BIODIVERSITY, ECOSYSTEMS AND SPECIES: WHERE DOES THE ENDANGERED SPECIES ACT FIT IN?

JASON M. PATLIS*

* Attorney, Office of General Counsel of Fisheries, National Oceanic and Atmospheric Administration, U.S. Department of Commerce, Silver Spring, Maryland; J.D., Cornell Law School, 1992; B.A., Haverford College, 1985. The views expressed in this article are solely those of the author, and do not represent the position or policy of the National Oceanic and Atmospheric Administration or the Department of Commerce.

I. INTRODUCTION

It is almost impossible to read a law review article on the Endangered Species Act[1] (ESA or the Act) that does not begin with some colorful characterization of the Act's sweeping mandate. For canine lovers, it has been dubbed "the pit bull of environmental statutes,"[2] and for high society it has been called "the crown jewel" of environmental laws. The Supreme Court has labeled it "the most comprehensive legislation for the preservation of endangered species *ever* enacted by *any* nation."[3] Superlatives abound with reference to the ESA. Usually what follows in these articles, however, is a thorough trashing of the ESA and a discussion of why it has not lived up to any of these superlatives.

With respect to ecosystem protection, there is no sweeping mandate in the ESA, nor are there any sweeping judicial decisions like *TVA v. Hill*, so that there are no failed promises. This is not to say, however, that ecosystem protection was not contemplated in the ESA. Indeed, ecosystem protection and biodiversity preservation were instrumental concepts in the passage of the ESA. Although ecosystem protection has been explicitly mentioned numerous times in the legislative history of the ESA, and can be read into the statute itself in numerous instances, this legislative consciousness was never transposed into regulatory obligation or judicial interpretation, so that the promise of the ESA, with respect to ecosystem protection, never even materialized.

Despite the lack of regulatory or judicial mandates, the implementing agencies certainly maintain authority to incorporate ecosystem protection into the implementation of the Act. That such measures are not required by the statute does not mean that they are not allowed by the statute. Such measures are being taken to some extent already, and while there are inherent limitations in the statute and existing regulations in protecting ecosystems, the ESA is the strongest tool currently available for protecting our biological diversity.

That this article discusses the protection of ecosystems as a means to protect biodiversity presupposes the relationship between ecosystems

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1. 16 U.S.C. § 1531 *et seq*. (1988).

2. Address by Donald Barry, Majority Counsel, House of Representatives Comm. on Merchant Marine and Fisheries, ABA Section on Natural Resources, Energy and Environmental Law, Workshop on Endangered Species (April 6, 1990) (cited in Karl Gleaves, et al., *The Meaning of "Species" Under the Endangered Species Act*, 13 PUB. LAND L. REV. 25 (1992).

3. Tennessee Valley Authority v. Hill, 437 U.S. 153, 180 (1978) (emphasis added) (hereinafter TVA v. Hill).

and biodiversity. Consequently, Part II discusses the meaning of biological diversity and its relationship to ecosystems. It also discusses the scientific basis for the ESA, with its focus on individual species, to be used as a means for protecting ecosystems, and concludes that while the tools for this protection do exist in the ESA, they have yet to be applied. Part III analyzes the legislative history and language of the ESA, and demonstrates that ecosystem management could have—and should have—been a more integral component of the Act's operative and mandatory provisions. This section also explores reasons why ecosystem management was not incorporated into the Act's obligations. In light of this shortcoming, Part IV examines several means by which ecosystem management can be incorporated into the Act's provisions, without amendment by Congress, and considers several examples of how this is currently being implemented.

II. BIOLOGICAL DIVERSITY AND ECOSYSTEM PROTECTION

A. Biodiversity, Ecosystems and their Relationship

The most certain knowledge biologists have with respect to biological diversity is that the level of knowledge currently possessed is a fraction of the potential knowledge to be acquired.[4] Scientists' limited understanding extends to all levels of biodiversity, including issues such as defining the genetic characteristics of distinct population groups, cataloging species in unexplored ecosystems such as tropical rainforests or ocean bottoms, and determining the attributes of ecosystems. Furthermore, the relationship of genes, species and ecosystems to one

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4. For an excellent discussion that "plumb[s] the depth of our ignorance," *see generally* EDWARD O. WILSON, THE DIVERSITY OF LIFE 131-62 (1992).

> Even though some 1.4 million species . . . have been discovered . . . the total number alive on earth is somewhere between 10 and 100 million . . . . Of the species given scientific names, fewer than 10% have been studied at a level deeper than gross anatomy. The revolution in molecular biology and medicine was achieved with a still smaller fraction . . . altogether comprising no more than a hundred species.

Id. at 346; *see also* Otto T. Solbrig, *The Origin and Function of Biodiversity*, 33 ENVIRONMENT 16 (1991).

Numerous examples of recent discoveries indicating our lack of knowledge exist. Only recently, a new group of single cell marine organisms, picoplankton, were discovered, which has led scientists to believe that they may have underestimated the productivity of marine ecosystems by 50 percent. Solbrig, at 16-18. Wilson describes the 1983 discovery of loriciferons (*Nanaloricus mysticus*), and the decision to place this species in its own phylum, a rare occurrence. WILSON, at 132.

another and to the larger meaning of biodiversity is also poorly understood.[5] This said, scientists who have previously studied the different components of biodiversity independent of one another are pooling their data to develop theories regarding the significance of biodiversity in terms of the health of the planet and the necessity to take steps to preserve this biodiversity.[6]

Biological diversity can be analyzed on three levels: genetic diversity is a measure of the variation of genes within a species, including distinct populations within a species or genetic diversity within a population; species diversity is a measure of the variety of species in a region, including not only the number of different species but also the number of different taxonomic groupings; and ecosystem diversity is a measure of the variety of groupings of species, including species abundance, age structures, and relationships among species, such as predatory, parasitic or symbiotic relationships.[7] In addition, ecosystem diversity includes processes and functions of the habitat, as well as species composition of the habitat.[8]

Species diversity can be measured in three ways: "[a]lpha diversity is the number of species at one habitat in one locality . . . [b]eta

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5. Solbrig, *supra* note 5, at 18. *See also* Yvonne Baskin, *Ecologists Dare to Ask: How Much Does Diversity Matter?*, 264 SCIENCE 202 (1994).

6. *See e.g.* WILSON, *supra* note 4, at 312.

> The solution will require cooperation among professions long separated by academic and practical tradition. Biology, anthropology, economics, agriculture, government and law will have to find a common voice. Their conjunction has already given rise to a new discipline, biodiversity studies, defined as the systematic study of the full array of organic diversity and the origin of that diversity, together with the methods by which it can be maintained and used for the benefit of humanity.

Id.

7. World Resources Institute, *The World Conservation Union*, *United Nations Environment Programme*, *Global Biodiversity Strategy: Guidelines for Action to Save*, *Study and Use Earth's Biotic Wealth Sustainably and Equitably* (1992), at 2 [hereinafter *Global Biodiversity Strategy*].

Wilson attempts to quantify the total biodiversity on the planet, looking at the three levels of species, individuals and genes, to the nearest order of magnitude: "10^8 (100 million) species multiplied by 10^9 (1 billion) nucleotide pairs on average per species; hence a total of 10^{17} (100 quadrillion) nucleotide pairs specifying the full genetic diversity among species." This figure does not account for individual differences within a species, which alone is conservatively estimated at 10^{18} (assuming one out of 1000 sites where two nucleotides may occur at the same site on different chromosomes, resulting in three possible combinations: 1/1000 of $10^9 = 10^6$, multiplied by 3). WILSON, *supra* note 4, at 161-62.

8. *Global Biodiversity Strategy*, *supra* note 7, at 2.

diversity . . . is the rate at which the species number increases as nearby habitats are added . . . . gamma diversity is the totality of species in all habitats across a broad area."[9] It is not enough, however, to look at species diversity solely in terms of species: "Every species born, given enough time to evolve and proliferate into multiple species, is a potential genus or taxon of still higher rank. The longer this assemblage survives and evolves, the more it comes to differ genetically from the remainder of life."[10] For example, the giant panda is the only representative of the genus *Ailuropeda*,[11] so that to lose the panda would be to lose the entire genus, not merely the species.

Of the three levels of biodiversity, ecosystems are the least understood. In short, all that is known is that ecosystems contain a tremendous amount of organization,[12] but it is enough knowledge to place ecosystems, in terms of the "organizational level of importance to biological diversity," at the top of the hierarchy, followed by communities, guilds, species, organisms and genes.[13] On one level, it involves the interaction of living organisms to the point where they have developed self-integrating and self-organizing processes.[14] On another level, it includes not only organizational units, but the transfers of energy and matter between these units.[15] While "community generally refers to the assemblage of species or populations in a location without explicit

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9. WILSON, *supra* note 4, at 150.

10. *Id*. at 156.

11. *Id*. at 157.

12. *Id*. at 180. "We know some keystone species, some assembly rules, some processes of competition and symbiosis that serve as a weak gravitational force." *Id*.

13. *Id*. at 157.

14. *See* Henry A. Regier, *The Notion of Natural and Cultural Integrity*, Ecological Integrity and the Management of Ecosystems 3, 4 (Stephen Woodley, et al., eds., 1993) [hereinafter Ecological Integrity]. Regier relies on a summary of one model of "how living systems effect self-integration:"

> 'Bertaanffy's model of hierarchical order [has] four related concepts: As life ascends [from a state of low] complexity, there is a *progressive integration*, in which the parts become more dependent on the whole, and *progressive differentiation*, in which the parts become more specialized. In consequence, the [living system] exhibits a wider repertoire of behavior. But this is paid for by *progressive mechanization*, which is the limiting of parts to a single function, and *progressive centralization*, in which there emerge leading parts . . . that dominate the behavior of the system.'

Id. (citing M. Davidson, *Uncommon Sense: The Life and Thought of Ludwig von Bertalanffy (1901-1972)*, Father of General Systems Theory (1983)).

15. Anthony W. King, *Considerations of Scale and Hierarchy*, *in* ECOLOGICAL INTEGRITY, *supra* note 14, at 19, 20.

reference to their physical environment . . . the ecosystem includes the physical or abiotic environment in addition to biological components."[16]

Related to the ecosystem is ecosystem function, which involves how the units are organized and how the transfers of energy and matter are implemented.[17]

B. Loss of Biodiversity

It is not until one has a sense of the extent of biodiversity that can one appreciate the extent of its potential demise. There is evidence that extirpation of many species has been tied to the first migrations of humans more than 10,000 years ago.[18] Even though almost all the species that ever existed are extinct, there are more species existing today than ever before.[19] Precisely because such a small percentage of species have been identified, it is impossible to determine how many species are disappearing as a result of human activities.

Some estimates can be made with respect to biodiversity in rain forests, by studying the rate of rain forest destruction and extrapolating the rate of extinction based on the loss of area. Considering that the current level of deforestation (142,000 square kilometers/year) may result in the extirpation of 1/2% of the species in the rain forest each year, by the year 2022, half the forest will be gone and 10-25% of the species will be extinct.[20] A conservative estimate of the absolute number of species being extinguished each year is 27,000.[21] "[N]ormal 'background' extinction rate is about one species per one million species a year[;]

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16. *Id.*

17. *Id.* "Ecosystem function generally refers to the functioning or operation of the ecosystem, [and] its integrated holistic dynamics . . . ." *Id.*

18. *See* WILSON, *supra* note 4, at 245-53.

> The collapse of diversity [in North America] occurred about the same time that the first Paleo-Indian hunters entered the New World, 12,000 to 16,000 years ago . . . . It was not a casual, up-and-down event. Mammoths had flourished for two million years to that time and were represented by three species . . . . Within a thousand years all were gone. The ground sloths, another ancient race, vanished almost simultaneously . . . . The birds that became extinct were also those most vulnerable to human hunters . . . . The effect was . . . swift destruction, on the scale of evolution that measures normal lifespans of genera and species in millions of years.

Id.

19. *See* WILSON, *supra* note 4, at 216.

20. *Id.* at 276-77.

21. *Id.* at 280.

[h]uman activity has increased extinction between 1,000 and 10,000 times over this level in the rain forest by reduction in area alone."[22] Of the five previous great extinction episodes of history, this is one of the most severe.

C. Species Protection as a Surrogate for Ecosystem Protection

Given the need to protect biodiversity at least on a level of ecosystems, the question arises whether the ESA, which focuses on species as they currently exist, can adequately serve this purpose.[23] A steady debate exists whether an "endangered ecosystem act" would be more efficacious in protecting biodiversity than an "endangered species act." The answer is one of policy and resource management as much as it is of science.

In terms of science, it is established that in some cases, certain "indicator species" or "keystone species" provide a measure for the health of an ecosystem, and by studying those species, scientists can determine trends in the ecosystems of those species.[24] Similarly, scientists can identify certain "umbrella species" that provide a measure for the protection of an ecosystem, and by protecting those species, managers can protect the entire ecosystems of those species.[25] These umbrella species "have properties (*e.g.*, long generation times, relatively low intrinsic rates of population growth) that make them particularly vulnerable to anthropogenic change to natural environments."[26] These species can be viewed as coarse filters through which communities of species within an ecosystem can be protected.[27] While the identification and protection of an umbrella species will not protect all species in an ecosystem, it will provide protection for most species, leaving only a few

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22. *Id.*

23. *See* Elizabeth Losos, *The Future of the U.S. Endangered Species Act*, 8 TRENDS IN ECOLOGY AND EVOLUTION (hereinafter TREE) 332, 333-35 (1993) (discussing the scientific debate over the ESA).

24. *See* WILSON, *supra* note 4, at 164. "As the name implies, the removal of a keystone species causes a substantial part of the community to change drastically." *Id.*

25. C. Richard Tracy & Peter F. Brussard, *Preserving Biodiversity: Species in Landscapes*, 4 ECOLOGICAL APPLICATIONS 205 (1994).

26. *Id.*

27. *Id. See also* David Wilcove, *Getting Ahead of the Extinction Curve*, 3 ECOLOGICAL APPLICATIONS 218-220 (1993).

species to be protected on an individual basis.[28] Critics of this approach, however, point out that it is frequently not possible to identify an umbrella species for an ecosystem.[29] Even if it is, adequate protections for these coarse filters may not be adequate for the ecosystem itself or smaller, dependent species.[30] It is argued that many ecosystems are too complex, containing many species of lower taxa that would not receive protection.[31]

Ecosystems may also be measured more by particular processes and trends rather than by particular species. In this case, some believe that "[an] ecosystem approach is . . . the only way to conserve . . . processes . . . [and] habitats . . . ."[32] Destruction of habitat is seen as the major threat to species' survival, and this threat is not adequately addressed by focusing on protection of species only.[33] Critics note that problems with this approach lie in the elusiveness of a definition of ecosystem, and the difficulty in identifying particular processes to protect.[34]

In terms of resource management, an ecosystem approach is only now being developed that considers the range of biophysical elements, such as species, communities and landscapes.[35] This approach entails initially classification and mapping of ecosystem components, including climate, physiography, physiochemistry, geology, soils and vegetation.[36] Only when such mapping is conducted will managers be able to develop the priorities for preservation and protection not only of species, but those components within the ecosystem vital to the species' survival.[37] Some

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28. Tracy & Brussard, *supra* note 25, at 205 ("[T]he coarse filter approach to preserving biodiversity hierarchically considers the needs of an umbrella species and subsequently considers the needs of species not protected under the protection afforded to the umbrella species."). *Id*.

29. *See* Losos, *supra* note 23, at 333.

30. Jerry F. Franklin, *Response to Preserving Biodiversity: Species in Landscapes*, 4 ECOLOGICAL APPLICATIONS 208 (1994). Franklin states that the "heroic megafauna" that generally get listed "do not necessarily make good coarse filters although they may be conceptual and legal engines that impel the development of such strategies." *Id*.

31. Losos, *supra* note 23, at 333.

32. J.F. Franklin, *Preserving Biodiversity: Species*, *Ecosystems or Landscapes?*, 3 ECOLOGICAL APPLICATIONS 202-05 (1993).

33. Losos, *supra* note 23, at 333.

34. *See* Tracy & Brussard, *supra* note 25, at 205-06.

35. Edward T. LaRoe, *Implementation of an Ecosystem Approach to Endangered Species Conservation*, 10 ENDANGERED SPECIES UPDATE 3, 5 (1993).

36. Burton V. Barnes, *The Landscape Ecosystem Approach and Conservation of Endangered Spaces*, 10 ENDANGERED SPECIES UPDATE at 13 (1993).

37. *Id*. at 17.

scholars contrast this approach with that taken currently by resource managers, in which they look at individual species within one ecosystem, such as the northern spotted owl, only to revisit the same issues later when another species in the same ecosystem, such as the marbled murrelet, becomes threatened. Rather, the issue should be "what habitat mix would optimally maintain those species that are dependent upon old-growth forest ecosystems."[38] Although an ecosystem approach is ultimately more cost-effective, allowing managers to deal with multiple species simultaneously, there are a number of roadblocks to the adoption of such an approach: logistically, it involves more political entities, more parties, and additional statutory requirements; conceptually, it involves less discrete boundaries and definitions; biologically, it involves greater numbers of species, sometimes with conflicting or competing requirements; economically, it may initially require greater funding while mapping is being conducted (although costs in the long run should be greatly reduced).[39]

The scientific debate aside, whether the ESA will be used as the camera to which to attach those "coarse filters," is a policy decision. The resource management issues aside, whether the ESA can be used as a basis for ecosystem management is likewise a policy decision. It is a policy decision whether the ESA will be used to provide protections to individual species threatened with extinction without consideration of their role in the larger ecosystem, or to provide protections to those targeted species that are the coarse filters for the larger environment.[40] For example, consideration may be given to the priority and basis of listing decisions, status reviews of umbrella species may be given priority, and groupings of species to be listed may be considered. It is also a policy decision whether the ESA will be used to protect primarily

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38. LaRoe, *supra* note 35, at 5.

39. *Id*. at 5-6.

40. Efforts to protect ecosystems depend on how efforts to protect individual species are handled:

> The top priority of any ecosystem plan should be to protect all of the sensitive species in the ecosystem. In fact, some of the most celebrated "ecosystem" plans . . . are more like multi-species conservation plans in which the habitat requirements of a dozen or so sensitive species are simultaneously considered when deciding which areas to protect. The distinction between "single-species management" and "ecosystem management" is a false dichotomy; both are part of a continuum of steps necessary to protect biodiversity.

David Wilcove, *Response to Preserving Biodiversity: Species in Landscapes*, 4 ECOLOGICAL APPLICATIONS 207 (1994).

species themselves, or both the species and their habitats. For example, consideration may be given to the scope and purpose of critical habitat designations and the definition of taking, harming and harassing species. Whether the scientific debate focuses on certain umbrella species, or focuses on broader habitat concerns, the ESA can address either issue as one of policy, without amendment to the Act. The tools are present in the ESA; they need only be applied.

III. ECOSYSTEM PROTECTION AS A LOST MANDATE OF THE ESA

A. The Mandate: Statutory Language and Legislative History

1. Statutory Language

The first federal law addressing endangered species, Endangered Species Preservation Act of 1966,[41] makes no mention of ecosystems, although it does have a bland reference to habitat protection[42] and created the National Wildlife Refuge System. Three years later, Congress passed the Endangered Species Conservation Act,[43] which, although providing for stronger protections for endangered species and greater trade restrictions, makes no mention of habitats or ecosystems.

The term "ecosystem" is explicitly mentioned only once in the ESA, in the preamble: "The purposes of this chapter are to provide a means whereby ecosystems upon which endangered species [or] threatened species depend may be conserved, to provide a program for the conservation of such endangered species and threatened species . . . ."[44]

Although the preamble contains the only explicit reference to ecosystems, the ESA makes clear in numerous provisions that species preservation and ecosystem protection go hand in hand. Insofar as the protection of species depends on protection of their habitats, and habitats are one of several aspects of ecosystems, the three are inextricably linked

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41. Pub. L. No. 89-669, 80 Stat. 926 (1966).

42. *Id.*

> "It is further declared to be the policy of Congress that . . . insofar as is practicable and consistent with the primary purposes of [the Secretaries of Interior, Agriculture and Defense] shall preserve the habitats of such threatened species on lands under their jurisdiction."

Id.

43. Pub. L. No. 91-135, 83 Stat. 275 (1969).

44. 16 U.S.C. § 1531(b).

with each other. This relationship is laid out in the definitions of "critical habitat" and "conservation" in section 3 of the Act,[45] which both tie habitat protection to recovery of species.

In terms of actual habitat protection, several provisions of the Act are applicable. One of the criteria for listing, reclassifying or delisting a species under section 4(a) of the Act is "the present or threatened destruction, modification, or curtailment of its habitat or range."[46] Acquisition of land to conserve listed species is authorized in section 5,[47] and management agreements between the Secretary and states may be executed for the "administration and management of any area established for the conservation of endangered species or threatened species."[48]

In terms of conservation of the species, which includes habitat protection as part of its definition, several provisions of the Act are applicable. Section 4(f) of the Act establishes the broad charge to the Secretary to develop and implement recovery plans for the conservation of the species.[49] Section 7(a)(1) provides that "Federal agencies shall . . . utilize their authorities in furtherance of the purposes of [the Act] by carrying out programs for the conservation of endangered species and threatened species[.]"[50] Nonfederal entities that seek an exemption from the prohibitions against taking listed species must develop a conservation plan pursuant to section 10(a)(2).[51]

Even without explicit consideration of ecosystem protection, the Act implicitly provides for the protection of ecosystems if necessary to

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45. "Conservation" is defined as:

> the use of all methods and procedures which are necessary to bring any endangered species or threatened species to the point at which the measures provided pursuant to this [Act] are no longer necessary. Such [measures may] include, but are not limited to, all activities associated with scientific resources management such as . . . habitat acquisition and maintenance . . . .

Id. § 1532(3).

"Critical habitat" is defined as "the specific areas within the geographical area occupied by the species . . . on which are found those physical or biological features (I) essential to the conservation of the species and (II) which may require special management considerations or protection." *Id.* § 1532(5)(A)(i).

46. *Id.* § 1533(a)(1)(A).
47. *Id.* § 1534(a).
48. *Id.* § 1535(b).
49. *Id.* § 1533(f).
50. *Id.* § 1536(a)(1).
51. *Id.* § 1539(a)(2)(A).

protect individual species. The Act recognizes that information as to how best to protect endangered and threatened species is often unavailable and always changing. As a result, the Act provides for a flexible management regime in which the Services and other Federal agencies must use the "best scientific and commercial data available."[52] While the statute does not identify the precise measures necessary to protect listed species, neither does it limit the possible measures available for such protection. Rather, it leaves such decisions open, to be based on current science. If the current science indicates that species cannot be protected without consideration of their ecosystem—a fact which Congress clearly recognized regardless—then such protections are in keeping with the scientific standard established in the statute. If current information indicates that protection of the ecosystem itself is necessary to protect listed species, then Federal agencies are mandated to take appropriate measures to protect the ecosystem.

2. Legislative History

The legislative history of the ESA supports the premise that the statute was intended to preserve the biological diversity of the planet and the ecosystems that store this diversity, inasmuch if not more than protecting the individual species that comprise these ecosystems and biodiversity. The hearings and conference reports from the original passage of the Act are replete with discussions relating to biological diversity.[53] For example, the Report of the House Committee of Merchant Marine and Fisheries noted that "[f]rom the most narrow possible point of view, it is in the best interests of mankind to minimize

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52. *Id.* § 1533(b)(1)(A); 16 U.S.C. § 1536(a)(2).

53. As one example, the Report of the House Committee on Merchant Marine and Fisheries offered this poignant observation:

> As we homogenize the habitats in which these plants and animals evolved, and as we increase the pressure for products that they are in a position to supply . . . we threaten[ed] their—and our own—genetic heritage. The value of this genetic heritage, is quite literally, incalculable. The blue whale evolved over a long period of time and the combination of factors in its background has produced a certain code, found in its genes, which enables it to reproduce itself, rather than producing sperm whales, dolphins or goldfish. If the blue whale were to disappear, it would not be possible to replace it—it would simply be gone. Irretrievably. Forever.

H.R. REP. NO. 93-412, 93rd Cong., 1st Sess. (1973), *reprinted in* A Legislative History of the Endangered Species Act of 1973, as Amended in 1976, 1977, 1978, 1979 and 1980, 140, 143 (1982) [hereinafter Legislative History of the Act].

the losses of genetic variations."[54] The House Report also emphasized "the critical nature of the interrelationships of plants and animals between themselves and with their environment," and that it is "cold, hard fact [that] 'everything is connected to everything else.'"[55] The Report of the Senate Committee on Commerce echoed these thoughts: "Consideration of this need to protect endangered species goes beyond the aesthetic. In hearings . . . it was shown that many of these animals perform vital biological services to maintain [the] 'balance of nature' within their environments. Also revealed was the need for biological diversity for scientific purposes."[56] These discussions indicate that the broad purpose of the Act, as intended at its passage, was to protect biodiversity. Both species protection and ecosystem protection could thus be viewed as means to an end, rather than ends in themselves.

In fact, the legislative history further indicates that species protection itself was to be done through ecosystem protection. The reference to ecosystem protection in section 2 of the Act was not included in the original bill introduced by Representative Dingell,[57] but added after debate within the House Merchant Marine and Fisheries Committee in the bill introduced to the House floor.[58] The Report of the House Committee of Merchant Marine and Fisheries contrasted a "simple 'hands-off' attitude" with a more aggressive attitude towards protection of endangered species, and noted that the "basic purpose of the Act is clearly stated in the legislation" and is to protect ecosystems themselves.[59] Indeed, the Report later stated: "the essential purpose of the Act is to provide a means for protecting the ecosystems upon which we and other species depend. Another, allied purpose is to provide a specific program for the protection of endangered species."[60] The

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54. *Id*. at 144.

55. *Id*. at 145.

56. S. REP. NO. 93-307, 93rd Cong., 1st Sess. (1973) *reprinted in* Legislative History of the Act, *supra* note 53, at 301.

57. H.R. 37, 93rd Cong., 1st Sess. (1973).

58. H.R. 37, as amended, 93rd Cong., 1st Sess. (1973).

59. H.R. REP. NO. 93-412, 93rd Cong., 1st Sess. (1973), *reprinted in* A Legislative History of the Act, *supra* note 53, at 140, 145:

> "Such an attitude lies at the heart of the legislation here presented to the House. The basic purpose of the Act is clearly stated in the legislation; to provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved, protected or restored."

Id.

60. *Id*. at 149.

emphasis is on ecosystems, and as the legislative history demonstrates, the goal is to protect biological diversity.[61]

The Senate bill followed a similar path. The original bill introduced by Senator Williams[62] contained no language relating to ecosystems, although the bill as amended considered ecosystem protection on a level equal with species protection.[63] Discussion on the House floor supported the Senate bill as amended: Representative Dingell noted that "the purposes of the bill include the conservation of the species and of the ecosystems on which they depend, and every agency of [the] Government is committed to see that those purposes are carried out."[64]

Legislative history subsequent to 1973 is bespeckled with references to both biological diversity and ecosystem protection reaffirming the original congressional intent of the Act. In 1976, the Report of the House Committee on Merchant Marine and Fisheries noted that "[t]he goal of the endangered species program is to maintain a healthy diversity of species and to preserve in their natural ecosystems species of animals and plants that are endangered with extinction or threatened with endangerment."[65] The Report of the Senate Commerce Committee had virtually identical language.[66]

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61. *See infra* note 63 and accompanying text.

62. S. 1983, 93d Cong., 1st Sess. (1973).

63. S. 1983, as amended, 93d Cong., 1st. Sess. (1973). The Congress hereby declares that the purposes and policy of this Act are to:

> (1) provide an effective means to conserve, protect, and restore the ecosystems upon which endangered and threatened species of fish or wildlife depend;
>
> (2) provide a viable program for the conservation, protection, restoration, and propagation of endangered and threatened species.

Id.

64. 119 CONG. REC., 1973 (statement of Rep. Dingell), *reprinted in* Legislative History of the Act, *supra* note 53, at 481.

65. H.R. 887, 94th Cong., 2d Sess. (1976), *reprinted in* Legislative History of the Act, *supra* note 53, at 496. *See also* 122 CONG. REC. 3259 (1976) (statement of Rep. Leggett on H.R. 10229) ("The phrase 'extinct is forever' emphasizes the unique and serious nature of the problem facing the world's endangered species. Unlike some problems which can be remedied after a mistake is made, the extinction of a species is irreversible. The occurrence of such loss is not merely aesthetic, but educational, scientific, economic, and perhaps even ethical."); 122 CONG. REC. 6401 (1976) (statement of Rep. Leggett on H.R. 8092) ("This legislation was a recognition of the fact that the variety of species in our ecosystem provide not only a pleasing [a]esthetic surrounding, but also an educational, scientific, and economic resource").

66. S. 837, 94th Cong. 2d Sess. (1976) *reprinted in* Legislative History of the Act, *supra* note 53, at 518.

In 1978, the Report of the House Committee on Merchant Marine and Fisheries stated that "the ultimate goal of the Act is the conservation of the ecosystem on which all species, *whether endangered or not*, depend for survival."[67] The Report further noted that "the primary purpose of the Endangered Species Act of 1973 is to prevent animal and plant species endangerment and extinction caused by man's influence on ecosystems, and to return the species to the point where they are viable components of their ecosystems."[68] While these passing references through the years may be a form of legislative boilerplate, the fact that they continue to be made nevertheless indicates a consciousness on the part of the legislators that the Act seeks to protect more than species, but the ecosystems of these species necessary for their survival.

Congress amended the ESA in 1982 to allow for permits to be issued to nonfederal entities for the taking of endangered species incidental to otherwise lawful activities. While these permits provided an exception to the taking prohibition of section 9, the permit applicant was required to develop and implement a conservation plan as a condition for the permit.[69] In the context of the these amendments, the House Conference Report observed:

> In enacting the Endangered Species Act, Congress recognized that individual species should not be viewed in isolation, but must be viewed in terms of their relationship to the ecosystem of which they form a constituent element. Although the regulatory mechanisms of the Act focus on species that are formally listed as endangered or threatened, the purposes and policies of the Act are far broader than simply providing for the conservation of individual species or individual members of listed species. This is consistent with the purposes of several other fish and wildlife statutes . . . which are intended to authorize the Secretary to cooperate with states and private entities on matters regarding conservation of all fish and wildlife resources of this nation. The conservation plan will implement the broader

67. H.R. REP. NO. 1625, 95th Cong. 2d Sess. 16, *reprinted in* Legislative History of the Act, *supra* note 53, at 740 (emphasis added).

68. *Id*.

69. *See* 16 U.S.C. § 1539(a)(2).

> purposes of all those statutes and allow unlisted species to be addressed in the plan.[70]

These amendments, in particular the requirement of a conservation plan, are significant in that Congress recognizes, through this operative provision of the statute rather than through the preamble, that the ESA protects more than individual species. As noted in the passage, the regulatory mechanisms of the Act typically focus on individual species although the legislative history of the Act typically focuses on species in the larger context of their ecosystems. These amendments in 1982 narrow the gap between the statutory requirements and the legislative history.

Even as Congress prepares for a contentious reauthorization of the ESA next year, it adheres to the original premise that the ESA needs to focus on ecosystems as a means to protect threatened and endangered species.[71]

B. Disappearance of the Mandate: Regulatory Implementation and Judicial Interpretation

Despite the statutory language and the legislative history, it has become evident through the years that the ESA, as implemented by the agencies[72] and interpreted by the courts, is species-oriented, even myopically so at times. There are several reasons for this. To a large extent, this ecosystem-based approach was laid out in the preamble and the definitions, but was never carried over to the operative provisions of the Act. Furthermore, those operative provisions that most directly incorporate this approach—protection of the species' critical habitat pursuant to section 7(a)(2), and the duty of Federal agencies to conserve

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70. H.R. CONF. REP. No. 835, 97th Cong., 2d Sess. (1982) *reprinted in* 128 Cong. Rec. 24148 (1982).

71. *See Hearing on Reauthorization of the Endangered Species Act Before the Subcomm. on Clean Water, Fisheries and Wildlife of the Senate Comm. on Environment and Public Works*, 103d Cong., 2d Sess. (1994) (statements of Senators Graham and Baucus).

72. The Secretaries of Commerce and Interior are both charged with implementing the ESA. The Secretary of Commerce has ESA jurisdiction over most marine species, including anadromous species of fish. *See* 16 U.S.C. § 1532(15); *see also* Reorganization Plan No. 4 of 1970, 84 Stat. 2090 (1970) *reprinted in* 5 U.S.C. app. 1349 (1988); *see also* Memorandum of Understanding Regarding Jurisdictional Responsibilities and Listing Procedures under the Endangered Species Act of 1973 (Aug. 28, 1974, executed by FWS and NMFS). The Secretaries of Commerce and the Interior in turn have delegated most ESA responsibilities to the National Marine Fisheries Service and Fish and Wildlife Service, respectively.

listed species pursuant to section 7(a)(1)—were interpreted by the implementing agencies and by the courts in such a way that their significance was greatly minimized. This article examines administrative implementation of critical habitat protections and judicial interpretation of section 7(a)(1).

1. Administrative Implementation of Critical Habitat Provisions

The Act calls for both listing of species and the designation of critical habitat for that species. Once a species is listed and critical habitat designated, section 7(a)(2) places stringent proscriptions on all Federal agencies:

> Each Federal agency shall, in consultation with and with the assistance of the Secretary, insure that any action authorized, funded or carried out by such agency . . . is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of [critical] habitat of such species . . . .[73]

The statute does not define either jeopardy or adverse modification. However, the Fish and Wildlife Service (FWS) and the National Marine Fishery Service (NMFS) promulgated joint regulations in 1986 that included definitions of both terms.[74]

The regulatory definition of adversely modifying critical habitat is almost identical with the definition of jeopardizing the species. Both agencies have thus taken the position that the prohibitions against jeopardy and adverse modification are largely duplicative.[75] Both

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73. 16 U.S.C. § 1536(a)(2).

74. The regulations state:

> *Destruction or adverse modification* means a direct or indirect alteration that appreciably diminishes the value of critical habitat for both the survival and recovery of listed species . . . .
>
> *Jeopardize the continued existence of* means to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species.

50 C.F.R. § 402.02 (1993).

75. *See e.g.*, Final rule designating critical habitat for Sacramento River winter-run chinook salmon, 59 Fed. Reg. 33212 (1993) (to be codified at 50 C.F.R. pt. 226).

standards require an analysis based on appreciably diminishing or reducing the survival and recovery of a species.[76]

A number of scholars have criticized this interpretation, arguing that it undermines the broad goals of the Act,[77] and even that it contravenes the Act by rendering the adverse modification prohibition nugatory.[78] To a large extent, however, this approach is complemented by the statutory charge to assess the economic impacts of critical habitat

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76. FWS, however, has recently developed a somewhat ambiguous distinction between adverse modification and jeopardy. In its proposed rule to designate critical habitat for the threatened marbled murrelet, FWS stated:

> As a result of the link between critical habitat and recovery in the Act's definition of critical habitat, the prohibition against destruction or adverse modification of critical habitat should provide for the protection of the critical habitat's ability to contribute to the recovery of the species. Thus, the adverse modification standard may be reached closer to the recovery end of the survival continuum, whereas the jeopardy standard has been applied nearer to the extinction end of the continuum.

See Proposed Designation of Critical Habitat for the Marbled Murrelet, 59 Fed. Reg. 3811, 3819 (1994) (to be codified at 50 C.F.R. pt. 17). While FWS articulates a difference between the adverse modification standard and the jeopardy standard, it neglects to consider that both standards are to be measured against "*both* the survival and recovery of a listed species" (emphasis added), which, according to the regulations, indicates "that, except in exceptional circumstances, injury to recovery alone would not warrant issuance of a 'jeopardy' biological opinion." 51 Fed. Reg. 19926, 19934 (1986) (to be codified at 50 C.F.R. pt. 402).

77. *See* DANIEL ROHLF, THE ENDANGERED SPECIES ACT: A GUIDE TO ITS PROTECTIONS AND IMPLEMENTATION 151-53 (1989).

> As interpreted by current section 7 regulations, the statutory language in § 7(a)(2) forbidding destruction or adverse modification of critical habitat gives species *no* substantive protection beyond that to which the species are entitled under the jeopardy standard . . . . Since a jeopardy finding alone is sufficient to constitute a section 7 violation, the ESA's critical habitat mandate, as interpreted by the regulations, adds nothing to section 7's substantive protection and is therefore simply redundant . . . . By essentially reading the prohibition of destruction or adverse modification of critical habitat out of section 7(a)(2), the section 7 regulations clearly conflict with the intent of the ESA, as well as with [the] express statutory language.

Id.

78. Oliver Houck, *The Endangered Species Act and Its Implementation by the U.S. Departments of Interior and Commerce*, 64 U. COLO. L. REV. 277, 299 (1992). Describing the regulations as "sleight of hand," Houck states that "these regulations lead to an 'unnecessarily crabbed' application of the ESA . . . ." (citing Calvert Cliffs Coordinating Comm'n v. U.S. Atomic Energy Comm'n, 449 F.2d 1109, 1117 (D.C. Cir. 1971). He adds, "[w]hat should be equally plain is that the regulations are unlawful." *Id.* He provides as reasons the rule of statutory construction that "a law will be interpreted to give effect to all of its portions so that no part will be 'inoperative or superfluous, void or insignificant, and so that one section will not destroy another,'" *id.* at 300, and that the regulations "restrict 'critical habitat' to bare species survival, despite a legislative definition that requires considerably more." *Id.*

designation coupled with the statutory prohibition from assessing economic impacts of listing a species.[79] This dichotomous treatment of the two protections in the statute has led the agencies to develop an incremental approach to the economic analysis of critical habitat designations, in which only those costs associated with the designation alone are considered.[80] Just as the economic impact of critical habitat beyond listing is considered incrementally in section 4 of the ESA, so too is the protective force of no-adverse modification beyond no-jeopardy considered incrementally in section 7 of the ESA.

Consequently, the strength of the ESA lies in the listing itself, which is immune from economic analysis and which triggers the no-jeopardy mandate. The listing of species as endangered, or in certain cases, as threatened, also triggers the prohibitions against takings in section 9 of the ESA. In light of the statutory definition of "take" to include "harm,"[81] and the regulatory interpretation of harm to include a certain level of habitat degradation,[82] the prohibition against adverse modification of critical habitat also duplicates the takings prohibition.

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79. The statute provides: "The Secretary shall make determinations [that a species is endangered or threatened] solely on the basis of the best scientific and commercial data available . . . ." 16 U.S.C. § 1533(b)(1)(A). "The Secretary shall designate critical habitat . . . on the basis of the best scientific data available and after taking into consideration the economic impact, and any other relevant impact, of specifying any particular area as critical habitat." 16 U.S.C. § 1533(b)(2).

80. *See e.g.*, Final rule designating critical habitat for Snake River sockeye, Snake River spring/summer chinook, and Snake River fall chinook, 58 Fed. Reg. 68543 (1993) (to be codified at 50 C.F.R. pt. 226) [hereinafter Snake River salmon critical habitat designation].

> The law is unambiguous in both its prohibition of the consideration of economics in the listing process and its requirement to analyze the economic impact of designating critical habitat. These disparate requirements for each determination lead to an incremental analysis in which only the economic impacts resulting from the designation of critical habitat are considered.

Id. at 68549.

81. 16 U.S.C. § 1532(19).

82. 50 C.F.R. § 17.3 (1993).

> "*Harm* in the definition of *take* in the Act means an act which actually kills or injures wildlife. Such act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering."

Id.

While this definition of taking to include habitat degradation traditionally has been upheld by the courts, *see* Palila v. Hawaii Dept. of Land and Natural Resources, 852 F.2d 1106 (9th Cir. 1988), a split in the circuits was recently created when one court struck down the regulatory definition as being arbitrary and capricious, with no basis in the statute or legislative history. *See*

While critical habitat designation may not provide protections beyond listing, the designation is seen to have value in informing the public, and in particular Federal agencies, that certain habitat does have special import for a listed species and may warrant special management considerations to be addressed through consultations with FWS or NMFS pursuant to section 7(a)(2).[83] Furthermore, FWS has recently provided a slightly new interpretation of critical habitat designations.[84] Nevertheless, actual protections afforded by critical habitat designations, and the no-adverse modification standard, have been historically interpreted by the implementing agencies to be largely duplicative with the listing and no-jeopardy standard.

2. Judicial Interpretation of Section 7(a)(1)

Section 7(a)(1) states that:

> "Federal agencies shall . . . utilize their authorities in furtherance of the purposes of [the Act] by carrying out programs for the conservation of endangered species and threatened species . . . ."[85]

Although the language of this provision is mandatory, agencies maintain significant discretion in determining how and to what extent they shall utilize their duties to conserve listed species. In general, courts have recognized a conservation duty upon Federal agencies in the abstract sense, but have refrained from delineating the scope of this duty in a practical sense.

In *Pyramid Lake Paiute Tribe v. Dept. of Navy*,[86] the court recognized the affirmative mandate of section 7(a)(1) and rejected the

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Sweet Home Chapter of Communities for a Great Oregon v. Babbitt, 17 F.3d 1463 (D.C. Cir. 1994), *cert. granted*, 63 U.S.L.W. 3513 (U.S. 1995).

83. *See, e.g.*, Snake River critical habitat designation, *supra* note 80, at 68549:

> Critical habitat is important because it identifies habitat that is essential for the continued existence of a species and that may require special management measures. This facilitates and enhances Federal agencies' ability to comply with section 7 by ensuring that they are aware of the habitat that should be considered in analyzing the effects of their activities on listed species and habitats essential to support them.

Id.

84. *See* Proposed Designation of Critical Habitat for the Marbled Murrelet, *supra* note 76, at 3819.

85. 16 U.S.C. § 1536(a)(1).

86. Pyramid Lake Paiute Tribe v. Dept. of Navy, 898 F.2d 1410 (9th Cir. 1990).

Navy's argument that such a mandate was not intended to frustrate the "primary mission" of an agency.[87] In defining the scope of this mandate however, the court noted that "the Secretary is to be afforded some discretion in ascertaining how best to fulfill the mandate to conserve under section 7(a)(1),"[88] and it rejected the Tribe's argument that section 7(a)(1) requires an agency to use the "least burdensome alternative."[89]

In *Carson-Truckee Water Conservancy District v. Clark*,[90] the court held that the Federal agency maintained discretion to use its authority under section 7(a)(1) to use water from the reclamation project to conserve listed fish rather than to sell for commercial purposes.[91] The court first noted that the Secretary is not required to sell water commercially,[92] and then observed that given this discretion, the Secretary can decide to not sell water but rather conserve listed species.[93]

Thus, to the extent that the agency maintains discretion over programs within its control, it can invoke section 7(a)(1) to take conservation measures for the benefit of listed species.

The district court of Wyoming relied on *Carson-Truckee* in distinguishing between "*undertak[ing]* a project that threatens the existence of an endangered or threatened species" and "implementing a very concise and aggressive management plan that has as its ultimate goal the preservation of the grizzly."[94] The court observed, "[w]hile the

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87. *Id.* at 1417-18 (citing TVA v. Hill, 437 U.S. 153 (1978), the court noted that "Congress 'carefully omitted' from the final version of the Act all proposed language which tempered federal agencies' duty to conserve.") *Id.*

88. *Id.* at 1418.

89. *Id.* at 1417.

90. Carson-Truckee Water Conservancy Dist. v. Clark, 741 F.2d 257 (9th Cir. 1984).

91. *Id.* at 262.

92. The court noted that the Washoe Project Act, which governs the management and operations of the reclamation project, "anticipates but does not require the Secretary to sell water to recover project construction costs." *Id.*

93. The court stated:

> ESA, on the other hand, directs the Secretary to use programs under his control for conservation purposes where threatened or endangered species are involved. Following this directive, the Secretary here decided to conserve the fish and not to sell the project's water. Given these circumstances, the ESA supports the Secretary's decision to give priority to the fish until such time as they no longer need ESA's protection. *Id.*

94. National Wildlife Federation v. National Park Service, 669 F. Supp. 384, 388 (D. Wyo. 1987). This case is somewhat confusing in that it poorly characterizes the nature of the interim management plan that was designed to protect grizzlies. A formal consultation was conducted

affirmative nature of § 1536(a)(1) is beyond dispute, the definition of conservation in § 1532 provides some discretion among conservation measures."[95] However, the court transposed the mandatory language to enabling language: "[t]he purpose behind § 1536(a)(1) is to authorize the Secretary and various federal agencies to dedicate all means at their disposal to the conservation of endangered or threatened species."[96]

Occasionally courts have found that conservation is mandatory. For example, one court set aside duck hunting regulations promulgated by FWS that allowed hunting during pre-dawn and post-dusk hours when listed birds could be misidentified for game birds. FWS argued that it need only demonstrate that the regulation does not jeopardize the continued existence of listed species, but the court held, "[FWS] must do far more than merely avoid the elimination of protected species. It must bring these species back from the brink so that they may be removed from the protected class, and it must use all methods necessary to do so."[97]

IV. INCORPORATION OF ECOSYSTEM PROTECTION IN THE ESA

Ecosystem considerations can be taken into account in several provisions of the Act. For example, new listings of species can be determined and grouped according to the ecosystems in which they are found; recovery plans can be developed for groups of species found in a particular ecosystem and thus focus on ecosystem recovery as well as individual species recovery; conservation plans pursuant to section 10 of the Act can also address ecosystem-based considerations rather than single-species concerns. Most importantly, however, ecosystem considerations can be—and, in certain instances, may be required to be—incorporated into the consultation process of section 7(a)(2).

A. General Policy

Both FWS and NMFS, as well as other Federal agencies, have been moving to an ecosystem-based approach in addressing many aspects of listed species. This approach has been evident through a number of

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between FWS and the NPS on the plan, which implies that the proposed action was likely to adversely affect listed species, yet the court determined that the plan served to conserve grizzlies.

95. *Id.* at 387.

96. *Id.* at 388.

97. Defenders of Wildlife v. Andrus, 428 F. Supp. 167, 170 (D.D.C. 1977).

agreements and policy statements that have been issued by Federal agencies recently, as well as individual agency decisions.

Most significantly, FWS and NMFS recently issued a joint policy statement that formally provides an ecosystem approach to implementation of the Act.[98] The policy "incorporate[s] ecosystem considerations in Endangered Species Act actions regarding listing, interagency cooperation, recovery[,] and cooperative activities."[99] It recognizes that "[s]pecies will be conserved best not by a species-by-species approach but by an ecosystem conservation strategy that transcends individual species[;] [t]he future for endangered and threatened species will be determined by how well the agencies integrate ecosystem conservation with the growing need for resource use."[100]

Specifically, the policy states that listing decisions will be grouped on a geographic, taxonomic, or ecosystem basis where possible, and that comprehensive status reviews across the entire range of candidate species shall be conducted in conjunction with other Federal, Tribal, state and private agencies. Recovery plans shall be developed and implemented for communities or ecosystems where multiple listed and candidate species occur, in a manner that conserves the biotic diversity of the ecosystems upon which listed species depend. The policy also provides for cooperative efforts to prevent listings by protecting, conserving, restoring or rehabilitating ecosystems that are important for the conservation of biodiversity. These efforts would include integration of research and technology development, and system monitoring schemes to develop adaptive management strategies.

In addition, thirteen agencies of six departments recently signed a Memorandum of Understanding on Implementation of the Endangered Species Act.[101] The agreement seeks to "establish a general framework for cooperation and participation among the Cooperators in the exercise of their responsibilities under the ESA . . . to achieve the common goal of conserving [listed] species . . . by protecting and managing their

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98. *See* Notice of Interagency Cooperative Policy for the Ecosystem Approach to the Endangered Species Act, 59 Fed. Reg. 34273 (1994).

99. *Id.*

100. *Id.* at 34274.

101. Memorandum of Understanding Between U.S. Dept. of Agriculture (Forest Service, Soil Conservation Service), U.S. Dept. of the Army (Corps of Engineers), U.S. Dept. of Commerce (NMFS), U.S. Dept. of the Interior (BLM, BOR, FWS, Minerals Management Service, National Park Service), U.S. Dept. of Transportation (Coast Guard, Federal Aviation Administration, Federal Highway Administration), signed Sept. 28, 1994.

populations and the ecosystems upon which those populations depend."[102] Specifically, the agreement provides a mechanism for coordinated action and focuses on species and ecosystems equally. Agencies are to identify critical threats to native species and ecosystems; identify new and existing approaches to alleviate these threats; and assemble interagency, interdisciplinary teams to develop recovery plans and conservation agreements for both species and ecosystems. Most relevant to ecosystem protection through the consultation process, the Cooperators have agreed "to identify and resolve regional issues associated with interagency consultation undertaken pursuant to section 7(a)(2) of the ESA [such as] encouraging multi-agency, multi-project consultations [and] exploring opportunities to increase the effectiveness of programmatic consultations . . . ."[103]

In addition to these general policies and agreements, ecosystem-based efforts are being made with respect to particular species and genera. For example, NMFS has been incorporating an ecosystem-based approach into many of its activities relating to Pacific salmonid stocks. With respect to the three listed species of Snake River salmon—Snake River fall chinook,[104] Snake River spring/summer chinook,[105] and Snake River sockeye[106]—NMFS has designated critical habitat for all three species combined.[107] This combined designation allows NMFS, as well as Federal action agencies, to consider effects upon all species sharing the same habitat. Furthermore, the designation included habitat not presently occupied by the listed species but that constituted part of the species' ecosystem.[108] In addition, NMFS is currently developing one recovery

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102. *Id.*
103. *Id.*
104. *See* 57 Fed. Reg. 14653 (1992) (to be codified at 50 C.F.R. pt. 227).
105. *Id.*
106. *See* 56 Fed. Reg. 58619 (1991) (to be codified at 50 C.F.R. pt. 222).
107. *See* 58 Fed. Reg. 68543 (1993) (to be codified at 50 C.F.R. pt. 226).
108. The preamble to the final rule states:

> NMFS acknowledges that many of the river reaches within hydrologic units designated as critical habitat are not presently inhabited by the listed species. However, the vast majority of streams above the confluence of the Columbia and Snake Rivers contribute essential elements such as food, gravel, large woody debris, and water quality. Hence, their inclusion as part of the critical habitat is in keeping with the ESA's purpose ". . . to provide a means whereby the ecosystems upon which . . . species depend may be conserved . . . ." [ESA section 2(b)].

58 Fed. Reg. 68543, 68548 (1993) (to be codified at 50 C.F.R. pt. 226).

plan that will address the conservation needs of all three species together.[109]

With respect to the future listings of other anadromous stocks, NMFS has initiated status reviews on a coast-wide basis for all five biological species of Pacific salmon, including sockeye, chinook, coho, pink, and chum, as well as steelhead[110] and cutthroat trout. These expanded status reviews cover the range of the species in the continental United States, and represent a significant step toward protecting the entire ecosystems of these species. NMFS lists an individual stock of Pacific salmonids if that stock: (1) constitutes an Evolutionarily Significant Unit (ESU), which is measured by the reproductive isolation and the evolutionary significance of that stock in relation to the larger population;[111] and (2) meets the criteria for listing as threatened or endangered.[112] Expanded status reviews will allow NMFS to conduct a more thorough assessment on all levels of the determination for listings: whether individual or groups of stocks contribute to the genetic and ecological diversity of the coast-wide populations; whether individual or groups of stocks constitute ESUs; whether individual stocks or larger populations are threatened or endangered given their status. Addressing these issues on a range-wide basis will provide a more accurate, thorough and holistic approach to listing anadromous species that will afford greater protection to the entire ecosystems encompassing the range of these species.

In addition to NMFS' own actions regarding Pacific salmonids, Federal agencies have sought to enter into agreements in an effort to prevent or postpone future listings of stocks, and thereby avoid the stringent protective measures invoked upon listing. Agencies recognize that the most effective means to achieve this goal is to protect entire ecosystems of salmonid stocks. For example, Forest Service, National Park Service, Bureau of Land Management, FWS and NMFS entered

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109. *See* Snake River Recovery Team: Final Recommendations to the National Marine Fisheries Service, April 1994.

110. *See* Notice of determination for Illinois River Winter Steelhead, 58 Fed. Reg. 29390 (1993).

111. *See* Policy on Applying the Definition of "Species" Under the Endangered Species Act to Pacific Salmon, 56 Fed. Reg. 58612 (1991). *See also* Robin Waples, *Pacific Salmon and the Definition of Species Under the Endangered Species Act*, 53 Marine Fisheries Review 11 (1991); Karl Gleaves, et al., *The Meaning of "Species" Under the Endangered Species Act*, 13 THE PUB. LAND L. REV. 25 (1992).

112. *See* 16 U.S.C. § 1533(a)(1).

into a Memorandum of Understanding last year to "work together and achieve a common goal of conservation of selected species . . . that are tending toward federal listing . . . through protection and management of their habitats and ecosystems upon which they depend."[113]

Even if species have already been listed, agreements to provide broader ecosystem management are being negotiated. For example, four Federal agencies signed an agreement to coordinate Federal activities regarding the San Francisco Bay/Sacramento-San Joaquin River Delta, and to specifically incorporate an ecosystem-based approach into their activities.[114] This agreement, in turn, has been incorporated into a larger framework agreement between the same Federal agencies and the State of California.[115]

B. Section 10 Conservation Plans

Section 10(a)(1)(B) of the ESA provides an exemption from the section 9 prohibition against takings for any taking that "is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity"

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113. Memorandum of Understanding Between U.S. Dept. of Agriculture (FS), U.S. Dept. of the Interior (FWS, BLM, NPS), and U.S. Dept. of Commerce (NMFS), Jan. 25, 1994. Specifically, this MOU provides for the development of "habitat conservation assessments" that will contain technical information to develop an ecosystem management approach on all lands managed by the parties, including national forests, national parks, and public rangelands. In addition, it is anticipated that the parties will enter into specific "conservation agreements" for candidate species, which, although voluntary in nature, could reduce threats to a candidate species and its habitat and thereby lower likelihood of listing.

114. Agreement For Coordination on California Bay/Delta Issues, signed by FWS, NMFS, Bureau of Reclamation and EPA, Sept. 10, 1993. The Agreement provides for closer coordination among the Federal agencies, as well as with state agencies, in restoring the Bay/Delta. Specifically, the Agreement states:

> First we reaffirm our commitment to a comprehensive, ecosystem-based approach to the Bay/Delta estuary. We further believe that the standards and implementation measures developed by the four agencies must be justified by the best available scientific evidence, and that these standards and implementation measures are essential to begin the restoration of the Bay/Delta ecosystem . . . . Third, we affirm our commitment to coordinate on [certain] activities . . . so as to facilitate recovery of habitat and species in an ecosystem-based manner. This coordination should assist in reducing the need for adding species to the Federal endangered and threatened species list.

Id.

115. Framework Agreement Between the Governor's Water Policy Council of the State of California and the Federal Ecosystem Directorate, signed by Bureau of Reclamation, FWS, NMFS, EPA and California EPA and California Water Policy Council, May 1994.

by a nonfederal entity.[116] The Secretary may issue a permit for such taking, conditioned upon the development and implementation of a conservation plan that minimizes and mitigates the impacts of the incidental taking.[117] In addition, the Secretary must find that adequate funding for the plan will be provided, and that the taking will not appreciably reduce the likelihood of survival and recovery of the species in the wild.[118]

As previously noted, conservation plans are intended to provide broad protections to both listed and nonlisted species through cooperative public and private initiatives.[119] FWS has recently engaged in several rulemakings, pursuant to section 4(d) of the ESA, to incorporate state and local conservation planning into the section 10 permit process for the threatened California gnatcatcher[120] and the threatened northern spotted owl.[121] The rulemakings provide that certain incidental takings of threatened species would be exempt from the takings prohibition and yet would not require an incidental take permit under section 10, provided that they are in compliance with state law and specific state and local conservation planning requirements. These planning requirements generally focus on ecosystem protections, not only individual species.

For example, FWS promulgated the rule providing that certain land-use activities resulting in incidental takings of the California gnatcatcher would not be considered a violation of section 9 as long as the land-use activity was addressed in a plan approved under the California Natural Community Conservation Planning Act of 1991 (NCCP).[122] FWS noted that the "NCCP program intends to provide for the conservation of listed and other sensitive species at a regional or

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116. 16 U.S.C. § 1539(a)(1)(B).

117. *Id.* § 1539(a)(2)(A).

118. *Id.* § 1539(a)(2)(B). *See* FWS and NMFS, No Surprises: Assuring Certainty for Private Landowners in Endangered Species Act Habitat Conservation Planning, August 11, 1994. This joint policy provides: "assurances to non-federal landowners participating in Habitat Conservation Planning (HCP) that no additional land restrictions or financial compensation will be required from an HCP permittee for species adequately covered by a properly functioning HCP in light of unforeseen or extraordinary circumstances." *Id.*

119. See *supra* note 113 and accompanying text.

120. Final Rule Concerning the Take of Threatened Coastal California Gnatcatcher, 58 Fed. Reg. 65088 (1993) (to be codified at 50 C.F.R. pt. 17).

121. Notice of Intent to Prepare an EIS on Proposed Rule for the Conservation of the Northern Spotted Owl, 58 Fed. Reg. 69132 (1993).

122. Cal. Fish & Game Code § 2800 *et seq* (Deering 1989 & Supp. 1994).

ecosystem [level]."[123] Specifically, the NCCP program focuses conservation efforts on three "target" species—the California gnatcatcher, the cactus wren and the orange-throated whiptail[124]—in order to maintain the overall viability of the coastal sage scrub ecosystem, given those species' broad distribution throughout the ecosystem.[125]

There are a number of benefits to these rulemakings that help fulfill the ESA's broader goals of ecosystem protection. They focus on state-managed and regionally managed programs that address general ecosystem concerns, rather than individual landowner's projects that would likely address individual species. This in turn, provides for alternative, less burdensome mechanisms for compliance with the substantive mandates of the ESA.[126] They allow the FWS to directly incorporate the state's research and planning efforts as the best available data in its decision making.[127] They also allow the states to take the initiative in conservation planning.

C. Section 7 Consultations

One of the most significant operative provisions of the Act is the no-jeopardy mandate of section 7(a)(2).[128] Joint regulations promulgated by FWS and NMFS provide a detailed framework for compliance with

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123. 58 Fed. Reg. 65088 (1993) (to be codified at 50 C.F.R. pt. 17).

124. These latter two species are category 2 candidate species.

125. 58 Fed. Reg. 65088, 65093 (1993) (to be codified at 50 C.F.R. pt. 17).

126. *Id.* at 65094. With respect to the special rule for California gnatcatcher, the FWS stated:

> While participation in the NCCP program is voluntary, the special rule provides incentives for participation by eliminating the necessity and costs of procuring incidental take permits under section 10(a) of the Act on an individual project basis and facilitating comprehensive planning for the conservation of the gnatcatcher and other coastal sage scrub species on a regionwide basis. Such regional planning is expected to afford significant protection for the gnatcatcher and the entire coastal sage scrub ecosystem, thus reducing threats to other coastal sage scrub species and providing a significant measure of certainty for future development in the region.

Id.

127. *See* i*d.* at 65090-91. In the rule for the California gnatcatcher, FWS recognized that data from local entities involved in conservation planning are generally the best available. It also noted that it will rely on such data "to the maximum extent permitted by law in reviewing activities under section 7 and section 10(a) of the Act to ensure consistency with completed or ongoing subregional NCCP planning efforts and to prevent the foreclosure of long-term planning options." *Id.*

128. 16 U.S.C. § 1536(a)(2).

section 7(a)(2).[129] Based on the consultation, either FWS or NMFS (depending on the species) issues a biological opinion, concluding whether the proposed action will likely jeopardize a species or not. Two reasons why section 7(a)(2) has become such a powerful tool are the broad definition of agency action and the scope of the effects of the action to be considered.

On its face, the scope of agency action as provided in the statute—anything authorized, funded or carried out by the agency—and the definition of "action" as provided in the regulations,[130] are both tremendously broad, and this breadth has not been lost on the courts. The Supreme Court, in *TVA v. Hill*, recognized that "action" includes both proposed actions and ongoing actions.[131] It is further evident, through numerous statements, that the Court considered ongoing activities to be those that have already been funded or approved, but that continue to be, or remain to be, carried out.[132] Other courts have followed this

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129. *See* 50 C.F.R. § 402.

130. *See* 40 C.F.R. § 402.02.

> *Action* means all activities or programs of any kind authorized, funded, or carried out, in whole or part, by Federal agencies in the United States or upon the high seas. Examples include, but are not limited to:
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> (a) actions intended to conserve listed species or their habitat;
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> (b) the promulgation of regulations;
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> (c) the granting of licenses, contracts, leases, easements, rights-of-way, permits, or grants-in-aid; or
>
> (d) actions directly or indirectly causing modifications to the land, water, or air.

Id.

131. TVA v. Hill, 437 U.S. 153, 186 (1978). "[I]t is clear Congress foresaw that § 7 would, on occasion, require agencies to alter ongoing projects in order to fulfill the goals of the Act." *Id.*

132. For example, the Court takes issue with the dissent's contention that the ESA is being applied retroactively, and states, "[o]ur holding merely gives effect to the plain [meaning of the] words of the statute, namely, that § 7 affects all projects which remain to be authorized, funded or carried out." *Id.*, n. 32. Indeed, the Court explicitly recognizes that the approval and funding of the dam construction had already occurred in the past: "[i]t has not been shown, for example, how TVA can close the gates of the Tellico Dam without 'carrying out' an action that *has been* 'authorized' and 'funded' by a federal agency." *Id.* at 173 (emphasis added).

Elsewhere, the Court rejected the dissent's statement that "'actions' referred to are not all actions that an agency can ever take, but rather actions that the agency is *deciding whether* to authorize, to fund, or to carry out," *id.* at 206 (Powell, J., dissenting) and stated that "the dissent's position logically means that an agency would be obligated to comply with § 7 only when the project is in the planning stage[,] [b]ut if Congress had meant to so limit the Act, it surely would have used words to that effect, as it did in the National Environmental Policy Act." *Id.* at 173, n. 18.

expansive interpretation.[133] As long as the agency maintains any discretion to halt an action it approves or carries out, the action may be subject to section 7.[134] Examples of agency actions include issuance of a right-of-way permit,[135] issuance of certain grants or loan guarantees,[136] creation of categories of nationwide permits to allow discharges,[137] approval of a registration program for pesticides,[138] and announcement of a strategy regarding timber sales.[139]

The "effects of the action" that are required to be addressed in the consultation process are also extremely broad. The regulations provide:

> "Effects of the action" refer to the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action, that will be added to the environmental baseline . . . . Indirect effects are those that are caused by the proposed action and are

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133. *See e.g.*, North Slope Borough v. Andrus, 486 F. Supp. 332, 351 (D.D.C. 1979), *aff'd in part and rev'd in part*, 642 F.2d 589 (D.C. Cir 1980):

> The ESA, as amended, affirms the Supreme Court's expansive concept of agency action. The statutory language cited in *TVA v. Hill* remains unchanged, and the legislative history reflects Congressional approval of the Supreme Court's approach in that case . . . . Caution can only be exercised if the agency takes a look at all possible ramifications of the agency action . . . . The parameters of agency action are best understood in light of this "proceed with caution" Congressional mandate. The ESA requires that agency action be defined broadly.

Id. On appeal, the circuit court recognized the broad scope of agency action by concluding that "[i]n short, 'agency action' in this case may signify the lease sale and *all subsequent activities*." 642 F.2d at 609 (emphasis added).

134. *See* Sierra Club v. Lujan and Seneca Saw Mill Co., Civ. No. 92-248-MA (D. Or. filed Nov. 10, 1992). Plaintiff challenged BLM's issuance of a right-of-way permit for road construction and logging operations by a private company, without consulting under § 7 of the ESA. BLM argued that the contract under which the permit was issued did not provide for ESA considerations as a basis for denying the permit, and generally afforded the agency so little discretion that consultation was not warranted. BLM admitted, however, that it could order the permitted to halt construction of the road until the permittee itself complied with the ESA by obtaining a section 10 permit, which "suggests that the BLM has some *discretion* in the matter" (emphasis in original). Consequently, consultation was required.

135. *Id*.

136. Pacific Legal Foundation v. Watt, 539 F. Supp. 841 (C.D. Cal. 1982), *aff'd in part*, *rev'd in part*, *and vacated in part*, *without opinion*, 703 F.2d 576 (9th Cir. 1983).

137. Riverside Irrigation District v. Andrews, 758 F.2d 508 (10th Cir. 1985).

138. Defenders of Wildlife v. EPA, 688 F. Supp. 1334 (D. Minn. 1988), *aff'd in part*, *rev'd in part*, 882 F.2d 1294 (8th Cir. 1989).

139. Lane County Audubon Society v. Jamison, 958 F.2d 290 (9th Cir. 1992).

> later in time, but still are reasonably certain to occur. Interrelated actions are those that are part of a larger action and depend on the larger action for their justification. Interdependent actions are those that have no independent utility apart from the action under consideration.[140]

Again, courts have broadly construed the requirement that all effects of the action, indirect and direct, be considered during the consultation process.[141]

Given the scope of section 7(a)(2), the most efficacious means of incorporating ecosystem considerations into the substantive requirements to protect listed species is through the consultation process. There are two types of consultations in particular best suited for this purpose: consultations on programmatic actions of an agency, and consultations on coordinated actions of several agencies.

1. Consultations on Programmatic Actions

Programmatic actions of a Federal agency are programs, plans, guidelines or frameworks established primarily for the purpose of guiding subsequent, discreet, individual projects undertaken by the agency.[142] They themselves generally do not involve any ground-disturbing, physical activity.[143] Indeed, they may not even explicitly authorize ground-disturbing activities.[144] They do, however, establish the direction and delineate the standards, guidelines, criteria, etc., that govern ground-disturbing activities, and in this sense, they very much authorize ground-

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140. 50 C.F.R. § 402.02.

141. *See e.g.*, Sierra Club v. Lujan and Seneca Saw Mill, *supra* note 135.

BLM's tacit approval of the right-of-way (and failure to require § 10 compliance) constitutes an "agency action," triggering section 7 consultation to consider not only the direct impact of the road on the [listed] owl's habitat, but also the indirect impact of its action, including Seneca's proposed logging on adjacent lands. *Id*. *See also* National Wildlife Federation v. Coleman, 529 F.2d 359 (5th Cir. 1976) *reh'g denied* 532 F.2d 1375, *cert. denied*, 429 U.S. 979 (1976).

142. *See generally* Peter Van Tuyn and Christine Everett, *The Endangered Species Act and Federal Programmatic Land and Resource Management: Consultation Fact or Fiction*, 13 PUB. LAND L. REV. 99 (1992).

143. *See e.g.*, City of Tenakee Springs v. Block, 778 F.2d 1402 (9th Cir. 1985).

144. *See e.g.*, Swan View Coalition, Inc. v. Turner, 824 F. Supp. 923, 935 (D. Mont. 1992) ("the Forest Plan is a broad framework for the management of a National Forest which does not directly commit to development").

disturbing activities, albeit implicitly.[145] Examples of programmatic actions include: (1) Land and Resource Management Plans by the Forest Service under the National Forest Management Act,[146] which serve as guidelines for subsequent, site-specific projects within national forests; (2) Fishery Management Plans approved by NOAA under the Magnuson Fishery Conservation and Management Act,[147] which provide for long-term commercial fishing practices for an entire fishery; (3) nationwide permit programs established by various statutes, such as the Clean Water Act, implemented by the EPA[148] and Army Corps of Engineers, which provide a framework under which local permits are issued by either federal or state agencies; (4) "state assumption programs," which are approved by a Federal agency but carried out by the state, such as states' coastal zone management programs under the Coastal Zone Management Act[149] and states' development of water quality standards under the Clean Water Act.[150]

Most programmatic actions have a common characteristic in that even after they are initially adopted or approved by the Federal agency, they continue to serve as guidance for other site-specific projects, and in this sense, they are ongoing actions. There is little argument that the initial approval of a programmatic action requires compliance with

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145. *See e.g.*, Pacific Rivers Council v. Thomas, 30 F.3d 1050 (9th Cir. 1994); Lane County Audubon Society v. Jamison, 958 F.2d 290 (9th Cir. 1992). *But see* Sierra Club v. Robertson, 28 F.3d 753 (8th Cir. 1994). In that case, the court stated:

> The mere existence of the . . . Forest Plan does not produce an imminent injury-in-fact . . . . Adoption of the Plan does not effectuate any on-the-ground environmental changes. Nor does it dictate that any [events] must occur . . . . Finding an environmental injury based on the Plan alone, without reference to a particular site-specific action, would "take[] us into the area of speculation and conjecture."

Id. (citing O'Shea v. Littleton, 94 S. Ct. 669 (1974)). While this language contradicts that of other cases regarding programmatic actions, the holding relates to the justiciability of a claim relating to the forest plan in the abstract, divorced from any particular site-specific action; the holding does not address ESA issues, and has nothing to do with interpretation of "agency action" under section 7(a)(2). It should be also noted that the court in *Robertson*, "recogniz[ing], however, that the standing issue presents a close question," rendered an alternative holding on the merits.

146. *See* 16 U.S.C. § 1600 *et seq*.

147. *Id.* § 1800 *et seq*.

148. *See* Federal Water Pollution Control Act, 33 U.S.C. § 1342 (EPA mandated to establish a national program for NPDES permits to control discharge of storm water from industrial sites). *Id.* at § 1744(p).

149. *See* 16 U.S.C. § 1451 *et seq*.

150. *See Id.* § 1344.

section 7 as an agency action.[151] However, the Federal action, for purposes of section 7, is not only the agency's initial approval of the programmatic action, but its ongoing tacit approval by its continued use of the programmatic action.[152] As long as the initial adoption or approval of the programmatic action was a Federal action for purposes of section 7, and the Federal agency maintains discretion to amend or revoke the guidance incorporated in the programmatic action, section 7 remains applicable.[153]

It is important to recognize that once the consultation requirement is triggered, as with the adoption of a plan, section 7 obligations remain in effect for the life of the action, as with continuing use of the plan in management decisions. To look at only discrete moments at which to consult under section 7—such as initial adoption, amendments, revisions or renewals of plans—does not satisfy the requirements of section 7.[154]

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151. *See* Lane County Audubon Society v. Jamison, 958 F.2d 290 (9th Cir. 1992). BLM promulgated the Jamison Strategy, an interim strategy to establish timber management standards, including criteria for timber sales and total annual allowable harvests. The court observed, "[t]he impact of each individual sale on owl habitat cannot be measured without reference to the management criteria established in . . . the Jamison Strategy." *Id*. at 294. Citing the broad statutory and regulatory language defining agency action, the Circuit Court affirmed the lower court holding that Jamison Strategy was an agency action that required compliance with section 7. *Id*. at 295. *See also* Conner v. Burford, 848 F.2d 1441, 1452 (9th Cir. 1988), *cert. denied*, 489 U.S. 1012 (1989).

152. *See* Pacific Rivers Council v. Thomas, 30 F.3d 1050 (9th Cir. 1994). With respect to the Land and Resource Management Plans (LRMPs) promulgated by the Forest Service, the circuit court held: "The LRMPs are comprehensive management plans governing a multitude of individual projects. Indeed, every individual project planned . . . is implemented according to the LRMPs. Thus, because the LRMPs have an ongoing and long-lasting effect even after adoption, we hold that the LRMPs represent ongoing agency action." *Id*. at 1053. *See also* North Slope Borough v. Andrus, 642 F.2d 589, 609 (D.C. Cir. 1980) (although finding no violation in analyzing the effects of the action, the court recognized the broad scope of that action and noted that "'agency action' in this case may signify the lease sale and all subsequent activities.").

153. *See* 50 C.F.R. § 402.03. "Section 7 and the requirements of this part apply to all actions in which there is discretionary Federal involvement or control." *Id*. *See also* 50 C.F.R. § 402.16. "Reinitiation of formal consultation is required and shall be requested by the Federal agency or by the Service, where discretionary Federal involvement of control over the action has been retained or is authorized by law . . . ." *Id*. *See also* Sierra Club v. Lujan and Seneca Saw Mill Co., Civ. No. 92-248-MA (D. Or. Filed Nov. 10, 1992).

154. *See Pacific Rivers Council*, 30 F.3d at 1050. In considering whether the LRMP is a continuing agency action, the court observed:

> Perhaps most telling, the [FS] and the NMFS are amending the LRMPs, admitting that they are inadequate because they do not address the newly listed species. These amendments belie the Forest Service's claim that the LRMPs do not constitute continuing agency action. They expressly acknowledge the need to revisit the LRMPs in light of the salmon's listing as a threatened species. Given the importance of the LRMPs in establishing resource and land

These discrete moments may serve as triggers for reinitiation of consultation, but other triggers exist as well.[155] Furthermore, these triggers do not address the scope of the analysis required.[156]

In terms of the mechanics of consulting on programmatic action, one problem is that often the effects to be analyzed at the programmatic level are too remote temporally and too speculative scientifically. This does not negate the requirement to consider all direct and indirect effects of the programmatic action, however, nor does it allow for deferral of an analysis of the effects to the site-specific level.[157] Rather, it requires agencies to analyze the best available data at the point at which consultation is required[158]—at the programmatic level—although

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> use policies for the forests in question there is little doubt that they are continuing agency action under § 7(a)(2) of the ESA.

Id. at 1056.

155. *See* 50 C.F.R. § 402.16.

> Reinitiation is triggered by one of four events:
>
> > (a) if the amount or extent of taking specified in the incidental take statement is exceeded; (b) if new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered; (c) if the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in the biological opinion; or (d) if a new species is listed or critical habitat designated that may be affected by the identified action.

Id.

The amendment or revision of plans are in essence modifications to the original action on which there was consultation, which falls under 50 C.F.R. § 402.16(c). In *Pacific Rivers Council*, the court held that the listing of a new species triggered the requirement that FS reinitiate consultation on its LRMPs, on which it had consulted with FWS when they were adopted. *Pacific Rivers Council*, 30 F.3d at 1056-57. Furthermore, the court noted that consultations on the amendments themselves were not sufficient. *Id*. The analysis must examine both the original action and the amendments, so as to consider how the underlying action, as amended, affects listed species. *Id*.

156. The scope of the analysis depends on two factors: the extent to which safeguards are built into the statutory framework that establishes the programmatic action, *Cf*. Conner v. Burford and North Slope Borough v. Andrus; and the extent to which the programmatic action has any bearing on subsequent activities. Neither of these, however, address whether there should be consultation; they address only the level of analysis to be applied in the consultation.

157. *See Conner*, 848 F.2d at 1454. ("[I]ncomplete information about post-leasing activities does not excuse the failure to comply with the statutory requirement of a comprehensive biological opinion using the best information available."). *Id*.

158. *See* Roosevelt Campobello Int'l Park Comm'n v. EPA, 684 F.2d 1041 (1st Cir. 1982) (holding that EPA and the Coast Guard failed to fulfill their obligations to obtain the "best scientific and commercial data" by deferring several real time simulation studies due to lack of money).

specific data may not be available until the site-specific level.[159] There are several mechanisms available to the action agency and consulting agency for this situation. One mechanism is to use the incremental step process provided in the regulations at 50 C.F.R. § 402.14(k)[160], which was designed expressly for programmatic activities.[161] Another mechanism is to develop counterpart regulations, if necessary.[162] A third mechanism is to use the standard consultation procedures. The service agency can extend the consultation timeframe in order to obtain more data.[163] Even where uncertainty remains, it can be compensated by establishing, in the programmatic opinion, a set of parameters for all subsequent projects that can be used to determine whether those subsequent projects require additional scrutiny.

A second issue regarding the mechanics of consultations on programmatic actions is the nature of the biological opinion and any accompanying incidental take statement. Although programmatic actions generally do not involve ground-disturbing actions, and thus may not

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159. *See* Resources Ltd. v. Robertson, No. 92-35047, 1994 WL 315780 (9th Cir. 1994). Plaintiffs insisted on specific water quality data to be analyzed in the programmatic Environmental Impact Statement on the LRMP, but the court held, "we are convinced that such specific analysis is better done when a specific development action is to be taken, not at the programmatic level." *Id.*

160. 50 C.F.R. § 402.14(k) provides: "When the action is authorized by a statute that allows the agency to take incremental steps toward the completion of the action, the Service shall, if requested by the Federal agency, issue a biological opinion on the incremental step being considered, including its views on the entire action." *Id.* The opinion must conclude that the incremental step will not violate § 7(a)(2); the action agency must continue to consult on the entire action and obtain biological opinions for each incremental step; the action agency must continue to obtain sufficient data for a conclusion on the entire action; the incremental step cannot violate § 7(d); and there must be a reasonable likelihood that the entire action will not violate § 7(a)(2). *Id.*

161. *See* 51 Fed. Reg. 19926, 19955 (1986) (to be codified at 50 C.F.R. pt. 402):

> Paragraph (k) applies, at the option of the Federal agency, in situations where a statute authorizes the Federal action to be taken in incremental steps. Such circumstances existed in North Slope Borough v. Andrus, 642 F.2d 589 (D.C. Cir. 1980) . . . . First, the Service adopts paragraph (k) because it provides a viable consultation approach sanctioned by the court in North Slope Borough v. Andrus . . . . Second, the risk of section 7(a)(2) and 7(d) noncompliance should not be diminished because the incremental step approach is used . . . . Third, consulting in incremental steps can be a valuable tool for developing information as an action progresses.

Id.

With respect to lack of information, the preamble notes that this incremental step process is designed "especially [for] those [consultations] where, in the absence of additional information, the final determination of 'likely jeopardy' for the entire action would be highly speculative if consultation were not limited to the initial step or steps." *Id.*

162. 50 C.F.R. § 402.04.

163. *Id.* § 402.14(f).

directly result in the taking of a listed species, they may indirectly result in takings through their continuing approval and implementation at the site-specific level. In considering the full range of direct, indirect, interrelated and interdependent effects of the programmatic action, adverse effects to listed species may be anticipated, which would trigger formal consultation. While these impacts might be addressed to a greater extent at the site-specific level, they may also be identified at the programmatic level, and some are exclusively identified at the programmatic level. In instances where adverse effects may result in takings, an incidental take statement must accompany the biological opinion.[164]

The incidental take statement has several purposes: it identifies the impacts of the action upon the species; it provides reasonable and prudent measures and terms and conditions for minimizing these impacts; and it provides an exemption from the takings prohibition for those takings identified in the incidental take statement. These purposes can be fulfilled through an incidental take statement for a programmatic action as much as for a site-specific action. In terms of identifying the impact of taking on a species, Congress has been explicit in stating that such identification need not be a specific number.[165] The regulations reiterate

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164. *See* 16 U.S.C. § 1536(b)(4):

> If after consultation . . . the Secretary concludes that—(A) the agency action will not violate [§ 7(a)(2)] . . . and (B) the taking of an endangered or threatened species incidental to the agency action will not violate [§ 7(a)(2)]; the Secretary shall provide the Federal agency and the applicant concerned, if any, with a written statement that—(i) specifies the impact of such incidental taking on the species, (ii) specifies those reasonable and prudent measures that the Secretary considers necessary or appropriate to minimize such impact, and (iii) sets forth the terms and conditions . . . that must be complied with by the Federal agency and applicant (if any), or both, to implement the measures specified under clause (ii).

Id.

165. H.R. Rep. No. 567, 97th Cong., 2d Sess. (1982):

> Section 7(b)(4) requires the Secretary to specify the impact on such incidental taking on the species. The Committee does not intend that the Secretary will, in every instance, interpret the word "impact" to be a precise number. Where possible, the impact should be specified in terms of a numerical limitation on the Federal agency or permittee or licensee. The Committee recognizes, however, that it may not be possible for the Secretary to specify a number in every instance . . . . The Committee intends only that such numbers be established where possible.

Id. *See* Pacific Northwest Generating Co-op v. Brown, 822 F. Supp. 1479, 1510 (D. Or. 1993) ("Plaintiffs' claim that the incidental take statements are facially invalid for failing to identify

this Congressional intent.[166] In terms of minimizing impacts to the species, there is a fair degree of latitude to devise appropriate measures, and terms and conditions, within the regulatory parameters.[167] For example, monitoring and reporting requirements are one means to help minimize takings,[168] and these are certainly appropriate terms and conditions at the programmatic level. Requirement for additional research is another means to minimize the impact of takings.[169] Indeed, minimizing the impacts upon listed species may be more effective at the programmatic level than at the site-specific level. In terms of the exemption, to the extent that takings can be attributed to the programmatic action—and it is recognized that there may be evidentiary problems in making such an attribution—the action agency may be in violation of the section 9 takings prohibition applicable to all endangered species and certain threatened species if it does not have an incidental take statement.[170]

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specific impacts" (i.e., an anticipated number of listed species to be harvested) is belied by clear legislative history that demonstrates that Congress fully anticipated that there would be occasions when impacts would have to be estimated). *Id.*

166. The preamble to the regulations at 50 C.F.R. § 402 states:

> The impact of a particular action may only be predictable in terms of the extent of land or marine areas that may be affected. Precise numbers of individuals that may be taken are preferable to descriptions of the extent of disruption and will be provided when they can be computed. However . . . . [t]he Service declines to endorse the use of numerical amounts in all cases over the use of descriptions of extent, because for some species loss of habitat resulting in death or injury may be more deleterious than the direct loss of a certain number of individuals.

51 Fed. Reg. 19926, 19953-54 (1986) (to be codified at 50 C.F.R. pt. 402).

167. *See* 50 C.F.R. § 402.14(i)(2). "Reasonable and prudent measures, along with the terms and conditions that implement them, cannot alter the basic design, location, scope, duration, or timing of the action and may involve only minor changes." *Id.*

168. *See* H.R. Rep. No. 567, 97th Cong., 2d Sess. (1982). "One of the enumerated terms and conditions is appropriate reporting requirements so that the Secretary may monitor the impact of the taking on a species." *Id. See also* 50 C.F.R. § 402.14(i)(3) ("In order to monitor the impacts of incidental take, the Federal agency or any applicant must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement."). *Id.*

169. *See* 51 Fed. Reg. 19926, 19954 (1986) (to be codified at 50 C.F.R. pt. 402) ("Should the Service believe that the way to minimize the incidental takings is through research, an explanation of how such research will accomplish this will be included.").

170. 16 U.S.C. § 1536(o). It is important to note that the incidental take statement does not serve as a permit or authorization *per se* to take listed species, but rather as an exemption to the prohibition. In this sense, it is not a question of whether takings are authorized or not, but whether they can be identified or not.

Even though programmatic consultations may be species-oriented, they necessarily involve a more broad-based, a more long-term, a more comprehensive approach for protection of listed species, which provide significant protections to the ecosystems as well.[171] For these reasons, the resource management objectives expressed earlier[172] can be more readily attained through programmatic consultations than through site-specific actions. For example, programmatic actions involve types of decisions that are not expressed in site-specific actions, such as the establishment of multiple-use goals and objectives; establishment of standards and guidelines; the establishment of management areas and wilderness allocations, and standards for those areas; the designation of habitat suitability for certain activities; and the establishment of monitoring requirements.[173] All of these decisions can address landscape-level effects for particular species, as well as effects to the ecosystem itself that will adversely affect individual species, that can be analyzed only at the programmatic level. Whether one subscribes to the approach of protecting umbrella species or to an ecosystem approach, these decisions are a prerequisite for adequately addressing either.

Given that such analyses are necessary to adequately address the role of individual species in the ecosystem, one might consider whether such analyses can be done at the site-specific level rather than the programmatic level, especially in light of the expansive definition of the "effects of the action."[174] It is difficult to develop a meaningful analysis of the watershed-or landscape-level impacts on a site-specific level. These analyses might not even be appropriate or feasible at the site-specific level. Furthermore, where an adequate analysis may be undertaken, it is even more difficult to conclude that any one site-specific project would jeopardize listed species. To analogize, it is near to impossible to say that any one pack of cigarettes that a person smokes

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171. Even where the actions themselves may not be geared to the ecosystem—for example, LRMPS fall along arbitrary geographic boundaries, determined by the National Forests themselves, which may cross several ecosystems—the analysis to determine how these actions affect species will be done in an ecosystem-based manner.

172. *See supra* notes 35-37 and accompanying text.

173. *See e.g.*, U.S. Dept. of Agriculture (Forest Service) and U.S. Dept. of the Interior (BLM), Environmental Assessment for the Implementation of Interim Strategies for Managing Anadromous Fish-producing Watersheds in Eastern Oregon and Washington, Idaho, and Portions of California (March 1994) [hereinafter PACFISH]; Forest Ecosystem Plan and Record of Decision for Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl, (1994) [hereinafter FEMAT].

174. *See* 50 C.F.R. § 402.02 and § 402.14(g)(4).

will cause cancer, yet if one looks at a program to smoke a pack a day for fifteen years, one can readily conclude that cancer is a risk.[175]

2. Consultations on Coordinated Actions

In addition to programmatic actions, FWS and NMFS consult on coordinated actions, which include joint actions by two or more agencies, as well as different actions by several agencies on a related issue.[176] Both programmatic and coordinated actions derive their benefit through analytical and administrative economies of scale; the difference is that programmatic actions have a vertical relationship with subsequent site-specific actions, while coordinated consultations have a horizontal relationship with other concomitant, interconnected activities. This difference helps explain why consultations on coordinated actions are not as legally contentious or complicated as consultations on programmatic actions; in addition, they do not raise novel questions of law beyond the general issues of section 7 consultations.

One issue is whether consultations can be conducted with both Federal agencies and nonfederal agencies, even where the nonfederal entity may not be an "applicant."[177] As long as there is a sufficient Federal nexus to the action—which includes approval and denial of a permit—courts will generally find that section 7 is applicable.[178] It thus appears that there is a fair amount of latitude in consulting with Federal and nonfederal agencies under section 7.

In addition to coordination among the action agencies, there also needs to be coordination between the consulting service agencies. One issue concerns the level of consistency in data, analyses and conclusions by the service agencies. In the least, the agencies need to demonstrate, under the appropriate judicial standard of review, that they were reasonable in determining that the data upon which they relied is the best available scientific and commercial data. More than that, however, the

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175. This "medical" analogy provided by Karl Gleaves, Office of General Counsel for Fisheries, NOAA.

176. Frequently, programmatic actions are also examples of coordinated actions. Such is the case with both FEMAT, a joint project of BLM, FS, FWS, NMFS and BOR, and PACFISH, a joint project of BLM and FS.

177. *See* 50 C.F.R. § 402.02. "Applicant refers to any person . . . who requires formal approval or authorization from a Federal agency as a prerequisite to conducting the action." *Id*.

178. While "federal nexus" is NEPA terminology, it provides a fairly accurate characterization of the ESA requirements as well.

agencies should maintain some level of consistency where they are evaluating the effects of different actions on the same species, or similar actions on different species.[179] Another issue concerns the level of consistency in the mechanics and process of consultations. For example, both agencies should strive for a similar approach in analyzing the effects of programmatic actions and determining whether such actions should be more appropriately addressed through informal consultations or formal consultations.

Agencies may coordinate activities for ESA purposes for one of two reasons: in an optimistic vein, agencies are realizing that their activities do not occur in isolation, and that efficient, efficacious ecosystem management requires an analysis of agencies' interrelated, collective effects; in a pessimistic vein, certain ecosystems are in such dire straits that multiple species are being listed as endangered or threatened in these areas, thus forcing agencies to consider all their activities together upon a variety of species. Whether the government is being proactive or reactive, however, the result is the same: these coordinated efforts result in a more holistic, ecosystem-based approach to resource management.

The importance of such coordinated actions is illustrated by PACFISH, a joint aquatic habitat and riparian management strategy developed by FS and BLM.[180] Presently, three species of Snake River salmon are listed as endangered. Two other species are proposed for listing. NMFS is currently conducting status reviews for all five species of salmon, as well as steelhead and cutthroat trout, throughout their range in the continental United States. One study has identified 214 salmonid stocks at risk,[181] of which 134 are on FS lands and another 109 are on

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179. While not addressing the issue directly, the court in Idaho Dept. of Fish and Game v. NMFS noted that this substantive standard often requires agencies to seek data from sources they may not otherwise be required to include in the decisionmaking process:

> Federal defendants are under no legal obligation to listen and respond to salmon plans from every corner of the Northwest, but the ESA does impose substantive obligations with respect to an agency's consideration of significant information and data from well-qualified scientists such as the fisheries biologists from the states and tribes.

Idaho Dep't of Fish and Game v. National Marine Fisheries Service, 850 F. Supp. 886, 900 (D. Or. 1994).

180. *See* PACFISH, *supra* note 173.

181. W. Nehlsen, et al., *Pacific Salmon at the Crossroads: Stocks at Risk from California, Oregon, Idaho, and Washington*, 16 Fisheries 4-21 (1991).

BLM lands.[182] The PACFISH strategy will be used across five states, designed to benefit all anadromous species.

PACFISH first defines "good" habitat conditions for salmonids, based on certain criteria, and then outlines measures to achieve these conditions.[183] On the most local level, riparian conservation zones will protect streams; on a larger level, entire watersheds will be identified for special management; on a larger level still, the selection of watersheds to be managed will be based on an overall ecosystem-based approach. PACFISH addresses many effects of most Federal habitat-related actions on salmonids, and thus represents a holistic approach with respect to these habitat-related impacts. However, true ecosystem protection will not be achieved until similar approaches can be taken for other sectors that affect salmonids, such as in-river activities (including hydropower related actions, dredging, diversions and harvest), ocean activities (harvest), and hatchery-related activities.

Another illustration of coordinated actions involves those of NMFS, FWS, EPA and BOR regarding the San Francisco Bay and Delta, an ecosystem in critical condition as evidenced by several recent listings under the ESA.[184] In addition, Congress passed the Central Valley Project Improvement Act (CVPIA) in order to protect the Central Valley and Trinity River basin ecosystems and the fisheries resources of the ecosystems.[185] Specifically, the CVPIA mandates a host of actions to protect and restore wildlife populations, including the dedication of 800,000 acre-feet of Central Valley Project annual yield for fish and wildlife, and habitat restoration. Coordination between the Federal agencies and between the Federal agencies and the state has been formalized through several agreements.[186] These agreements will facilitate interagency planning and provide additional impetus to move toward an ecosystem-based approach.

Even before the agreements, NMFS had consulted with both BOR and the state on the Central Valley Project and the State project

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182. PACFISH, *supra* note 173, at 4.

183. *Id.*

184. NMFS listed Sacramento winter-run chinook in 1989, and in December 1993 uplisted it to endangered given declining run sizes. *See* 59 Fed. Reg. 440 (1994) (to be codified at 50 C.F.R. pts. 220 and 227). The FWS has currently listed delta smelt as threatened, and has proposed listing the Sacramento splittail as threatened, as well as proposing critical habitat for delta smelt.

185. Pub. L. No. 102-575, 106 Stat. 4600 (1992).

186. *See supra* note 173 and accompanying text.

together. The Federal and state projects are very closely tied to one another, as laid out in a Coordinated Operations Agreement.[187] In addition, both FWS and NMFS are jointly consulting with EPA on EPA's promulgation of water quality standards in the bay and delta. These standards address water quality criteria for salinity, temperature and dissolved oxygen, among other measures. EPA has worked closely with the State in developing these standards, so that again, the consultation may likely include the State as well as EPA.

The ecosystem protections afforded by coordinated consultations are somewhat different than those afforded by programmatic actions. In terms of resource management, coordinated consultations provide a forum that overcomes many of the hurdles identified earlier.[188] For example, coordinated consultations will bring together several agencies and thereby overcome political boundaries, improve dialogue and improve cost-effectiveness from the outset in protecting a newly listed species. In terms of the science, coordinated consultations provide an opportunity to do the mapping and other analyses that are necessary to determine the protections needed for ecosystems. In addition, they provide an opportunity to better protect individual species across their natural ranges, and thereby protect the entire ecosystems of those species.

V. CONCLUSION

The biological diversity of the planet is disappearing at a staggering rate, and unlike the great extinction episodes of the past, this loss is the consequence of the poor stewardship of one of the species comprising that diversity—humankind. While our scientific understanding has been propelled by new research, there is an overwhelming lack of knowledge regarding even the basic elements of biological diversity. These fundamental facts that exist in 1994—a lack of knowledge, a rapid loss of biodiversity, and an ability to influence this loss—are the same fundamental facts that existed in 1973 and formed the

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187. *See* NMFS, Biological Opinion for the Operation of the Federal Central Valley Project and the California State Water Project, 1993.

Because both the CVP and the State water Project utilize the Sacramento River and the Sacramento-San Joaquin Delta as common conveyance facilities, reservoir releases and Delta export operations must be coordinated to ensure each retains its share of the commingled water and bears its share of the joint obligations to protect beneficial uses.
Id. at 9.

188. *See supra* note 39 and accompanying text.

basis for the Endangered Species Act. Indeed, as we only now begin to comprehend the severity of the threat to our planet's biodiversity can we begin to appreciate the indubitable prescience of Congress in 1973.

The ESA, in one sense, is a simplistic statute that provides a simplistic mandate: protect the species living on this planet because we may never know what we are losing until it is lost, at which point it is too late. Congress recognized in 1973 that the protection of species is only a means to an end; the essence of the Endangered Species Act is the preservation of biological diversity. In another sense, the ESA is an extremely complex statute that provides complex means of implementation: it reaches both public and private entities; it requires analyses of the biological needs of threatened and endangered species; it requires projections of effects of human activities; it requires identification of thresholds of effects to those species; and it requires all of these in light of much scientific uncertainty on each element.

Although the Act's implementation focuses on species protection, the Act's purpose focuses on ecosystem protection and biological diversity. It may be that Congress originally believed that species protection was the best means to preserve biodiversity. However, where ecosystem protection is the best means to achieve the same goal, then the ESA provides the authority to do so. Indeed, one can argue that ESA may even require it. The question then becomes: what aspect of the ESA's implementation is best suited for protecting ecosystems? The complex implementation, to some extent, contains the flexibility to achieve the simple mandate.

This article considers several tools currently being applied—general policies with respect to listings, recovery plans and conservation programs, use of habitat conservation plans, consultations on programmatic and coordinated actions—each with its own benefits in protecting ecosystems. The ESA should be amended to explicitly provide for some of these initiatives. These actions, however, do not provide either complete solutions to the threat to biodiversity or complete means to ecosystem protections. Rather, they are significant, pragmatic steps in preventing the continuing demise of thousands of species, and reversing this trend in many other species, while other, more thorough solutions can be developed. These measures can serve as a form of intensive care for endangered species and ecosystems, but the solutions that need to be developed are those that form sweeping scientific, legal

and ethical tenets that will protect the biological diversity across boundaries and generations.