before listing becomes a high priority.” Notice of Availability of Draft Guidance for Candidate Species Under the Endangered Species Act, 59 Fed. Reg. 65,780 (1994). The policy builds upon agreements FWS has reached with federal and state authorities in several instances to establish measures to prevent the need to list species. *See, e.g.*, Memorandum of Understanding Between USFWS and Indiana Department of Transportation (Oct. 13, 1993) (on file with author) (regarding cave-dwelling invertebrate species). These efforts may become increasingly important given the fact that FWS considers over 2000 animal species as candidates. *See* Notice of Review: Endangered and Threatened Wildlife and Plants; Animal Candidate Review for Listing as Endangered or Threatened Species, 59 Fed. Reg. 58,982 (1994).

100. A classic example of an indicator species is the Barton Springs salamander, which has been found only in three spring outlets of the Barton Springs aquifer in Austin, Texas. The watershed recharging the Barton Springs aquifer covers an area of over 350 square miles lying southwest of Austin. Many creeks and tributaries feed at numerous points into recharge features leading directly into the limestone aquifer structure. Natural spring outlets exist near downtown Austin and provide popular human recreational locations. The spring outlets also provide the only known habitat (besides possibly the subterranean voids of the aquifer itself) of the salamander. The health of the salamander population is believed to respond to water quality conditions, and therefore acts

listing actions reveal FWS's new focus on indicator and keystone species reflecting the integrity of large ecosystems.¹⁰¹ Some proposed and final listing actions quite overtly are directed at preserving last vestiges of ecosystem types threatened by development.¹⁰² Development is not the only target, moreover, as some species have been listed based on more endemic habitat degradation factors such as acid rain.¹⁰³ One danger in this approach, however, is that in its quest to protect ecosystems FWS may overstate the case of the species' endangerment and the ecosystem's degradation, thus opening the

as an indicator of the health of exclusively subterranean aquifer species the study of which is complicated by their elusiveness. Paul Chippendale et al., *A New Species of Perennibranchiate Salamander From Austin, Texas*, 49 *HERPETOLOGICA* 248 (1993). FWS has proposed listing the salamander as endangered. Proposal to List the Barton Springs Salamander as Endangered, 59 Fed. Reg. 7968 (1994) (to be codified at 50 C.F.R. § 17.11(h)). Because no other species existing in or depending on the continuing integrity of the aquifer provided such a tangible "indicator" of the health of that ecosystem, FWS's proposed protection of the salamander can be seen as a surrogate for protection of the aquifer as a whole, a theme which resonates through the agency's proposed listing rule. *Id.* Issues concerning the adequacy of state water quality regulations and the underlying biological data regarding the species' status led FWS to postpone its listing decision until August 1995. See 60 Fed. Reg. 13,105 (1995); U.S. Dep't of Interior, News Release, Secretary Babbitt Delays Decision on Barton Springs Salamander, Commends Governor Bush for Commitment to Protect Water Quality (Mar. 7, 1995) (on file with author).

101. See, e.g., Determination of Threatened Status for the Delta Smelt, 58 Fed. Reg. 12,854 (1993) (to be codified at 50 C.F.R. § 17.11(h)) (small fish allegedly threatened by loss of San Joaquin River delta habitat); Final Rule to List the Mexican Spotted Owl as a Threatened Species, 58 Fed. Reg. 14,248 (1993) (to be codified at 50 C.F.R. § 17.11(h)) (decline of owl population allegedly associated with loss of mature forest habitat in five southwestern states).

102. See, e.g., Determination of Endangered Status for the Delhi Sands Flower-loving Fly, 58 Fed. Reg. 49,881 (1993) (to be codified at 50 C.F.R. § 17.11(h)) (small fly known only in several small areas of scrubby vegetation native to Delhi sands dune systems, all surrounded by urban uses); Proposed Rule to List the Hine's Emerald Dragonfly as Endangered, 58 Fed. Reg. 51,604 (1993) (to be codified at 50 C.F.R. § 17.11(h)) (small fly known only in ten fragmented wetland habitats in Wisconsin and Illinois, all threatened by urbanization and agricultural uses); Emergency Rule to List the Pacific Pocket Mouse as Endangered, 59 Fed. Reg. 5306 (1994) (to be codified at 50 C.F.R. § 17.11(h)) (mouse previously known throughout sandy coastal sage scrub habitat found along the southern California coast, now known only in one site, which is threatened with development).

103. See, e.g., Proposal to List the Spruce-Fir Moss Spider as an Endangered Species, 59 Fed. Reg. 3825 (1994) (to be codified at 50 C.F.R. § 17.11(h)) (small spider endemic to high elevation eastern spruce-fir forests threatened by forest desiccation caused by, among other things, acid precipitation). For a description of the Spruce-Fir Moss spider's unusual life cycle and threatened status, see Ron Geatz, *Arachniphobia II*, *NATURE CONSERVANCY*, Nov.-Dec. 1994, at 6.

listing action up to criticism,¹⁰⁴ and the agency may overstep its authority under the take prohibition to prevent further habitat degradation, thus prompting opposition such as the litigation challenging the validity of the harm definition.¹⁰⁵ Nevertheless, since 1992 FWS clearly has embarked on a policy of focusing on indicator and keystone species as a major component of the species listing program.

ii. Large Scale Critical Habitat Designations

Although FWS and NMFS's implementation of the critical habitat designation procedure has been criticized as underused and ineffective,¹⁰⁶ recent designations suggest that the agency has reversed course in that regard on behalf of biodiversity conservation. Since 1992, several critical habitat designations include vast expanses of territory which are also associated with high biodiversity values. For example, in 1992 FWS designated almost 6.9 million acres of land in California, Oregon, and Washington as critical habitat for the northern spotted owl, which FWS describes as depending on old growth forests in those states for most of its life functions.¹⁰⁷ On January 27, 1994, FWS proposed to designate over three million acres in California, Oregon, and Washington as critical habitat for the marbled murrelet, a marine bird that nests in inland old growth forests.¹⁰⁸ On February 8, 1994, FWS designated almost 6.5 million acres in California, Arizona, Nevada, and Utah, over one million acres of which is on private lands, as critical habitat for the Mojave population of the desert tortoise.¹⁰⁹ On March 21, 1994, FWS designated a total of 1980 linear miles of the lower Colorado River basin river flow and shoreline as critical habitat for four endangered fish.¹¹⁰ And

104. Litigation challenging the substantive and procedural bases for FWS's listing decisions has increased since 1988. See Ruhl, *supra* note 57, at 68-69.

105. See *supra* notes 80-83.

106. See Houck, *supra* note 56, at 296-315.

107. Determination of Critical Habitat for the Northern Spotted Owl, 57 Fed. Reg. 1796 (1992) (to be codified at 50 C.F.R. §§ 17.11(h) and 17.95(b)).

108. Proposed Designation of Critical Habitat for the Marbled Murrelet, 59 Fed. Reg. 3811 (1994) (to be codified at 50 C.F.R. §§ 17.11(h) and 17.95(b)).

109. Determination of Critical Habitat for the Mojave Population of the Desert Tortoise, 59 Fed. Reg. 5820 (1994) (to be codified at 50 C.F.R. § 17.95(c)).

110. Determination of Critical Habitat for the Colorado River Endangered Fishes: Razorback Sucker, Colorado Squawfish, Humpback Chub, and Bonytail Chub, 59 Fed. Reg. 13,374 (1994) (to be codified at 50 C.F.R. §§ 17.11(h) and

on December 7, 1994, FWS proposed the designation of 4.77 million acres in several southwestern states—sixteen percent of which are nonfederal—as critical habitat for the Mexican spotted owl.¹¹¹

Such actions do not characterize a passive or reluctant approach by the agencies to the critical habitat designation process. To the contrary, although FWS was forced by litigation to designate critical habitat in many of the referenced instances¹¹² and openly acknowledges that critical habitat has a limited role in the ESA in terms of imposing direct restraints on land use,¹¹³ these large-scale designations also recognize the important role critical habitat designation can have in defining ecosystems. Hence, through large-scale critical habitat designations, FWS has created the base from which to promote biodiversity through management of a single species' habitat. Recognizing the potential cloud such a designation can cast over development opportunities in an area, however, economic interests have responded in kind with a flurry of litigation challenging the agency's emerging approach to critical habitat.¹¹⁴

17.95(e)).

111. Proposed Determination of Critical Habitat for the Mexican Spotted Owl, 59 Fed. Reg. 63,162 (1994) (to be codified at 50 C.F.R. §§ 17.11(h) and 17.95(b)).

112. See, e.g., *Silver v. Babbitt*, No. 94-0337-PHX-CAM (D. Ariz. Aug. 11, 1994) (order) (ordering FWS to designate critical habitat for the Mexican spotted owl); *Colorado Wildlife Fed'n v. Turner*, No. 92-F-884 (D. Colo. Oct. 27, 1992) (order) (ordering FWS to designate critical habitat for the razorback sucker); *Northern Spotted Owl v. Lujan*, 758 F. Supp. 621, 625-26 (W.D. Wash. 1991) (order) (ordering FWS to designate critical habitat for the northern spotted owl).

113. FWS has observed that designation of critical habitat helps focus conservation activities by identifying areas that contain essential habitat features . . . regardless of whether or not they are currently occupied by the listed species, thus alerting the public to the importance of an area in the conservation of a listed species. Critical habitat also identifies areas that may require special management or protection. Critical habitat receives protection under section 7 of the Act with regard to actions carried out, funded, or authorized by a Federal agency Aside from the added protection provided under section 7, the Act does not provide other forms of protection to lands designated as critical habitat.

57 Fed. Reg. 1796 (1992).

114. See, e.g., *Board of County Comm'rs of Catron County v. United States Fish & Wildlife Serv.*, No. 93-730-HB (D.N.M. Oct. 13, 1994); *Douglas County v. Lujan*, 810 F. Supp. 1470 (D. Or. 1992), *aff'd in part, rev'd in part sub nom. Douglas County v. Babbitt*, 48 F.3d 1495 (9th Cir. 1995).

iii. Ecosystem Recovery Plans

FWS and NMFS have also been criticized for allowing the recovery planning process to lag far behind the species listing process.¹¹⁵ In the agencies' "ecosystem approach" joint policy statement, however, recovery planning featured even more prominently than species listing as a tool for biodiversity protection.¹¹⁶

The flexibility that recovery planning offers makes it a suitable tool for the agency to choose for biodiversity protection. For example, shortly after issuing its policy statement on recovery planning, FWS released its draft recovery plan for five aquatic species found in the San Marcos and Comal river systems that are fed by major spring outlets of the Edwards Aquifer in central Texas.¹¹⁷ FWS had listed the species over a decade before based on perceived threats to their riverine habitat from the withdrawal of aquifer water by urban and agricultural uses.¹¹⁸ FWS's 1985 recovery plan for the species had been largely unimplemented, however, and litigation resulted in FWS agreeing to develop and implement a revised plan.¹¹⁹ The new document describes the river and aquifer

115. See Houck, *supra* note 56, at 344-51.

116. Significantly, FWS and NMFS chose recovery planning as the subject for specific reference to the concept of biodiversity conservation, stating they would work to

[d]evelop and implement recovery plans for threatened and endangered species in a manner that restores, reconstructs, or rehabilitates the structure, distribution, connectivity and function upon which those listed species depend. In particular, these recovery plans shall be developed and implemented in a manner that conserves the biotic diversity (including the conservation of candidate species, other rare species that may not be listed, unique biotic communities, etc.) of the ecosystems upon which the listed species depend.

59 Fed. Reg. 34,274 (1994).

117. See U.S. Fish & Wildlife Serv., Draft San Marcos and Comal Springs and Associated Aquatic Ecosystems (Revised) Recovery Plan (Aug. 1, 1994) (on file with author) [hereinafter Recovery Plan].

118. *Id.* at 1-3.

119. See *Sierra Club v. Babbitt*, No. MO-91-CA-069, 1993 U.S. Dist. LEXIS 3361 (W.D. Tex. 1991), *appeal dismissed*, 995 F.2d 571 (5th Cir. 1993). The DOI later agreed to pay \$2 million in litigation costs to the plaintiffs. *Sierra Club v. Babbitt*, [1994] 24 *Envtl. L. Rep.* (Envtl. L. Inst.) 10,743 (W.D. Tex. Sept. 23, 1994).

systems in classic biodiversity jargon,¹²⁰ and, with those ecosystem relations in mind, the thrust of the conservation measures adopted in the plan unmistakably is directed at biodiversity conservation.¹²¹ To the chagrin of the City of San Antonio and local economic interests, however, the plaintiffs have posited that enforcement through section 10(a) permits and section 7 consultations is the means of achieving those measures.¹²²

120. FWS explained that:

Both the San Marcos and Comal springs and river systems are dependent upon water from the Edwards Aquifer and thus represent components of the larger Edwards Aquifer ecosystem. On a smaller scale, both the San Marcos and Comal aquatic systems contain unique flora and/or fauna that do not occur throughout the Edwards Aquifer ecosystem as a whole. . . . [and] are considered individual ecosystems with the understanding that they are connected to, and an integral part of, the larger Edwards Aquifer system.

Recovery Plan, *supra* note 117, at 2-3.

121. FWS explained that:

[T]he San Marcos and Comal ecosystems, including the spring runs and the San Marcos and Comal rivers, have one of the greatest known diversities of organisms of any aquatic ecosystem in the southwestern United States. . . . The Edwards Aquifer, itself, is also believed to contain a great diversity of organisms that live within it, underground.

. . . . The 1984 San Marcos Recovery Plan was the first recovery plan to address the recovery of multiple species through an ecosystem approach. The importance of conservation of the entire spring ecosystem as the only viable approach for recovery of these species was recognized early in the development of that plan. Any recovery plan for these endangered and threatened species that fails to address the continued functioning of the ecosystems will fail to achieve the recovery goals set forth for these listed species. Protection of these ecosystems should also help conserve the many other unique organisms that reside there, including species that are candidates for listing.

Id. at 1-3. The recovery actions specified in the plan include scientific research to increase understanding of the species and their relation to the ecosystems, controls on groundwater pumping, pollution controls, habitat restoration, and captive stock management.

122. In April 1994, the Sierra Club sent letters to a variety of federal, state, local, and private entities, alleging that they were in violation of the take prohibition as a result of their water pumping withdrawals from the aquifer. See Letter from Ken Kramer, Director, Lone Star Chapter of the Sierra Club, to Bruce Babbitt, Secretary, United States Department of Interior (Apr. 15, 1994) (on file with author). Texas has since challenged the notion that pumping constitutes take of endangered species requiring ESA authorization. See *Texas v. Babbitt*, No. W-94-CA-271 (W.D. Tex. filed Sept. 30, 1994). The district court judge in *Sierra Club v. Babbitt*, however, recently held a hearing at which he ordered the parties to provide written arguments on the issue of his authority under the ESA to order pumping limits, observing that "[s]ome people say I [don't have the right to] regulate pumping. Let me tell you this: I think I do, and until the 5th Circuit says I can't, I can." Roy Bragg, *Aquifer-pumping Curb Threatened*, SAN ANTONIO EXPRESS-NEWS, Feb. 25, 1995, at 1A.

Hence, although FWS faces many hurdles for implementing the Edwards Aquifer recovery plan and others like it based on ecosystem protection, not the least of which are funding constraints and litigation, FWS clearly has shifted its species recovery focus to an overt acknowledgment that biodiversity conservation is a principal goal of the recovery planning function.¹²³

iv. Regional Habitat Conservation Planning

Indicator and keystone species listings, large-scale critical habitat designations, and ecosystem recovery planning are not independent agendas for FWS and NMFS's ESA implementation. Rather, those programs set the stage for implementation policies based on habitat protection rather than merely species protection. FWS in particular has been aggressive in that respect, using the harm definition as leverage for achieving its habitat protection strategies of the listing and recovery programs.

In areas where ecosystem management takes on a regional dimension, most notably southern California, the Pacific Northwest, and central Texas, FWS has convinced local authorities and private interests that the harm definition imposes strong restrictions on habitat development regardless of the direct impacts of such actions on species individuals. Although the harm definition has only occasionally been effective in that respect when tested in court,¹²⁴ and indeed has failed completely in that respect in at least one forum,¹²⁵ FWS has succeeded in using its specter as a means of promot-

123. See also Memorandum of Agreement for Central Platte River Basin Endangered Species Recovery Implementation Program (June 10, 1994) (on file with author) (FWS and three states agreed to provide recovery efforts on behalf of endangered species in the Platte River basin).

124. Although its potential potency is beyond dispute, the harm definition has only rarely been applied to find that a take has occurred. See generally Cheever, *supra* note 62. FWS has seldom prosecuted administrative, civil, or criminal actions solely on the ground of habitat modification; rather, citizen group litigation has been the principal source of case law regarding the scope of the harm definition in that regard. See, e.g., cases cited *supra* note 82.

125. See Sweet Home Chapter of Communities for a Great Or. v. Babbitt, 17 F.3d 1463 (D.C. Cir. 1994), *cert. granted*, 115 S. Ct. 714 (1995).

ing large-scale habitat conservation planning efforts under the auspices of "regional" section 10(a) permits.¹²⁶

Although the concept of regional planning has much application to biodiversity conservation conceptually and support from FWS towards that purpose, regional permitting efforts in practice have been mostly uninspiring. While much regional planning activity appears to be occurring, relatively little actual regional habitat conservation is being accomplished.¹²⁷ Nevertheless, a promising example of what

126. See MICHAEL J. BEAN ET AL., WORLD WILDLIFE FUND, RECONCILING CONFLICTS UNDER THE ENDANGERED SPECIES ACT: THE HABITAT CONSERVATION PLANNING EXPERIENCE (1991); J.B. Ruhl, *Regional Habitat Conservation Planning Under the Endangered Species Act: Pushing the Practical and Legal Limits of Species Protection*, 44 SW. L.J. 1393 (1991); Robert D. Thornton, *Searching for Consensus and Predictability: Habitat Conservation Planning Under the Endangered Species Act of 1973*, 21 ENVTL. L. 605 (1991). A regional § 10(a) permit generally involves issuance of a permit to some regional authority, such as a consortium of governments, private interests, or both, who will use the permit to authorize public and private activities that would otherwise require (at least in FWS's opinion) an individual incidental take authorization under § 10(a) or through a § 7 consultation. In return for that blanket permit, the regional authority administers an organized habitat conservation program financed through fees and land donations obtained from individual users of the regional permit, as well as through public funding sources. Presumably, the advantage of the regional approach, as opposed to individualized permitting, is its ability to pool resources and avoid fragmented habitat losses that impair the overall regional biodiversity. See, e.g., Lindell L. Marsh, *Conservation Planning Under the Endangered Species Act: A New Paradigm for Conserving Biological Diversity*, 8 TUL. ENVTL. L.J. 97 (1994). To promote those advantages and ensure the regulated community of its resolve to support regional plans, FWS in 1994 issued its "No Surprises" policy statement outlining measures for assuring lasting regulatory certainty for private landowners who engage in ESA habitat conservation efforts. See U.S. FISH & WILDLIFE SERV. & NATIONAL MARINE FISHERIES SERV., NO SURPRISES: ASSURING CERTAINTY FOR PRIVATE LANDOWNERS IN ENDANGERED SPECIES ACT HABITAT CONSERVATION PLANNING (1994) [hereinafter NO SURPRISES]; see also U.S. FISH & WILDLIFE SERV., DRAFT INTERIM HANDBOOK FOR HABITAT CONSERVATION PLANNING AND INCIDENTAL TAKE PERMIT PROCESSING (1994) [hereinafter INTERIM HANDBOOK] (describing planning criteria for regional habitat conservation plans). Five more § 10(a) permits had been issued by September 1994. See William E. Lehman, *Reconciling Conflicts Through Habitat Conservation Planning*, ENDANGERED SPECIES BULL. (U.S. Dept of Interior/Fish & Wildlife Serv., Wash., D.C.), Jan.-Feb. 1995, at 16, 18.

127. Of the 31 section 10(a) permits issued through June 15, 1994, only four were regional in dimension, albeit several permits issued to individual applicants were significant in size. See SPECIES PROTECTION ON NONFEDERAL LANDS, *supra* note 12, at 18-20. FWS reports that, as of January 4, 1995, more than 100 § 10(a) applications are pending agency review, with a small fraction of those being region-wide in scope. U.S. FISH & WILDLIFE SERV., STATUS OF HABITAT CONSERVATION PLANS (1995). Regional planning poses both financial and political challenges. For example, the Balcones Canyonlands Conservation Plan, once

regional planning could accomplish when consensus is genuinely sought and funding impacts are equitably distributed is FWS's September 1994 approval of a regional permit for the metropolitan area around Bakersfield, California.¹²⁸ The Metropolitan Bakersfield Habitat Conservation Plan is the largest multi-species habitat conservation plan which FWS has approved to date, covering 17 species in a 408 square mile planning area.¹²⁹ The permit grew from true consensus building efforts between FWS, local governments, environmental groups, and the affected private interests. Through reasonable "pay as you go" development fees and tradable development rights, the permit holds much potential for amassing significant habitat conservation tracts that will inevitably promote biodiversity values. The Bakersfield permit thus provides a model for future regional planning efforts and an indication of FWS's strong interest in regional planning as a biodiversity conservation tool.¹³⁰

touted as the solution for solving all the ESA issues facing Austin, Texas and the model for all other areas of the country, has been in the planning stage for over six years, has engendered intense opposition by the purported landowner and developer beneficiaries, and remains as of this writing just a plan. Public bond financed funding requirements of over \$48 million dissuaded taxpayers from approving a bond referendum to finance an early version of the plan, and development fees proposed at one time as high as \$40,000 per acre dissuaded many developers and landowners from endorsing a later version of the plan. In short, Austin's plan had neither adequate funding nor the support of the regulated community. See Ruhl, *supra* note 126, at 1413-23; Melinda E. Taylor, *Promoting Recovery or Hedging a Bet Against Extinction: Austin, Texas's Risky Approach to Ensuring Endangered Species' Survival in the Texas Hill Country*, 24 ENVTL. L. 581 (1994). See generally *infra* text accompanying notes 243-62.

128. METROPOLITAN BAKERSFIELD HABITAT CONSERVATION PLAN STEERING COMM., CONSERVATION PLAN (1994).

129. *Id.* at ii.

130. Regional planning efforts under state endangered species protection initiatives also hold promise as a means of biodiversity protection. For example, in 1991 the California legislature enacted the Natural Community Conservation Planning Act ("NCCP Act"), which encourages cooperation with respect to biodiversity conservation among land managers, environmentalists, local governments, and state and federal agencies. CAL. FISH & GAME CODE §§ 2800-2840 (West Supp. 1995). The NCCP Act authorizes the state to enter into agreements with local and private entities to prepare natural community conservation plans promoting "regional or area-wide protection and perpetuation of natural wildlife diversity, while allowing compatible development and growth." *Id.* §§ 2805(a), 2810. FWS has pledged to support the NCCP Act plans financially and through regulatory efforts. Memorandum of Understanding Between the California Department of Fish and Game and the United States Fish and Wildlife Service Regarding Coastal Sage Scrub Natural Community Conservation Planning in Southern California (Dec. 4, 1991) (on file with author). Hence, by obtaining

d. Conclusion

The ESA is rightfully the center stage of biodiversity policy in the United States today, particularly when local and private lands are the subject of the biodiversity conservation efforts. The species-based focus of the law does limit its flexibility, and its heavy-handed regulatory approach alienates many of the constituencies whose support is needed for a successful biodiversity conservation program. FWS's multi-front policy of indicator and keystone species listings, large-scale critical habitat designations, ecosystem-based recovery plans, and regional habitat conservation planning largely overcome the shortcomings posed by the species-specific focus of the law, but at the expense in many cases of even further resentment by state and local authorities and private interests. Where FWS's policies have been most successful are instances of broad consensus between government, environmental, and private interests, such as the Bakersfield regional permit, thus suggesting that flexibility and consensus in general are key elements of a successful biodiversity conservation policy.

2. Clean Water Act Section 404

Section 404 of the Clean Water Act ("CWA")¹³¹ takes up just a few provisions of the nation's principal water pollution control statute, but has engendered more than passing controversy and litigation regarding its regulation of activities affecting "wetlands." Perhaps as much as the Endangered

state and federal approval of a plan, the local and private entities will satisfy the requirements of the ESA and the California Endangered Species Act. See California Dep't of Fish & Game, Southern California Coastal Sage Scrub, Natural Community Conservation Planning: Process Guidelines, at 18, § 5.7 (Nov., 1993) (unpublished document, on file with author). The promise of the NCCP Act and its initial successes in southern California led FWS to promulgate a special rule authorizing certain development activities within the range of the threatened coastal California gnatcatcher. Special Rule Concerning Take of the Threatened Coastal California Gnatcatcher, 58 Fed. Reg. 65,088 (1993) (describing "the conditions under which take of the coastal California gnatcatcher would not be a violation of section 9" of the ESA). For a detailed discussion of the NCCP Act, see Craig Manson, *Natural Communities Conservation Planning: California's New Ecosystem Approach to Biodiversity*, 24 ENVTL. L. 603 (1994). Many other states have initiated similar habitat acquisition and preserve programs. See generally NATIONAL REPORT, *supra* note 10, at 301-03.

131. Pub. L. No. 92-500, § 404, 86 Stat. 884 (1972) (codified as amended at 33 U.S.C. § 1344 (1988 & Supp. V 1993)).

Species Act, section 404 has evoked the ire of landowners and disdain of environmentalists as to the level to which it preserves coastal and freshwater wetland ecosystems. Perhaps more so than the ESA, however, its specific focus on ecosystems, albeit only a particular kind, presents important opportunities for biodiversity conservation.¹³²

a. Basic Goals and Structure Pertaining to Biodiversity

Unlike the ESA, section 404 does not posit lofty goals for protection of wetlands. Indeed, the word wetlands does not even appear in the statutory provisions. Rather, as an exception to the CWA's basic prohibition of discharges of pollutants into waters of the United States,¹³³ section 404(a) authorizes the Secretary of the Army to "issue permits . . . for the discharge of dredged or fill material into the navigable waters at specified disposal sites."¹³⁴ Section 404(b)(1) directs the Secretary of the Army to select disposal sites based on the application of guidelines promulgated by the Environmental Protection Agency ("EPA").¹³⁵ The EPA, moreover, may veto the specification of a disposal site whenever it determines that the discharge at the site "will have an unacceptable adverse effect on . . . shellfish beds and fishery areas (including spawning and breeding areas), wildlife, or recreational areas."¹³⁶ Section 404(f) specifies certain activities as exempt from the permitting procedure and discharge siting guidelines,¹³⁷ and section 404(e) allows the Secretary of the Army to specify categories of low impact activity, on a state-wide, regional, or national basis, exempt from permitting on a project-by-project basis if such exemption is consistent with the section

132. Notwithstanding its significant potential for promoting biological resource conservation, only one other legal commentary on biodiversity conservation even mentions § 404 in any significant way. See Robert L. Fischman, *Biological Diversity and Environmental Protection: Authorities to Reduce Risk*, 22 ENVTL. L. 435, 491-98 (1992). For a superb and comprehensive overview of the § 404 program, see Margaret N. Strand, *Federal Wetlands Law*, in ENVIRONMENTAL LAW INST., WETLANDS DESKBOOK (1993); see also WILLIAM L. WANT, LAW OF WETLANDS REGULATION (1989 & Supp. 1994).

133. 33 U.S.C. § 1311(a).

134. *Id.* § 1344(a).

135. *Id.* § 1344(b)(1).

136. *Id.* § 1344(c).

137. *Id.* § 1344(f).

404(b)(1) guidelines.¹³⁸ Pursuant to section 404(h), the EPA, with the Secretary's approval, may also delegate the permitting and enforcement authorities under section 404 to states, though few states have sought such authority.¹³⁹

The Secretary of the Army, through the Corps of Engineers ("Corps"), has implemented the section 404 permitting authorities through regulations which give a healthy dose of attention to ecosystem considerations.¹⁴⁰ Although initially the Corps' regulations encompassed only waters capable of or affecting navigation, judicial construction of section 404 required the Corps to expand the jurisdictional waters to include certain wetland areas.¹⁴¹ Wetlands, the definition of which has been a matter of raging debate surrounding the so-called *Federal Wetlands Delineation Manual*,¹⁴² now comprise the bull's eye of the section 404 program.

The Corps' regulations impose a variety of review criteria on applications for discharge permits.¹⁴³ Together these criteria form a public interest test balancing the expected benefits of the permitted activity and its potential environmental harms.

138. *Id.* § 1344(e).

139. *Id.* § 1333(h). For a discussion of why only two states—Michigan and New Jersey—have availed themselves of delegation of the § 404 program, see Survey, *Wetlands Protection, Federal and State Coordination: A Survey of Administrative Law Schemes*, 46 ADMIN. L. REV. 447 (1994).

140. 33 C.F.R. pts. 320-30 (1994).

141. For a thorough exploration of the history of the judicial expansion of the Corps' § 404 jurisdiction, see Virginia S. Albrecht & David Isaacs, *Wetlands Jurisdiction and Judicial Review*, NAT. RESOURCES & ENV'T, Summer 1992, at 29; Elizabeth A.G. Geltman, *Regulation of Non-Adjacent Wetlands Under Section 404 of the Clean Water Act*, 23 NEW ENG. L. REV. 615 (1988-89).

142. U.S. FISH & WILDLIFE SERVICE ET AL., *FEDERAL WETLANDS DELINEATION MANUAL* (1989). In 1977 the Corps and EPA adopted a unified definition of wetlands that remains in effect today. They define wetlands to include "areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation adapted for life in saturated soil conditions." 33 C.F.R. § 328.3(b) (1994) (Corps); 40 C.F.R. § 230.3(t) (1994) (EPA). Nevertheless, the agencies have had a tortured history of agreement and vacillation regarding how to implement the definition in the field. The agencies' so-called *Federal Wetlands Delineation Manual* used for that purpose has undergone several transformations in recent years as the focal point of political and scientific debate over what really and what legally constitutes a wetland. See generally ENVIRONMENTAL DEFENSE FUND & WORLD WILDLIFE FUND, *HOW WET IS A WETLAND?: THE IMPACTS OF THE PROPOSED REVISIONS TO THE FEDERAL WETLANDS DELINEATION MANUAL* (1992); Michael R. Deland, *No Net Loss of Wetlands: A Comprehensive Approach*, NAT. RESOURCES & ENV'T, Summer 1992, at 3; Strand, *supra* note 132, at 14-16.

143. 33 C.F.R. § 320.4(a) (1994).

On the one hand, for example, the Corps will consider effects on economics, land use, navigation, recreation, water supply, energy needs, and, significantly, "considerations of property ownership."¹⁴⁴ Those factors could often pose interests inconsistent with the goal of promoting biodiversity. On the other hand, biodiversity could be enhanced under the Corps' required consideration of conservation, aesthetics, wetlands, fish and wildlife values, and, as a catch-all, "general environmental concerns."¹⁴⁵

With respect to wetlands specifically, moreover, the Corps' rules advise that unnecessary alteration or destruction of wetlands "should be discouraged as contrary to the public interest"¹⁴⁶ and that "the cumulative effect of numerous piecemeal changes can result in a major impairment of wetlands resources."¹⁴⁷ Hence, there are strong presumptions against discharges in wetlands and there are meaningful review criteria by which to promote preservation of such ecosystems. The Corps' categorical permits, known as "Nationwide Permits," also contain provisions restricting their use by an otherwise qualifying project when endangered species may be affected.¹⁴⁸

The EPA's section 404(b)(1) guidelines for specification of disposal sites,¹⁴⁹ which the Corps recognizes as legally binding on its permitting program,¹⁵⁰ go even farther than the Corps' regulations in managing activities in wetlands ecosystems. The principal mechanism in the EPA's rules for prohibiting development in wetlands is the requirement that the Corps not issue a permit to discharge if there is a practicable alternative with less adverse environmental impact.¹⁵¹ If fulfilling the basic purpose of a project does not require access or proximity to or siting within jurisdictional waters—i.e., is not "water dependant"—practicable alternatives which do not require discharge in a wetland are presumed to be available and less environmen-

144. *Id.*

145. *Id.*

146. *Id.* § 320.4(b)(1).

147. *Id.* § 320.4(b)(3).

148. *Id.* § 330.4(f).

149. 40 C.F.R. pt. 230 (1994).

150. 33 C.F.R. § 320.4(b)(1).

151. 40 C.F.R. § 230.10(a)(1).

tally adverse.¹⁵² Even where discharge in wetlands is the least adverse option and only practicable alternative, a permit cannot be granted if the discharge would contribute to significant degradation of jurisdictional waters.¹⁵³ The criteria for that analysis include the effect on "aquatic ecosystem diversity."¹⁵⁴ Where the EPA concludes the Corps has granted a permit in violation of those section 404(b)(1) guidelines, it may implement its section 404(c) permit denial authority.¹⁵⁵

The practical effect of the EPA's section 404(b)(1) guidelines is to establish a hierarchy of preferred management strategies. Under the practicable alternatives test, avoidance of disturbances to wetland areas is the highest preference, and the Corps and the EPA will scrutinize a project proposal to ensure it affects wetlands only if and where necessary. Minimization of the degree of impacts in wetlands that cannot be avoided is the second strategy in the hierarchy and may require project design measures such as reduced density or construction precautions to reduce adverse impacts.¹⁵⁶ Finally, the last preference, for impacts that cannot be avoided or further reduced in intensity, is to require that the project applicant provide compensatory mitigation for wetlands degradation and losses.¹⁵⁷

b. Biodiversity Strengths and Shortcomings

Among the programs regulating nonfederal lands and development, the section 404 program stands out in specifically addressing biodiversity as a regulatory goal and criterion. Unlike the case of the ESA, therefore, the Corps and the EPA need not stretch section 404 to fabricate an enforceable

152. *Id.* § 230.10(a)(3). For an overview of the EPA's practicable alternatives test and its application in administrative and judicial forums, see Robert Uram, *The Evolution of the Practicable Alternatives Test*, NAT. RESOURCES & ENV'T, Summer 1992, at 15.

153. 40 C.F.R. § 230.10(c).

154. *Id.* § 230.10(c)(3).

155. 40 C.F.R. pt. 231. For a discussion of how the EPA has implemented its permit veto authority, see William B. Ellis, *Section 404(c): Where's the Balance?*, NAT. RESOURCES & ENV'T, Summer 1992, at 25.

156. 40 C.F.R. § 230.10(d), §§ 230.70-.77.

157. *Id.* § 233.23(c)(9). The Corps and EPA have developed a memorandum of agreement defining wetlands mitigation policies consistent with the § 404(b)(1) guidelines. See Memorandum of Agreement; Clean Water Act Section 404(b)(1) Guidelines, 55 Fed. Reg. 9210 (1990). See generally Margot Zallen, *The Mitigation Agreement—A Major Development in Wetland Regulation*, 7 NAT. RESOURCES & ENV'T, Summer 1992, at 19.

biodiversity policy; rather, the statutory terms are broad enough to accommodate promotion of biodiversity, and both the Corps and, to a greater degree, the EPA took that invitation to make biodiversity a powerful regulatory goal implemented through the Corps' permitting authority and the EPA's permit veto authority. Indeed, if the amount of landowner and developer ire is any reliable measure of the degree to which biodiversity protection is coerced under a program, section 404 easily stands side-by-side with the ESA.¹⁵⁸

Yet section 404 also is the subject of harsh criticism by advocates of biodiversity protection, who point to statistics reporting the nation's long term wetlands losses.¹⁵⁹ In short,

158. Of the four federal land use regulation programs covered in this article, § 404 has been the most frequent target of claims that a federal permitting decision has led to a taking of private property for which compensation from the government is due. U.S. GEN. ACCT. OFF., PUB. NO. GAO/RCED-93-176FS, CLEAN WATER ACT: PRIVATE PROPERTY TAKINGS CLAIMS AS A RESULT OF THE SECTION 404 PROGRAM (1993) (examining the financial impact of takings litigation under § 404); Jon Kusler & Eric Meyers, *Takings: Is the Claims Court All Wet?*, NAT'L WETLANDS NEWSL. (Envtl. L. Inst., Wash., D.C.), Nov.-Dec. 1990, at 6 (takings claims have been raised in over 200 wetlands cases). According to Federal Court of Claims Chief Judge Loren A. Smith, wetlands cases comprise 12% of the court's docket and 25%, the largest component, of all the court's Fifth Amendment takings cases. Honorable Loren A. Smith, *Wetlands: Past, Present, and Future*, Address Before the Association of American Law Schools, Sections on Agricultural Law and Environmental Law (Jan. 6, 1995) (on file with author).

159. Although the United States has lost over 50% of the domestic wetlands present before European settlement, over 100 million acres of domestic wetlands remain intact today. Pressure to develop those remaining areas continues to exist. See generally COUNCIL ON ENVTL. QUALITY, *OUR NATION'S WETLANDS* (1978); THOMAS E. DAHL, U.S. DEPT. OF INTERIOR, *WETLANDS LOSSES IN THE UNITED STATES 1780S TO 1980S* (1990); TECHNOLOGIES, *supra* note 4, at 66; Robert E. Beck, *The Movement in the United States to Restoration and Creation of Wetlands*, 34 NAT. RESOURCES J. 783, 783-99 (1994); Thomas E. Dahl, *Wetlands Losses Since the Revolution*, NAT'L WETLANDS NEWSL. (Envtl. L. Inst., Wash., D.C.), Nov.-Dec. 1990, at 16. The annual rate of wetland acres filled is believed to have decreased steadily since the Corps was required to extend § 404 jurisdiction to wetlands. U.S. GEN. ACCT. OFF., PUB. NO. GAO/RCED-92-79FS, *WETLANDS OVERVIEW: FEDERAL AND STATE POLICIES, LEGISLATION, AND PROGRAMS* (1991). Estimates are that about 140,000 to 290,000 acres of domestic wetlands currently are lost annually to development, agriculture, and other uses. *Id.* at 11. It is contended by some, however, that the most recent studies show that the annual number of filled acres is at the low end of that range, and that about the same number or more acres of wetlands are created or restored each year pursuant to the § 404 program and other initiatives. In other words, the nation could begin to experience a net increase of domestic wetlands in 1994. See generally JONATHAN TOLMAN, *COMPETITIVE ENTER. INST., GAINING MORE GROUND: ANALYSIS OF WETLAND TRENDS IN THE UNITED STATES* (1994). Of course, these statistics all depend on how one defines a wetland and they do not purport to measure the

they argue, section 404 is designed to allow discharges in wetlands, and more often than not, dischargers get close to their way as to the amount and location of discharge. Whether those are fair criticisms or not, it is the case that section 404, like the ESA, is designed to allow activities that would be fundamentally inconsistent with biodiversity conservation unless that goal is closely monitored, controlled, and enforced.

Structurally, moreover, section 404 has significant limitations on its role in a comprehensive biodiversity conservation program. As a threshold matter, of course, it deals with only one type of ecosystem, albeit an important one. Wetlands, however, are not the only ecosystem in need of attention. Moreover, the regulatory definition of a wetland is imprecise and thus leaves room to define wetlands in the field in different ways. The amount of land subject to section 404 therefore can swing dramatically depending on the field definition adopted.¹⁶⁰ Section 404 thus suffers from a "bright line" jurisdictional trigger similar to the one that limits ESA jurisdiction—because the Corps and EPA traditionally have defined wetlands according to the presence of specified physical and biological characteristics, which generally do not account for how those characteristics interrelate with the surrounding ecosystem, some upland areas which may be important to adjacent wetland ecosystem management may be left unregulated because they just marginally do not fit the rigid definition of wetlands in use at the time. Like species that are declining towards threatened status, stressed near-wetlands receive no protection. In addition, even areas that qualify as jurisdictional wetlands may fall through the cracks of biodiversity protection through application of the statutory exclusions and Nationwide Permits that limit or preclude closer regulatory scrutiny.

c. Section 404 Biodiversity Initiatives

The principal biodiversity initiative under the section 404 program is known as mitigation banking, the section 404 analogy to the ESA's regional conservation planning effort.

biological quality of wetlands lost and gained. Under a broad definition of what constitutes a wetland, it would be entirely possible for us to experience a net gain in wetlands, but a net loss of biological value in wetlands functions, or vice versa.

160. The potential for wide swings in the amount of wetlands covered by § 404 is amply demonstrated by the *Federal Wetlands Delineation Manual* controversy, discussed *supra* note 142.

Although mitigation for wetland losses approved in section 404 permits is the last preference of EPA's wetland protection measures, avoidance and minimization being superior in EPA's view, mitigation is an often-used and a widespread approach to wetlands protection.

Recognizing the importance of mitigation to the section 404 program, in 1995 the Corps and the EPA issued a joint internal guidance document to establish general guidelines for the establishment and use of wetlands mitigation banks under section 404.¹⁶¹ Wetlands mitigation banking involves the creation, restoration, or enhancement of wetland or other aquatic habitats expressly for the purpose of providing compensatory mitigation in advance of discharges into wetlands permitted under the section 404 regulatory program. Mitigation banks often involve areas larger than the area needed to compensate for the loss of wetlands authorized in an individual section 404 permit. The resulting wetland "bank" can be used by the permittee to compensate for future wetland losses for which the permittee may seek authorization, or may be sold in parcels to other permittees whose permit conditions impose compensatory mitigation measures.

The EPA and the Corps identify many biological, financial, and regulatory advantages of mitigation banking in their guidance document. Because mitigation banking occurs ahead of permitting, it avoids temporal losses of wetland habitat experienced in post-permit mitigation scenarios. Like regional habitat conservation efforts under the ESA, moreover, wetland

161. Federal Guidance for the Establishment, Use and Operation of Mitigation Banks, 60 Fed. Reg. 12,286 (1995). The EPA and the Corps acted with solid historical support from the White House and Congress in adopting a mitigation banking policy. In 1991 President Bush had proclaimed mitigation banking efforts consistent with the overall wetland protection program. Statement on Wetlands Preservation, 2 PUB. PAPERS 1032 (1991). Congress also had endorsed mitigation banking in legislation authorizing state highway departments to use banking as a method of compensation for wetland losses resulting from surface transportation projects. Intermodal Surface Transportation Efficiency Act of 1991, Pub. L. No. 102-240, 105 Stat. 1914. For a detailed discussion of the wetland mitigation banking program and other wetland restoration and creation initiatives, see Beck, *supra* note 159, at 799-824; William W. Sapp, *Mitigation Banking: Panacea or Poison for Wetlands Protection*, 1 ENVTL. LAW. 99 (1994); Jonathan Silverstein, *Taking Wetlands to the Bank: The Role of Wetland Mitigation Banking in a Comprehensive Approach to Wetlands Protection*, 22 B.C. ENVTL. AFF. L. REV. 129 (1994); Robert D. Sokolove & Pamela D. Huang, *Privatization of Wetland Mitigation Banking*, NAT. RESOURCES & ENV'T, Summer 1992, at 36.

banking efforts produce larger contiguous wetland ecosystems than could be expected through individualized mitigation efforts. If the location of mitigation banks is chosen carefully based on biological resource factors, the resulting wetland areas potentially will function more like a complex wetland ecosystem, and can benefit by their size from a buffer effect against the intrusions of surrounding development. Indeed, it is entirely possible that the wetland banking area will provide more biodiversity values than the numerous smaller parcels of lost or degraded wetlands for which the bank acts as compensation. The economies of scale associated with larger restoration and creation efforts make banking attractive to developers and allow the pooled resources to retain greater biological and planning expertise. Finally, the presence of approved mitigation banks lends greater certainty to the regulatory process, as permittees and the agencies know ahead of time that mitigation conditions are satisfied. Mitigation banking is thus firmly established as an approved policy for compensatory mitigation under the section 404 program, and holds much promise as a means of improving the overall biodiversity of the wetlands ecosystems of the nation.

d. Conclusion

Despite its explicit focus on biodiversity values, section 404 has been largely ignored in biodiversity literature as a significant biodiversity program. Section 404, in short, has few friends. The regulatory focus of the wetlands protection law has evoked strong resentment from the landowner and developer communities. Environmental interests bemoan that the section 404 program has not stopped the tide of wetland losses. Neither side is being quite fair to section 404 or recognizing the significant potential it has for biodiversity conservation. The mitigation banking concept offers a means of ameliorating the regulatory pinch while at the same time producing meaningful biodiversity values. Those efforts, however, will succeed only because of a close consensus of diverse interests, once again indicating that flexibility of approach and consensus-building are necessary ingredients to successful biodiversity protection programs.

3. National Environmental Policy Act

The National Environmental Policy Act of 1969 ("NEPA")¹⁶² establishes an environmental impact review procedure for certain actions funded, authorized, or carried out by federal agencies. As such, NEPA presents opportunities to consider impacts on biodiversity as one of the review criteria, and thereby to improve the ability of federal agencies to make decisions promoting biodiversity conservation.¹⁶³

a. Basic Goals and Structure Pertaining to Biodiversity

NEPA was enacted in 1970 in recognition of "the profound impact of man's activity on the interrelations of all components of the natural environment."¹⁶⁴ Although pronouncing that "each person . . . has a responsibility to contribute to the preservation and enhancement of the environment"¹⁶⁵ and that the federal government has the responsibility to "use all practicable means . . . [to] maintain, wherever possible, an environment which supports diversity and variety of individual choice,"¹⁶⁶ NEPA does not overtly address biodiversity conservation.

Rather, in a manner that has been described as "not stunning in its specificity,"¹⁶⁷ NEPA implores the federal government to attain six broad goals of environmental policy.¹⁶⁸ In the only concrete program established to carry out those goals, section 102(2)(c) of NEPA requires that federal agencies "include in every recommendation or report on proposals for legislation and other major federal actions significantly affecting the quality of the human environment" a detailed statement on, among other things, "the environmental impact of the proposed action . . . [and] alternatives to the

162. Pub. L. No. 91-190, 83 Stat. 852 (1970) (codified as amended at 42 U.S.C. §§ 4321-4370d (1988 & Supp. V 1993)).

163. For a comprehensive overview of the NEPA program, see RONALD E. BASS & ALBERT I. HERSON, *MASTERING NEPA: A STEP-BY-STEP APPROACH* (1993); DANIEL R. MANDELKER, *NEPA LAW AND LITIGATION* (2d ed. 1992); WILLIAM H. RODGERS, JR., *ENVIRONMENTAL LAW 800-1023* (2d ed. 1994).

164. NEPA § 101(a), 42 U.S.C. § 4331(a).

165. NEPA § 101(c), 42 U.S.C. § 4331(c).

166. NEPA § 101(b), 42 U.S.C. § 4331(b).

167. RODGERS, *supra* note 163, at 802.

168. NEPA § 101(b)(1)-(6), 42 U.S.C. § 4331(b)(1)-(6).

proposed action.”¹⁶⁹ The duty to compile such reports, known as environmental impact statements (“EIS”s), has spawned a plethora of litigation over the meaning of key statutory terms such as “major Federal actions” and “significantly affecting” and the scope of “environmental impacts” and “alternatives” to be considered.¹⁷⁰ The magnitude of litigation surrounding those issues and the weight case law has given to NEPA as a force to be reckoned with in environmental planning far outstrips what anyone had in mind or hope when the statute was first enacted.

NEPA established the Council on Environmental Quality (“CEQ”) to place the meat on the bones of the broad federal agency programs outlined in the statute.¹⁷¹ Hints of biodiversity factors appear in CEQ’s regulations defining those procedures.¹⁷² For example, CEQ defines “significantly,” as in “significantly affecting,” to include consideration of the “[u]nique characteristics of the geographic area such as . . . ecologically critical areas”¹⁷³ and the “degree to which the action may adversely affect an endangered or threatened species or its habitat.”¹⁷⁴ The effects of the proposed action that must be considered in the impact review include effects on “natural systems, including ecosystems.”¹⁷⁵ To the extent different agencies might implement NEPA differently with regard to those ecosystem criteria, the EPA’s authority to review *all* other federal agency EISs¹⁷⁶ acts to ensure that a standard approach to environmental factors is provided throughout the federal government. Hence, NEPA, as filled out by CEQ

169. NEPA § 102(2)(c), 42 U.S.C. § 4332(2)(c).

170. For a comprehensive overview of these and other issues arising under NEPA’s EIS provision, see MANDELKER, *supra* note 163, at 8-1 to 10-105.

171. NEPA §§ 201-208, 42 U.S.C. §§ 4341-4347. By Executive Order, CEQ was authorized to issue the procedural guidelines other agencies must follow in fulfilling the EIS requirement. See Exec. Order No. 11,514, 3 C.F.R. 104 (1970), *reprinted as amended in* 42 U.S.C. § 4321 (1988).

172. Council on Environmental Quality, 40 C.F.R. pts. 1500-1508, 1515-1517 (1994).

173. *Id.* § 1508.27(b)(3).

174. *Id.* § 1508.27(b)(9).

175. *Id.* § 1508.8(b).

176. The EPA is required to review and comment on the environmental impact of any matter related to its areas of jurisdiction in connection with federal agency proposed legislation, construction projects, proposed federal regulations, and any action subject to NEPA. 42 U.S.C. § 7609(a). EPA has promulgated procedures for EIS review. 40 C.F.R. pt. 6 (1994). For a discussion of how EPA could use this authority to promote more thorough consideration of biodiversity in federal agency EISs, see Fischman, *supra* note 132, at 477-78.

regulations and administered under the EPA's omnibus review authority, undoubtedly would accommodate a close look at the impact of a proposed federal action on biodiversity factors.

b. Biodiversity Strengths and Shortcomings

NEPA presents several advantages for promoting biodiversity conservation when compared to the Endangered Species Act and Clean Water Act section 404 programs. First, it is not bound by the presence of and impact to a listed species or a wetlands—it applies potentially to any federal action. Areas worthy of biodiversity protection are not always associated with listed species, wetlands, or any specific subjects of other environmental laws. Wherever federal actions occur, therefore, NEPA could carry to them the duty to consider biodiversity impacts. Second, NEPA applies broadly to the ecosystem which may be affected by federal action, thus expanding the impact analysis beyond a specific species or ecosystem component. Only to the extent that a species or ecosystem component acts as an indicator of or keystone for the health of the surrounding ecosystem will the ESA and CWA section 404 lend support to biodiversity goals. Hence, the primary advantage of NEPA is its breadth and ombudsman-like jurisdiction over federal actions.

Yet, with NEPA's breadth of jurisdiction has also come a dearth of substantive effect, thus leading to its shortcomings as a biodiversity policy tool. First and foremost among NEPA's limitations is the restriction of the EIS duty to purely procedural implications. Nothing in NEPA dictates the substantive results of federal agency decisions.¹⁷⁷ Federal agencies must go through the process of complying with the environmental review procedure in NEPA section 102(2)(c), but NEPA does not prescribe what the agency must decide based on the information gathered and analyzed in the EIS. Hence, although NEPA can produce much valuable information about biodiversity, NEPA alone does not provide a legal tool for directing decisions towards enhancing biodiversity.¹⁷⁸

177. *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 350 (1989) (stating that "NEPA itself does not mandate particular results, but simply prescribes the necessary process").

178. See generally Cynthia Carlson, *NEPA and the Conservation of Biological Diversity*, 19 ENVTL. L. 15 (1988) (advocating revision of NEPA as a means of addressing biological diversity).

Moreover, even the procedural benefits of NEPA do not materialize at all unless the federal action in question will have significant effects on the environment. If an initial study, known as an environmental assessment ("EA"),¹⁷⁹ determines the effects of the action are not significant, a full EIS study is not required.¹⁸⁰ Many federal actions have been classified as presumptively not significant, thus qualifying for categorical exclusion from the EIS requirement.¹⁸¹ Indeed, some federal actions which undoubtedly would pass as significant under NEPA are considered exempt from the EIS requirement by operation of other laws, usually because the other laws contain impact review procedures inconsistent with or supplanting NEPA, though not always with as broad a set of review criteria.¹⁸² Hence, not every federal action will undergo the level of scrutiny associated with an EIS, thereby limiting the opportunities for consideration of impacts to biodiversity.

Finally, unlike the ESA and CWA section 404, NEPA does not necessarily apply to local and private actions which might affect biodiversity. To be sure, many local and private actions require some form of federal funding or authorization that triggers NEPA's application to the federal funding or approval agency, but many either do not receive federal funding or qualify for a categorical exclusion. Such projects would slip through the NEPA net for purposes of biodiversity consideration, albeit some states have enacted "baby NEPAs" which might serve to fill that gap.¹⁸³ On balance, then, while NEPA offers a tremendous biodiversity conservation planning tool for many federal actions, its nature as a strictly procedure-driven law with numerous jurisdictional boundaries will limit its usefulness towards establishing a system for comprehensive, flexible promotion of biodiversity conservation on nonfederal lands.

179. Council on Environmental Quality, 40 C.F.R. § 1508.9 (1994).

180. *Id.* § 1501.4.

181. *Id.* § 1508.4.

182. See, e.g., *Pacific Legal Found. v. Andrus*, 657 F.2d 829 (6th Cir. 1981) (holding that an ESA species listing decision is not subject to NEPA because ESA already prescribes narrow decisional criteria).

183. See generally MANDELKER, *supra* note 163, at 12-1 to 12-79.

c. *NEPA Biodiversity Initiatives*

Recognizing that federal agencies' NEPA analyses "have not usually included the full range of effects or the appropriate scale required for adequate consideration of biodiversity," and acting on the premise that "[s]uccessful implementation of the principles of biodiversity management requires that they be effectively integrated into the NEPA process," in 1993 CEQ issued a major policy guidance on ways of incorporating biodiversity considerations into NEPA review.¹⁸⁴ Significantly, CEQ contends that:

[B]iodiversity cannot be adequately conserved on the federal level alone. Even though federal lands and resources play a major role, the protection of biological resources will require concerted efforts by all levels of government and the private sector. NEPA addresses the effects of federal actions *whether or not they involve federally managed land or resources*.¹⁸⁵

Hence, CEQ explicitly has directed its biodiversity policy initiative at state, local, and private lands.

The CEQ policy identifies four basic deficiencies of NEPA analyses as implemented generally by the federal agencies: (1) inadequate consideration of species not listed under the ESA; (2) inadequate consideration of areas not expressly protected under other federal laws; (3) inadequate protection of species which are not economically important; and (4) inadequate consideration of cumulative impacts of proposed actions.¹⁸⁶ CEQ thus outlines the techniques federal agencies can use in NEPA review to ensure that "[w]hen agencies undertake NEPA analysis . . . they should consider whether the reduction in biodiversity is likely to be a relevant and significant issue."¹⁸⁷ The policy document also provides measures which federal agencies can take to ensure they fulfill their duty under section

184. BIODIVERSITY CONSIDERATIONS, *supra* note 5, at 16-17.

185. *Id.* at 16 (emphasis added); *see also* LINKING ECOSYSTEMS, *supra* note 10, at 142 (contending that ecosystem "management can not be effective without considering the interactions between protected and multiple-use areas—public and private").

186. BIODIVERSITY CONSIDERATIONS, *supra* note 5, at 18.

187. *Id.* at 18-19.

101 of NEPA to “maintain, wherever possible, an environment which supports diversity and variety of individual choice.”¹⁸⁸

The CEQ policy on biodiversity thus represents a significant recognition of the importance of biodiversity factors in the NEPA program. To be sure, much of the effect NEPA has on federal actions depends on how other federal agencies implement CEQ’s rules, and the same will thus be true of CEQ’s biodiversity policy. However, the CEQ policy statement provides a green light to other federal agencies to broaden biological resource impacts review beyond listed species and protected areas, and thus to consider the broad range of ecosystem management impacts when conducting NEPA reviews.

d. Conclusion

NEPA provides a broad forum for developing federal biodiversity conservation policy through its environmental impacts review procedure. Because the impacts review is not tied to specific listed species or protected areas, NEPA can embrace biodiversity values generally as an objective. Of course, being principally procedural in scope, even a strong emphasis in NEPA on biodiversity conservation will not translate into effective conservation measures without the commitment of federal agencies and state, local, and private interests. Some regulatory framework ultimately will be needed to direct what those commitments are, how they are to be distributed, and how satisfaction of them is rewarded. NEPA cannot do that alone, particularly on nonfederal lands where many projects will not fall within the statute’s scope, and thus CEQ may have overstated the case when it concluded that “[t]he extent to which biodiversity is considered in future NEPA

188. NEPA § 101(b)(4), 42 U.S.C. § 4331(b)(4). CEQ’s recommended measures are (1) acknowledge the conservation of biodiversity as national policy and incorporate its consideration in the NEPA process; (2) encourage and seek out opportunities to participate in efforts to develop regional ecosystem plans; (3) actively seek relevant information from sources both within and outside government agencies; (4) encourage and participate in efforts to improve communication, cooperation, and collaboration between and among governmental and non-governmental entities; (5) improve the availability of information on the status and distribution of biodiversity, and on techniques for managing and restoring it; (6) expand the information base on which biodiversity analyses and management decisions are based. BIODIVERSITY CONSIDERATIONS, *supra* note 5, at 23-24.

analyses of federal actions will strongly affect whether biodiversity is adequately protected in the coming decades."¹⁸⁹ NEPA could be an important component in that cause, but without substantially altering NEPA's basic procedural character it will never provide the framework for a comprehensive biodiversity conservation policy for state, local, and private lands.

4. Coastal Zone Management Act

The Coastal Zone Management Act (CZMA)¹⁹⁰ establishes federal policies for the use of land in the coastal zone. It allows, but does not require, coastal states to develop management plans governing coastal zone land uses consistent with these federal policies, in return for which the states receive federal aid and cooperation in implementing the program. Because of its focus on an important ecosystem, the CZMA presents important biodiversity planning and regulation opportunities, though it has been largely ignored in that respect in legal and scientific literature addressing biodiversity policy.¹⁹¹

a. Basic Goals and Structure Pertaining to Biodiversity

The CZMA was enacted in 1972 to promote the "national interest in the effective management, beneficial use, protection, and development of the coastal zone."¹⁹² Ecological protection was paramount among the concerns Congress expressed as reason for addressing the "increasing and competing demands upon the lands and waters of our coastal zone."¹⁹³ For example, Congress recognized that "[t]he coastal zone is rich in a variety of natural . . . ecological . . . and esthetic resources of immediate and potential value to the present and future well-

189. BIODIVERSITY CONSIDERATIONS, *supra* note 5, at 16.

190. Pub. L. No. 89-454, 86 Stat. 1280 (1972) (codified as amended at 16 U.S.C. §§ 1451-1464 (1988 & Supp. V 1993)).

191. For a comprehensive overview of the CZMA as a land use program, see Jack H. Archer, *Evolution of Major 1990 CZMA Amendments: Restoring Federal Consistency and Protecting Coastal Water Quality*, 1 TERR. SEA J. 191 (1991); Linda A. Malone, *The Coastal Zone Management Act and the Takings Clause in the 1990's: Making the Case for Federal Land Use to Preserve Coastal Areas*, 62 U. COLO. L. REV. 711 (1991); Ronald J. Rychlak, *Coastal Zone Management and the Search for Integration*, 40 DEPAUL L. REV. 981 (1991).

192. CZMA § 302(a), 16 U.S.C. § 1451(a).

193. CZMA § 302(c), 16 U.S.C. § 1451(c).

being of the Nation,"¹⁹⁴ and that "[t]he habitat areas of the coastal zone . . . are ecologically fragile and consequently extremely vulnerable to destruction by man's alterations."¹⁹⁵ Hence, Congress stated as its principal goal for the CZMA "to preserve, protect, develop, and where possible, to restore or enhance, the resources of the Nation's coastal zone for this and succeeding generations."¹⁹⁶

The approach Congress took in the CZMA, however, is decidedly different from the regulatory structures of the Endangered Species Act and section 404 of the Clean Water Act. Congress was convinced that "[t]he key to more effective protection and use of the land and water resources of the coastal zone is to encourage the states to exercise their full authority over the lands and waters in the coastal zone."¹⁹⁷ The CZMA does this by establishing a method by which the states, in cooperation with federal and local governments, can establish "unified policies, criteria, standards, methods, and processes for dealing with land and water use decisions of more than local significance."¹⁹⁸ The two CZMA programs for carrying out that objective are the development and approval of coastal management plans ("CMP"s) and the review of federal actions for consistency with established CMPs.

Sections 305 and 306 of the CZMA provide federal grants to the thirty-five coastal states for developing and implementing their CMPs.¹⁹⁹ A CMP must be consistent with guidelines established by the Secretary of Commerce, which must require "identification of the means by which the State proposes to exert control over the land uses and water uses"²⁰⁰ and the "priorities of uses in particular areas."²⁰¹ A state's CMP development must be conducted "with the opportunity of full participation by relevant Federal agencies, State agencies, local governments, regional organizations, port authorities, and other interested parties and individuals, public and private . . ."²⁰² and must provide "an effective mechanism for continuing

194. CZMA § 302(b), 16 U.S.C. § 1451(b).

195. CZMA § 302(d), 16 U.S.C. § 1451(d).

196. CZMA § 303, 16 U.S.C. § 1452(1).

197. CZMA § 302, 16 U.S.C. § 1451(i).

198. *Id.*

199. CZMA §§ 305, 306A, 16 U.S.C. §§ 1454, 1455a.

200. CZMA § 406(d)(2)(D), 16 U.S.C. § 1455(d)(2)(D) (Supp. V 1993).

201. CZMA § 406(d)(2)(E), 16 U.S.C. § 1455(d)(2)(E).

202. CZMA § 406(d)(1), 16 U.S.C. § 1455(d)(1).

consultation and coordination"²⁰³ between those entities. The CMP must define permissible land and water uses in the coastal zone and identify in that regard "areas of particular concern."²⁰⁴ The CMP also must demonstrate that land and water uses can be controlled and coordinated through either state establishment of standards for local implementation, direct state regulation, state review of all state, local, and private development proposals for consistency with the CMP, or a combination of those three general approaches.²⁰⁵

The Secretary's CZMA regulations, promulgated through the National Oceanic and Atmospheric Administration ("NOAA"), elaborate on each of those key statutory elements for CMP development and approval.²⁰⁶ Significantly, NOAA's rules for special management areas address in detail the "areas of particular concern" feature of the CMP.²⁰⁷ NOAA's rules recognize that a state's set of controls for the coastal zone may vary throughout the zone in intensity, scope, and detail. NOAA requires that "[w]here these policies are limited and non-specific, greater emphasis should be placed on areas of particular concern [in the CMP] to assure effective management and an adequate degree of program specificity."²⁰⁸ Among the areas of particular concern which NOAA requires states to identify are "[a]reas of high natural productivity or essential habitat for living resources, including fish, wildlife, and endangered species and the various trophic levels in the food web critical to their well-being."²⁰⁹ Hence, while biodiversity is not mentioned by name in either the CZMA or NOAA's rules, the CMP development and approval process provides ample opportunity for promoting biodiversity interests.

Once a state's CMP is in place, the CZMA requires that all actions carried out by federal agencies directly, or by nonfederal entities requiring some form of federal approval or funding, be concurred with by the state or its designated agency as consistent with the CMP.²¹⁰ Significantly, the consistency

203. CZMA § 406(d)(3)(B), 16 U.S.C. § 1455(d)(3)(B).

204. CZMA § 406(d)(2)(C), 16 U.S.C. § 1455(d)(2)(C).

205. CZMA § 406(d)(11), 16 U.S.C. § 1455(d)(11).

206. Coastal Zone Management Program Development and Approval Regulations, 15 C.F.R. § 923 (1994).

207. *Id.* § 923.20.

208. *Id.* § 923.20(b).

209. *Id.* § 923.21(b)(1)(i)(B).

210. CZMA § 307, 16 U.S.C. § 1456.

review requirement applies not only to activities physically located within the CMP boundary, but also to activities outside the boundary which may affect the coastal zone.²¹¹ NOAA's regulations implement a detailed consistency review procedure.²¹²

b. Biodiversity Strengths and Shortcomings

The chief advantage the CZMA presents for promoting biodiversity protection is its flexibility, which operates on many levels. The CZMA allows a state flexibility to adopt the management approach for the coastal zone most consistent with that state's general style of land use regulation and management. For example, if the focal point of the state's general approach is local decision-making, the CMP can adopt that approach.²¹³ States relying more on centralized controls can use that approach, either through direct state control²¹⁴ or through state review of local and regional decisions.²¹⁵ Hence, the CZMA is more likely to produce a regulatory system harmonious with the state's own regulatory culture than are programs using a rigid, top-down federal regulatory scheme, such as the ESA and CWA section 404.

The CZMA also exhibits flexibility in terms of geographic emphasis and intensity of the regulatory program. The program for areas of particular concern allows states to focus regulatory efforts on specified areas in need of close attention, such as those needing intense biodiversity protection. The CZMA also inherently recognizes that land and water uses will occur in the coastal zone and must be accommodated. Hence, rather than requiring a uniform level of regulation throughout the coastal zone ecosystem, the CZMA recognizes that some areas will experience more development than others and some will require a greater degree of protection than others. Also, the CZMA recognizes that actions outside the coastal zone boundary may affect coastal resources and thus need to be addressed. By contrast, for example, the CWA section 404 program for protecting wetlands would not address an activity

211. CZMA § 307(c)(1)(A), 16 U.S.C. § 1456(c)(1)(A).

212. 15 C.F.R. § 930.

213. *Id.* § 923.42.

214. *Id.* § 923.43.

215. *Id.* § 923.44.

potentially harmful to a wetlands area if the activity takes place outside the wetlands and involves no fill into the wetlands.

The CZMA's flexibility, however, also imposes burdens in terms of developing and implementing the CMP according to the loosely-stated federal guidelines. The danger exists that goals such as biodiversity protection will become diffusely enforced and thus ineffective as management tools. In that sense, then, if the detailed consistency review procedures are not closely followed, the CZMA could prove ineffective for biodiversity protection in the coastal zone.

Another potential disadvantage of the CZMA exists with respect to its perception by the regulated community. Like NEPA, the CZMA operates within the fabric of other coercive federal regulations, such as the ESA and CWA section 404. There is a danger, therefore, that those other programs will dominate state, local, and private land use issues in the coastal zone notwithstanding all the flexibility and good intentions of the CMP. Moreover, the tendency may be for the regulated community to perceive the CMP as just another layer of regulation rather than providing the comprehensive management system for the coastal ecosystem. That very issue became the central point of debate over Texas's recent CMP development efforts, diverting attention away from the more important issues of CMP substance.²¹⁶

c. CZMA Biodiversity Initiatives

Of the thirty-five coastal states eligible to participate in the CZMA program, only six had declined to do so as of 1994. One of the major holdouts, Texas, reversed course in 1991 with the enactment of state legislation establishing the Coastal Coordination Council ("CCC"), an amalgamation of representatives from many state resource agencies, and directing the CCC to develop a CMP for the state.²¹⁷ Under the leadership of the

216. This was the experience when Texas recently adopted regulations supporting a CMP, discussed more fully at the text accompanying notes 218-29, *infra*. Many public comments on the proposed Texas CMP alleged that the CMP would result in "loss of local control of the coast" and that it "represented an additional layer of bureaucracy." 19 Tex. Reg. 5195, 5212-13 (1994) (summarizing public comments on the CMP and the Coastal Coordination Council's responses to them).

217. TEX. NAT. RES. CODE ANN. §§ 33.201-308 (West Supp. 1995).

Texas General Land Office, the CCC proposed a CMP and, after inviting and considering public comments, issued a version it believed would satisfy the CZMA.²¹⁸ As the first CMP of any coastal state developed since biodiversity policy has emerged as a potent regulatory influence, the Texas CMP offers an example of the potential for biodiversity initiatives under the CZMA.

From its inception, the Texas CMP adopted the "network" approach described in the CZMA as one of the means of demonstrating that state authority exists to implement the CMP. Hence, the CMP "does not impose or create any requirement which is beyond the existing legal authority of an agency or local government to implement," but is best described as "a compendium of existing statutes, rules, and regulations."²¹⁹ The objective in that regard was to ensure that the CCC could "work closely with local governments to improve management of the coast, and provide a broader forum for local input into the actions taken and authorized by state and federal agencies."²²⁰

The Texas CMP, however, is by no means simply a passive dictionary of existing state laws. Rather, it provides the mechanism for coordinating the implementation of existing state authorities around the unifying theme of coastal zone management. Although the CMP is premised on the policy that "economic vitality of the coastal area is dependent upon the quality and availability of the coastal natural resources, and neither is treated as superior,"²²¹ the CMP specifies as no other existing state law could the goals of coastal zone environmental management. Indeed, the express primary goal of the CMP is to "protect, preserve, restore, and enhance the diversity, quality, quantity, functions, and values of coastal natural resource areas."²²² The CMP aims at that goal not through a new layer of coercive regulation, but rather by drawing upon existing authority in an organized, well-planned manner.

218. 19 Tex. Reg. 7606 (1994) (to be codified at 31 TEX. ADMIN. CODE pt. XVI) (issued Sept. 27, 1994 and adopting provisions proposed in 19 Tex. Reg. 1895 on Mar. 18, 1994). Public comments to the proposed CMP and the CCC's responses to them were also published in 19 Tex. Reg. 5195 (1994).

219. 19 Tex. Reg. 5195, 5213.

220. *Id.* at 5196.

221. *Id.*

222. 19 Tex. Reg. 7606, 7647 (to be codified at TEX. ADMIN. CODE tit. 31, § 501.12(1)).

For example, a central purpose of the Texas CMP is the more efficient and effective use of coastal natural resource areas ("CNRA").²²³ The biological and ecological characteristics upon which CNRA status may be based read like a compendium of biodiversity management factors: "terrestrial and aquatic wildlife habitat, travel corridors, escape routes, resting areas and cover; food supply and feeding areas; and breeding, spawning, nesting, and nursery areas."²²⁴ Actions which may adversely affect those values or "otherwise adversely alter coastal ecosystem dynamics" of a CNRA are subject to review under the CMP.²²⁵ Heightened review criteria apply to "critical areas," which are CNRA's "possessing special ecological characteristics of productivity, habitat, wildlife protection, or other important and easily disrupted ecological values that contribute significantly to the general overall environmental health or vitality of the coastal ecosystem."²²⁶ The CMP also provides for development of special area management plans for areas of particular concern within the meaning of the CZMA.²²⁷ The Texas CMP draws on the full authority under the CZMA to require review of federal actions affecting CNRA's,²²⁸ and imposes procedures for review of state and local actions as well.²²⁹

The Texas CMP thus serves as a model for how the CZMA can be used to integrate biodiversity conservation factors into

223. *Id.* at 7642 (to be codified at TEX. ADMIN. CODE tit. 31, § 501.1(a)).

224. *Id.* at 7643 (to be codified at TEX. ADMIN. CODE tit. 31, § 501.2(a)).

225. *Id.* (to be codified at TEX. ADMIN. CODE tit. 31, § 501.2(d)(1)).

226. *Id.* at 7645 (to be codified at TEX. ADMIN. CODE tit. 31, § 501.3(a)(8)).

227. *Id.* at 7659 (to be codified at TEX. ADMIN. CODE tit. 31, § 504).

228. *Id.* at 7695 (to be codified at TEX. ADMIN. CODE tit. 31, § 506).

229. *Id.* at 7670 (to be codified at TEX. ADMIN. CODE tit. 31, § 505).

According to officials with the Texas General Land Office's Coastal Management Division, Governor Richards submitted the state's CMP to the Department of Commerce in December 1994, before leaving office. Also, the CCC delayed the effective date of the CMP until July 31, 1995, to allow the Texas legislature to approve or alter the basic structure. Two bills, one to endorse the CMP as proposed and one to require adjustments, currently are under consideration in the legislature. Telephone Interview with Tom Nuckols, Texas General Land Office, Coastal Management Division (Mar. 9, 1995). To allow that process to unfold, in March 1995 Governor Bush withdrew the state's CMP from Commerce Department review. See Letter from George W. Bush, Governor, State of Texas, to Jeffrey R. Benoit, Director, Office of Ocean and Coastal Resources Management, National Oceanic and Atmospheric Administration, United States Department of Commerce (Mar. 8, 1995) (on file with author). See generally Dave McNeely, *Revenge for Perry Not So Sweet for Bush*, AUSTIN AM.-STATESMAN, Mar. 14, 1995, at A11.

the existing web of land use controls, albeit with respect to only one ecosystem type. Without increasing the regulatory burden, Texas has shifted the focus of those burdens to account for biodiversity as a coordinating goal.

d. Conclusion

The CZMA represents a hybrid approach to biodiversity conservation policy in that it serves as a vehicle for expressing specific biodiversity goals for a defined ecosystem, but it implements those goals through what is functionally a review procedure without independent substantive regulatory authority. The regulatory brunt of the CZMA is softened compared to the ESA and CWA section 404, but the procedural duties are strengthened compared to NEPA. Through explicit reference to biodiversity as a CZMA review factor and vigilant adherence to the review procedures and criteria, the CZMA thus can be used to influence the federal, state, local, and private interests in the coastal zone to cooperate towards a comprehensive biodiversity management policy.

II. PROSPECTS FOR THE MATURATION OF BIODIVERSITY
CONSERVATION POLICY

*The way in which the Department of Interior is going about protecting many species puts unjust limits on the use, market value, and transferability of certain property This debate is no longer about protecting our treasured natural resources from harm, it's about the federal government seizing control of Texans' land. We must put a stop to this, and we must point the Department of the Interior in a new direction.*²³⁰

The four statutory programs discussed in Part I encompass the core of federal biodiversity regulation of local and private lands. Two features of the statutes as a group contribute to forming the "web" of regulation and to the complexity of that web. First, the statutes are interrelated through several feedback loops. The ESA, for example, applies its take prohibi-

230. Kay Bailey Hutchinson, *New Habitat Plan Hides an Old Game*, AUSTIN AM.-STATESMAN, Jan. 16, 1995, at A11, A11 (discussing her views on an ESA regional habitat plan proposal the Department of Interior had just issued the previous week).

tion to all persons but adds additional responsibilities for federal approvals issued under programs such as section 404 of the CWA. NEPA depends on the presence of federal action or approvals as well, and thus potentially applies in any ESA or CWA section 404 permitting situation. The CZMA consistency review procedure also would potentially apply to ESA and CWA section 404 permit decisions. Hence, these four laws are tied together, and likewise they are tied into the larger network of federal environmental laws regulating such matters as air pollutant emissions, waste water and storm water discharges, and historic and cultural resources.

Nevertheless, the federal biodiversity regulation web is not as orderly and tight as it may seem. Six different agencies are involved in the administration of the four principal biodiversity laws. They may not always agree about how to administer the interrelations that exist between the laws and the agencies. Fundamental differences exist in the style, structure, scope, and approach of the four laws and those six agencies. The ESA and section 404 are administered through large federal agencies relying on detailed, command-and-control style regulations. By contrast, CEQ is a small agency, and its rules guiding other federal agencies in NEPA implementation merely establish a framework within which the other agencies have considerable flexibility. The result is a very decentralized approach to NEPA policy and procedure within the federal system. Different from both of those approaches is the CZMA's strong reliance on state involvement as the principal architect of coastal zone protection. Like the ESA and CWA section 404, the CZMA establishes detailed federal objectives; however, like NEPA, the CZMA embraces flexibility and decentralized regulation as the means of achieving those objectives.

The differences between the four statutory programs makes gluing them together into the web of interconnected regulations an ineffective means of promoting biodiversity conservation. As a threshold matter, since none of the statutes establishes biodiversity as its central goal—the ESA is too narrow and the other statutes too broad for that purpose—the web cannot be said to position biodiversity conservation as the principal objective. Nor is there a single agency that is charged with spinning a biodiversity policy from the web. As shown above, each of the agencies is pursuing biodiversity initiatives, but often independently of the other relevant agencies. It is

difficult, therefore, to expect the regulated community of local and private land owners to enthusiastically embrace biodiversity as a goal when the federal government's own biodiversity policies are fractured and buried in obscurity in various provisions of four very different laws.

Hence, if the federal government wishes to assume a leading role in the biodiversity policy realm, as it should, it is imperative that it adopt a single law to crystalize and implement a unified federal biodiversity policy for local and private lands. The differences that exist between the laws currently used for biodiversity regulation of local and private land uses offer some insight into how that single biodiversity protection law might be structured with respect to the manner in which the federal program influences the local and private decisions. Three models of regulatory approach can be constructed from the existing regulatory landscape: (1) the command-and-control approach of the ESA and CWA section 404, which we can call the "Coercion" model; (2) the decision-making review and analysis procedure approach of NEPA, which we can call the "Coordination" model; and (3) the CZMA's approach of using states to hand craft regulatory structures for implementing prescribed federal objectives and standards, which we can call the "Cooperation" approach.

The experience of the four existing statutes in addressing and accomplishing the goals of biodiversity conservation on local and private lands can be used as an indication of the appropriate manner of structuring a unified, comprehensive federal biodiversity program. Of course, defining the goals of a biodiversity conservation program is the important first step in the process of evaluating the models. Those goals must balance the aspirational values lying behind biodiversity conservation which lead to a "more is better" approach, with the realities of scientific uncertainty, administrative practicality, and political controversy that have burdened efforts to achieve biodiversity conservation under the ESA, CWA, NEPA, and the CZMA.

A. The Goals of a Comprehensive Biodiversity Conservation Program

The basic goal of a biodiversity protection program must be to "maintain naturally occurring ecosystems, communities, and

native species."²³¹ In order to do so, the biodiversity conservation program must be effective at identifying and locating activities in less sensitive areas, minimizing impacts of actions taken in sensitive areas, and restoring lost biodiversity.²³² That involves implementing the principles of biodiversity management which the CEQ outlined in its 1993 policy statement for NEPA. Additionally, those goals must be implemented without alienating local and private interests to the point of broad resistance; indeed, local and private interests ideally would see the biodiversity conservation program as significantly superior to the existing framework in terms of promoting land use value and sensible land use decision-making. With those broad programmatic goals in mind, any proposal for a unified, comprehensive biodiversity law applicable for local and private lands must answer five basic questions: who, what, when, how, and how much.²³³

1. Who

The who questions come in three forms: who shall establish the policies and objectives of the program, who shall implement them, and who shall be subject to the program as implemented? The first two questions require a decision as to the degree to which the federal government prescribes and implements the program, and through what entity, versus relying on other governmental units such as states and their political subdivisions. Section 404 of the CWA and the CZMA define the range

231. BIODIVERSITY CONSIDERATIONS, *supra* note 5, at 5.

232. *Id.*

233. The question of *where* to focus biodiversity conservation policy is implicitly answered in part by the title of this article—nonfederal lands. A fundamentally different policy may be required for an effective biodiversity program on federally owned lands. Indeed, the central point of this article is that, although ecosystems may not respect those ownership boundaries, landowners and their perception of the reasonable expectations that come with land ownership do pay very much attention to those boundaries. While there is no question that the biodiversity policies for federal and nonfederal lands must be coordinated and work together where both kinds of properties are mixed together within an identified ecosystem, it has been a fundamental mistake of the federal government thus far to assume that policies that seem to work in one realm—federally-owned land where the federal government is its own master—will necessarily work in the other realm. Indeed, as shown herein, the federal government is learning that lesson the hard way in parts of the country where only a small portion of the land which is the subject of federal biodiversity conservation efforts is owned by the federal government. See *infra* text accompanying notes 243-45.

taken under the four existing programs, with section 404 representing a dominant federal program and the CZMA relying heavily on state implementation of federal objectives, albeit under close federal scrutiny. Based on the experience under the four existing statutes, the goals in those respects should be defining the federal objective with clarity and enlisting the enthusiastic participation of whatever local jurisdictions will feel the effects of regulation directed towards those objectives.

As to who shall be subject to regulation, the four existing programs offer an array of possibilities. The wetlands protection program under CWA section 404 extends broadly to all persons. By contrast, only federal agencies are subject to the duty under NEPA to conduct pre-decisional review of the environmental impact of their actions, albeit that duty reaches deeply into state, local, and private affairs given that it is triggered by federal approvals of nonfederal actions. The ESA takes both approaches: all persons are subject to the section 9 prohibition against take of endangered species, but only federal agencies (and nonfederal projects they fund or authorize) are subject to the duty to consult under section 7. That approach has not always provided a clear picture of who is the appropriate regulated party, however, as some questions of species protection have no clear nexus to any particular "taker" or federal action.²³⁴ The CZMA takes an unusual approach, acting mainly as a funnel for whatever form of state regulation the state adopts in its coastal management plan, so that the persons subject to those state regulations are subject to the CZMA. The CZMA's federal consistency review program further sweeps in all federal actions, and nonfederal actions subject to federal funding or approval.

Based on the experience under those four statutes, the goals for whom to regulate under any approach for a biodiversity program should be identifying the persons whose actions most affect biodiversity and who can be enlisted for support of the biodiversity conservation program.

234. For example, the Spruce-Fir Moss spider, which FWS has proposed for listing as an endangered species, is believed to be threatened principally by the foliage desiccation caused by acid deposition. See *supra* note 103. Who causes that?

2. What

The science of biodiversity appears to be approaching the point of enabling us to identify areas of biodiversity wealth and of informing us as to which of those areas are in need of legal protection. We also have developed an understanding of some of the major threats to biodiversity and how they contribute to biodiversity degradation, including habitat alteration, pollution, overharvesting, introduction of exotic species, disruption of natural processes, and global climate change. That knowledge, however, does not tell us what to regulate—that is, the regulatory targets. Targets of environmental regulation include products, pollutants, facilities, government agencies, individuals, and specified land uses.²³⁵ For biodiversity conservation, the targets might include defined biodiversity areas, specific biological traits of areas, pollutants of concern, certain activities perceived to injure sensitive areas, or all of those and others.

The four existing programs exhibit a broad range of approaches with respect to the targets of regulation. The ESA, for example, focuses on individual species. When critical habitat is designated for a species, further definition of the core area of the regulation is available; however, critical habitat designation remains of little legal significance and is seldom used. To compensate, FWS has created the unwieldy notion of behavioral habitat under the harm definition, which has invited judicial chastising. By contrast, the CZMA and CWA section 404 programs rely on carefully defined ecosystems. Section 404 relies on physical characteristics to define wetlands, whereas the CZMA uses geographic characteristics to define the coastal zone. At the extreme is NEPA's procedural review program, which requires consideration of environmental impacts generally, using as broad a definition of environment as possible. Each of those approaches has shortcomings. The ESA's species focus does not inherently equate with biodiversity. The identification in the CZMA and section 404 of discrete ecosystems limits the usefulness of those laws outside such defined areas. Conversely, NEPA's breadth dilutes its effectiveness in specific contexts.

The goal of a biodiversity program, therefore, should be to define the what of biodiversity regulation in a manner that is

235. ROBERT V. PERCIVAL ET AL., ENVIRONMENTAL REGULATION: LAW, SCIENCE, AND POLICY 143-45 (1992).

geographically and scientifically capable of identification, study, and evaluation, and which encompasses all the factors needed to effectively manage the biodiversity of the defined geographic area and ecosystem entity.

3. When

The when factor of biodiversity regulation focuses on the timing of regulatory response. NEPA's environmental impact review procedure, for example, focuses on the point of administrative commitment to an action, as do the CZMA's federal action consistency review and ESA section 7 consultation procedures. The CWA section 404 and ESA section 10(a) permitting procedures are triggered when persons subject to those statutes—effectively everyone—propose to take actions which would be prohibited in the absence of a permit. Under either approach, the regulatory program is triggered prior to the regulated action, but only when an action is under consideration. Only by establishing uniform standards and applying them consistently program-wide and over time to all actions subject to review could any form of comprehensive, proactive biodiversity policy emerge from that approach. The existing programs taking that approach have had mixed measures of success in that regard. By contrast, the duty of federal agencies under section 7(a)(1) of the ESA to conserve species implies an affirmative, ongoing program independent of specific proposed actions. That broad implication, however, is seldom followed, and no clear set of principles, whether legislative, administrative, or judicial, has emerged to guide what the conservation duty entails.

Based on those experiences, the goal of when to regulate under a federal biodiversity law should be to instill some form of meaningful ongoing and proactive protection efforts, while ensuring that proposed actions and their cumulative effects on existing and other likely future actions are evaluated early in their planning stages.

4. How

Once we have decided who should regulate and be regulated, what to regulate, and when to regulate, the how question asks which tools and methods of environmental regulation should be used to meet the regulatory goals. For example, some of the tools of regulation used in environmental law include

design standards, performance standards, ambient standards, emissions limits, marketable allowances, taxes and other fees, subsidies, liability rules, planning requirements, and information gathering and disclosure requirements.²³⁶ Depending on which tools are considered most effective, the methods chosen may include a permitting program, used most often when design or performance standards are the option, or a procedural review requirement, used when information gathering, analysis, and dissemination are the objective, or some form of grant or incentive program, used when subsidies or other financial mechanisms appear to be the most promising approach.

The four existing biodiversity programs define a broad range of tools and methods. NEPA adopts a procedural review methodology for imposing planning and informational requirements. As CEQ's biodiversity initiatives suggest, however, that approach may prove too passive to produce meaningful biodiversity conservation. The CZMA strengthens the planning step considerably by providing incentives to states to network regulatory authorities in their coastal management plans and imposing the consistency review procedure on state and federal agencies. The added measure of substantive force the CZMA offers over NEPA allows states to develop and enforce comprehensive coastal zone protection programs in a flexible manner. By contrast, the ESA and CWA section 404 go the full distance in terms of prescriptive tools and methods, by imposing a permitting requirement as the only means of avoiding a direct prohibition of specified actions deemed harmful to the statutory goals. The ESA and section 404 thus are able to take a more direct route to bring about biodiversity conservation measures than is possible under NEPA and the CZMA, but at the expense of relations with the regulated entities.

The goal of a biodiversity conservation program, therefore, should be to incorporate meaningful tools and methods of substantive *regulation*, rather than simply procedures, but to do so in a flexible framework which avoids alienating the regulated community.

236. *Id.* at 149-52.

5. How Much

One of the most difficult policy decisions when designing a regulatory program is to determine how much regulation to impose through whatever tools and methods provide the regulatory framework. There must be some mechanism for measuring the need for and requisite intensity of the regulatory response, as well as for evaluating the ongoing success of the program. For example, the criteria adopted in environmental regulations include measures of public health, environmental quality, safety, technological feasibility, economic practicability, or a balancing of those factors.²³⁷

Most of the existing biodiversity conservation programs adopt a balancing approach, in which specified interests including biodiversity are weighed to determine the overall thrust and success of the program. The Corps' description of public interest review criteria under the CWA section 404 program provides a classic example of such a balancing approach. NEPA and the CZMA are less explicit in that respect, but involve principally a balancing of competing interests. By contrast, the ESA focuses almost exclusively on species protection criteria.²³⁸ That narrow focus has led to intense criticism of the ESA by state, local, and private interests, portraying it as an inflexible tool capable of absurd results. A successful biodiversity program may need to depend more on the flexibility inherent in multiple-focus statutes such as NEPA, CWA section 404, and the CZMA.

237. *Id.* at 146-47.

238. Only in the limited contexts of critical habitat designation and recovery planning does the ESA expressly allow other criteria, such as economic impact, to weigh in the balance. See 16 U.S.C. § 1533(b)(2) (1988) (critical habitat); 16 U.S.C. § 1533(f)(1)(B)(i)-(iii) (1988) (recovery planning). Moreover, FWS takes the position, with CEQ's support, that its species listing and critical habitat designation decision making functions are not subject to ESA, insulating them even further from broad based criteria review. See 48 Fed. Reg. 49,244 (1983); see also *Pacific Legal Found. v. Andrus*, 657 F.2d 829, 836 n.6 (6th Cir. 1981) (listing decisions not subject to NEPA); *Douglas County v. Babbitt*, 48 F.3d 1495 (9th Cir. 1995) (critical habitat designation is not subject to NEPA). For the view that FWS's implementation of the ESA is accommodating to economic interests, see Jon A. Souder, *Chasing Armadillos Down Yellow Lines: Economics in the Endangered Species Act*, 33 NAT. RESOURCES J. 1095 (1993).

B. *Assessing the Models*

The foregoing examination of the regulatory imperatives of a biodiversity conservation program suggest that the central necessary feature must be flexibility. Flexibility will be needed to respond to different types of ecosystems facing different types of pressures. Flexibility will be needed to adapt regulatory responses to existing state and local regulatory culture. And flexibility will be needed to shape regulatory consequences according to realistic appraisals of where protection is needed most, will be most efficacious, and will not cause undue adverse social and economic consequences. Although each of the three regulatory models is capable of supplying the who, what, when, how, and how much, they differ markedly in terms of doing so with the flexibility needed for an effective biodiversity conservation program.

1. Coercion Model—Cannons Aimed at Anthills

Statutes fitting the Coercion model, such as the ESA and CWA section 404, start from the premise that a specified activity or condition is flatly prohibited. Thus, the ESA prohibits taking of listed species, and section 404 prohibits discharges in waters of the United States. The stronger the initial prohibition is made and the more broadly its scope in terms of persons subject to the prohibition, the more potent the coercive effect will be. For example, the ESA's take prohibition with respect to fish and wildlife species extends broadly to all persons on all lands, and thus is an extremely heavy hammer; whereas the prohibition of take of plant species applies narrowly to actions on federal lands and to state law violations, and thus receives very little attention.

The coercive effect of the prohibitory element is translated into extraction of benefits through the second major premise of Coercion model statutes—the permitting or variance procedure. By authorizing the implementing agency to permit the prohibited activity under prescribed conditions, the Coercion model statutes extend a carrot as a reward for obeying the stick of the prohibitory provision. The Coercion model statutes thus define the playing field by delineating how the otherwise proscribed activity or impact must be carried out in order to take advantage of the permitting opportunity.

But the reward of a permit comes at high cost through the third major premise of Coercion model statutes—the mitigation condition. Mitigation is simply the coerced payment required for the permit. As the EPA's guidelines under the section 404 program illustrate, compensatory mitigation, though subordinate to avoidance and minimization of effects on wetlands as a policy, plays a large role in shaping the impact of section 404 on nonfederal lands.

The reason so many environmental statutes employ the Coercion model is that it is so easy to design and implement, and virtually nothing stands in the way of an aggressive use of the coercive tactics with respect to nonfederal lands. Under the Commerce Clause Congress has nearly boundless jurisdiction to impose the coercive structure on nonfederal lands in response to almost any perceived environmental deprivation.²³⁹ Moreover, through the extension of a permitting procedure as relief from the prohibitory element, the Coercion model statute can avoid a facial attack alleging it is contrary to the requirement that government justly compensate takings of private property. By judiciously using the mitigation requirement to extract only so much as the permit applicant can tolerate and still be left with an economically viable project, the implementing agency can avoid most claims that denial of a permit or the functional equivalent thereof has caused an uncompensated taking.²⁴⁰ Hence, for example, no case has found the exercise

239. See, e.g., *United States v. Riverside Bayview Homes*, 474 U.S. 121 (1985) (confirming that Corps jurisdiction under § 404 extends to wetlands located adjacent to navigable waters because of their possible influence on such waters). The only case in the past three decades even to suggest a commerce power limitation on the scope of federal environmental regulation, *Hoffman Homes, Inc. v. United States Env'tl. Protection Agency*, 961 F.2d 1310 (7th Cir. 1992) (section 404 does not reach isolated wetlands which have no demonstrable connection to interstate commerce), was later vacated by the en banc court of appeals. *Hoffman Homes, Inc. v. United States Env'tl. Protection Agency*, 975 F.2d 1554 (7th Cir. 1992).

240. For thorough discussions of why private property takings law does not pose substantial obstacles to the land use impacts wrought by federal environmental regulatory programs, see Richard A. Epstein, *Lucas v. South Carolina Coastal Council: A Tangled Web of Expectations*, 45 STAN. L. REV. 1369 (1993); Robert Meltz, *Where the Wild Things Are: The Endangered Species Act and Private Property*, 24 ENVTL. L. 369 (1994); Glenn P. Sugameli, *Takings Issues in Light of Lucas v. South Carolina Coastal Council: A Decision Full of Sound and Fury Signifying Nothing*, 12 VA. ENVTL. L.J. 439 (1993). For the contrary view, depicting takings law as increasingly posing an obstacle to aggressive federal environmental land use regulation, see Joseph L. Sax, *Property Rights and the*

of ESA jurisdiction to be a taking of property,²⁴¹ and only in cases of outright permit denial has section 404 been found to cause an uncompensated taking.²⁴² In short, the only viable check on congressional use of the Coercion model and the implementing agencies' aggressive application of it is political self-restraint.

The central advantage the Coercion model offers to biodiversity conservation, therefore, is its potent ability to translate specified uniform federal goals into desired behavior responses by the regulated community. The Coercion model is fast, easy, and cheap in that respect. It is fast in the sense that the structure for compliance can be established within the framework of the legislation itself; no third party contribution is needed. The Coercion model is easy in the sense that the desired response by the regulated community can be shaped with a great degree of precision through the coercive qualities of the prohibition and permitting elements. And the Coercion approach is cheap because, other than the cost of administration and enforcement necessary to support the coercive framework, the desired behavior response comes at no cost to the federal government.

Those strengths, however, are the source of the Coercion model's ultimate downfall. Fearing the potential for runaway administrative policies when agencies are armed with too much coercive power, Congress tightly controls both the scope of the prohibitory element of the Coercion model statutes and the criteria for administration. For example, the ESA limits the broad reach of the take prohibition to fish and wildlife species, details the criteria by which species must be listed, and establishes the standards for measuring incidental take authorizations. FWS is left having to squeeze its broad and ambitious "ecosystem approach" into the ESA's more narrow species focus.

Economy of Nature: Understanding Lucas v. South Carolina Coastal Council, 45 STAN. L. REV. 1433 (1993); Susan Shaheen, *The Endangered Species Act: Inadequate Species Protection in the Wake of the Destruction of Private Property Rights*, 55 OHIO ST. L.J. 453 (1994). For a very broad discussion of the history of land use patterns within the context of environmental regulation and takings law, see Fred Bosselman, *Four Land Ethics: Order, Reform, Responsibility, Opportunity*, 34 ENVTL. L. 1439 (1994).

241. See Sugameli, *supra* note 240, at 491-93.

242. See, e.g., *Florida Rock Indus. v. United States*, 18 F.3d 1560 (Fed. Cir. 1994); *Loveladies Harbor, Inc. v. United States*, 28 F.3d 1171 (Fed. Cir. 1994).

The Coercion model thus poses a dichotomy of tremendous potency channeled into narrowly defined zones of jurisdiction and authority. Administrative agencies faced with carrying out broad policy mandates set by Congress under Coercion model statutes generally respond to that dichotomy by regulating fiercely within the prescribed zone. The result, very often, is a backlash by the regulated community of equally fierce and focused intensity. The all-or-nothing warfare mentality that develops in such cases threatens the viability of the underlying goals of the regulatory program, notwithstanding that consensus often exists as to the basic desirability of achieving those goals.

A classic case in point is provided in the city of Austin, Texas and surrounding Travis County. Beginning with a public meeting FWS convened in February 1988, federal, state, and local governments joined with environmental and development groups from the Austin area in an attempt to forge a regional solution to the many issues posed by the presence of endangered species within the urbanized area.²⁴³ Although the effort suffered many fits and starts at first, by 1993, five years after the process was initiated, a plan had been developed in principle, the City of Austin had successfully passed a bond referendum to finance its portion of habitat acquisition, and Travis County had placed a \$49 million bond referendum on the November 1993 ballot to finance the remainder.²⁴⁴

Most of those efforts, however, had been coerced, in the sense that FWS's strident application of the harm definition had gridlocked development in the prime development areas of the county. During the six years of regional planning, FWS had exercised little restraint in posing the harm definition as a weapon to be used against anyone daring to develop in areas that FWS had declared should be preserved.²⁴⁵ FWS extract-

243. See generally Ruhl, *supra* note 126, at 1413-23.

244. See generally Taylor, *supra* note 127, at 595-601.

245. FWS eventually became nothing short of the gatekeeper of land use in the Austin area by using the harm definition as its ground for claiming that persons could not develop in or near the habitat of several listed endangered song birds and cave-dwelling invertebrate species. Developers and their financiers, as well as owners of individual lots, deluged FWS with requests for advisory opinions as to the need for incidental take authorization. Several thousand of these so-called "bird letters" and "bug letters" were sought. A frequent response FWS offered was that the possibility of causing harm, even when remote, could not conclusively be ruled out, and thus an incidental take permit should be sought.

ed expensive mitigation conditions from the few developers and companies brazen enough to seek individual take authorizations before the regional plan was put in place.²⁴⁶ FWS's unmistakable message was that individual permitting would be expensive and time consuming, so wait for (and support) the regional plan. Regardless of whether FWS's policies faithfully implemented the ESA as Congress intended or stretched it beyond its legal bounds, a question now squarely in Congress's court, the regulated community in Austin at the time perceived that it had a gun held to its head, leaving it no choice but to engage in the regional planning effort.

Indeed, notwithstanding general agreement among landowners and development interests that regional planning offers an efficient, sensible way of managing local biological resources, the coercive nature of FWS's policies eventually built pervasive resentment and distrust of FWS and the regional planning process within the regulated community. In quick succession, events from November 1993 to November 1994 eroded anything that had been gained towards a solution. First, a grass roots campaign by landowner and anti-tax interests defeated the county's bond election, leaving the regional plan without a

Telephone Interview with Steven D. Paulson, Austin Office Director, SWCA, Inc. (Nov. 18, 1994) (consultant who prepared many requests for a "bird letter" or "bug letter"); *see, e.g.*, Letter from Sam D. Hamilton, Austin Field Supervisor, United States Fish and Wildlife Service, to Don Walden, Riata Associates, Inc. (Dec. 18, 1991) (on file with author) (reciting the agency's prototype response that "[w]e do not have sufficient information at this time to state that development of the remainder of the tract would not adversely affect the warbler"). Of course, as no simple or inexpensive procedure for securing such authorization exists, many individual lot owners either suspended plans for their homes or simply risked the consequences of building. Ironically, developers with deeper financial resources began seeking incidental take authorizations, which FWS was obligated to process, thus reducing the need within the development community for a regional plan. *See, e.g.*, Ralph K.M. Haurwitz, *FM Properties Qualifies for Permit*, AUSTIN AM.-STATESMAN, Feb. 1, 1994, at B1 (4700-acre development approved for ESA § 10(a) permit in return for dedication of 4000-acre preserve area). FWS also eventually issued a simplified, reduced cost permitting procedure for a limited class of single family lots, *see* AUSTIN FIELD OFF., U.S. FISH & WILDLIFE SERV., ENDANGERED SPECIES ACT COMPLIANCE PROCESS FOR SINGLE FAMILY RESIDENTIAL LOT (Jan. 1995) (on file with author), and Texas sued the agency as *parens patriae* for its citizens to challenge the need for any permits in the first place. *Texas v. Babbitt*, No. W-94-CA-271 (W.D. Tex. filed Sept. 30, 1994).

246. Permit application and take mitigation costs for the projects that received FWS approval under § 10(a) or § 7(a)(2) of the ESA through June 1992 averaged \$9000 per acre of development. *See* Gau & Jarrett, *supra* note 71, at 4-13.

funding source.²⁴⁷ To fill the funding gap, the city proposed a plan that relied on development fees approaching \$40,000 per acre of development, a deal developers found easy to do without.²⁴⁸ The March 1994 decision *Sweet Home Chapter of Communities for a Great Oregon v. Babbitt*,²⁴⁹ which invalidated FWS's harm definition,²⁵⁰ served as a rallying point for Austin area landowner interests, a vindication that they were "right" about FWS's coercive excesses. Because no cooperative incentives had ever been established between FWS and landowners,²⁵¹ the landowner community has little reason

247. See generally Taylor, *supra* note 127, at 596 n.81.

248. Letter from J.B. Ruhl, Conserve As You Grow (CAYG) Task Force Representative, Real Estate Council of Austin, to George Avery, CAYG Task Force Representative, Sierra Club 2 (Feb. 28, 1994) (on file with author). I was a member of the task force the Mayor of Austin convened to determine whether the City's proposal would have been acceptable to the variety of competing interests involved as a means of meeting the funding needs, which were in excess of \$200 million for the preserve acquisition and maintenance. See CITY OF AUSTIN, CONSERVE AS YOU GROW (CAYG) PLAN FUNDING ASSUMPTIONS 5 (Apr. 11, 1994) (on file with author). The City's proposal, known as the "Conserve As You Grow" plan, involved a mixture of development fees and mitigation ratios which would have resulted in the typical real estate developer facing the prospect of having to recover over \$40,000 for each acre of development authorized under the regional permit. See CONSERVE AS YOU GROW: A STRATEGY FOR REGIONAL HABITAT CONSERVATION PLAN IMPLEMENTATION IN THE BALCONES CANYONLANDS (Draft Feb. 14, 1994) (on file with author) (describing the development fees and mitigation ratios to be used); Letter from J.B. Ruhl, CAYG Task Force Representative, Real Estate Council of Austin, to George Avery, CAYG Task Force Representative, Sierra Club (Feb. 28, 1994) (on file with author) (describing application of the proposed development fees and mitigation ratios to a typical development project). An alternative proposal from the development community would have capped development fees at \$6000 per acre. See Letter from Paul J. Bury, President, Real Estate Council of Austin, to Bruce Todd, Mayor, City of Austin (Mar. 17, 1994) (on file with author). The Task Force vote rejected the City's proposal and resulted in a tie vote on the development community's alternative, City of Austin, Mayor's Task Force Ballot Final Tally (Apr. 11, 1994) (on file with author), and the City Council of Austin and Commissioners Court of Travis County rejected both approaches.

249. 17 F.3d 1463 (D.C. Cir. 1994), *cert. granted*, 115 S. Ct. 714 (1995).

250. See *supra* notes 80-83 and accompanying text.

251. For a discussion of the breakdown of relations between the landowning community and the governmental entities promoting the regional plan, see Catherine M. Allen, *Regional Habitat Conservation Planning: Is It Really the Answer to Reconciling Conflicts Under the Endangered Species Act?* (June 1994) (unpublished M.A. thesis, Institute for Conflict Analysis and Resolution, George Mason University) (on file with author); see also TRAVIS COUNTY COMMISSIONER'S COURT, TRAVIS COUNTY LANDOWNER SURVEY: FOCUS ON ENDANGERED SPECIES ISSUES (Mar. 1993) (on file with author) (revealing widespread distrust of ESA authorities and policies among the surveyed property owners).

after *Sweet Home* to continue the regional planning dialogue, at least not until the final word on *Sweet Home* is spoken. This was particularly so given that the estimates at the time of the total cost of acquiring and maintaining the habitat preserve areas for the thirty-one-year life of the permit would be in excess of \$219 million.²⁵² The last straw came when news leaked of alleged plans by FWS to designate thirty-three central Texas counties as critical habitat for the Golden-cheeked warbler, a migratory songbird that nests exclusively in central Texas.²⁵³ The critical habitat issue became the cause celebre for a broad "wise use" property rights movement known as "Take Back Texas," which demanded local and state action against FWS and the federal government generally.²⁵⁴

Being an election year, Governor Ann Richards answered those pleas and more, albeit to no apparent advantage given her resounding defeat in the election. Her plans to designate a sensitive watershed in Austin as protected under the Clean Water Act were tabled.²⁵⁵ Her stern letter to Secretary of Interior Babbitt²⁵⁶ evoked an agreement not to designate any critical habitat.²⁵⁷ Ironically, Secretary Babbitt's purported

252. See CITY OF AUSTIN, *supra* note 248, at 5.

253. See Jerry Needham, *Songbird Plan Hits Sour Note with Lawmaker*, SAN ANTONIO EXPRESS-NEWS, July 13, 1994, at 1B.

254. See Ralph K.M. Haurwitz, *Land Groups Unite to Protect Private Property Rights*, AUSTIN AM.-STATESMAN, Aug. 24, 1994, at B1; Michele Kay, *Environmentalists Experience "Backlash,"* AUSTIN AM.-STATESMAN, July 29, 1994, at A1; Linda L. Welch, *Crowd Blasts Species Act at Meeting*, AUSTIN AM.-STATESMAN, Sept. 22, 1994, at B1.

255. See Letter from Ann Richards to John Hall, *supra* note 1.

256. See Letter from Ann Richards to Bruce Babbitt, *supra* note 20.

257. See Letter from Bruce Babbitt, Secretary, United States Department of Interior, to Ann W. Richards, Governor, State of Texas (Sept. 22, 1994) (on file with author); see also Ralph K.M. Haurwitz, *Babbitt Backs Down Once Again, Critics Say*, AUSTIN AM.-STATESMAN, Sept. 29, 1994, at A1; Stefanie Scott, *Feds Ground Warbler Plan*, SAN ANTONIO EXPRESS-NEWS, Sept. 28, 1994, at 1A. The Interior Department's efforts to quell private landowner criticisms of the ESA subsequently broadened to include, for the first time in the Clinton administration, advocating limited legislative reforms designed to ease the impact of small landowners in the hope, apparently, that such acceptance of mild reform will stave off a complete statutory overhaul in Congress. See U.S. DEPT OF INTERIOR, PROTECTING AMERICA'S LIVING HERITAGE: A FAIR, COOPERATIVE, AND SCIENTIFICALLY SOUND APPROACH TO IMPROVING THE ESA (Mar. 6, 1995); United States Department of Interior, News Release: Administration Proposes Endangered Species Act Exemptions for Small Landowners; "Guideposts for Reform" Would Give More Authority to States (Mar. 6, 1995) (on file with author). See generally John H. Cushman, *Babbitt Seeks to Ease Rules in Bid to Rescue Imperiled Species Law*, N.Y. TIMES, Mar. 7, 1995, at B7.

reason for not pursuing critical habitat was the existence of the regional planning effort, which by then was in shambles. To top it off, the Texas Attorney General sued Secretary Babbitt alleging a litany of illegal, overreaching actions by FWS in its ESA implementation in Texas,²⁵⁸ and the Texas legislature initiated a series of property rights hearings putting FWS on the hot seat.²⁵⁹ It remains to be seen whether a new version of the regional habitat plan FWS unhatched in January 1995, ostensibly to inject local involvement into the process, can heal the wounds the agency's past practices inflicted on relations with nonfederal stakeholders.²⁶⁰ Initially, Secretary Babbitt's description of the plan as being as "local as the corner grocery store"²⁶¹ contrasted sharply with United States Senator Kay Bailey Hutchinson's description of the proposal as "extortion."²⁶²

258. See *Texas v. Babbitt*, No. W-94-CA-271 (W.D. Tex. filed Sept. 30, 1994).

259. See Subcommittee on Mitigation of Private Property Rights, Texas House of Representatives, Press Release (June 3, 1994) (on file with author) (announcing public hearings).

260. The new version proposes that development fees initially be set at \$5500 per acre of occupied habitat and \$2750 per acre of "possible" species habitat, subject to future adjustments according to the market price of the 9500 acres of preserve lands sought to be acquired through such private funding sources. See United States Department of Interior and the City of Austin, *Balcones Canyonlands Conservation Plan (BCCP): Shared Vision* (Jan. 18, 1995) (on file with author); City of Austin, *Participation Fee Calculations Under the Balcones Canyonlands Conservation Plan* (Jan. 1995) (on file with author). If the proposed development fee approximates the market price of the preserve lands, therefore, the private sector would fund about \$52 million of the regional plan's cost. The agency's latest proposal nonetheless would thereby, according to FWS's press release, dramatically lower the private sector burden of the regional plan. See Office of the Secretary, United States Department of Interior, Press Release: *Babbitt Agrees to Balcones Development Proposal; Would Allow Faster, Less Expensive Permit Process for Major Development Projects* (Jan. 10, 1995) (on file with author). See generally Ralph K.M. Haurwitz, *New Balcones Plan Counts on Capitalism*, AUSTIN AM.-STATESMAN, Jan. 12, 1995, at B2.

261. See Office of the Secretary, United States Department of Interior, *supra* note 260, at 2.

262. See Hutchinson, *supra* note 230, at A11. Many property rights advocates also criticized the most recent proposal as being "nothing but bribery." See Ralph K. M. Haurwitz, *Landowners Deride Conservation Plan*, AUSTIN AM.-STATESMAN, Feb. 1, 1995, at B6 (quoting the president of the Take Back Texas organization). At least one influential development industry representative, the Capitol Area Builders Association, withdrew support from the plan as proposed shortly into the negotiations the Department of Interior convened through a "Community Conservation Plan Working Group." See Tim Lott, *Builders Group Withdraws From BCCP Talks*, AUSTIN AM.-STATESMAN, Feb. 11, 1995, at B4. The group apparently did not believe the proposal would provide sufficient long-term

Austin's experience illustrates the Coercion model's limitations when solutions require a strong measure of local and private autonomy. Even though Austin's regional planning effort ostensibly was local in nature, its motivation was essentially coerced by rigid federal policies. By no means is Austin alone in this experience with Coercion model regulation. Litigation throughout the nation challenging implementation decisions under ESA and section 404 is simply the manifestation of a more deeply rooted movement challenging Coercive model federal land use regulations in courts, state and federal legislatures, and the media. Known as the "wise use" movement, its theme focuses on three alleged deficiencies of Coercive model laws: (1) intrusion on private property rights; (2) creation of underfunded regulatory mandates; and (3) insensitivity to economic efficiency and cost-benefit analysis of regulatory policy.²⁶³ Regardless of the merits of the arguments employed to articulate that so-called "Unholy Trini-

development certainty, or was even necessary given the limited scope of the harm definition. See Letter from James R. Irvine, President, National Home Builders Association, to Bruce Babbitt, Secretary, United States Department of Interior (Feb. 21, 1995) (on file with author).

263. The so-called "wise use" movement has emerged from a grass roots level response that has been remarkably effective despite its nearly invisible formal structure, financial backing, and written imprint. See AMERICANS FOR THE ENVIRONMENT, THE POLITICAL AGENDA OF THE "WISE USE" MOVEMENT (1993) (citing newspaper editorials by "wise users"). Ironically, the most organized, accessible descriptions of the wise use philosophy appear in documents prepared by environmental groups opposed to the wise use agenda, most of which are presented in hyperbolic invective. See, e.g., THE WILDERNESS SOCIETY, THE WISE USE MOVEMENT: STRATEGIC ANALYSIS AND FIFTY STATE REVIEW (3d printing, revised Mar. 1993). Most of the environmental groups following the issue trace the origin of the wise use movement to the August 1988 Multiple Use Strategy Conference in Reno, Nevada. See, e.g., *id.* at 6. Although there appears to be no leading, formally structured wise use organization, environmental groups identify several organizations as the core of the wise use movement, including the Center for the Defense of Free Enterprise, Alliance for America, and People of the West. *Id.* at 6-11; see also CENTRAL ROCKIES REGION, THE WILDERNESS SOCIETY, THE WISE GUYS: DISMANTLING THE PUBLIC LANDS (1993). Whatever, whoever, and wherever it is, the wise use movement clearly has rattled the environmental groups most interested in biodiversity issues, causing the presidents and executive directors of 15 national environmental groups jointly to publish an appeal to their combined memberships to implement a "Citizen Action Plan" in opposition to the wise use movement's message. Letter from Ted Danson, President, American Oceans Campaign et al., to "Environmentalists" (July 5, 1994) (on file with author).

ty,"²⁶⁴ the political reality is that the wise use movement, with its deceptively simple theme, has captured the attention of state and local jurisdictions,²⁶⁵ many federal legislators,²⁶⁶ and, apparently, the electorate in the 1994 national election.

As this recent history illustrates, FWS's efforts to work with state, local, and private interests as "partners" will continue to fall flat as a biodiversity conservation policy so long as the ESA forces the partners to the table, makes up all the rules, and keeps the deck stacked in its favor. There is little basis for concluding that any other Coercive model approach to federal biodiversity conservation policy will fare any better. As most of the proposals in legal literature on biodiversity demonstrate, however, the typical response to the failure of coercive mechanisms is to enlist yet more coercive mechanisms as reinforcements in the effort to dictate nonfederal behavior. The regulated community responds only by digging its bunkers deeper and stronger. The building of more coercive tools and

264. I am not sure from whom or where the description of the wise use agenda as the "Unholy Trinity" first arose, or for that matter who coined the term "wise use," though both appear to be the widely accepted monikers for what is represented, or purported to be represented, by the movement. *See, e.g.*, sources cited *supra* note 263.

265. Many state legislatures have proposed or adopted so-called "takings bills," under which the state law defines procedures and standards for weighing whether a state environmental regulation has caused a taking for which compensation is due under state law. *See generally* NATIONAL AUDUBON SOCIETY, STATE TAKINGS LEGISLATION: A RESOURCE BOOK FOR ACTIVISTS (1993); John Martinez, *Statutes Enacting Takings Law: Flying In the Face of Uncertainty*, 26 URB. LAW. 327 (1994). Several states have pending legislation to this effect. *See, e.g.*, Colo. S.B. 136, 60th Gen. Assembly, 1st Sess. (1995); Ill. H.B. 276, 89th Gen. Assembly, Reg. Sess. (1995-96); Tex. H.B. 665, 74th Leg., Reg. Sess. (1995).

266. Several bills introduced in the 103d Congress would have altered federal takings law in the context of programs such as the ESA and section 404 by imposing additional compensation duties not presently applied under the constitutional takings analysis. *See* ROBERT MELTZ, CONGRESSIONAL RESEARCH SERV., POINTS OF DIVERGENCE BETWEEN COMPENSATION PROVISIONS OF THE "PRIVATE PROPERTY OWNER'S BILL OF RIGHTS" (H.R. 3875) AND SUPREME COURT TAKINGS JURISPRUDENCE (1994); *see, e.g.*, H.R. 1490, 103d Cong., 2d Sess. (1993) (requiring compensation under the ESA in specified circumstances); S. 177, 103d Cong., 2d Sess. (1993). Similar measures have begun to emerge, quite successfully this time, in the 104th Congress as well. *See, e.g.*, Private Property Rights Act of 1995, S. 22, 104th Cong., 1st Sess. (1995); S. 135, 104th Cong., 1st Sess. (1995); S. 145, 104th Cong., 1st Sess. (1995); H.R. 9, 104th Cong., 1st Sess. (1995) (passed the House Mar. 3, 1995; incorporating in full the provisions of the Private Property Protection Act of 1995, H.R. 925, 104th Cong., 1st Sess. (1995), as amended through Mar. 3, 1995).

more resentment in response takes on synergistic qualities and, ultimately, leads to submission by one side or the other and the loss of all sense of cooperative solution. The real victim, of course, is the policy goal itself, which, in the case of biodiversity conservation, implicates very real consequences to human existence.²⁶⁷

2. Coordination Model—Popguns Aimed at Elephants

Whereas the Coercion model relies on extensive power directed in a narrow zone of focus, Coordination model statutes rely on diffused regulatory burdens aimed at a wide target. The basic structure of these statutes begins with a broad statement of federal goals and policies geared towards coordinating “federal action.” The Coordination model statutes then inject a procedural review step into the decision-making process of the covered federal actions to ensure the decisions are made with at least some level of coordination around the goals and policies expressed in the statute. Because federal action typically is defined as involving nonfederal projects receiving federal funds or authorization, the Coordination model achieves the overall objective of coordinating a substantial portion of nonfederal projects under the federal policies.

As is true of NEPA, Coordination model statutes seldom have a substantive dimension in the sense of requiring or influencing a particular outcome in the underlying decision-making process. Given the wide jurisdiction of the statutes (usually all federal actions are covered) Congress may be leery of providing real power over decision-making outcomes. Hence,

267. Although I disagree strenuously with and demonstrate the fallacies of two of the Cato Institute’s three premises advanced in support of a “no action” federal option for biodiversity policy, see *supra* text accompanying note 16, I am hard-pressed to summarize better than the Institute the central defect of relying on the Coercion model as the guiding principle of federal biodiversity policy:

To imagine . . . that the federal government has the wisdom and knowledge to determine a single set of ecosystems for the nation and precisely locate potentially tens of thousands of miles of ecosystem boundaries, establish agreed-upon and measurable goals for the performance and desired condition of each of those ecosystems in all its complexity, and manage the intricacies of all the natural and human forces that affect the living and nonliving things on the landscape to reach those goals is to credit the federal government with an omniscience that simply does not exist in the real world.

Fitzsimmons, *supra* note 15, at 22.

although the procedural requirement can act as a sword against administrative action, as it has quite effectively under NEPA, in the final analysis the Coordination model seldom achieves the broadly stated goals and policies of the statute.

Indeed, NEPA represents about as much as one could ever hope to accomplish under a Coordination model statute in terms of shaping substantive policy, and its influence in federal land development regulation has been eclipsed by more coercive regimes such as the ESA and section 404. Other Coordination model statutes, such as the Fish and Wildlife Coordination Act²⁶⁸ and section 4(f) of the Department of Transportation Act,²⁶⁹ have left small footprints in the substantive body of law. Those laws contrast sharply with the impact of section 7 of the ESA, which blends the consultation procedure with powerful substantive regulatory and enforcement consequences, and which has thus had considerable effect on federal policy.

It is unlikely, therefore, that the Coordination model on its own can serve as an effective tool for molding federal biodiversity conservation policy. CEQ's efforts to infuse biodiversity thinking into NEPA analysis, while commendable, offer little real promise of bringing about substantive results. By contrast, FWS's "ecosystem approach" under the ESA has taken advantage of the ESA's immense regulatory clout to impose biodiversity factors as a mandatory consideration in ESA proceedings. With neither a stick nor a carrot to offer, the Coordination model itself offers little on behalf of long term biodiversity results.

3. Cooperation Model—Choosing the Right-Sized Gun for Each Target

The Cooperation model offers some measure of balance between Coercion and Coordination model statutes, holding traits of each. The essence of the Cooperation model is the expression of strong federal goals and policies in the context of a flexible partnership between federal, state, and local interests in seeing to it that the federal policies are implemented in the form of substantive legal requirements. Cooperation model

268. Pub. L. No. 85-624, 48 Stat. 401 (1934) (codified at 16 U.S.C. §§ 661-666c (1988 & Supp. V 1993)).

269. Pub. L. No. 89-670, § 4(f), 80 Stat. 934 (1966) (codified at 49 U.S.C. § 303 (1988)).

statutes often hold out some form of regulatory carrot or stick, or blend of both, as an incentive for the partners to act together within the framework of the federal goals and policies, but substantive review criteria and outcomes generally are not prescribed. Rather, it is left to the cooperative process to formulate a regulatory response directed at the particular state or local planning area.

The Cooperation model statutes thus are expensive to operate. They involve substantial transactions costs and time as the cooperating partners forge consensus over the final substantive shape of the regulatory policy. But the final result offers promise of achieving the substantive outcome with greater impact than the Coordination model offers, and with greater consensus than the Coercion model offers.

An example of both the cost and potential the Cooperation model might entail in furtherance of biodiversity conservation is the National Estuary Program,²⁷⁰ which CEQ has described as a model for biodiversity conservation efforts.²⁷¹ Authorized in 1987 under the Clean Water Act, the program allows a governor or the EPA to nominate an estuary, which may be in more than one state, and request a management conference to, among other things, "develop a comprehensive conservation and management plan that recommends priority corrective actions and compliance schedules addressing point and nonpoint sources of pollution to restore and maintain the chemical, physical, and biological integrity of the estuary."²⁷² The convening of such a conference rests in the hands of the EPA and must be based on such factors as pollutant loads, ecosystem assessment, and "the impact of nutrients, sediments, and pollutants on water quality, the ecosystem, and designated or potential uses of the [estuary]."²⁷³ The EPA may extend grants for research of those factors and administration of a plan, and the federal government then must commit to cooperate by carrying out its actions in a manner consistent with the plan.

Among the identified advantages the estuary program has offered for such important areas as the Chesapeake Bay, which

270. Pub. L. No. 100-4, § 320, 100 Stat. 7 (1987) (codified at 33 U.S.C. § 1330 (1988)).

271. LINKING ECOSYSTEMS, *supra* note 10, at 172.

272. 33 U.S.C. § 1330(b).

273. *Id.* § 1330(j).

would not have been realized through a coercive regulatory approach, is that "by establishing partnerships with the state and local governments, EPA is better able to address land use issues."²⁷⁴ Also, because of the broad focus of the National Estuary Program, it allows "planning for an ecosystem rather than a medium," making it "better able than conventional regulatory approaches to respond to cross-media pollution problems."²⁷⁵

Hence, like the CZMA and other Cooperation model statutes, the National Estuary Program offers benefits of allowing state and local interests to hand craft a plan responding to federal goals, and to implement the plan with federal financial and management support. When state and local interests motivate such efforts, rather than relying on federal coercion, the outcome is more likely to correspond to the private interests whose land and economic fate is affected by the plan. The land use measures necessary to achieve the federal goals thus are more likely to be implemented without disruptive confrontation and backlash against the federal goals. The Cooperation model, therefore, offers the most promise as the structure around which a unified federal biodiversity conservation policy should congeal.²⁷⁶

274. See Fischman, *supra* note 132, at 500.

275. *Id.*

276. Another recent example of the potential for state-led cooperative efforts comes from the San Francisco Bay-San Joaquin River Delta Estuary area of southern California ("Bay-Delta"), where state and federal agencies have agreed to a framework for managing water diversion practices which the federal government had alleged were causing takes of endangered aquatic species, most notably the Delta Smelt. See Principles for Agreement on Bay-Delta Standards Between the State of California and the Federal Government (Dec. 14, 1994) (on file with author). The Bay-Delta provides water for 20 million people, irrigation for 45% of the nation's fruits and vegetables, and life support for 120 species of fish, and yet the history of Bay-Delta management negotiations between the federal and state governments is routinely described as a decade of "combat." See, e.g., *California, U.S. Set Water Plan Affecting Farmers*, WALL ST. J., Dec. 16, 1994, at A7; *Deadline for Delta Standards*, S.F. CHRON., Dec. 14, 1994, at A22; *Water Wars Near An End?*, SAN DIEGO UNION TRIB., Dec. 13, 1994, at B6. On the one hand, therefore, the landmark agreement, which at best is still only the template for an experiment in cooperation, suggests that the state and federal governments can achieve ecosystem management frameworks affecting nonfederal lands and resources through cooperation. On the other hand, there is no question that the history of the Bay-Delta agreement was complicated and confused by the lack of a federal framework for promoting that cooperative process.

III. A SURVEY OF RECENT AND CURRENT PROPOSALS FOR ENHANCING BIODIVERSITY CONSERVATION

Most of the well-developed biodiversity conservation program proposals dealing with nonfederal lands come in one of three forms. One approach bolsters existing regulatory controls an order of magnitude by either creating one omnipotent statute or spinning more wire into the existing regulatory web. A second form, perhaps recognizing the tailspin the ESA has experienced as a harbinger of things to come for the Coercion model, attempts to soften the blow of coercive regulation of nonfederal lands by building "incentives" into the programs in order to induce greater compliance and less resentment among nonfederal actors. Under the third alternative, many proposals would embed procedural review steps in existing programs such as NEPA as a way of promoting biodiversity. None of these approaches deals head on with the levels of intensity and flexibility needed to establish a truly meaningful, workable federal biodiversity conservation program.

A. *Mega-Regulation Proposals*

Three significant proposals relying on the Coercion model differ in the "who" and "what" of regulatory choices. One proposal depends on enhancing the EPA's biodiversity regulation role under existing environmental laws. Two other proposals call for a unified federal biodiversity regulation statute, one as an extension of the ESA and the other as an extension of NEPA.

1. The EPA as Biodiversity Czar

Conspicuously absent from the existing web of federal biodiversity regulations is the EPA, whose role is limited to oversight of the Corps of Engineers' permitting under CWA section 404 and review of federal agencies' EISs prepared under NEPA. Hence, it is not surprising that a proposal has surfaced for expanding EPA's role by addressing biodiversity conservation through an even wider network of environmental authorities.

In 1993, the Environmental Law Institute ("ELI"), with the EPA's financial support, outlined the measures the EPA could take to enhance biodiversity conservation by leveraging the

EPA's existing pollution control authorities.²⁷⁷ The thesis of ELI's work is that the EPA's duty under ESA section 7(a)(1) to promote conservation of species "requires the EPA to engage all of its available powers and authorities to protect and recover species. Carrying out this conservation duty can provide further basis for the agency's use of its statutory authorities to provide affirmative protection to ecosystems and biological diversity in a variety of contexts."²⁷⁸

The ELI report examines how, through its authorities under ten major environmental statutes,²⁷⁹ the EPA could institute a regime of biodiversity regulation through changes to the way the agency implements six principal administrative functions: (1) permits and related approvals; (2) standard setting; (3) enforcement related activities; (4) delegating programs to states; (5) financial assistance; and (6) information gathering.²⁸⁰ ELI concludes that these statutes and the EPA's implementation functions provide "an extensive array of pollution control authorities that can be mobilized by both federal and state agencies for reducing ecological risks and for protecting [threatened and endangered] species and their habitats."²⁸¹

Although ELI's recommended measures include such steps as improving employee training and links with FWS, the bulk of ELI's proposal focuses on coercive regulatory measures the EPA could impose on the largely nonfederal community regulated under the pollution control statutes. For example, under the EPA's various Clean Water Act authorities ELI recommends that the agency take such measures as incorporating ESA compliance into the pollutant discharge permitting

277. ENVIRONMENTAL LAW INST., USING POLLUTION CONTROL AUTHORITIES TO PROTECT THREATENED AND ENDANGERED SPECIES AND REDUCE BIOLOGICAL RISK (1993) [hereinafter POLLUTION CONTROL AUTHORITIES]. The thesis of ELI's work is also explored in an article prepared by Professor Robert L. Fischman while he was on leave from ELI. See Fischman, *supra* note 132.

278. POLLUTION CONTROL AUTHORITIES, *supra* note 277, at 4 (discussing ESA § 7(a)(1), 16 U.S.C. § 1536(a)).

279. The ten statutes covered in the ELI report are the Clean Water Act, the Federal Insecticide, Fungicide, and Rodenticide Act, the Toxic Substances Control Act, the Resource Conservation and Recovery Act, the Clean Air Act, the Comprehensive Environmental Response, Compensation, and Liability Act, the National Environmental Policy Act, the Safe Drinking Water Act, the Emergency Planning and Community Right to Know Act, and the Pollution Prevention Act.

280. POLLUTION CONTROL AUTHORITIES, *supra* note 277, at 5.

281. *Id.* at 131.

process,²⁸² vetoing Corps permits the EPA concludes to be inconsistent with ESA concerns, establishing federal water quality criteria²⁸³ that incorporate protection of species and habitats, targeting CWA enforcement towards violators that are believed to be adversely affecting species and habitats, and conditioning grants to states for nonpoint source pollution controls,²⁸⁴ and other programs based on ESA concerns.²⁸⁵

The EPA has embraced ELI's thesis aggressively. The agency formed an Ecosystem Protection Workgroup ("Workgroup"), which met on March 15, 1994 to outline the agency's strategy for ecosystem protection.²⁸⁶ The basic finding of the Workgroup was that "[b]ecause EPA has concentrated on issuing permits, establishing pollutant limits, and setting national standards, the Agency has not paid enough attention to the overall environmental health of specific ecosystems. In short, the EPA has been 'program-driven' rather than 'place-driven.'"²⁸⁷ Meeting attendees outlined a variety of measures the agency could institute in order to fulfill ELI's vision, including reinterpreting existing laws to include biodiversity goals, elevating biodiversity as a prominent factor in permits, grants, and other program functions, making biodiversity a specific budget item for programs, and reorienting the EPA leadership towards a biodiversity conservation focus.²⁸⁸ The Workgroup prescribed a six-month time frame for identifying and evaluating regional ecosystem "demonstration area plans" designed to implement the place-driven focus of ecosystem

282. No person may discharge pollutants to waters of the United States without authorization pursuant to § 402 of the Clean Water Act. 33 U.S.C. § 1342(a) (1988).

283. Section 303 of the Clean Water Act provides a mechanism for establishing ambient water quality goals. *Id.* § 1313. The criteria used in establishing those goals and the effluent limitations necessary to achieve them include "the effects of pollutants on biological community diversity." *Id.* § 1314(a)(1).

284. Section 319(h) of the Clean Water Act authorizes federal grants to assist states in developing plans for management of nonpoint source water pollution. *Id.* § 1329(h).

285. POLLUTION CONTROL AUTHORITIES, *supra* note 277, at 131-32.

286. See U.S. ENVIRONMENTAL PROTECTION AGENCY, TOWARD A PLACE-DRIVEN APPROACH: THE EDGEWATER CONSENSUS ON AN EPA STRATEGY FOR ECOSYSTEM PROTECTION (Draft 1994) [hereinafter EDGEWATER CONSENSUS]. The conference was held in Edgewater, Maryland, thus the name of the document.

287. *Id.* at 1.

288. *Id.* at app. A.

management.²⁸⁹ In short, the EPA adopted ELI's recommendations and began to implement them.

ELI's proposal, if as comprehensively implemented as EPA appears to be headed, would fall none short of elevating EPA to the position of biodiversity czar among federal agencies and converting its various pollution control programs into biodiversity conservation programs. The fallacies of that approach are numerous. First, although some of the pollution control statutes, particularly the CWA, contain a significant element of habitat protection as a goal, none is principally directed at that purpose. Squeezing the round peg of biodiversity conservation into the square hole of pollution control programs both dilutes the basic regulatory purpose of the statutes and creates a tenuous biodiversity conservation authority. The central basis for pollution control authorities as legislative enactments of common law nuisance concepts does not support the addition of biodiversity conservation, which has no tenable basis in common law nuisance, as a major program component.²⁹⁰ The basic resolution of the regulated communi-

289. *Id.* at app. C. The Workgroup's recommendations have already begun to take hold at the program level within EPA. In late 1994 the Administrator of EPA's Office of Water distributed an office-wide memorandum spelling out the agency's water agenda and placing ecosystem management in a prominent position. See Memorandum from Robert Perciasepe, Acting Administrator, EPA Office of Water, to Employees of the National Water Program (Dec. 30, 1994) (on file with author). Under the heading "Organize, Work and Communicate to Protect 'Places'," the memorandum notes that "EPA is developing a multi-media program to further institutionalize and improve ecosystem management" and integrates virtually all of the Workgroup's recommendations for how to do so. *Id.* at 4; see also *1995 EPA Water Program Will Increase Focus on Existing Initiatives, Staff Told in Memo* [Current Developments] *Env't Rep.* (BNA) 1681 (Jan. 6, 1995). More broadly, in early 1995 EPA's Office of Policy, Planning and Evaluation proposed a reorganization which would establish a new Ecosystems and Communities Office to act as an "advocate for ecological consideration" throughout all of EPA's pollution control programs. Telephone Interview with Andy Spillman, Special Assistant to Director, Ecosystems and Community Office of OPPE (Mar. 20, 1995).

290. Pollution control statutes duplicate what otherwise could be accomplished under common law nuisance, and therefore do not impair the bundle of rights associated with property ownership any more so than do the common law restrictions inherent in title to property in all cases. By contrast, NEPA and programs for the protection of endangered species, coastal zones, and wetlands resources find no direct corollary in the common law of nuisance, and thus are exposed to potential challenge under private property takings law. See *Loveladies Harbor, Inc. v. United States*, 28 F.3d 1171 (Fed. Cir. 1994). Indeed, as Professor Joseph Sax observes, recent Supreme Court jurisprudence in the property takings arena seems intended to provide an anticipatory repudiation of any notions that

ty to pollution control regulations, forged largely on their common law nuisance origins, may dissolve if a strong biodiversity protection element is injected.²⁹¹ Even putting those considerations aside, however, it is difficult to imagine an effective biodiversity conservation program emerging from policies scattered under yet additional statutory programs. Notwithstanding the EPA's umbrella authority over the statutes covered in the ELI report, the ELI proposal and the EPA's Edgewater Consensus implementation plan may do more to balkanize biodiversity policy further than is experienced under the existing regulatory web.

2. A Federal Ecosystems Protection Act

Based on her conclusion that the ESA provides too narrow a focus for effective biodiversity conservation, Professor Julie Bloch suggests that an "Ecosystems Protection Act" modeled on the ESA, but with an expanded focus, would dramatically improve biodiversity protection.²⁹² Bloch proposes that the legislation authorize a comprehensive inventory of all ecosystems in the United States and that, "[o]nce a comprehensive national inventory has been completed, ecosystems can be categorized according to their need for protection."²⁹³ In essence, this ecosystem designation process is a parallel to the ESA species listing process. Then, although the details of her

biodiversity and other "sensitive lands" theories are on equal footing with nuisance law under the property takings calculus. See generally Sax, *supra* note 240, at 1441. At the same time, however, it is the Supreme Court's narrow factual application of private property takings law that prevents any meaningful restriction on the application of coercive biodiversity regulation. See generally Sugameli, *supra* note 240, at 491-93.

291. For this reason, as Professor Tarlock has put it, "the politics of biodiversity protection are infinitely more complex than the politics of pollution." Tarlock, *supra* note 3, at 557. The focus of biodiversity policy is on the raw development of the land, not on the consequences of the development's end uses. In the eyes of landowners, therefore, "the potential interference with private property is greater for programs that focus on individual landowners than for programs designed to curb air and water pollution." *Id.* at 558. Hence, unlike the pollution programs, which can rely on the Coercion model with impunity, for biodiversity protection "the realities of federal, state, and local politics create a need for mutual cooperation among all three levels of government." *Id.* at 574.

292. Julie B. Bloch, *Preserving Biological Diversity in the United States: The Case for Moving to an Ecosystems Approach to Protect the Nation's Biological Wealth*, 10 PACE ENVTL. L. REV. 175 (1992).

293. *Id.* at 218.

proposal are fuzzy, Bloch suggests that a regulatory regime should apply to listed ecosystems much like the ESA:

The next important step in the process would occur when a federal, state, or individual actor wished to develop an ecosystem designated for protection under the Act. The Act would contain an exemption procedure similar to the procedure provided for in section 7 of the ESA. Areas listed as "hot spots" would require a high burden of proof before development would be permitted. Areas listed as "warm spots" would require a lesser burden. . . . The criteria for granting an exemption under the ESA could be a starting point for this new legislation.²⁹⁴

Bloch proposes, moreover, that the ESA and the full panoply of other existing biodiversity statutes would continue to apply.²⁹⁵

Bloch suggests that the proposed new regulatory program presents not only biological advantages over the ESA, but "political advantages as well."²⁹⁶ She postulates that the new law would "allow environmentalists and scientists to circumvent the very difficult process of obtaining public support for preserving individual species"²⁹⁷ and "would give greater legitimacy to the preservationist cause," advocates of which "seem to be trying to impose their values on the rest of society."²⁹⁸ Indeed, preservationists often *are* trying to impose their values on the rest of society, which is precisely why the proposed Ecosystem Protection Act does not have a chance of succeeding. Perhaps because the backlash against programs like the ESA and CWA section 404 had not reached its crescendo at the time she published her proposal, Bloch's political musings are far off the mark. Given the recent experience of the ESA in "hot spots" like central Texas, for Congress to attempt to enact anything like the program Bloch proposes would invite a full scale political rumble, because her proposal amplifies rather than suppresses the fundamental shortcomings of the Coercion model. The Ecosystem Protection Act would depend on *federal* designation of ecosystems, *federal* permitting of ecosystem development, and *federal* determination of mitigation, and, to boot, would not supplant or replace the

294. *Id.* at 219.

295. *Id.* at 222.

296. *Id.* at 220.

297. *Id.*

298. *Id.* at 221.

existing web of *federal* regulations that already have become the focal point of the nonfederal regulated community's scourge. It is hardly likely that the regulated community's strong sentiments would be reversed by adding a new, omnipotent regulatory regime to the picture. In short, although the proposed Ecosystem Protection Act would, if successfully forced upon nonfederal landowners, result in more biodiversity conservation, the requirement that it be forced upon the regulated community ultimately breeds its own failure.

3. A Federal Land Use Act

The boldest Coercion model biodiversity conservation proposal to surface to date is premised on the goal that "duplicative layers of state and federal regulation, which hinder rational, long-term land use planning, be eliminated or consolidated."²⁹⁹ In other words, this proposal would completely displace the state and local component of land use control with a supreme Federal Land Use Act. Although the proponent of this approach, Christopher A. Cole, portrays the Federal Land Use Act as "function[ing] very much like NEPA,"³⁰⁰ in fact it would not. The shell for the proposed Federal Land Use Act would be NEPA's environmental impact review procedure, administered by the Department of Interior rather than CEQ and the EPA; however, from there NEPA and the Federal Land Use Act would bear little resemblance. The Federal Land Use Act would, in all measures, exemplify the Coercion model.

The proposed Federal Land Use Act would create a comprehensive environmental review and permitting program for *all* land development projects, not just those within NEPA's scope of actions federally carried out, funded, or authorized. Unlike NEPA, the Federal Land Use Act would have a powerful substantive application to all such projects. As Cole describes the proposal:

The [Federal Land Use Act ("LUA")] would go one step further than NEPA by providing DOI, an agency with land use expertise, with substantive veto power. Thus, DOI could

299. Christopher A. Cole, *Species Conservation in the United States: The Ultimate Failure of the Endangered Species Act and Other Land Use Laws*, 72 B.U. L. REV. 343, 369 (1992).

300. *Id.* at 374.

compare the project's impact with its overall environmental planning goals.

The LUA also would require private developers, regardless of the presence of any federal nexus, to apply for development permits. . . .

. . . The agency then would be empowered to approve the application with or without condition, to request supplementation, or to deny it. Facing a permit denial, a frustrated applicant could bring an agency appeal. Failing at the agency appeal level, the decision could be appealed to a federal court.³⁰¹

Cole thus posits the Federal Land Use Act as "nationaliz[ing] impact assessment criteria while eliminating duplicative permit requirements."³⁰² The new law thus would have the virtue, not shared by the proposed Ecosystem Protection Act, of supplanting all other state and federal land use regulation statutes and providing a uniform federal program in their place. However, the proposal also would supplant all state and local autonomy and the flexibility to adapt the regulatory program to localized and specialized biodiversity issues.³⁰³

To an extent, moreover, the patchwork qualities of the existing network of environmental laws is not entirely irrational or inefficient. There is an advantage to charging statutes and agencies with a narrowly focused mission in order to maximize the program's effectiveness and the agency's expertise. It is questionable whether the DOI, despite its experience under the ESA and other land use statutes, could establish authoritative expertise in all aspects of land use planning or could fashion a land use review procedure for the entire nation that effectively accommodates all the variations and nuances experienced in different locations and different ecosystem types. That is why NEPA is nonsubstantive in effect and is implemented by the various federal agencies on a program-by-program basis rather

301. *Id.* at 375-76 (footnotes omitted).

302. *Id.* at 377.

303. Although the proposal contemplates delegation of permitting authority to the states, *id.* at 375-76, the history of such delegated authorities under the existing pollution control statutes is that they remain largely subject to federal dictate through the requirement that the state program remain at least as stringent as and otherwise consistent with the federal standards. See Jim Haley, *EPA at Twenty: The View from the States*, NAT. RESOURCES & ENV'T, Summer 1990, at 14. In other words, delegation to the states does not eliminate the coercive fabric of the regulatory scheme.

than by a single ombudsman review agency. That is also why the substantive Coercive model statutes, such as the ESA and CWA section 404, adopt a narrow regulatory subject focus.

In short, the regulated community is likely to perceive any single federal agency attempting to implement the proposed Federal Land Use Act in all its manifestations as monolithic and immensely coercive. The proposal mistakenly blends the broad focus of NEPA with the substantive power of the ESA, creating an unwieldy giant of regulatory clout. The proposal would have been closer to the mark had it borrowed the ecosystem listing concept of the proposed Ecosystem Protection Act as a way of narrowing the subject matter and regulatory focus. Then, the virtue of supplanting other permitting statutes would have set the stage for the only other missing necessary ingredient—state and local autonomy. Instead, given its overbroad focus, immensely coercive approach, and paltry accommodation of state and local autonomy, the proposed Federal Land Use Act suffers irreparably from the deficiencies of the Coercive model.

B. *Economic Incentives Proposals*

The response of many environmental groups to the emergence of the wise use movement has been to lash out in counterattack. Defenders of Wildlife, however, has recognized that the impetus for the wise use movement and the reason for its sustaining political force was a genuine concern in the landowning community that federal regulations had largely divested landowners of involvement in land use decision-making. Thus, says the group in a recent report, although Defenders of Wildlife “has long been a strong supporter of a regulatory approach, . . . we have become more aware of the limitations of a regulatory approach, particularly when dealing with private landowners.”³⁰⁴ Based on their research with economists and endangered species experts, Defenders of Wildlife became “convinced . . . that the idea of building economic incentives into the Endangered Species Act merits more discussion.”³⁰⁵

By “economic incentives,” however, Defenders of Wildlife means incentives designed to induce private behavior which is

304. BUILDING ECONOMIC INCENTIVES, *supra* note 12, at v.

305. *Id.*

consistent with the goals and prescriptions of the existing coercive regulatory structure. For example, among the proposals made in the papers are federal tax credits for habitat improvement and ESA compliance measures and federal tax penalties for habitat conversion,³⁰⁶ a system of tradable development credits awarded to landowners who preserve habitat,³⁰⁷ and a system of tiered development impact fees designed to promote development in less environmentally sensitive areas.³⁰⁸ All of the proposals either rely on the existing Coercive model regulatory structure within which to build the incentives, or replace the regulatory structure with a financial program that duplicates the coercive effect of the regulatory scheme.

It is not clear that the nonfederal regulated community would perceive such incentive systems as a substantial improvement over the existing structure. Nor is it clear that society could afford to make them think of such programs as so. To the extent incentives lighten the financial burden of regulation, they will induce more compliance behavior only at the margin where noncompliance and compliance formerly were economically close in consequence. The fact will remain, however, that the behavior of complying remains essentially nonvoluntary in that context. Moreover, to the extent purported "incentives" in fact are designed to increase the sting of noncompliance, such as through tax penalties or higher impact fees for development in habitat, they are fundamentally coercive and will only exacerbate resentment of the regulatory scheme. To work truly as incentives promoting positive behavior, the mechanisms must be designed to reward behavior taken in excess of that required by law.

For an incentives program meaningfully to reverse the deficiencies of the Coercive model, therefore, it must induce compliance through positive economic rewards that make biodiversity conservation more valuable to landowners than development, without the leverage of coercive regulatory

306. See McKinney, *supra* note 12.

307. See Todd G. Olson et al., *The Habitat Transaction Method: A Proposal for Creating Tradable Credits In Endangered Species Habitat*, in BUILDING ECONOMIC INCENTIVES, *supra* note 12, at 27.

308. See Walter Reid, *Creating Incentives for Conserving Biodiversity*, in BUILDING ECONOMIC INCENTIVES, *supra* note 12, at 43.

consequences. As one of the papers in the Defenders of Wildlife publication observes:

The problem is compounded further by the way land is evaluated in the United States. Neoclassical economics texts continue to teach that the value of land is nothing more than the revenue potential of its production capacity. The benchmark for land tax assessments is the "highest and best use" to which land can be put, which means determining the maximum likely revenue potential for each parcel of earth. The presence of endangered species habitat on private land is a liability that is scored in the debit column. Our task is to convert the tremendous value our society holds for endangered species and biodiversity into positive financial terms, so that these valuable resources will begin to be scored in the asset column.³⁰⁹

One must question whether society genuinely is willing to pay private landowners for what *society* values about their land to that degree. Although there is an impressive history of public willingness to acquire private land for public use in large blocs devoted, in some cases, to habitat conservation,³¹⁰ the scale of land preservation and conservation required to accomplish a meaningful biodiversity policy for nonfederal lands may be orders of magnitude larger than what has ever been contemplated in the past.³¹¹ The steadily growing reliance by society

309. See McKinney, *supra* note 12, at 2.

310. For example, Congress enacted the Land and Water Conservation Fund in 1965 to collect funds from such sources as surplus land sales and recreational user fees and appropriate them under other applicable authorities to support federal acquisition of authorized national park, conservation, and recreation areas and to make recreation area acquisition grants to states and local governments. Pub. L. No. 88-578, 78 Stat. 897 (codified as amended at 16 U.S.C. § 4601-4 to -11 (1988)). Purchase of lands for endangered species habitat, national wildlife refuges, and wetlands preservation, as authorized in other specifically referenced statutes, is among the allowable funding purposes provided in the Land and Water Conservation Fund, *id.* § 4601-9(1), and is specifically authorized in section 5 of the ESA. 16 U.S.C. § 1534(b) (1988).

311. For example, the ESA regional plan proposed in Austin as a measure to place into preserve status 30,000 acres of privately owned, undeveloped urban-area lands on which several endangered species depend is estimated to cost upwards of \$220 million to implement. See *supra* text accompanying note 252. Since 1967, only about \$238 million has been spent under the Land and Water Conservation Fund for purposes of endangered species habitat preservation pursuant to § 5(a) of the ESA. See *supra* note 77. In other words, funding Austin's biodiversity initiative alone would almost match *all* the federal government's historical endangered species habitat preservation outlays for *all* species, and even then full funding of the Austin proposal would not satisfy all the habitat

on the Coercion model regulatory system to impose land development restrictions, and the anathema of government to inverse condemnation claims, suggest that it will be a long time before society would be willing to fund an incentives system which, working alone, will ever bring about widespread biodiversity conservation behavior on nonfederal land.

The concept of economic incentives, however, should not be abandoned. Indeed, there is strong evidence from a recent report by the Northern Forest Lands Council that our present estate and transfer tax structure is perversely inconsistent with biodiversity conservation and that, at the very least, reform is necessary in that and other financially related respects to weed out those counterproductive elements.³¹² The broader question is whether economic incentives can be blended with a regulatory approach that results in enhanced compliance without enhanced resentment. The Coercion model is not an appropriate candidate for that task, and economic incentives cannot smooth over the deficiencies of the Coercion model. Proposals to the contrary generally emanate from single-sided interests groups who have wedded themselves irreversibly to the Coercion model approach and portray economic incentives as a tremendous concession to the regulated community. Economic incentives should draw their power from the inherent features of the market and economic responses to market forces, not from the threat of regulatory punishment.

On the other hand, focusing the role of economic incentives on market forces, and using such incentives as one tool within the context of a noncoercive regulatory structure, is not to be confused with the Cato Institute's notion of using exclusively "noncoercive market processes" to dictate biodiversity re-

preservation goals of the various Austin area endangered species' recovery plans. See, e.g., U.S. Fish & Wildlife Serv., Golden-Cheeked Warbler Recovery Plan 35-37 (1992) (recovery of the species from endangered and threatened status may be attained only when viable independent populations exist in eight different subregions of the species' range, only one of which includes the area proposed as the Austin regional plan preserve).

312. NORTHERN FOREST LANDS COUNCIL, SUMMARY OF PUBLIC COMMENT ON FINDING COMMON GROUND 25-29 (1994) [hereinafter COMMON GROUND]. The Northern Forest Lands Council was conceived in 1990 as a forum for recommending management options for the 26-million acre wooded area extending across Maine, New Hampshire, Vermont, and New York. The council's panel included representatives from the United States Forest Service, state government, landowners, industry, and environmental groups. *Id.* at 23.

sults.³¹³ A complete abdication of federal regulation to the so-called free market would remove biodiversity goals as a direct economic incentive or disincentive for any nonfederal landowner in making land use decisions. Biodiversity might benefit or perish indirectly as the consequence of decisions made to maximize, for example, market value, resource use value, and development potential of land, but such “noncoercive market processes” do not lead to any particular biodiversity outcome. For example, the owner of a forest might manage it from the perspective of sustainable income in ways which, as an indirect consequence of that approach, benefit the sustained existence of certain species in the forest ecosystem. As demonstrated by the Tragedy of the Commons paradigm,³¹⁴ however, we cannot expect the unfettered operation of human economic incentives always to result in biodiversity results, or even economic results, which we desire as a society. Both the Coercion model, in its response to the perceived ravages of the marketplace, and the “noncoercive market processes” model, in its response to the perceived ravages of government command and control styles of regulation, “underestimate the prospects of cooperation getting started in human endeavors”³¹⁵ and thus serving as the framework both for regulatory responses and for economic incentives.

When a broader vision is used, therefore, the Cooperation model rises to the top of the list as a mechanism for enhancing the effect of economic incentives in a noncoercive setting. For example, conspicuously absent from the Northern Forest Lands

313. See Fitzsimmons, *supra* note 15, at 23.

314. See Garrett Hardin, *The Tragedy of the Commons*, 162 SCI. 1243 (1968). Hardin demonstrated how, in the absence of concerted cooperation and management, individual users sharing a common resource, such as a grazing land or fishing area, are likely to deplete the common resource to their mutual disadvantage simply by each individually attempting to maximize personal gain from the resource.

315. RODGERS, *supra* note 163, at 41. Professor Rodgers observes that there are “countless examples of successful strategies of communities that have escaped from the trap of the tragedy of the commons—lobster fishing in Maine, cattle grazing in the Alps, rice cultivation in Bali . . . and many others The two solutions urged in the simple models—complete government control and untrammelled privatization—are prominent only in the minds of analysts.” *Id.* at 41-42. My thesis is simply that, given the innate propensity of humans to cooperate in the face of such resource depletion questions, our regulatory structure should do as much as possible to take advantage of that propensity rather than dictate the outcome through coercive regulation.

Council report, which unquestionably is the most comprehensive study to date of the role of economic factors in biodiversity conservation, is any sweeping proposal for more regulation and more coercion of private land uses. Instead, the report is teeming with calls for more cooperative structures to allow land use decisions to be made through mechanisms relying on state and local autonomy and cooperation with private landowners.³¹⁶ It is through such a Cooperative model structure that the report advocates economic incentives, particularly relief from counterproductive income and inheritance taxes, as playing an important positive role.³¹⁷ Hence, the federal biodiversity conservation program should eschew economic incentives as a means of ameliorating the Coercion model's pernicious effects, but should consider relying on economic incentives as one tool for promoting compliance behavior through a Cooperative model approach.

316. Of the 33 specific recommendations made in *Common Ground*, not one calls for increased scope or intensity of coercive regulation. One recommendation advises that "[s]tate agencies should periodically review the effectiveness of administrative rules regarding business, land use and the environment, using a process that involves all interested parties." COMMON GROUND, *supra* note 312, at 66. Another recommendation is that "[s]tate agencies should develop and implement innovative approaches to simplify and stabilize the regulatory process." *Id.* at 67. The report also called for states to "conduct objective assessments of existing . . . regulations, to evaluate their adequacy in protecting wood supply, water quality, aesthetics, recreational opportunities, forest health, and biological resources." *Id.* at 44. With respect to biodiversity conservation generally, the report recommended merely that "[s]tates should develop a process to conserve and enhance biodiversity across the landscape." *Id.* at 31. All other recommendations dealt with economic and tax incentives, public funding strategies, information gathering and exchange, and educational programs. For a thorough examination of the Northern Forest Lands Council's recommendations in the context of ecosystem management policy on private lands, particularly in their rejection of coercion model approaches, see Lee Breckenridge, *Reweaving the Landscape: The Institutional Challenges of Ecosystem Management for Lands in Private Ownership*, 19 VT. L. REV. 363 (1995).

317. Seven of the report's 33 recommendations deal with improvements to tax policies. *Id.* at 9-13, 25-30, 39-41. The GAO has identified as one of the major economic obstacles to biodiversity conservation those "[f]ederal and state income and inheritance taxes [which] generally do not distinguish between landowners who undertake costly actions supporting desired ecological goals and those who do not." ECOSYSTEM MANAGEMENT, *supra* note 10, at 59. For a complete evaluation of the tax policy recommendations, see Janet E. Milne, *Timber Taxes: A Critique of the Northern Forest Lands Council's Tax Recommendations*, 19 VT. L. REV. 423 (1995).

C. Information and Planning Proposals

The only proposal for a unified federal biodiversity conservation program for nonfederal lands that has seen the light of day in Congress relies on an expansion of NEPA procedures to embrace biodiversity goals. The proposed National Biological Diversity, Conservation, and Environmental Research Act, introduced in the 103d and previous Congresses, is intended to establish a national policy for biodiversity conservation through support of environmental research and by establishing coordination mechanisms. Like NEPA, the bill is predicated on broad findings and goals. The bill correctly recognizes that "existing laws and programs relevant to the loss of biological diversity in the United States are largely uncoordinated and inadequate, and sometimes result in duplication of efforts, conflicts in goals, and gaps in geographic and taxonomic coverage."³¹⁸ Despite its call for a "comprehensive and coordinated Federal strategy"³¹⁹ to address those defects, however, the bill would do very little that is not already being done by one agency or another under one of the existing biodiversity regulation statutes. For example, the bill would establish a National Center for Biological Diversity and Conservation Research to compile information on biodiversity,³²⁰ something the National Biological Survey already is accomplishing.³²¹ The bill would amend NEPA to require CEQ's rules to mandate consideration in EISs of the effect the federal action would have on biodiversity values,³²² something CEQ has already begun through its NEPA initiatives.³²³ Hence, as one commentator has observed, "[l]ike NEPA itself, the bill is more symbolic than substantive. It would create a large, and probably unnecessary, federal bureaucracy."³²⁴ Although the measures outlined in the bill are a necessary component of a federal biodiversity

318. H.R. 305, 103d Cong., 1st Sess. § 2(9) (1993). The legislative initiative largely would have implemented recommendations the Office of Technology and Assessment had made years earlier. See TECHNOLOGIES, *supra* note 4, at 11-22.

319. H.R. 305, 103d Cong., 1st Sess. § 2(10).

320. *Id.* § 9.

321. See *supra* text accompanying notes 44-46.

322. H.R. 305, 103d Cong., 1st Sess. § 4(b)-(f).

323. See *supra* text accompanying notes 184-88.

324. Doremus, *supra* note 2, at 327. For other commentary on the proposed legislation, see Carlson, *supra* note 178, at 23-26.

conservation program, they would fall far short of all that is necessary.

IV. A PROPOSAL FOR BIODIVERSITY'S FUTURE—USING THE FEDERAL COOPERATION MODEL AS A NEW BEGINNING

*And now for something completely different.*³²⁵

The assessment of the three regulatory models demonstrates that the Cooperation model poses the greatest promise of achieving the goals of a unified federal biodiversity conservation program for nonfederal lands. Unfortunately, meaningful biodiversity program proposals to date generally have not adopted the Cooperation model; rather, Congress had timidly relied on the Coordination model, proposing weak information gathering and procedural review measures, whereas environmental advocates, particularly in legal literature, have exhibited strong devotion to the Coercion model.

Only one other commentator, Holly Doremus, has suggested the virtues the Cooperative model would offer to a federal biodiversity conservation program.³²⁶ She advocates adoption of a "Representative Ecosystems Act" sharing most of the Coercion model qualities of Bloch's proposed "Ecosystem Protection Act."³²⁷ In classic understatement, however, she acknowledges that the coercive elements of such proposals are "likely to arouse organized political opposition,"³²⁸ and thus she suggests that:

Perhaps the best model for the [Representative Ecosystems Act] would be one of federal-state cooperation. The federal government should develop an overview of ecosystems, and designate those most in need of protection. States should retain a local management role, provided they meet federal standards. States could be afforded some flexibility with regard to what portions of ecosystems to protect and what activities to allow in protected areas, within federal specifications.³²⁹

325. Segue line used often in the BBC television series *Monty Python's Flying Circus*.

326. Doremus, *supra* note 2.

327. *Id.* at 323-26.

328. *Id.* at 326.

329. *Id.* at 323.

That is the extent of Doremus's exploration of the Cooperative model, however, and even in that sparse detail the proposal is too stingy in the degree of autonomy it accords to state and local governments. Although Doremus should be credited as being almost alone among commentators thus far in allowing for the possibility of some departure from the Coercion model, there has yet to be a proposal for a federal biodiversity conservation program for nonfederal lands based principally and enthusiastically on the Cooperation model.

The point of the Cooperation model proposal made in this article, therefore, is to offer an alternative to the existing regulatory web which has a meaningful chance of being biologically *and* politically effective. The proposal depends on a blend of federal objectives, state and local autonomy, and regulatory flexibility to achieve those dual purposes. The proposal recognizes, however, that it is unlikely that biodiversity conservation on nonfederal lands will ever be delivered in significant measure through completely voluntary behavior by the regulated community. Hence, the proposal uses the existing regulatory structure as leverage to promote state and local governments and the private sector to explore consensus-based alternatives with real biological results. Where the regulated community takes advantage of the measures outlined in this proposal, thus opting out of the existing regulatory structure, it will be in a position to deliver more biodiversity conservation value to society for less regulatory headache to itself, and for no more cost.

The proposal calls for a unified federal biodiversity conservation statute, the Biological Resources Zone Management Act ("BRZMA"), centered around three stages of biodiversity conservation management: (1) state identification, inventory, and nomination of biological resource zones; (2) local and private development, and federal approval, of biological resource zone management plans; and (3) implementation of the management plan in lieu of the existing federal regulatory structure. The first stage allows states to identify areas of biological resources which are in need of protection and which may present controversial issues if those protective measures are carried out through the existing coercive federal regula-

tions.³³⁰ The second stage allows the local and private entities potentially most at risk of bearing the brunt of federal regulation to develop a comprehensive management plan for the biological resources zone, knowing that it must not only meet their needs, but also the federal objectives of biodiversity conservation.³³¹ The third stage provides the reward to the state, local, and private interests for their expenditure of time and effort and their commitment to the plan—complete relief from all the headaches of the existing federal structure, including the multiple permitting requirements, inflexible and overlapping regulatory standards, different agencies and policies, and never-ending litigation. The first two elements, which draw from such existing programs as the CZMA and the CWA National Estuary Program, are what set the proposal apart from other biodiversity conservation legislation proposals made thus far; the third element, which has no corollary in the existing federal structure, sets the proposal apart from anything ever ventured in federal environmental law, but which is needed if the federal government expects its “partners” to feel and act like partners.

A. *Biological Resource Zones*

The BRZMA procedure for identifying biological resource zones (“BRZ”s) would codify the efforts of the National Biological Service and similar state institutions to develop a standard ecosystem inventory and evaluation system. The research from those efforts would amass a baseline of information regarding the locations and conditions of biological resources comprising the principal biodiversity components. A specific purpose of the research would be to describe BRZs within each state corresponding to local and regional ecosystems requiring the greatest levels of protection because they are unique, sensitive, or threatened.

330. The GAO identifies ecosystem delineation as a problematic process, but also as a prerequisite to effective biological conservation management. See ECOSYSTEM MANAGEMENT, *supra* note 10, at 42-48.

331. According to the GAO, development of a management plan involves examining “(1) the desired future ecological conditions, (2) the types, levels, and mixes of activities that can be sustained while still achieving these conditions, and (3) the distribution of these activities over time among the various land units within the ecosystem.” *Id.* at 49.

Some BRZs may require or justify no further protection. For those, the existing web of federal regulation would remain in place to check any serious decline and alert the state in the future to the need to take the BRZMA process to the next step of nomination. Other BRZs, of course, would emerge from the identification stage as immediate candidates for nomination. The nomination process would resemble the National Estuary Plan process, under which a state may request that the EPA convene an estuary management conference. The BRZ nomination process would require a state to demonstrate three conditions to the Secretary of the Interior: (1) the BRZ is comprised principally of nonfederal lands and is geographically well defined for purposes of evaluating its biological resources and ecological boundaries; (2) the BRZ is either unique, unusually sensitive to natural or human disturbances, or currently subject to substantial threat of decline,³³² and (3) a majority of the local jurisdictions within the BRZ boundaries have confirmed a preference for the BRZMA process and will contribute, along with the state, up to half of the funding necessary for development of a biological resources zone management plan. These three conditions will ensure that the BRZ is a definable entity which will benefit from focused management efforts, and that the impetus for such efforts comes from local interests. If either of those elements is missing, there is either no use or no need for the BRZMA process.

When a BRZ falls within more than one state, the nomination process would allow one state to request that the Secretary of the Interior convene a conference of the affected states to determine which states wish to participate in the BRZMA process. No state should be forced into the process, however, and thus in the event any state opts not to participate the remaining states would be required to design and defend the nomination for the BRZ area within their jurisdictions.

332. Although evidence that an ecosystem is threatened by anthropogenic forces clearly would be relevant to the nomination process, the determination of ecosystem eligibility could be based on a finding of vulnerability resulting exclusively from natural phenomena, such as the impermanence of mid-successional forests, the oligotrophic conditions of many freshwater systems, the undersaturated populations found in desert springs and glacial lakes, and the isolation of island and mountaintop populations. See *THREATS TO BIODIVERSITY*, *supra* note 27, at 21-23.

The Secretary would evaluate the BRZ nomination based on the three principal criteria only according to the best available scientific information regarding the biological need for and benefits of the BRZMA process relative to biological resources in the defined area. In other words, other than the ministerial act of confirming the commitment of local jurisdictions to participate, the Secretary would have no discretion to reject a nomination on political or policy grounds. In the event the Secretary rejects the nomination, that decision would be appealable to the members of the Endangered Species Committee provided for in the ESA,³³³ who would comprise the BRZMA Committee. Acceptance of the nomination would commit the federal government to finance at least one-half of the cost of developing the BRZ management plan.

B. Biological Resource Zone Management Plans

Once a BRZ nomination is approved, the governor of each state within which the BRZ is located would appoint a lead state agency to administer the management plan development and a committee of local officials comprised of one representative from each local political subdivision within which the BRZ is located. In the case of a multi-state BRZ, the designated state agencies would serve as planning liaisons.

Working closely with private interests, the BRZ management plan process would initiate an in-depth inventory of geographic, biological, and socioeconomic factors relevant to planning land and resource uses within the BRZ, including the location of biological resources, land uses, growth trends, resource development trends, existing preserve areas, and future preserve opportunities. This "map" would be used to identify areas of particular concern in terms of biological sensitivity, land use trends, and threat to resources, similar to the CZMA process for identifying special management areas.

The next planning step would involve an evaluation of how the present legal framework would apply to the conditions disclosed in the resource and land use assessment. The point

333. The Endangered Species Committee is authorized to grant exemptions to the prohibition federal agencies face against jeopardizing the continued existence of a species listed under the ESA. 16 U.S.C. § 1536(e)-(p) (1988). The Committee consists of the Secretaries of Agriculture, the Army, and the Interior, the Chairman of the Council of Economic Advisors, the EPA Administrator, the NOAA Administrator, and one individual from each affected state. *Id.* §1536(e)(3).

of such an evaluation would be to determine where existing regulations may be inadequate to achieve necessary levels of protection and where they may be too extreme. Also, the process of applying the existing regulations demonstrates to the planning entities and private interests the likely effects on local economic and growth factors of not participating in the BRZMA process. It may turn out that the existing regulatory structure is meeting biodiversity conservation goals adequately without generating local and private controversy, in which case the full BRZMA process may be unnecessary or premature. At least in those cases the biological resources will have benefited from the increased level of information available for future assessments, and the local and private sectors will have benefited from the increased awareness of the operation of the existing federal laws.

In the event the legal evaluation points to the need for further BRZMA procedures, the next step would involve a comprehensive land planning process designating the types of land use controls, from none to preservation, applicable throughout the BRZ. Controls applicable in any particular area, and in the BRZ generally, could not significantly depart from the existing regulatory consequences, either more or less stringently, without adequate biological or economic justification. Implicit in this process is the possibility that lands previously unregulated, such as uplands adjacent to wetlands, could be subject to new land use controls. Also implicit, however, is the possibility that lands subject to existing regulation under the ESA, section 404, the CZMA, and similar laws, but which offer little biodiversity value in comparison to their socioeconomic development value, might no longer be subject to such regulation. Thus, a small stand of trees offering potential habitat to an endangered bird may not be protected if it lies in the path of development and other more productive habitat areas are available for preservation within the BRZ. The BRZ management plan would designate a state-level authority for administering the land use controls through a permitting review procedure.

The last planning step would involve developing a financing system for preserve acquisition and for compensating landowners for any increased regulatory burdens. Because the entire economy within the BRZ is likely to benefit from the long-term certainty and reduced regulatory strings offered by the BRZMA

process,³³⁴ it is appropriate to require that state and local public financing constitute a substantial share, at least half. Also, because a successful BRZ management plan will relieve the federal government of many regulatory burdens, federal funding should also constitute a significant portion. Private-sector financing through development fees, recreational user fees, and similar mechanisms could generate additional funds.³³⁵ Incentives to private landowners, such as transferable development rights and land swaps, could also induce compliance at affordable levels and provide appropriate

334. For example, in connection with its consideration of participating in the regional habitat conservation planning effort underway in Austin, Texas pursuant to § 10(a) of the ESA, see *supra* notes 243-62 and accompanying text, Travis County, Texas commissioned a study comparing the economic impact of the regional approach to the economic impact over the 20-year life of the regional plan of continuing ESA permitting on a piecemeal, individual project-by-project basis. Gau & Jarrett, *supra* note 71, at 1-2. The report concluded that the regional approach could result in up to 39,000 more jobs, up to \$439 million in property tax revenue, and \$300 million less in compliance costs, for a possible net benefit of over \$700 million. *Id.* at 1-10 to 1-12. Not only were those economic advantages potentially to be reaped, but FWS's whole objective in promoting the plan was based on the extensive evidence that it would also prove superior for the endangered species in question, notwithstanding that the regional plan would facilitate development. *Id.* at 1-12. Hence, there is every reason to expect that the potential for win-win outcomes that could be experienced under ESA-style regional planning would be duplicated under the BRZMA approach, only without the contentious, adversarial element that has burdened the ESA regional planning effort as a result of its essentially coerced origins. Indeed, notwithstanding the tremendous expected economic and biological benefits of the Austin regional plan, it remains, over 2500 days after the planning effort began, still no more than a plan faced with intense opposition by some state, local, and private figures who perceive it as fundamentally coercive in nature, a perception that is difficult to dispute. See *supra* text accompanying notes 260-62.

335. For example, though the effort failed as a result of legislative calendar deadlines, a bill proposed in the Texas legislature would have generated sufficient funding for the Austin regional plan through the imposition of modest development fees added to the local platting and permitting process for *all* new development in the planning area. See Tex. S.B. 880, 73rd Leg., Reg. Sess. (1993). The initiative recognized that the regional plan would have facilitated economic activity generally throughout the planning area, see *supra* note 334, and thus it was equitable to impose fees throughout the planning area. S.B. 880. By spreading the economic burden as broadly as the economic benefit, no individual project faced onerous fees, and the total amount of funding needed to acquire the habitat preserves which were the basis of the regional ESA permit would have been generated swiftly. Unfortunately, after that bill failed to reach a vote within the legislative deadline, the fragile consensus which had formed dissolved, and later funding proposals have focused the brunt of private sector funding on a more limited universe of development projects. See *supra* text accompanying notes 248 and 260.

compensation to private entities for accepting any increased regulatory burdens. The goal of the financing system would be to finance fair market value acquisition of all land areas needed to satisfy the BRZMA plan approval criteria discussed below, and to put no private entity in any worse position than had the existing regulatory structure been applied, taking into account, of course, that the costs of complying with the existing system will no longer apply.

Once the BRZ management plan is developed and approved at the state level, the state (or states) would submit the plan to the BRZMA Committee.³³⁶ The BRZMA Committee shall operate and vote according to the ESA procedures for the Endangered Species Committee. Approval of a BRZ management plan would be required if the BRZMA Committee finds that: (1) the BRZ nomination continues to satisfy the BRZ nomination criteria; (2) the BRZ management plan promotes biodiversity conservation on the whole within the BRZ boundaries at least as adequately as would be the case under existing federal laws; (3) private property and other economic interests on the whole within the BRZ boundaries bear no significantly greater regulatory or financial burdens under the BRZ management plan than they would under existing regulations; and (4) financing for the implementation of the BRZ management plan is adequate and reasonably assured for the foreseeable future. These approval criteria import the biological protection elements of the existing regulatory structure, but allow them to be distributed within the "bubble" of the BRZMA management plan area in the way that makes the most sense for the area.³³⁷ The BRZMA Committee's decision would be subject

336. Because the delineation of a BRZ is principally a biological and information planning question within the expertise of the Department of the Interior, the BRZ nomination approval decision is delegated to the Secretary of the Interior alone. By contrast, the BRZ management plan approval process includes a broader array of criteria, including economic impacts, and thus is appropriate for consideration by the full BRZMA Committee.

337. Precedent for such an approach is found in the Clean Air Act "bubble policy," which allows a facility to have its air pollutant emissions measured as if an imaginary single-vented bubble covers the facility, rather than measuring emissions at each real vent or emission point. That policy has been supported as a successful example of "seek[ing] to accommodate progress in reducing air pollution with economic growth." *Chevron v. Natural Resources Defense Council*, 467 U.S. 837 (1984). Under the bubble policy, if two pieces of machinery emit similar pollutant loads and would be subject to similar emission limits if independently regulated, the facility operator may weight its devotion of pollution

to the same judicial review provisions that apply to decisions of the Endangered Species Committee.

C. *In with the New, Out with the Old*

According to the GAO study, one of the major impediments to implementing federal biodiversity conservation policy on nonfederal lands has been the “spotty . . . often contradictory, laws and regulations,” which result in private landowners having to “comply with the rules of multiple governments, multiple agencies, and multiple purposes—different authorities with competing and often conflicting directives on protecting water quality, wildlife habitat, [and] fish habitat.”³³⁸ GAO suggests that this condition “poses tremendous institutional challenges to coordinated landscape-level management” and requires that we “examine how and where laws interact and conflict, who is affected, and possible ways of reconciling priorities.”³³⁹ Although GAO should be credited with recognizing this phenomenon, the better approach is not to find ways of managing and reconciling the statutory chaos, but rather to find ways of eliminating it altogether in the first instance.

Upon approval of a BRZ management plan, therefore, no provisions of the ESA, CWA section 404, the CZMA, or NEPA would apply within the BRZ except insofar as the BRZMA management plan specifically incorporates them. Moreover, although other environmental laws, such as the pollution control statutes discussed in the EPA’s Edgewater Consensus,

control technology to the piece of machinery which will respond more efficiently, so long as the combined emissions achieved through that method are less than or equal to what the independently mandated limits would have been when combined. The effect of such a policy is to allow the facility to make the most economically efficient production and pollution control choices for the facility as a whole, while still achieving the same total pollutant emission levels emitted from the “bubble” as would be experienced under a point-by-point disaggregated measuring system. See generally Bruce A. Ackerman & Richard B. Stewart, *Reforming Environmental Law*, 37 STAN. L. REV. 1333 (1985); Robert W. Hahn & Robert N. Stavins, *Incentive-Based Environmental Regulation: A New Era from an Old Idea?*, 18 ECOLOGY L.Q. 1 (1991). Similarly, if the BRZMA management plan can provide the same or a greater level of protection for resources overall within the “bubble” defined by the BRZ as would be experienced under the scenario of individualized projects seeking a variety of permits and authorizations under the existing web of regulatory programs, it makes sense to allow the state and local jurisdictions to distribute the regulatory impacts within the “bubble” in the manner most efficient for maximizing the local economic and planning goals.

338. ECOSYSTEM MANAGEMENT, *supra* note 10, at 57.

339. *Id.* at 58.

would continue to apply within the BRZ, biological resource considerations would no longer be relevant decision-making factors for actions carried out, funded, or approved under such laws. The very point of the BRZ management plan is to meld *all* the biodiversity conservation goals and protections of *all* existing federal statutes into one plan and allow that plan to take over as the exclusive biodiversity conservation regulatory mechanism for the BRZ area. The BRZ management plan would also, therefore, preempt state and local laws from adding any biodiversity conservation requirements through other regulatory mechanisms. These features are simply the necessary corollaries to the use of a "bubble" approach to how regulatory impacts are distributed within the BRZ.³⁴⁰ They undoubtedly would be the most controversial among proponents of stronger regulatory responses; however, they are the kind of measures that will be necessary in order to break out of the Coercion model mold.

Permitting of nonfederal actions under a BRZ management plan thus would be as simple as demonstrating compliance with the plan requirements. Projects would have to deal with only one permitting entity, and would know well in advance of project development what regulatory standards and financial burdens would apply. Permitting of *direct* federal actions³⁴¹ under the plan would require a consistency review finding similar to the CZMA process.

Because of the possibility that factors taking place outside the BRZ could affect resources or land use decisions within the BRZ, a BRZ management plan would be subject to ten-year reviews in which the state or any other member of the BRZMA Committee could request reopening of the BRZ management plan for amendment. An amendment to a plan could be based

340. In other words, this approach is analogous to the Clean Air Act bubble policy approach of not applying otherwise applicable emission limits to individual emission points within a facility operating under the bubble. It would defeat the purposes of the bubble policy to continue to apply individualized point source emission limits within the facility bubble. Similarly, it would defeat the purpose of the BRZMA management plan to continue to apply the ESA, § 404, NEPA, the CZMA, and the biological impact review components of other environmental laws unabated within the BRZ bubble.

341. The category of direct federal actions subject to the consistency review would be limited to actions carried out by federal agencies. Nonfederal projects authorized or funded by federal agencies would be treated as would any other nonfederal action.

only on a finding that the plan no longer satisfies the BRZMA management plan approval criteria, and could result in no additional uncompensated regulatory burdens on private landowners. Of course, an amendment could not diminish the biological protections intended to be afforded by the BRZMA management plan.

Finally, enforcement of a BRZ management plan with respect to nonfederal entities would take place exclusively through the plan's state administrative entity using whatever measures the state provides in the plan. No federal citizen suit action would be available against alleged nonfederal violators, but would be available against federal actors alleged to have violated the plan. Only in the event that the BRZMA Committee finds that the state administrative entity is not adequately enforcing the plan could the federal government take action to enforce the plan, including instituting proceedings to rescind plan approval.

CONCLUSION

*I need a pizza break.*³⁴²

Many details of the proposed Biological Resources Zone Management Act would need to be developed further before it could be seriously proposed as a legislative measure for managing biodiversity conservation on nonfederal lands. The point of this article principally is to demonstrate the need to wean ourselves off of the Coercion model, not to write the regulations that would implement the BRZMA. At that broader level, this article has shown that, even in the short lifespan of federal biodiversity policy, the inherent limitations of the Coercion model have already begun to manifest themselves in failed efforts such as that experienced in Austin, Texas, and that we must make room for a paradigm-shifting initiative such as the BRZMA in order to displace the present coercive, confused structure of federal biodiversity conservation law with a unified statute relying on the Cooperation model for its energy and effectiveness.

342. Favorite line of the character Michaelangelo from the television cartoon series *Teenage Mutant Ninja Turtles*, uttered when he is fed up with whatever predicament he and his fellow turtles are facing.

A strong federal presence in shaping our national response to biodiversity conservation clearly is needed. The present federal system for defining that policy, however, is in danger of disintegrating as a result of uncoordinated regulatory efforts and overzealous application of unbridled regulatory powers. Areas such as Austin offer prime examples of the need for a focused federal plan that does not rely on focused federal power. Austin is an area as rich in biological diversity as any, but which poses all the complications of regulating in the realm of nonfederal interests. The approach the federal government has taken thus far in Austin has been largely coercive and has backfired as a result. One would be hard-pressed to find anyone involved in the Austin regional habitat planning experience who would not take the opportunity to turn back the clock and start over with a fresh approach.

We don't need more Austins. We need a break from strong-arm federal regulations. We need a solution that does not rely on yet more and strengthened Coercive model regulation. But we also need federal policy to guide the process. The fresh approach proposed in this article for doing so relies more on the Cooperative model of regulation than any other biodiversity conservation proposal offered to date.

The Cooperative model, as embodied in the proposed BRZMA, offers as much if not more biological resource protection than does the fractured Coercive model approach, and does so in a flexible manner posing no added regulatory or financial burden to the nonfederal sector on the whole. To be sure, developing a management plan as outlined under the BRZMA would be time consuming, controversial, and expensive in its own right, but the product would be a long-term structure offering benefits to the biological and regulated communities.

We cannot afford, in terms of money, environmental health, and political stability, to allow federal biodiversity conservation policy for nonfederal lands to be carried out any longer by the present structure. Its myopic emphasis on regulation through coercive mechanisms will not produce meaningful biodiversity conservation without an unacceptable human-factor cost. We have discovered, painfully, that humanity is a "context for the global ecology,"³⁴³ and thus everything we do affects the global system's biodiversity. By the same token, the global ecology is

343. COHEN & STEWART, *supra* note 17, at 389.

a context for humanity, and thus everything relating to the global ecology affects humanity. An effective biodiversity policy must stay aware of both contexts if it is to succeed in both.

