THE U.S. COMMITMENT TO AGENDA 21: CHAPTER 11 COMBATING DEFORESTATION – THE ECOSYSTEM MANAGEMENT APPROACH

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> "Now that *you're* here, the word of the Lorax seems perfectly clear. UNLESS someone like you cares a whole awful lot, nothing is going to get better. It's not." "SO . . . Catch!" calls the Once-ler. He lets something fall. "It's a Truffula Seed. It's the last one of all! You're in charge of the last of the Truffula Seeds. And Truffula Trees are what everyone needs. Plant a new Truffula. Treat it with care. Give it clean water. And feed it fresh air. Grow a forest. Protect it from axes that hack. Then the Lorax and all of his friends may come back." [1]

I. INTRODUCTION

In June 1992, the Earth Summit in Rio de Janeiro brought together nearly two hundred nations to discuss strategies for worldwide sustainable development. The result was Agenda 21, a document consisting of a variety of agreements between participating countries to strive both intranationally and internationally to attain global sustainable development.[2] The United States was one of the nations that endorsed Agenda 21. Although Agenda 21 does not carry the force of law, the adoption of the text carries with it a strong moral obligation to ensure its full implementation.[3] Agenda 21 "reflects a global con-

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1. DR. SEUSS, THE LORAX (Random House 1971). The Lorax is a story about a being called the Once-ler who comes to the Truffula forest. The Once-ler discovers that he can use the tops of the Truffula tress to make a product. He sets up a company to mass produce the product and begins chopping down the Truffula tress. Along the way, the Lorax tries to warn the Once-ler that his actions are harming the trees, as well as all the other forest species. In the end, the Once-ler chops down all the Truffula trees and pollutes the forest air and water so that the rest of the forest species have to relocate to a place that can sustain their needs.

2. *Report of the United Nations Conference on Environment & Development,* Annex II, at 9, U.N. Doc. A/Conf.151/26/Rev.1 (Vol. I) (1993) [hereinafter AGENDA 21].

3. *See id.* ¶ 1.3.

sensus and political commitment at the highest level on developmental and environmental cooperation."[4]

A major topic at the Earth Summit was deforestation and the need for sustainable forest practices.[5] Over the past decades, nations have become increasingly aware of the "conflict between appropriation of forest resource[s] … and protection of the forest for the survival of people."[6] The main concern of the international participants was that "[i]ncreased rates of clearing for agriculture, logging for export markets, and use for fuel, fiber and timber [were] threatening the ability of forests to perform their environmental functions."[7] These environmental functions consist of regulating "global climate, local air quality, water flow, and soil productivity."[8] Forests also provide numerous resources such as "food, fuel, building materials, and a variety of chemicals including pharmaceuticals."[9] As a result of the concern over deforestation, the Earth Summit participants adopted Chapter 11 to address combating deforestation.[10] In addition, the participants adopted a separate agreement entitled the Non-legally Binding Authoritative Statement of Principles for a Global Consensus on the Management, Conservation and Sustainable Development of All Types of Forests.[11] This agreement is commonly referred to as the Forest Principles.[12] Chapter 11 of Agenda 21 establishes a goal of attaining sustainable management of forests by the year 2000.[13]

Chapter 11 is important to the United States because "[c]oncerns about the sustainability of American forests have been growing for the past several decades."[14] The National Forest System[15] provides a

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4. *Id.*

5. *See* Emmanuel B. Kasimbazi, *An International Legal Framework for Forest Management and Sustainable Development*, 2 ANN. SURV. INT'L & COMP. L. 67, 90 (1995). Sustainable forest practices consist of planning to "achieve conservation and rational utilization of . . . forests and tree based resources to increase their contribution to overall socio-economic development, environmental protection and peoples' quality of life." *Id.* at 90. *See also* Hal Salwasser et al., *An Ecosystem Perspective on Sustainable Forestry and New Directions for the U.S. National Forest System*, *in* DEFINING SUSTAINABLE FORESTRY 44 (Gregory H. Aplet et al. eds., 1993).

6. Ann Hooker, *International Law of Forests*, 34 NAT. RESOURCES J. 823, 828 (1994).

7. *Id.* at 827.

8. *Id.* at 823.

9. *Id.*

10. *See* AGENDA 21, *supra* note 2, at ch. 11.

11. *Report of the United Nations Conference on Environment & Development*, Annex III, at 480, U.N. Doc. A/Conf.151/26/Rev.1 (Vol. I) (1993) [hereinafter FOREST PRINCIPLES].

12. *See, e.g.*, Hooker, *supra* note 6, at 846-47.

13. *See* AGENDA 21, *supra* note 2, ¶ 11.2.

14. Salwasser, *supra* note 5, at 44.

significant amount of resources to the United States.[16] There have been increasing demands upon the National Forest System to provide even more forest resources to the American people.[17] The National Forest System cannot consistently produce resources under its present system of management without jeopardizing its long-term existence.[18] Recognizing this problem, the United States made a commitment "to managing its forest ecosystems on a sustainable basis for all of their diverse products, services, and values" by virtue of its adoption of Agenda 21 and the Forest Principles.[19]

This note discusses the United States' adherence to its Agenda 21 commitment to combat deforestation. Section II of the paper discusses the specific provisions of Chapter 11 that recommend strong governmental policy schemes and advocate a sustainable ecosystem management approach to the forests. Specifically, this section explains the concepts of Chapter 11 provisions and their importance to the United States. Section III examines actions taken by the United States to sustain its National Forests both before and after the Earth Summit. Section IV evaluates the United States' actions by analyzing the efforts of the United States Forest Service in implementing ecosystem management and determining the consistency of those efforts with Chapter 11 and the Forest Principles. Finally, Section V provides recommendations for future United States action in managing its National Forests so as to achieve the goals expressed in Chapter 11 of Agenda 21.

II. CHAPTER 11 AND THE FOREST PRINCIPLES

Chapter 11 of Agenda 21 provides program areas that address combating deforestation.[20] Each program area is divided into sections entitled "Basis for Action," "Objectives," "Activities," and "Means of Implementation."[21] Although Chapter 11 addresses four program areas, this paper limits the focus of discussion to two program areas

15. The United States National Forest System consists of: 155 Proclaimed or Designated National Forests; 20 National Grasslands; 51 Purchase Units; 8 Land Utilization Projects; 20 Research and Experimental Areas; and 33 Other Areas. *See* 36 C.F.R. § 200.1(c)(2) (1997).

16. *See* Salwasser, *supra* note 5, at 68-69.

17. *See id.* at 70.

18. *See id.*

19. V. Aleric Sample et al., *Defining Sustainable Forestry*, *in* DEFINING SUSTAINABLE FORESTRY, *supra* note 5, at 4.

20. *See* AGENDA 21, *supra* note 2, at ch. 11.

21. *Id.*

that deal directly with sustainable forest practices.[22] The first program area is under Section A of Chapter 11 entitled "Sustaining the Multiple Roles and Functions of All Types of Forests, Forest Lands and Woodlands."[23] The second program area is under Section B of Chapter 11 entitled "Enhancing the Protection, Sustainable Management and Conservation of All Forests."[24]

The Forest Principles are intended to acknowledge "the sovereign and inalienable right [of nations] to utilize, manage and develop their forests in accordance with their developmental needs."[25] In acknowledging this right, however, the principles establish a detailed set of guidelines for managing forests in a sustainable manner to ensure their use in future generations.[26] The principles are not legally binding, however, due to the dispute between developing and developed countries regarding the inclusion of an enforceable commitment to hold a future forest convention.[27] As a result, the Earth Summit participants compromised by establishing the Forest Principles and leaving open the possibility of future conventions.[28]

A. *Sustaining the Multiple Roles and Functions of All Types of Forests, Forest Lands and Woodlands* [29]

Under Section A, the "Basis for Action" addresses the problems in world forestry resulting from "major weaknesses in the policies, methods and mechanisms adopted to support and develop the multiple ecological, economic, social and cultural roles of … forests."[30] The pre-Agenda 21 forest policies of nations of the world were weak because they did not provide for conservation and sustainable man-

22. *See id.* ¶ 11.1-.19. The other two program areas address the utilization of forest resources and the observation of forest related projects. *See id.* ¶ 11.20-.40.

23. *Id.* ¶ 11.1-.9.

24. *Id.* ¶ 11.10-.19. This is only part of the title of Section B. The entire title is "Enhancing the Protection, Sustainable Management and Conservation of All Forests, and the Greening of Degraded Areas, Through Forest Rehabilitation, Afforestation, Reforestation and Other Rehabilitative Means." This paper will only focus on the sustainable management areas addressed in Section B, not the rehabilitative issues.

25. FOREST PRINCIPLES, *supra* note 11, ¶ 2(a).

26. *See id.* ¶ 1(a).

27. *See* Kasimbazi, *supra* note 5, at 92-96; Hooker, *supra* note 6, at 846-47.

28. *See id.*; FOREST PRINCIPLES, *supra* note 11, Preamble ¶ (d).

29. AGENDA 21, *supra* note 2, ¶ 11.1-.9.

30. *Id.* ¶ 11.1. Section A explains that "[t]he need for securing the multiple roles of forests and forest lands through adequate and appropriate institutional strengthening has been repeatedly emphasized in many of the reports, decisions and recommendations of FAO, ITTO, UNEP, the World Bank, IUCN and other organizations." *Id.* ¶ 11.1.

agement of the multiple roles of a forest.[31] The majority of national[32] forest policies dealt with managing to sustain the main resources of a forest, such as timber, grass, and minerals, rather than sustaining the multiple roles of a forest. Managing forests to sustain their main resources focuses only on maintaining a supply of economic commodities from the forests.[33] On the other hand, managing to sustain the multiple roles of a forest "emphasi[zes] … biodiversity and the hydrological, recreational, and climatic values of forests."[34] Thus, Section A asserts that strengthening national forest management policies will "ensure a rational and holistic approach to the sustainable and environmentally sound development of forests."[35]

There are two "Objectives" for the Section A program area. The first is that if governments strengthen their national forest management entities, the "scope and effectiveness of activities related to the management, conservation, and sustainable development of forests"[36] will improve. To strengthen a forest management entity, a government would have to provide a means for the entity to "acquire the necessary knowledge for the protection and conservation of forests."[37] Second, nations need to strengthen the skills of national forest entities "to effectively formulate and implement policies, plans, programmes, research and projects on management, conservation and sustainable development of all types of forests."[38]

Recommended "Activities" in Section A for governments to sustain multiple roles of forests include: revamping existing policies, strengthening administrative agencies, and conducting more research.[39]

Section A of Chapter 11 is important to the United States for several reasons. The United States Forest Service is the administra-

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31. The multiple roles of a forest include an ecological role in "planetary health, holding soils, cleansing waters, and maintaining atmospheric balances;" an economic role in providing resources and employment; a social role in providing a place for recreation; and various cultural roles depending on the location of the people and forest. *See* Salwasser, *supra* note 5, at 48-49.

32. In the context of Agenda 21, "national" means policies of the various countries that participated in the Earth Summit. AGENDA 21, *supra* note 2.

33. *See* Sample et al., *supra* note 19, at 4.

34. *Id.* at 3.

35. AGENDA 21, *supra* note 2, ¶ 11.1.

36. *Id.* ¶ 11.2(a).

37. *Id.*

38. *Id.* ¶ 11.2(b).

39. *See id.* ¶ 11.3.

tive agency that manages the National Forests.[40] The historic management policies of the Forest Service "focus[ed] on producing and renewing selected resources (such as timber, game fish, and livestock forage) or single sectors of forest-related enterprises (such as wood products, recreation, and cattle industry)."[41] Pursuant to Chapter 11, such policies focusing on selected uses of a forest are too weak to sustain the multiple roles of forests. The selected-use policies only consider sustaining certain resources and not protecting the forest as a whole.[42] In order to comply with Chapter 11, the Forest Service should revamp its policies to plan for sustaining the multiple roles of the National Forests.

The pursuit of research recommended in Chapter 11 is an important step in protecting the multiple roles of the National Forests. Both the Forest Service and environmental scholars argue that what entails sustainable management of forests is "not widely understood by the public, by forest policy and management professionals, or even by its advocates."[43] Therefore, establishing the capability for research will allow the Forest Service to expand its knowledge on how to sustain the multiple roles of forests. Thus, Chapter 11 provides the impetus for the United States to assess the weaknesses of its policies for managing the National Forests and improve those policies to sustain the multiple roles of forests.

B. *Enhancing the Protection, Sustainable Management and Conservation of All Forests*

A concern at the Earth Summit was that forests worldwide were "being threatened by uncontrolled degradation and . . . environmentally harmful mismanagement."[44] Section B explains in its "Basis for Action" that management errors resulted in "unsustainable commercial logging, . . . loss of biological diversity, damage to wildlife habitats and degradation of watershed areas, deterioration of the quality of life and reduction of the options for development."[45] Four important objectives of Section B are:

> (1) [t]o maintain existing forests through conservation and management . . . with a view to maintaining or restoring

40. *See* 16 U.S.C. § 1600(6) (1994).

41. Salwasser, *supra* note 5, at 47.

42. *See id.*

43. Sample, *supra* note 19, at 5; Salwasser, *supra* note 5, at 48, 61.

44. AGENDA 21, *supra* note 2, ¶ 11.10.

45. *Id.*

> the ecological balance and expanding the contribution of forests to human needs and welfare, . . . (2) [t]o prepare and implement . . . forestry action programmes and/or plans for the management, conservation and sustainable development of forests, . . . (3) [t]o ensure sustainable management and, where appropriate, conservation of existing and future forest resources; . . . and (4) [t]o maintain and increase the ecological, biological, climatic, socio-cultural and economic contributions of forest resources.[46]

Thus, the major goal of this section is for nations to plan for the maintenance of their forests as a whole, and not for consumption of particular resources.

The recommended "activity" for attaining sustainable management is to adopt planning techniques that protect the diversity of a forest. Implementing this type of management would require creating land-use plans for forest rehabilitation and conservation; amending existing land-use plans to address problem areas; and conducting research on biodiversity for an "understanding of problems and natural mechanisms related to the management and rehabilitation of forests."[47] Thus sustainable management is not management for multiple uses, but rather for sustaining the forest ecosystem as a whole.

The concerns and objectives articulated in Section B of Chapter 11 are pertinent to the United States because the Forest Service's forest management objectives concentrated on providing for multiple-use and sustained yield of resources.[48] Multiple-use management means managing renewable surface resources so that they are utilized in a way that best meets the needs of the American public.[49] Managing for selected resources does not consider the long-term effects on sustaining forest resources and biodiversity.[50] In order for the United States to fulfill its commitment to Chapter 11, it needs to assess its management directives and implement sustainable management practices.

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46. *Id.* ¶ 11.12(a)-(d). The fifth objective is to adhere to the Forest Principles. *Id.* ¶ 11.12(e).

47. *Id.* ¶ 11.14.

48. *See* 36 C.F.R. § 200.1(c)(2) (1997). Section 219.1 provides that the plans for forest management "shall provide for multiple use and sustained yield of goods and services from the National Forest System." *Id.* § 219.1.

49. *See id.* § 219.3.

50. *See generally*, THE WILDERNESS SOCIETY, DEFINING SUSTAINABLE FORESTRY (Gregory H. Aplet et al. eds. 1993) (containing various articles explaining the effect of multiple-use management on forest biodiversity).

III. UNITED STATES ACTION IN ITS NATIONAL FORESTS

A. *United States Forestry Before the Earth Summit*

1. Statutory Provisions for National Forest Management

The United States Forest Service was created in 1905.[51] Its role is to manage the land and resources of the National Forest System.[52] The National Forest System includes 156 designated national forests.[53] Until 1960, the Forest Service had wide discretion in managing the National Forests.[54] But in the 1960's, an increased demand for housing prompted the Forest Service to increase timber production from the National Forests.[55] This sparked conflicts between the timber industry's desire to increase timber production and conservationists desire to protect forest resources.[56] Congress responded to this pressure by enacting the Multiple-Use Sustained Yield Act of 1960 (MUSYA).[57]

MUSYA called for the Forest Service to utilize a multiple-use approach to forest management.[58] Multiple-use means "management of all the various renewable surface resources of the National Forest System so that they are utilized in the combination that will best meet the needs of the American people."[59] Sustained yield means the "achievement and maintenance in perpetuity of a high-level annual or regular periodic output of the various renewable resources of the National Forest System without impairment of the productivity of the

51. *See* Act of February 1, 1905, ch. 288, § 1, 33 Stat. 628 (codified as amended at 16 U.S.C. § 472 (1994)).

52. *See* 36 C.F.R. § 200.1(c)(2) (1997). One function of the Forest Service is to "provide overall leadership in forest and forest-range conservation, development and use. This involves determination of forestry conditions and requirements, and recommendations of policies and programs needed to keep the Nation's private and public lands fully productive." *Id.* § 200.3(b)(1).

53. *See id.* § 200.1(c)(2).

54. *See* Jack Tuholske & Beth Brennan, *The National Forest Management Act: Judicial Interpretation of a Substantive Environmental Statute*, 15 PUB. LAND L. REV. 53, 58 (1994).

55. *See id.* at 59. Timber production increased "from 2 billion board feet in 1940 to 8 billion board feet in 1959, and to 12 billion board feet in 1966, a 600 percent increase in just 26 years." *Id.*

56. *See* John P. Hogan, *The Legal Status of Land and Resource Management Plans for the National Forests: Paying the Price for Statutory Ambiguity*, 25 ENVTL. L. 865, 869-70 (1995).

57. 16 U.S.C. §§ 528-31 (1994) (originally enacted as Pub. L. No. 86-517, § 1, 74 Stat. 215 (1960)).

58. *See id.* § 529.

59. 36 C.F.R. § 219.3 (1997).

land."[60] In response to this Act, the Forest Service created "district and regional Multiple-Use Planning Guides"[61] for the national forests. Supervisors of individual National Forests were to use these guides to zone their forest and "organize multiple resource uses in each zone."[62] MUSYA brought about "the first systematic planning effort by the Forest Service to resolve conflicting use problems."[63] MUSYA is significant because it established the principle of managing forests for multiple use and sustained yield, which is still one of the main principles presently followed by the Forest Service.[64] However, it is notable that MUSYA "[i]n practice, . . . did not change the [Forest Service's] emphasis on timber production."[65]

By the mid-1970s Congress was again faced with conflict over the timber practices within the national forests.[66] The conflict prompted the Bolle Report,[67] which analyzed the Forest Service's management practices.[68] The Bolle Report "criticized the Forest Service's emphasis on timber production and its reliance on clearcutting."[69] As a result, Congress passed two statutes within two years of each other. First Congress passed the Forest and Rangeland Renewable Resources Planning Act of 1974 (RPA).[70] Second Congress passed the National Forest Management Act (NFMA), which amended the RPA.[71] The NFMA is the current statutory framework within which the United States Forest Service operates.

NFMA contains both procedural and substantive provisions and has been called "'the most complete forestry legislation ever passed.'"[72] Procedurally, the NFMA requires the Forest Service to

60. *Id.*

61. Hogan, *supra* note 56, at 870.

62. *Id.*

63. *Id.*

64. *See* 36 C.F.R. § 200.1(c)(2) (1997). This section states: "Administration of National Forest System lands and management of natural resources within the principle of multiple use and sustained yield." *Id.*

65. Tuholske & Brennan, *supra* note 54, at 60.

66. *See id.* at 61-62.

67. The report "was written by a faculty committee from the University of Montana headed by Dr. Arnold Bolle, the then-Dean of the Forestry School." Hogan, *supra* note 56, at 870 n.38.

68. *See* Tuholske & Brennan, *supra* note 54, at 61; Hogan, *supra* note 56, at 870-71.

69. *Id.*

70. Pub. L. No. 93-378, § 2, 88 Stat. 476 (codified as amended at 16 U.S.C. § 1600-1614 (1994)).

71. 16 U.S.C. §§ 1600-14 (1994).

72. Arnold W. Bolle, *The Bitterroot Revisited: A University Re-view of the Forest Service*, 10 PUB. LAND L. REV. 1, 15 (1989).

"develop, maintain, and, as appropriate, revise land and resource management plans for units of the National Forest System."[73] Consequently, when the statute was enacted the Forest Service had to "embark on a nationwide forest planning process for each of 156 separate units of the National Forest System."[74] Each land and resource management plan (forest plan)[75] covers one national forest. The forest plan serves to govern future projects within that forest because each project must be consistent with the overall plan for that forest.[76] NFMA mandates that the Forest Service must use "a systematic interdisciplinary approach to achieve integrated consideration of physical, biological, economic, and other sciences" in developing the forest management plans.[77] In addition, there is a requirement for public participation in the development of forest plans.[78] Although, forest plans vary based upon the specific conditions of a forest, each plan contains some basic features. For example a forest plan divides the forest into zones called "Management Areas."[79] The forest plan establishes standards and guidelines for the entire forest, and also sets standards and guidelines specifying the types of activity that are permitted in the separate "Management Areas."[80]

Substantively, NFMA contained unprecedented restrictions on the Forest Service's forest management practices.[81] The multiple-use and sustained yield principle was reiterated as the directive for developing forest plans.[82] The most rigorous substantive provision required the Forest Service to promulgate regulations for the development of land management plans.[83] Pursuant to this section, the Forest Service had to provide guidelines for the development of forest plans that would achieve the goals set forth in NFMA for the National For-

73. 16 U.S.C. § 1604(a) (1994).

74. Tuholske & Brennan, *supra* note 54, at 65.

75. A land and resource management plan is commonly referred to as a "forest plan" or a LRMP. Tuholske & Brennan, *supra* note 54, at 65.

76. Section 1604(i) provides that "[r]esource plans and permits, contracts, and other instruments for the use and occupancy of National Forest System lands shall be *consistent with the land management plans*." *Id.* (emphasis added).

77. 16 U.S.C. § 1604(b) (1994).

78. *See id.* § 1604(d).

79. Tuholske & Brennan, *supra* note 54, at 65.

80. *Id.*

81. *See id.* at 66.

82. *See* 16 U.S.C. § 1604(e) (1994).

83. *See id.* § 1604(g).

est System.[84] Those goals cover six substantive areas; one area of particular importance states that the guidelines for forest plans must "provide for diversity of plant and animal communities based on the suitability and capability of the specific land area in order to meet overall multiple-use objectives."[85] Thus, for the first time, the Forest Service was required to consider diversity when creating forest plans.

2. The Forest Service's Forest Planning Regulations

Congress ordered the Forest Service to set a goal of diversity in developing its forest plans, but it did not define the meaning of diversity.[86] Although Congress was attempting to diminish the managerial discretion of the Forest Service by enacting NFMA, the absence of a definition for diversity and the open-ended mandate to provide guidelines for achieving it, left the Forest Service with wide discretion over forest plans.[87]

In accordance with NFMA, the Forest Service promulgated the National Forest System Land and Resource Management Planning regulations for developing forest plans.[88] The regulations provided two management directives for diversity planning. First, the management of fish and wildlife habitats should "maintain viable populations of existing native and desired non-native vertebrate species in the planning area."[89] In order to maintain viable populations, the regulation directs that the effects of alternative management plans should be measured by "management indicator species."[90] Indicator species must be both vertebrate and invertebrate species and "shall be selected because their population changes are believed to indicate the effects of management activities."[91] The second management directive provided detailed management requirements.[92] One require-

84. *See id.* § 1604(g)(3).

85. *Id.* § 1604(g)(3)(B). The other substantive goals include "insuring consideration of economic and environmental aspects of various systems renewable resource management," monitoring and assessment of management practices for the productivity of land; "permitt[ing] increases in harvest levels based on intensified management practices;" creating guidelines for timber harvesting; and placing restrictions on clearcutting. *See* §§ 1604(g)(3)(A), (C)-(F).

86. *See* Tulhoske & Brennan, *supra* note 54, at 68.

87. *See id.* at 68-69.

88. 36 C.F.R. §§ 219.1-.29 (1997).

89. *Id.* § 219.19. This section explains that a viable population "shall be regarded as one which has the estimated numbers and distribution of reproductive individuals to insure its continued existence is well distributed in the planning area." *Id.*

90. *Id.* § 219.19(1).

91. *Id.*

92. *See id.* § 219.27.

ment was that "management prescriptions . . . shall preserve and enhance the diversity of plant and animal species, so that it is at least as great as that which would be expected in a natural forest."[93] The regulation does, however, provide for reduction in diversity if it is necessary to meet multiple-use objectives, such as logging.[94] In conclusion, prior to Agenda 21, the Forest Service's regulatory scheme contained some sustainability standards for the management of national forests.

3. "New Perspectives" for Managing the National Forest System

In 1990, the Forest Service began conducting "a series of research and management projects … under the title New Perspectives for Managing the National Forest System."[95] This resulted from growing concerns about the sustainability of the National Forests.[96] Concerns mounted because National Forest management had focused mainly on producing selected forest products rather than "on the processes that keep ecological systems healthy, diverse, and productive."[97] It became clear to the Forest Service that maintaining forest biodiversity would actually sustain forest resources better than planning to protect only a few dominant resources.[98] The "New Perspectives projects were used to shape an ecosystem management perspective that [was] also emerging in other nations."[99]

B. *United States Forestry After the Earth Summit*

1. The Forest Service's Ecosystem Management Approach

In June 1992, during the Earth Summit, the Forest Service announced its official adoption of an ecosystem management approach for planning within the National Forest System.[100] Before adopting

93. *Id.* § 219.27(g).

94. *See id.*

95. Deputy Chief James C. Overbay, Ecosystem Management, Address at the National Workshop on Taking an Ecological Approach to Management 322 (April, 27, 1992), *reprinted in* Testimony Before the Subcomm. on Interior and Related Agencies of the House Comm. on Appropriations, 103th Cong., 2d Sess. 322 (1992); Salwasser, *supra* note 5, at 48, 72.

96. Salwasser, *supra* note 5, at 44.

97. Overbay, *supra* note 95, at 322. As the members of the United States Forest Service explained "one traditional goal of management was to produce and sustain the yields of selected products, such as wood, wood fiber, livestock forage, game wildlife, water, fish, or recreation." Salwasser, *supra* note 5, at 75.

98. *See* Salwasser, *supra* note 5, at 72-73.

99. *Id.* at 73.

100. *See* Memorandum from Dale Robertson, Chief, U.S. Forest Service, to Regional For-

an ecosystem management approach, the Forest Service participated in a January 1992 conference called "Defining Sustainable Forestry."[101] This conference was attended by "[e]cologists, foresters, economists, and sociologists."[102] The purpose of the conference was to develop the idea of ecosystem management.[103] The participants' ideas were reduced to chapters in a book entitled *Defining Sustainable Forestry* which was updated and published in 1993. In a chapter written by Forest Service officials,[104] the Forest Service outlined "four principles to guide the evolution of ecosystem management":

1. Protect land health by restoring or sustaining the integrity of soils, air, waters, biological diversity, and ecological processes, thereby sustaining what Aldo Leopold (1949) called the land community and what we now call ecosystems.
2. Within the sustainable capability of the land, meet the needs of people who depend on natural resources for food, fuel, shelter, livelihood, and inspirational experiences.
3. Contribute to the social and economic well-being of communities, regions, and the nation through cost-effective and environmentally sensitive production and conservation of natural resources such as wood, water, minerals, energy, forage for domestic animals, and recreation opportunities, again within sustainable capability of the land.
4. Seek balance and harmony between people, land, and resources with equity between interests, across regions, and through generations, meeting this generation's resource needs while maintaining options for future generations also to meet their needs.[105]

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esters and Station Directors (June 4, 1992). *See also* Sample, *supra* note 19, at 4.; THE PRESIDENT'S COUNCIL ON SUSTAINABLE DEVELOPMENT, SUSTAINABLE AMERICA: A NEW CONSENSUS FOR PROSPERITY, OPPORTUNITY, AND A HEALTHY ENVIRONMENT FOR THE FUTURE 130 (1996).

101. Sample, *supra* note 19, at 5.

102. *Id.*

103. *See id.*

104. The title of the chapter is: "An Ecosystem Perspective on Sustainable Forestry and New Directions for the U.S. National Forest System." *See* Salwasser, *supra* note 5, at 44.

105. *Id.* at 74-75.

The Forest Service announced in this chapter that these principles were "consistent in spirit with [the] principles from the United Nations Conference on Environment and Development" (Earth Summit).[106] Thus, the Forest Service acknowledged its part in the commitment to combat deforestation that the United States made at the Earth Summit.

The Forest Service's chapter sets forth its framework for ecosystem management. According to the Forest Service, "[e]cosystem management means using an ecological approach to achieve the multiple-use management of national forests and grasslands by blending the needs of the people and environmental values in such a way that national forests and grasslands represent diverse, healthy, productive, and sustainable ecosystems."[107] An ecosystem is "a communit[y] of organisms working together with their environments as integrated units."[108] Further, "[a]ll ecosystems have flows of things—organisms, energy, water, air, nutrients—moving among them."[109] Ecosystems can range from a rotting log or pond to an entire forest; thus, each smaller ecosystem is part of a larger one.[110] There are no exact boundary lines for ecosystems.[111] Therefore, where a specific area is delineated for a forest plan, consideration must be given as to how the plan may affect surrounding areas.[112]

The management of ecosystems involves using "landscapes" and "biodiversity" in the planning process.[113] Landscapes are "large areas that have similar and repeatable patterns of physical features, habitats, and human communities." [114] They are used as the "geographic context for planning the management of ecosystems."[115] Biodiversity "is the variety of life in an area" and includes "genes, species, populations of species, the symbiotic associations of species that ecologists call *biological communities*, and the many processes through which all of the biological parts of ecosystems are interconnected with all

106. *Id.*

107. *Id.* at 74 (quoting F. D. Robertson, Ecosystem Management of the National Forests and Grasslands, Memo to Regional Foresters and Station Directors, USDA Forest Service, Washington, DC: June 4, 1992).

108. *Id.* at 73.

109. *Id.*

110. *See id.*

111. *See id.*

112. *See id.*

113. *See id.*

114. *Id.*

115. *Id.*

the physical parts through space and time."[116] Hence, the biodiversity of a forest defines its ecosystem. Thus, understanding the biodiversity of a forest is essential for implementing ecosystem management.

The Forest Service created a framework of eight objectives to be used in planning for forests under its ecosystem management approach. The Forest Service asserts that the objectives will (1) provide standards for management of land-use; and (2) serve as indicators to measure the success of managing for diversity and productivity. [117]

The first objective is to provide for the recovery and conservation of species that are listed as threatened or endangered. The goal is to reduce the number of species on these lists. The second objective is to ascertain populations of native plant and animal species that are close to endangerment. The purpose is to "protect, restore, and enhance sufficient kinds, amounts, qualities, and distributions of subpopulations and habitats" in order to achieve a viable population of the species.[118] This is similar to the current regulation that requires forest plans to provide for viable populations.[119] Conservation biology and population viability analysis are useful methods to implement this objective. The third objective is to "maintain a viable network of native biological communities and ecosystems."[120] As discussed above, there are smaller ecosystems within the larger ecosystems. These ecosystems create a network of communities that are the elements of biodiversity. The network ranges across a landscape, and each ecosystem provides resources that are relied upon by various species found within that landscape. To be sustainable, each network must maintain viable ecosystems or there will be a lack of essential resources to maintain the landscape.

The fourth objective is to maintain the structural make-up of the diversity of the forest. In other words, "snags, caves, fallen trees, and seeps provide habitats for many species that would not live in an area

116. *Id.* at 73-74 (emphasis added). Another illustrative definition of biodiveristy is: "the variety of organisms considered at all levels, from genetic variants belonging to the same species through arrays of species to arrays of genera, families, and still higher taxonomic levels; [and] includes the variety of ecosystems, which comprise both the communities of organisms within particular habitats and the physical conditions under which they live." Monica A. Genadio, *Toward a New Biodiversity Policy for Forest Managment*, 2 WIS. ENVTL. L. J. 303, 308 (quoting EDWARD O. WILSON, THE DIVERSITY OF LIFE 394 (1992)).

117. *See* Salwasser, *supra* note 5, at 76.

118. *Id.* at 76.

119. For a discussion of this regulation, see *supra* text accompanying notes 45-48.

120. Salwasser, *supra* note 5, at 77.

without them."[121] Because the structural diversity can be altered during logging and other disruptive activities, taking the structure of the forest into consideration assists in sustaining the species of the system. The fifth objective is to understand that in a natural setting plants and animals develop natural genetic variations. This variation can decline if species are intensely managed. By gaining an understanding of genetic variation, planning can protect this process of genetic variation so that species continue this process. The sixth objective is to produce and conserve needed resources. Ideally, resources, such as logs, need to be produced in a way that prevents harm to the environment. This objective aims to reduce the interference with biological diversity. The seventh objective is to protect ecosystems from the effects of human activity. The premise is that because "[e]very human activity has some effect on lands, waters, or biota,"[122] avoiding those activities that harm an ecosystem will maintain its integrity. Finally, the eighth objective is to evaluate biological communities that have sustained damage and determine methods for creating restoration and renewal plans.

These eight objectives take a holistic approach to understanding a forest ecosystem. In taking this kind of approach, a forest can be restored and sustained as a complete functioning unit. This will promote the long-term health of a forest and its species. The main premise behind these ecosystem management objectives is to maintain a productive forest while sustaining the forest as a whole.

2. Proposed Rule - Amending the Forest Service's Forest Planning Regulations

The current Forest Service regulations for forest planning were adopted in 1982.[123] In furtherance of its ecosystem management approach, the Forest Service published proposed rules to amend its forest planning regulations on April 13, 1995.[124] Although the rules have not yet been promulgated,[125] the publication is a significant step to-

121. *Id.*

122. *Id.* at 78.

123. *See* 36 C.F.R. § 219 (1982).

124. *See* National Forest System Land and Resources Management Planning, 60 Fed. Reg. 18,886 (1995) (to be codified at 36 C.F.R. pts. 215, 217, 219) (proposed Apr. 13, 1995). The advanced notice of proposed rulemaking was published at 56 Fed. Reg. 6,508 (February 15, 1991).

125. For a discussion of the status of these proposed rules, see *infra* notes 164-171 and accompanying text.

ward implementing an ecosystem approach.[126] The purpose of the proposed rules is to streamline the current system of planning for forests and to revise certain sections to incorporate principles of ecosystem management. There are four sections of the proposed rule relevant to ecosystem management.

The first is the definition section, which contains several new terms.[127] "Category 1 candidate species" are those species for which the U.S. Fish and Wildlife Service has enough data to support a listing as endangered species; those species under consideration for the endangered species list; and those species accepted as endangered, but not yet officially listed in the regulations.[128] "Category 2 candidate species" are those species that the U.S. Fish and Wildlife Service suggests might be listed as endangered species, but lacks data to support such a listing, as well as those species under consideration for the endangered species list.[129] In addition to these two categories, there is also a definition for "species or natural community ranking."[130] This is a "rating established and maintained by the Network of Natural Heritage Programs and Conservation Data Centers which reflects the biological imperilment status of a species or natural community."[131] The ratings of G1, G2, or G3 refer to species that are recognized as globally endangered because of their vulnerability for extinction.[132] G1 represents the highest level of threat, and G3 the least seriously threatened.[133] The N1, N2, or N3 ratings represent species recognized as endangered within a nation, and the ranking levels correspond to the same levels of threat as those in the global ranking.[134] The S1 and S2 ratings represent species recognized as endangered within a state and have similar levels of threat.[135] The T1, T2, or T3 ratings represent "subspecies or recognized varieties that

126. As the Forest Service noted in its background section of the proposed rule, "improvements in forest planning requirements can help better focus the issues and choices and lead to better, more informed decisions." 60 Fed. Reg. 18,887.

127. *See* 60 Fed. Reg. 18,919-21.

128. *See id.* at 18,919.

129. *See id.*

130. *Id.* at 18,921.

131. *Id.*

132. *See id.*

133. *See id.* The levels are defined as follows: level 1 is "less than 1,000 individual species remaining;" level 2 is "less than 3,000 individual species remaining"; level 3 is "less than 10,000 individual species remaining." *Id.*

134. *See id.*

135. *See id.*

are listable entities under the Endangered Species Act."[136] The ratings are not defined in the present regulations, but are essential to understanding the discussion of the ecosystem management sections of the proposed rule.

The second section relevant to ecosystem management is entitled "Sustainability of Ecosystems."[137] The Forest Service explained that this would be the predominant section in its regulatory shift to ecosystem management.[138] The section requires a forest plan "to establish goals and objectives describing desired conditions, indicative of sustainable ecosystems within the plan area" and establish "standards and guidelines that direct how to achieve those conditions."[139] As previously discussed, a forest plan lays the framework for every project that will take place within a forest.[140] This section outlines the various issues to evaluate and include when drafting a forest plan.

The Forest Service asserts that this section for sustaining ecosystems adopts the "Coarse Filter/Fine Filter" concept of conservation biology for forest planning.[141] A coarse filter strategy is "focused on maintaining the function, composition, and structure of an ecosystem as a whole [so that it] will be adequate to meet the needs of most species."[142] An ecosystem's function is the way in which species interact with each other. Ecosystem composition concerns the plants and animals within that ecosystem. Finally, the meaning of ecosystem structure ranges from the make-up of the overall landscape to the rotting logs which create the habitat for plant and animal species. The forest plan is the filter.[143] This filter acts as a barrier to preserve the needs of the species within the forest.[144] Therefore, planning in consideration of the three criteria creates a coarse filter that ensures "most species needs are caught by the mesh of the coarse filter."[145]

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136. *Id.*

137. *Id.* at 18,922. The proposed definition for sustainability of ecosystems is "[a] concept which reflects the capacity of a dynamic ecosystem to maintain its composition, function, and structure over time, thus maintaining the productivity of the land and a diversity of plant and animal communities." *Id.* at 18,921.

138. *See id.* at 18,892.

139. *Id.* at 18,922.

140. For a discussion of forest plans, see *supra* notes 82 -85 and accompanying text.

141. *See* 60 Fed. Reg. 18,893.

142. *Id.*

143. *See id.*

144. *See id.*

145. *Id.* (internal quotations omitted).

The fine filter strategy is a safeguard for protecting threatened species.[146] The theory is that "some species have additional needs or more narrow habitat requirements that are not adequately met by focusing solely on the ecosystem as a whole."[147] The fine filter strategy provides additional measures to "'catch' and support the special needs of species whose needs otherwise would have gone unmet."[148] The two filters work in combination to maintain the diversity of an ecosystem.[149]

A significant part of this proposed section is the presentation of two separate options for providing the "fine filter" for plants and animals with special needs in a forest plan. Proposed Option I is new and focuses on sensitive species, while Proposed Option II is the present method used to plan for diversity.[150] Under Option I, the identification of sensitive species would be based upon the definitions of categories one and two candidate species, and the Network of Heritage Programs and Conservation Data Centers species rankings.[151] The main purpose of this option is to "provide for the protection of habitat capability for sensitive species."[152] By contrast, Proposed Option II is concerned with species variability and is essentially identical to the existing rule governing fish and wildlife resources.[153] Thus, its purpose is to maintain viable populations of species by using management indicator species to gauge the effects of management activities.

The third relevant section of the proposed rule is entitled Ecosystem Analysis.[154] Ecosystem analysis consists of studies used to gain information on the "physical, biological, social, or economic aspects and interactions of an ecosystem."[155] The section states that an analysis can be "conducted at whatever scale is appropriate in order to

146. *See id.*

147. *Id.*

148. *Id.*

149. *See id.*

150. *See id.* For an evaluation of these two options, see *infra* text accompanying notes 178-200.

151. For a discussion of these definitions, see *supra* text accompanying notes 131-136.

152. 60 Fed. Reg. at 18,922 (1995).

153. *See* 36 C.F.R. § 219.19. For a discussion of this section, see *supra* text accompanying notes 88-94.

154. 60 Fed. Reg. at 18,925 (1995). Ecosystem analysis is defined as "[a] broad term used to denote various interdisciplinary studies conducted to provide information on and enhance an understanding of the physical, biological, social, and/or economic aspects and interactions of an ecosystem. *Id.* at 18,920.

155. *Id.*

provide the information desired,"[156] i.e., an entire region, landscape, or a sub-set within the landscape area. The assessments can also be "conducted whenever deemed appropriate by the agency."[157] The Forest Service explained that ecosystem analysis is not mandatory, but rather is an information gathering tool for understanding ecosystems.[158] In sum, this proposed section permits studies to be conducted and gives a framework for the type of information the research should yield.

Finally, the fourth relevant section covers monitoring and evaluation. This section mandates that the Forest Service prepare an overall forest strategy for monitoring and evaluating individual projects. The general purpose is to ascertain if projects are being implemented in accordance with forest plan goals. The strategy must provide instructions for forest managers to conduct the monitoring and evaluation.[159] Instructions are needed for "[a]ssessing, through the use of measurable indicators, if the activities being implemented are effective in achieving forest plan goals; . . . [and][d]etermining if there is new information or a change in conditions which substantially affects the validity of the forest plan."[160] The monitoring and evaluation section provides detailed topics to be included in a monitoring and evaluation strategy.

3. Status of Proposed Rule

The comment period for the Forest Service's proposed rule ended on August 17, 1995.[161] At the end of the comment period, the Forest Service analyzed the public comments and changed the proposed rule.[162] The amended proposed rule was reviewed by the United States Department of Agriculture, the department controlling the Forest Service.[163] On September 8, 1997, the Department of Agriculture issued a charter establishing a "Committee of Scientists."[164]

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156. *Id.*

157. *Id.*

158. *See id.* at 18,903.

159. *See id.* at 18,928.

160. *Id.*

161. *See* Notice, 60 Fed. Reg. 36,767 (1995).

162. Telephone Interview with Steve Segovia, Technical Staff Assistant, United States Forest Service (Mar. 31, 1998).

163. *See id.*

164. The Committee of Scientists, *Charter for Committee of Scientists* (visited Mar. 31, 1998) <http://www.cof.orst.edu/org/scicomm/charter.htm>. The Committee of Scientists includes individuals with experience in such fields as: "forest and range ecology, fish and wildlife biology, silviculture, hydrology, natural resource economics, sociology, public participation and

The mission of the Committee of Scientists is "to provide scientific and technical advice to the Secretary of Agriculture and the Chief of the Forest Service on improvements that can be made in the National Forest System Land and Resource Management planning process."[165] Under this charter, the Committee of Scientists is to hold meetings to address topics of forest planning such as: "biological diversity, use of ecosystem assessments in land and resource management planning, spatial and temporal scales for planning, public participation processes, sustainable forestry, [and] interdisciplinary analysis."[166] The Committee of Scientists is charged with providing a report four months after its initial meeting.[167] Including recommendations and "material for the Forest Service to consider for incorporation into the revised planning regulations."[168] The Committee of Scientists held its first meeting on December 19, 1997.[169] At this meeting, the participants reviewed the 1995 proposed regulations.[170] The "Committee will terminate upon the publication in the Federal Register of a proposed rule revising the land and resource management regulations at 36 CFR Part 219, or at the end of 2 years."[171] Thus, the proposed rule is presently under further evaluation.

IV. EVALUATION

A. *The Forest Service's Proposed Rule*

The Forest Service's proposed rule is a significant step towards sustainable management of the National Forests and is consistent with attaining the directives of Chapter 11 and the Forest Principles. The two main objectives of both Chapter 11 and the Forest Principles are to revamp policies for the multiple roles of forests and to adopt sustainable management planning for forests. The proposed rule addresses these objectives. This is evident by the Forest Service's assertion that "improvements in forest planning requirements and proce-

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conflict management, ecosystem management, land management planning, and natural resource law." *Id.*

165. *Id.*

166. *Id.*

167. *See id.*

168. *Id.*

169. *See* Mike Dombeck, *USFS Letter* (visited Mar. 31, 1998) <http://www.cof.orst.edu/org/scicomm/letter.htm>.

170. *See* The Committee of Scientists, *COS Index* (visited Mar. 31, 1998) <http://www.cof.orst.edu/org/scicomm/document.htm>.

171. The Committee of Scientists, *Charter for Committee of Scientists* (visited Mar. 31, 1998) <http://www.cof.orst.edu/org/scicomm/charter.htm>.

dures can help better focus the issues and choices and lead to better, more informed decisions."[172] Further, it was acknowledged that the "proposed rule is the culmination of a systematic and comprehensive review of forest planning rules and processes."[173] This is the action that Section A of Chapter 11 recommended to counter weaknesses in forest management policies.[174] Moreover, the Forest Service has officially adopted an ecosystem management approach for the National Forests and has implemented this approach in the proposed rule by including such amendments as the "Sustainability of Ecosystems."[175] The Forest Service has explained that ecosystem management is not an exact science.[176] An evaluation of the ecosystem management sections of the proposed rule demonstrates the difficulty in creating policies for this holistic approach to forestry.

Under the section entitled "Sustainability of Ecosystems," there are two options proposed for protecting sensitive species in forest plans. [177] Option I involves protecting the habitat of sensitive species. Option II involves protecting the viability of species. Both have flaws.

Option I, the newer offered approach to species diversity, indicates that only endangered or nearly endangered species are considered when drafting a forest plan.[178] This proposal is flawed because sensitive species at the state or local planning level would not be identified from the offered criteria. This presents a risk of missing certain species that should be found sensitive for the purposes of a forest plan.

As discussed above, in order to be classified as a species eligible for habitat protection under Option I, a plant or animal species must fall into at least one of three potential categories.[179] The first is the "Category I Candidate Species," those species about which the U.S. Fish and Wildlife Service has enough data to potentially place them on an endangered species list or is in the process of listing them as endangered.[180] The second are those species ranked as G1, G2, T1, or

172. 60 Fed. Reg. at 18,887.

173. *Id.*

174. *See* AGENDA 21, *supra* note 2, ¶ 11.3. For a discussion of Section A of Chapter 11, see *supra* notes 39-42 and accompanying text.

175. *See* Sample, *supra* note 19, at 4; 60 Fed. Reg. at 18,922.

176. *See* 60 Fed. Reg. at 18,928.

177. *See id.* at 18,922.

178. *See id.* at 18,922-23.

179. *See id.*

180. *See id.* For a discussion of Category I Candidate Species, see *supra* text accompanying

T2. [181] G1 and G2 refer to those species that are globally vulnerable to extinction.[182] The T1 and T2 levels refer to those "subspecies or recognized varieties that are listable entities under the Endangered Species Act."[183] The third category of potential sensitive species are *both* "Category 2 Candidate Species" and species ranked as G3, T3, N1, N2, or N3.[184] This applies to species about which the U.S. Fish and Wildlife Service has persuasive data of a threat, but not enough to support a listing proposal, and also are ranked globally or nationally as vulnerable to extinction.[185] The identification criteria do not include species considered imperiled at the state or local level.[186] The Forest Service admits that a species may not be considered imperiled globally or nationally, but may be threatened in a particular state or forest area. [187] The result of Option I is that state or local species considered non-sensitive under the Sensitive Species Option criteria will be overlooked in forest plans and will not receive habitat protection when forest projects are implemented.

The Forest Service argues that the exclusion of state or local sensitive species "is appropriate in order to address the two underlying reasons for protecting sensitive species: (1) to address how the agency will meet the NFMA goal of providing a diversity of plant and animal communities, and (2) to attempt to preclude the listing of species under the ESA."[188] However, neither of these reasons are advanced by excluding state or local sensitive species from habitat protection. A forest plan is for an individual National Forest. The forest plan dictates the requirements for projects within a National Forest. These projects are necessarily within a state, states, or local area. The goal of NFMA, to provide for diversity within a forest, is not met by excluding state or local sensitive species from habitat protection be-

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note 128.

181. *See* 60 Fed. Reg. at 18,921. For a discussion of these ranking numbers, see *supra* text accompanying notes 132-136.

182. *See* 60 Fed. Reg. at 18,921.

183. *Id.*

184. *See id.* at 18,922. For a discussion of Category 2 Candidate species and these ranking numbers, see *supra* text accompanying note 129.

185. *See* 60 Fed. Reg. at 18,922.

186. *See id.* at 18,896.

187. This assertion is supported by the Forest Service in the section of the proposed rule that describes each section. The Forest Service acknowledges that "[t]he scope of proposed Option I also varies from the existing rule in that it would include as sensitive species only those species at risk range-wide . . . For example, a plant species abundant in several States, but very limited in a particular plan area, would not be of range-wide concern and thus would not be identified as a sensitive species under Option I." *Id.*

188. *Id.*

cause those species are part of that particular forest's ecosystem. Not providing for their viability will affect the biological diversity of that ecosystem. Also, because a species threatened at the state or local level may not meet the criteria of being listed on the endangered species list, the Forest Service is not furthering its goal of keeping a species off the endangered list by giving them habitat protection.

Presumably aware of the flaw in Option I, the Forest Service commented: "[u]nder the 'coarse filter/fine filter' concept, the ecological conditions which will occur as a result of these various provisions for providing for diversity *should* meet the needs of many species of local, but not range-wide, concern."[189] Its reasoning for not providing protection to state or local sensitive species was that it would require "extensive additional analysis."[190] Thus, it seems that the supervisors of individual National Forests need not be aware or conduct additional analysis of threats to the habitat of species in their forest. Finally, the Forest Service explains that "nothing in the proposed rule precludes the Forest Service from working with State agencies and organizations to determine whether to protect species of local concern even though such protection would be beyond the requirements of Option I."[191]

Another weakness of Option I is the revocation of the requirement for management indicator species. The Forest Service asserts that "there is diminishing scientific support for focusing solely on individual species as indicators of the welfare of a group of associated species."[192] Further, it claims that the section on monitoring progress toward goals will "establish whatever measurable indicators are appropriate."[193] The monitoring and evaluation section, however, pertains to forest plans and projects overall, not to the goals for sustaining specific species. There should be specific criteria for monitoring sensitive species in order to ascertain if their sensitivity has increased or decreased. Also, it would be more logical and direct to include a provision for ascertaining indicators in the section dealing with species protection.

Option II, dealing with species viability, is essentially identical to the provision in the current regulations for the planning of species di-

189. *Id.* (emphasis added).

190. *Id.*

191. *Id.*

192. *Id.*

193. *Id.* For a discussion of the monitoring and evaluation section of the proposed rule, see *supra* text accompanying notes 159-160.

versity. This option is significant because it mandates that management indicator species must be selected to monitor the effects of forest projects on the population viability of species. The indicators are selected from:

Endangered and threatened plant and animal species identified on State and Federal lists for the plan area; species commonly hunted, fished, or trapped; non-game species of special interest; and additional plant or animal species selected because their population changes are believed to indicate the effects of management activities on other species of selected major biological communities. [194]

The above criteria used to identify species as indicators provides a more inclusive view of how management practices are affecting the diversity of species.

The Forest Service claims that one fault of Option II is that it does not provide for the management of habitats.[195] However, it does discuss protection of habitats by stating: "habitat must be provided to support, at least, a minimum number of reproductive individuals and that habitat must be well distributed so that those individuals can interact with others in the planning area."[196] Therefore, although Option I is more conspicuous in its discussion of habitat, Option II provides for the maintenance of species habitat.

Furthermore, the Forest Service alleges that focusing on populations under Option II is too difficult because it requires considering factors that are not under the agency's control.[197] For example, it asserts that "disease, predation, hunting or fishing pressures, natural cyclical changes and conditions occurring or actions being taken outside the plan area" are beyond its control.[198] This position is directly converse to the ecosystem management approach because these factors are supposed to be taken into consideration when planning. Specifically, the fact that an ecosystem does not have exact boundaries implies that the surrounding areas must be considered. In fact, the Forest Service contradicts this assertion in its explanation of the Ecosystem Analysis section.[199] There it states that an "area covered by an ecosystem analysis is defined by the ecosystem and not by jurisdictional or administrative boundaries [and] … to make decisions

194. *See* 60 Fed. Reg. at 18,886, 18,923.
195. *See id.* at 18,894.
196. *Id.* at 18,923.
197. *See id.* at 18,894.
198. *Id.*
199. *See id.* at 18,903.

for National Forest System lands, the agency believes it is important to be knowledgeable of the conditions on non-Forest Service lands within an ecosystem being studied."[200] Therefore, Option II should not be discarded because it is relevant to implementing ecosystem management.

Combining the two options would create a more inclusive planning method. The provisions that are lacking in Option I can be remedied by having the management indicator species of Option II included in the regulation. If sensitive species are considered when formulating plans, and non-sensitive management indicator species are also used, the Forest Service can monitor interactions between both types of species. This could lead to knowledge on how various species affect an ecosystem.

In addition, the sustainability of a species is promoted by combining Option I's detailed emphasis on protecting species habitats with Option II's provisions for ensuring viable populations. Taken separately, each provision provides important direction for sustaining ecosystems. Therefore, combining the two options would create a more complete and thorough planning strategy for ecosystem management.

The proposed Ecosystem Analysis section is too discretionary. This is evident from the indefinite language used in the section. The section purports to require ecosystem analyses "whenever deemed appropriate by the agency."[201] Moreover, the analysis can be conducted "at whatever scale is appropriate in order to provide the information desired."[202] The purpose of ecosystem analysis is to assist in forest planning, monitoring and evaluation, and determining opportunities to achieve various management goals.[203] The Forest Service advances two reasons for the discretionary language in this section. First, if the ecosystem analysis is discretionary, it is distinguishable from a decision-making action.[204] As a result, the ecosystem analysis will not "trigger NEPA analysis nor does the result of ecosystem analysis substitute for a EPA disclosure statement."[205] Second, the Forest Service wanted to prevent "ecosystem analysis [from being] used to identify any preferred or desired alternatives or

200. *Id.*
201. *Id.* at 18,925.
202. *Id.*
203. *See id.* at 18,904.
204. *See id.*
205. *Id.*

outcomes."[206] The reason for this concern is that "[i]dentification of such preferences would reflect value judgments on the part of those conducting the ecosystem analysis without the benefit of utilizing NEPA procedures."[207]

Although these reasons are persuasive, using discretionary language is not the only way to cure these concerns. The Forest Service could insert language in the regulation that explains that ecosystem analysis is not a decision-making action. The Forest Service claims that the goal of the proposed rule is to implement an ecosystem management approach to forestry.[208] Likewise, one basis for action listed in Chapter 11 of Agenda 21 was to improve weaknesses in policies and regulations.[209] The lack of understanding about ecosystems is acknowledged by the Forest Service.[210] By making the time and manner of conducting an ecosystem analysis discretionary, the Forest Service is stifling the achievement of ecosystem management by not promoting research.

The Monitoring and Evaluation section lacks specificity. First, if Option I is adopted, this section would be used to monitor the sensitive species instead of management indicator species in the current regulations. However, this section does not provide any criteria for establishing indicators.[211] The section merely states that instructions for monitoring must provide for "[a]ssessing, through the use of measurable indicators, if the activities being implemented are effective in achieving forest plan goals."[212] This is the only reference to ascertaining indicators to monitor forest plans. The section lacks specific detail on how to determine what species should be used to conduct the evaluations. This is another reason that the two options for protecting sensitive species should be combined.[213] If Option I is adopted, all criteria for determining indicator species will be removed from the regulatory scheme. As a result, the proposed regulations would lack any specificity for determining indicators to monitor and evaluate forest plans.

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206. *Id.*

207. *Id.*

208. *See id.* at 18,889.

209. *See* AGENDA 21, *supra* note 2, ¶ 11.3. For a discussion of this part of Chapter 11, see *supra* text accompanying notes 30-35.

210. *See* 60 Fed. Reg. at 18,928.

211. *See id.*

212. *Id.*

213. For a discussion on combining the two options for protecting sensitive species, see *supra* pp. 126-27.

The proposed regulations are indicative of the Forest Service implementation of the United States' commitment to Chapter 11 of Agenda 21 and the Forest Principles. The regulations meet Chapter 11's objective of recognizing weakness in policies and revamping those policies through the administrative branch of government.[214] Moreover, the regulations are aimed at implementing a holistic approach to forestry by adopting ecosystem management.[215] This is consistent with the Chapter 11 objective of adopting sustainable management of forests.[216] Regardless of whether the actual proposed provisions lack definition and specificity, the proposed rules as a whole are a good beginning for the revamping of the forest planning system to achieve sustainable forestry methods.

B. *Implementation of Ecosystem Management in the National Forests*

1. Positive Signs of Implementation

In February 1994, Jack Ward Thomas, the then new Chief of the United States Forest Service "issued a national action plan for implementing ecosystem management."[217] Chief Thomas explained that ecosystems "are incredibly complex, and we will never understand them completely. However, we have no option but to continue to move forward in natural resource management on the basis of what we know."[218] The national action plan "represents the commitment of the Forest Service to shift from the testing and demonstration phase to full implementation of ecosystem management agency wide."[219] Currently, Mike Dombeck is the Chief of the Forest Service.[220] On March 2, 1998, Chief Dombeck gave a speech announcing "A Natural Resource Agenda for the 21st Century."[221] This agenda

214. *See* AGENDA 21, *supra* note 2, ¶ 11.3.

215. *See* 60 Fed. Reg. at 18,889.

216. *See* AGENDA 21, *supra* note 2, ¶ 11.3.

217. *Ecosystem Management: Hearing Before the Subcomm. on Agricultural Research, Conservation, Forestry, and General Legislation of the Senate Comm. on Agriculture, Nutrition, and Forestry*, 103d Cong., 2nd Sess. 40 (1994) (statement of Jack Ward Thomas, Chief of Forest Service) [hereinafter *Ecosystem Management Hearing*].

218. *Id.* at 41.

219. *Id.* Chief Thomas also stated that "[w]e need to implement management strategies that truly conserve biodiversity and maintain aesthetic values, while producing needed commodities, and we must do more than change labels, we must change actual management." *Id.*

220. *See* U.S. Forest Service, *A Gradual Unfolding of a National Purpose: A Natural Resource Agenda for the 21st Century* (visited Mar. 31, 1998) <http://www.fs.fed.us/news/agenda/sp30298.html>.

221. *Id.* The agenda concentrates on four areas: "watershed health and restoration, sustain-

reaffirms the Forest Service's commitment to sustainable forest management.[222] Chief Dombeck explained that "[n]ew information about how to manage sustainable ecosystems will continue to evolve… [and] we can lead by example … by using the best available scientific information based on principles of ecosystem management that the Forest Service pioneered."[223] Further, Chief Dombeck asserted that the Forest Service "know[s] today that healthy forests do far more than grow trees and provide timber. For example, they 'grow' water, wildlife habitat, and recreation opportunities . . . And as we learn more, we are continually adapting our management."[224] Thus, the Forest Service continues to strive for the sustainable management of the National Forests.

The Forest Service implemented many projects both before and after the Earth Summit in its exploration of implementing ecosystem management. In a paper published in 1995, a Forest Service official affirmed that the Forest Service has conducted "a great deal of activity to implement the promises made at the Earth Summit . . . but needs to better focus its efforts."[225] This focus can be attained by using the past projects as tools for learning how to manage forest ecosystems. There are several project examples that demonstrate the advances that the Forest Service has made in learning about ecosystem management.

An interesting and successful project is the "Kirtland's Warbler Recovery Plan for the Huron-Manistee National Forest" in Michigan. [226] The Kirtland's warbler is a bird that requires a dense jack pine habitat.[227] The threat to the existence of the Kirtland's warbler resulted from the very limited habitat caused by human development in the only area where the warbler will nest.[228] Jack pine requires fire to regenerate.[229] Fire would occur naturally in a jack pine forest and keep the jack pine trees the way the Kirtland's warbler needs them—

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able forest ecosystem management, forest roads, and recreation." *Id.*

222. *See id.*

223. *Id.*

224. *Id.*

225. Mike Funston, USDA Forest Service, *Sustainable Forest Management* (published June 15, 1995) <http://www.fd.fed.us/land/sustain_dev/susdev2.html>.

226. *Ecosystem Management Hearing*, *supra* note 217, at 42.

227. The warbler "was one of the first to be listed as endangered after the *Endangered Species Act of 1973* was passed." *Managing the Forest for the Kirtland's Warbler* (visited Mar. 31, 1998) <http://users.netonecom.net/~hurmann/hmdoc6a.htm>.

228. *See id.*

229. *See id.*

young and bushy.[230] When human settlement in this area increased, "[n]ew roads and fire breaks were built. Fire protection was necessary to protect the settler's homes and lives. With fewer fires, there were fewer young jack pine forests—and fewer Kirtland's warblers."[231] The Forest Service reacted to this problem by implementing a management plan for Kirtland's warbler protection and restoration.[232]

The plan called for "regenerating [the] jack pine habitat through timber harvest and prescribed burning."[233] The Forest Service also teamed up with "private and corporate groups to cost share planting the high-density jack pine stands."[234] In addition, the plan included the Michigan Department of Natural Resources and the Forest Service cooperating with the local community "to provide access to bird watchers who want to see the Kirtland's warbler. This has benefited the local economy by allowing the local community motels to place ads in bird magazines advertising their proximity to the warbler."[235] The census of Kirtland's warblers taken each year reveals that "there has been an increase in the number of warblers living in the special areas created for them by forest managers."[236] This project is a great example of ecosystem management because it plans for sustaining both the species habitat and the social role of a forest. Further, both of these objectives are part of Chapter 11. Thus, the Kirtland's warbler management plan is a Forest Service action that is consistent with Chapter 11.

A current management project in the Ouachita National Forest in Arkansas is another good example of ecosystem management. This project consists of a coordinated effort between research and management groups including two national forests, two research stations, and ten universities. [237] This team is called the "Ecosystem Management Research Team."[238] The reason for this project was that "little research has been conducted in the [Ouachita] forest type and

230. *See id.*

231. *Id.*

232. *See id.*

233. *Ecosystem Management Hearing*, *supra* note 217, at 42.

234. *Id.*

235. *Id.*

236. *Id.*

237. *See* U.S. Forest Service, *Ouachita Ecosystem Management Research Team* (visited Mar. 31, 1998) <http://www.fs.fed.us/land/ouachita.htm>.

238. *Id.*

alternative management techniques were largely untested."[239] In fact, the management practices used before 1990 were those "actually developed for other kinds of forests," not the "shortleaf pine/hardwood ecosystem" of the Ouachita National Forest.[240]

The team's research is "designed to experiment with timber harvest techniques and natural regeneration [for shortleaf pine/hardwood forests] that [could] be used as alternatives to clear cutting and planting."[241] The research is broken into three phases.[242] The first two phases involve learning about alternative methods for timber harvesting.[243] The third phase will require the team to "monitor the large-scale ecosystem responses to these alternative management approaches."[244] The goal of the project is to learn more about the "ability to achieve and sustain desired ecosystem conditions and resource values."[245] Some of the elements for monitoring the project will include: "forest growth and yield, plant biodiversity, soil and litter nutrients, soil compaction and disturbance, stream morphology and woody debris deposition, small mammals, and neotropical migrant birds."[246]

This project will provide the Forest Service with scientific information to enable it to "develop more options for ecosystem management supported by sound science."[247] In short, this is "an example of bringing Forest Service research and management together to assess current management strategies."[248] Chapter 11 calls for conducting research to improve management practices and this project is consistent with this objective.

The "Southern Appalachian Man and the Biosphere Program, called SAMAB for short"[249] is a well-known ecosystem management project. The project began in 1988 "when six Federal agencies that have land-management responsibilities in the Southeastern United

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239. *Id.*

240. *See id.*

241. *Ecosystem Management Hearing*, *supra* note 217, at 42.

242. *See* U.S. Forest Service, *Ouachita Ecosystem Management Research Team* (visited Mar. 31, 1998) <http://www.fs.fed.us/land/ouachita.htm>.

243. *See id.*

244. *Ecosystem Management Hearing*, *supra* note 217, at 42.

245. *Id.*

246. *Id.*

247. U.S. Forest Service, *Ouachita Ecosystem Management Research Team* (visited Mar. 31, 1998) <http://www.fs.fed.us/land/ouachita.htm>.

248. *Ecosystem Management Hearing*, *supra* note 217, at 42.

249. *Id.* at 43.

States signed an interagency and cooperative agreement."[250] The Forest Service signed on to this agreement.[251] The main objective of this program was to create a model for creating biosphere reserves.[252] A biosphere reserve "is a voluntary, cooperative, conservation reserve created to protect the biological and cultural diversity of a region while promoting sustainable economic development."[253] The SAMAB biosphere reserve project "extend[s] outward in a zone of cooperation that embraces some 50,000 square miles in six states: North Carolina, Tennessee, Virginia, South Carolina, Alabama, and Georgia."[254] This project is an example of how the interagency cooperation objective of Chapter 11 can be implemented to research and promote sustainable forestry.

Up to 1994, SAMAB had conducted numerous research projects to ascertain "what really constitutes an ecosystem and what is involved in sound ecosystem management."[255] Since then, information gathered from these ongoing projects has been used to issue a report providing a landscape perspective on managing ecosystems.[256] The forest managers of the six Southern Appalachian National Forests are making plans based on the surrounding landscape information in the report.[257] In addition, the SAMAB report is used as a model in planning for other forest ecosystems, such as the Sierra Nevada Ecosystem Management project.[258]

The SAMAB project and the other projects discussed above are positive indications of the Forest Service abiding by its proclaimed goal of implementing an ecosystem management approach for the National Forests.[259] The Forest Service is working under its current

250. *Id.*

251. *See id.*

252. *See id.*

253. Natural Resources Defense Council, *What is a Biosphere Reserve?* (visited Feb. 11, 1997) <http://www.nrdc.org/bkgrd/fobio.html>. There are 47 biosphere reserves in the United States and 324 biosphere reserves worldwide from 83 countries. *Id.*

254. *Ecosystem Management Hearing*, *supra* note 217, at 45.

255. *Id.*

256. Telephone Interview with John Pasquantino, Legal Counsel, United States Forest Service (Apr. 1, 1998).

257. *See id.*

258. *See id.*

259. The projects discussed are a sample of the Forest Service's implementation of ecosystem management. There are numerous other projects in the National Forest System aimed toward researching and implementing ecosystem management. Telephone Interview with Steve Segovia, Technical Staff Assistant, United States Forest Service (Mar. 31, 1998). Two examples of other projects are the Bitterroot Ecosystem Management Research Project, United States Forest Service, *Bitterroot Ecosystem Management Research Project* (visited Mar. 31,

regulatory scheme to research and implement ecosystem management, consistent with the United States' commitment to Chapter 11 of Agenda 21 at the Earth Summit.[260]

2. Negative Signs of Implementation

Despite the positive steps mentioned above, the Forest Service's management and Congress's actions with respect to the Tongass National Forest in Alaska cast doubt on the implementation of ecosystem management. Since the 1950s, the Tongass National Forest was mainly used for logging, with clearcutting being the major method.[261] Clearcutting "means the felling and removal of all trees from a given tract of forest."[262] The severity of the past logging practices permitted by the Forest Service is placed in perspective when one considers that "[o]ver the past 40 years, two giant pulp companies consumed more than a million acres of old-growth Tongass rainforest."[263] Also, Congress and the Forest Service commissioned a group of scientists to evaluate these clearcutting practices.[264] The scientists found that the "protection for fish and wildlife habitat on the Tongass was … thoroughly inadequate."[265] Although two pulp companies are no longer logging in the Tongass, management practices in the Tongass continue to be controversial.[266]

The Tongass issue continues to be problematic because "[d]espite the pulp mill closures and the scientists' warnings … the Forest Service's proposed new plan for the Tongass envisions a regime of old-growth clearcutting that largely resurrects the failed and destructive practices of the past."[267] The pulp companies' unsustainable practices occurred because there was no forest plan in effect for the Tongass National Forest and the Forest Service permitted the

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1998) <http://www.forestry.umt.edu/BEMRP/bemrp-10.htm>, and the Southern Forest Health Monitoring Program, United States Forest Service, *Southern Regional Program* (visited Mar. 31, 1998) <http://willow.ncfes.unm.edu/fhm_fact/south.htm>.

260. *See* Mike Funston, USDA Forest Service, *Sustainable Forest Management* (published June 15, 1995) <http://www.fd.fed.us/land/sustain_dev/susdev2.html>.

261. *See* National Resources Defense Council, *Tongass National Forest Update* (visited Feb. 11, 1997) <http://www.nrdc.org/status/fotong.html>.

262. Natural Resources Defense Council, *What is Clearcutting?* (visited Feb. 11, 1997) <http://www.nrdc.org/bkgrd/focut.html>.

263. National Resources Defense Council, *Tongass National Forest Update* (visited Feb. 11, 1997) <http://www.nrdc.org/status/fotong.html>.

264. *See* National Resources Defense Council, *Tongass National Forest Update* (last modified Feb. 5, 1998) <http://www.nrdc.org/status/fotong.html>.

265. *Id.*

266. *See id.*

267. *Id.*

clearcutting practices.[268] In fact, the Forest Service has been drafting a Tongass forest plan for over ten years.[269] In May 1997, the Forest Service finally released its forest plan to guide projects in the Tongass National Forest.[270] The forest plan proposes to "authorize more than twice the 1996 logging level for each of the next ten years," which is approximately 300 million board feet a year.[271] Further, "instead of limiting future logging to previously logged areas, the new plan would continue to open up pristine rainforest valleys to industrial logging."[272] The proposed forest plan is controversial because the pro-timber groups allege that "a harvest level of at least 300 million board feet is needed for a viable timber industry."[273] On the other hand, environmentalists and Vice President Al Gore contend that "the forest can no longer sustain a 300-million-board-feet harvest level."[274] Currently, environmentalists are appealing the Tongass National Forest plan to Chief Mike Dombeck of the Forest Service.[275] Unfortunately, the implementation of this forest plan would be adverse to Chapter 11, the Forest Principles, and the Forest Service's self-declared ecosystem management approach.

In 1995, Congress enacted the Emergency Salvage Timber Program.[276] This program allowed the Forest Service to sell salvage timber from its National Forests.[277] The issue of concern was the amount of discretion the program gave the Forest Service to conduct these sales. Two areas of discretion were of particular concern. First, the definition of "salvage timber sale" provided that the Forest Service could remove trees with "disease- or insect-infested trees, dead, damaged, or down trees, or trees affected by fire or imminently susceptible to fire or insect attack."[278] However, the definition also in-

268. *See* National Journal, Inc., *Hearing to Highlight Administration Dilemma on Tongass*, CONGRESS DAILY, Apr. 28, 1997, *available in* 1997 WL 7761816.

269. *See id.*

270. *See* National Resources Defense Council, *Tongass National Forest Update* (last modified Feb. 5, 1998) <http://www.nrdc.org/status/fotong.html>.

271. *See id.*; National Journal, Inc., *supra* note 268.

272. National Resources Defense Council, *Tongass National Forest Update* (last modified Feb. 5, 1998) <http://www.nrdc.org/status/fotong.html>.

273. National Journal, Inc., *supra* note 268.

274. *Id.*

275. *See* National Resources Defense Council, *Tongass National Forest Update* (last modified Feb. 5, 1998) <http://www.nrdc.org/status/fotong.html>.

276. Emergency Salvage Timber Sale Program of 1995, Pub. L. No. 104-19, 109 Stat. 240 (codified as amended at 16 U.S.C. § 1611 (1994)).

277. *See id.*

278. *Id.*

cluded those trees, whether or not damaged, that had any identifiable characteristics listed in the definition.[279] This left considerable discretion to the Forest Service for identifying salvage timber because "[t]here are few trees that would not fit [into the definition]."[280]

Second, the program excluded the salvage timber sales from meeting the requirements of all federal forest statutes and regulations, "any compact, executive agreement, convention, treaty, and international agreement," and "[a]ll other Federal environmental and natural resource laws."[281] In essence, this program authorized the Forest Service to pick any timber it wanted and to harvest it without any consideration of the affect on the forest ecosystem. Many environmentalists called the provision "logging without laws."[282] As a result, there was litigation over many of the Forest Service's decisions under this program.[283] The program, however, had a limited existence since it was set to expire on December 31, 1996, and, to date, there has been no renewal.[284]

The salvage timber sale program is inconsistent with ecosystem management principles. Although the Forest Service has been involved in many positive projects in its quest to implement ecosystem management, the forest plan recently announced for the Tongass National Forest and the potential for salvage sale legislation in the future reveal that not all of the Forest Service's activities are geared toward sustainable forestry.

V. RECOMMENDATIONS FOR FUTURE U.S. ACTION

Although the statutory and regulatory schemes presently in place provide a good framework for the Forest Service's management of the national forest system, both need to be revised to provide for more specific guidelines for the ecological management of forests. The multiple-use/sustained yield standard is still the overriding policy objective of the Forest Service's management practices. This means

279. *See id.*

280. Natural Resources Defense Council, *The Salvage Law* (last modified Apr. 1, 1996) <http://www.nrdc.org/bkgrd/lasal1101.html>.

281. Emergency Salvage Timber Sale Program of 1995, Pub. L. No. 104-19, 109 Stat. 240 (codified as amended at 16 U.S.C. § 1611 (1994)).

282. *Supra* note 280.

283. *See, e.g.*, Inland Empire Pub. Lands Council v. Glickman, 88 F.3d 697 (9th Cir. 1996); Southwest Ctr. for Biological Diversity v. U.S. Forest Serv., 100 F.3d 1443 (9th Cir. 1996); Idaho Conservation League v. Thomas, 917 F. Supp. 1458, *aff'd*, 91 F.3d 1345 (D. Idaho 1995); Kentucky Heartwood, Inc., v. U.S. Forest Serv., 906 F. Supp. 410 (E.D. Ky. 1995).

284. *See* 109 Stat. 240.

that the Forest Service concentrates mainly on sustaining forests for particular products and services.[285] The multiple-use standard is also viewed as giving a great deal of discretion to the Forest Service.[286] This discretion is appropriate because the Forest Service personnel are experts and "are much more familiar with on-the-ground conditions than Congress or lobbyists in Washington."[287] If the Forest Service personnel did not retain this discretion it would hinder their ability to address changing circumstances and diverse forest conditions. Nevertheless, the Forest Service still requires that its discretion be specifically directed toward ecosystem management planning.

The multiple-use principle of forest management should be interpreted as maintenance of viable ecosystems. This is because viable and "[h]ealthy ecosystems, to varying degrees, can withstand some disturbance while maintaining their integrity."[288] As a result, a healthy ecosystem is better suited to provide for multiple-uses. In order to maintain viable ecosystems, decisions should take place after assessing forest conditions on two levels. The first should include "a complete inventory of current environmental conditions and natural resources, [and] federal land managers should apply known ecological principles to establish the maximum level of disturbance that can be allowed within the management area without destroying the viability of the ecosystem."[289] In combination with this first level, "an interdisciplinary team of land managers should, through federal land planning processes and based upon public input, determine the appropriate mix of uses that will be allowed within the ecosystem viability ceiling."[290] In order to assess forest conditions, either the Forest Service or Congress should create management indicators that will assist in implementing ecosystem management. It should be noted that the United States is currently "developing domestic criteria and indicators for sustainable management of U.S. forests."[291] Therefore, this discussion of indicators is a suggested set for the sustainable management of forests.

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285. *See* Scott W. Hardt, *Federal Land Management In the Twenty-First Century: From Wise Use to Wise Stewardship*, 18 HARV. ENVTL. L. REV. 345, 366 (1994).

286. *See id.* at 390.

287. *Id.*

288. *Id.* at 392.

289. *Id.*

290. *Id.* at 392-93.

291. United Nations, *Country Profile-United States* (visited Feb. 11, 1997) <http://www.un.org/dpcsd>.

Management indicators are essential to planning and monitoring forests. In contrast to the Forest Service's current regulations and the proposed rule, it is highly recommended to create an elaborate system of indicators. Management indicators should be divided into two categories. One set of indicators should monitor the development of management plans. This will ensure that Forest Service personnel actually considered all criteria essential for developing sound forest management plans.

The second set of indicators should monitor the goals of the forest plan and the implementation of projects within the forest. These indicators could be further broken down into different categories. One set includes "plant species, as well as mammalian and nonmammalian indicator animal species, that depend on critical ecological links and would be demonstrably affected by a disruption of those links."[292] Another set comprises "keystone species, [in other words] those species that have a significant effect on their ecosystems."[293] Finally, a set including "physical indicators, such as water quality, stream bed quality, and other elements that serve as critical energy and nutrient conduits within the ecosystem" would assist in planning for habitats.[294] These indicators should be specifically included in the statutory and regulatory schemes.

The indicators serve several purposes. The land managers can conduct "[e]cosystem viability determinations . . . based upon . . . independent analyses of the potential effects of proposed activities on the selected management indicators."[295] The indicators can also provide a more appropriate standard for judicial review because they provide a quantifiable system for measuring agency action, rather than an arbitrary abuse of discretion standard. Further, the indicators provide a means for the public to be involved in decisionmaking. The indicators would be articulated in the statute and regulations so that concrete details can be addressed when the public responds to the Forest Service's proposed forest plans. This in turn will provide more public confidence in the forest planning system because, instead of the Forest Service having wide discretion to pick whatever indicators they choose, there would be concrete indicators that must be considered.

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292. Hardt, *supra* note 285, at 398.
293. *Id.*
294. *Id.*
295. *Id.*

The indicators could also be used to implement a certification system. A "[f]orest certification system is a means of protecting forests by promoting environmentally responsible forestry practices."[296] The Forest Service could provide environmental labeling for the forest products of the National Forests. The system is analogous to the Department of Agriculture's food labeling system, and could push private forestry producers to follow suit. Products with an environmental label may be more popular and trusted than those without. Similar to the functioning of some ecosystem management projects, the Forest Service could join forces with private industry and environmental groups to develop a forest certification system. Thus, a system of management indicators is recommended for future revisions of the forestry statutes and regulations.

VI. CONCLUSION

The United States made a commitment to combat deforestation and implement sustainable forestry practices at the 1992 Earth Summit in Rio De Janiero. This commitment is important to the United States because the past management of its National Forests concentrated on providing specific resources and not protecting the multiple roles of forests. Although there are statutory and regulatory provisions governing the Forest Service's management practices, Chapter 11 requires correcting the weaknesses in those policies. Chapter 11 also recommends the implementation of sustainable forest management.

Since the Earth Summit, the Forest Service has strived to research and implement sustainable forest management. Before the Summit, the Forest Service conducted test projects and held conferences to learn about the ecosystem management of forests. After the Earth Summit the Forest Service established principles and objectives for its pursuit of ecosystem management that were consistent with the principles established at the Earth Summit. The Forest Service also took several steps toward its goal for ecosystem management. In June 1992, it officially adopted an ecosystem approach for forest planning. To further this obligation, the Forest Service published a proposed rule aimed at significantly amending the current forest planning regulations.

296. National Resources Defense Council, *Forest Certification FAQ* (last modified June 25, 1997) <http://www.nrdc.org/faqs/focertqa.html>.

The proposed rule contains several ecosystem management sections. The most prominent section was entitled the "Sustainability of Ecosystems." The Forest Service asserted that this section would provide protection to sensitive species in a forest by applying a "coarse filter/fine filter" approach. The purpose of the coarse filter was to provide for the needs of most species in a forest. The fine filter, on the other hand, would be an extra layer of planning that would provide for the needs of sensitive species or those under threat of extinction. The Forest Service proposed two options for implementing this fine filter planning. Option I concentrated on protecting the habitat of those species meeting the sensitive species criteria. Option II is essentially the same as the protection provided in the current regulations, which is to maintain a viable population of sensitive species. Because there are flaws in both options, it is suggested that combining the benefits of both options would be a way to amend the proposed regulation to cure the flaws.

Since the publication of this proposed rule, the United States Department of Agriculture has chartered a Committee of Scientists to conduct meetings on forest planning. The Committee is required to provide a report with suggested ways to amend the current forest planning regulations. The term of the Committee extends until a new set of proposed rules are published, or until two years. The Forest Service is presently working with the Committee to establish new planning regulations.

The Forest Service has implemented many successful ecosystem management projects over the years. These projects have been used as models for future management projects. On the other hand, there have been recent controversies regarding unsustainable forestry practices with respect to the Tongass National Forest and the salvage timber law. But overall, the Forest Service has illustrated a strong commitment to researching and implementing sustainable forestry practices. This note concludes that the activities of the Forest Service are consistent with the United States' commitment to adhere to Chapter 11 of Agenda 21 and the Forest Principles.