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An Agricultural Law Research Article

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Substantive Standard**

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Originally published in ENVIRONMENTAL LAW
27 ENVTL. L. 641 (1997)

www.NationalAgLawCenter.org

ELIMINATING THE NATIONAL FOREST MANAGEMENT ACT'S DIVERSITY REQUIREMENT AS A SUBSTANTIVE STANDARD

BY
JULIE A. WEIS*

Congress's 1976 passage of the National Forest Management Act (NFMA) reflected that body's recognition of the importance of biodiversity. The legislation requires the Forest Service to provide for biodiversity in the forest planning process, and the statute's implementing regulations require the maintenance not only of biodiversity but also of viable vertebrate populations. Translating these mandates into concrete resource management requirements has proven difficult, however, and courts typically have deferred to agency expertise on the complex biological issues involved in the management of our nation's forests. Under a recently proposed rule change, the Forest Service would abandon the technologically intensive viability concept and instead provide for biodiversity through ecosystem management. This Comment reviews the historical events leading to NFMA's passage and examines the statute's current biodiversity requirements. The author then discusses the future of the statute's biodiversity mandate under the proposed ecosystem management approach.

I. INTRODUCTION

When Congress passed the National Forest Management Act of 1976 (NFMA),¹ thereby amending the Forest and Rangeland Renewable Resources Planning Act of 1974,² many were hopeful that management of the nation's natural resources had entered an era of sustainability.³ The legislation resulted in part from public opposition to clearcutting on national forest lands.⁴ The statute's diversity provision⁵ reflected congressional

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¹ Pub. L. No. 94-588, 90 Stat. 2949 (codified at 16 U.S.C. §§ 1600-1614 (1994)).

² 16 U.S.C. §§ 1600-1612 (1976).

³ Arnold W. Bolle, *Foreward* to CHARLES F. WILKINSON & H. MICHAEL ANDERSON, *LAND AND RESOURCE PLANNING IN THE NATIONAL FORESTS* 1, 1 (1987).

⁴ James A. Siemans, *A "Hard Look" at Biodiversity and the National Forest Management Act*, 6 TUL. ENVTL. L. REV. 157, 166-67 (1992) (discussing effects of *West Va. Div. of the Isaak Walton League v. Butz*, 522 F.2d 945 (4th Cir. 1975)).

⁵ 16 U.S.C. § 1604(g)(3)(B) (1994); see *infra* text accompanying notes 65-71.

recognition of the importance of biodiversity,⁶ an ecological tenet that many people today take for granted.⁷

NFMA required the development of land and resource management plans for the national forests that would "provide for diversity of plant and animal communities."⁸ Despite that seemingly clear and decisive language, translating congressional intent regarding biodiversity into specific land management requirements proved problematic.⁹ To satisfy the diversity mandate, the United States Forest Service ultimately promulgated implementing regulations requiring the maintenance of plant and animal community diversity.¹⁰ The regulations also required the maintenance of viable vertebrate populations.¹¹

The meanings of the terms "biodiversity" and "species viability" are not static, however. Increases in scientific knowledge since the time of regulation drafting have changed those words' definitions.¹² Additionally, a fog of agency discretion regarding the meaning of those terms has obscured the NFMA diversity mandate. To the Forest Service, the diversity provision is but one of its many goals subsumed under the umbrella of multiple-use management.¹³ Moreover, courts typically defer to agency expertise on the topic.¹⁴ This line of reasoning culminated recently in the

⁶ Final Report of the Committee of Scientists, 44 Fed. Reg. 26,599, 26,608 (May 4, 1979) (noting the "significant Congressional [sic] policy that multiple-use management shall maintain a wide variety of plant and animal species in a variety of communities on National Forest system lands").

⁷ For example, the 1986 National Forum on BioDiversity "coincided with a noticeable rise in interest, among scientists and portions of the public, in matters related to biodiversity." Edward O. Wilson, *Editor's Foreword* to BIODIVERSITY at v (Edward O. Wilson ed., 1988). Widespread acknowledgement of the "practical value of wild species" and "that health and prosperity decline in a deteriorating environment" exists today. EDWARD O. WILSON, *THE DIVERSITY OF LIFE* 282 (1992).

⁸ 16 U.S.C. § 1604(g)(3)(B) (1994).

⁹ 44 Fed. Reg. at 26,608 ("Diversity is one of the more perplexing issues dealt with in these regulations."). The Committee of Scientists advised the Forest Service on development of the NFMA implementing regulations. WILKINSON & ANDERSON, *supra* note 3, at 43.

¹⁰ 36 C.F.R. §§ 219.26, 219.27(g) (1996). Diversity is defined as "[t]he distribution and abundance of different plant and animal communities and species within the area covered by a land and resource management plan." *Id.* § 219.3.

¹¹ *Id.* § 219.19.

¹² National Forest System Land and Resource Management Planning, 60 Fed. Reg. 18,886, 18,895 (1995) (to be codified at 36 C.F.R. pts. 215, 217, 219) (proposed Apr. 13, 1995) ("[T]he term 'viability' has been subject to continuously evolving scientific interpretation and no longer meets the agency's expectations at the time the rule was written.").

¹³ The Multiple-Use Sustained-Yield Act of 1960, 16 U.S.C. §§ 528-531 (1994), mandates multiple-use management on public lands. NFMA requires land and resource management plans to be consistent with this goal. 16 U.S.C. § 1604(e)(1) (1994). The Forest Service thus treats the NFMA diversity provision as "a goal within the context of multiple use." 60 Fed. Reg. at 18,892.

¹⁴ See, e.g., *Sierra Club v. Espy*, 38 F.3d 792, 801 (5th Cir. 1994) (declining "to define precisely the 'outer boundaries' of NFMA's . . . diversity requirement[]" but noting that clearcutting did not exceed those bounds); *Krichbaum v. Kelley*, 844 F. Supp. 1107, 1114-15 (W.D. Va. 1994) (creating even-aged tree stands did not violate NFMA diversity mandate because "the naturally occurring forest ecosystems . . . [were not] the sole yardstick by which diversity must be measured"), *aff'd*, 61 F.3d 900 (4th Cir. 1995); *Oregon Natural Re-*

Seventh Circuit's affirmation that NFMA does not require the Forest Service to recognize conservation biology principles in forest management planning.¹⁵

In *Sierra Club v. Marita*, environmental groups and conservation biologists unsuccessfully challenged the forest management plans for two Wisconsin National Forests.¹⁶ The plaintiffs alleged that the failure to apply conservation biology principles in developing management plans for those forests violated NFMA's diversity mandate.¹⁷ The court, however, affirmed the lower court's conclusions that NFMA does not dictate a particular method of providing for diversity. Rather, the statute allows the Forest Service to use any rational methodology.¹⁸

Current NFMA diversity regulations impose potential substantive limitations on agency discretion.¹⁹ Recently, however, the Forest Service proposed a rule change for land and resource management planning that would allow the agency unbridled discretion in managing the national forests.²⁰ The proposed rule change sensibly espouses the concept of "ecosystem management"²¹ and recognizes a goal of "sustainable ecosystems."²² The revision, however, would allow the Forest Service to define the term "sustainable ecosystem" and also to establish methods for obtaining this goal.²³ The proposed rule contains no "concrete standard re-

sources Council v. Lowe, 836 F. Supp. 727, 734 (D. Or. 1993) (allowing agency wide discretion in selecting scientific methodology), *aff'd*, No. 93-36025, 1997 WL 106954 (9th Cir. Mar. 12, 1997); *Sierra Club v. Robertson*, 810 F. Supp. 1021, 1028 (W.D. Ark. 1992) (noting that "mere disagreement" over methods used to provide for diversity is not sufficient grounds on which to challenge forest plan), *aff'd on merits but vacated for lack of standing*, 28 F.3d 753 (8th Cir. 1994).

¹⁵ *Sierra Club v. Marita*, 46 F.3d 606 (7th Cir. 1995).

¹⁶ *Id.* at 609. The forests at issue were the Nicolet and the Chequamegon. *Id.*

¹⁷ *Id.* at 610. Most notably, the Forest Service ignored the conservation biology principle "that biological diversity can only be maintained if a given habitat is sufficiently large so that populations within that habitat will remain viable in the event of disturbances." *Id.*

¹⁸ *Id.* at 620; *see also* *Sierra Club v. Marita*, 845 F. Supp. 1317, 1330 (E.D. Wis. 1994) (finding Forest Service methodology rational although not based on conservation biology principles); *Sierra Club v. Marita*, 843 F. Supp. 1526, 1542 (E.D. Wis. 1994) (upholding Forest Service methodology that did not consider principles of conservation biology). For a critique of the methodology employed by the Forest Service in the *Marita* case, see Patricia Smith King, *Applying Daubert to the "Hard Look" Requirement of NEPA: Scientific Evidence Before the Forest Service in Sierra Club v. Marita*, 2 WIS. ENVTL. L.J. 147, 166 (1995) (describing as circular the agency's logic that habitat diversity, calculated as a function of vegetative diversity, determines biodiversity).

¹⁹ For example, in *Sierra Club v. Espy*, 38 F.3d at 800, the court stated that the viability regulation ensured "a minimum level of protection." *But see* WILKINSON & ANDERSON, *supra* note 3, at 296 ("[I]t is difficult to discern any concrete legal standards on the face of the [NFMA diversity] provision.").

²⁰ National Forest System Land and Resource Management Planning, 60 Fed. Reg. 18,886 (1995) (to be codified at 36 C.F.R. pts. 215, 217, 219) (proposed Apr. 13, 1995).

²¹ *See* Robert B. Keiter, *Beyond the Boundary Line: Constructing a Law of Ecosystem Management*, 65 U. COLO. L. REV. 293, 300 (1994) (noting that "ecosystem management" is not yet a well-defined term). Ecosystem management may, however, be the "next logical phase in the evolution of public land policy." *Id.* at 296.

²² 60 Fed. Reg. at 18,892.

²³ *Id.*

garding . . . diversity"²⁴ and includes an option that would not require the maintenance of viable populations.²⁵ The resulting rule thus would lack obvious limits on agency actions and would possibly foreclose meaningful public input on ecosystem management.

This Comment explores the substantive biodiversity requirements of NFMA. Part II provides a brief historical overview of forest policy culminating in the development of NFMA. Part III discusses judicial treatment of NFMA challenges to the Forest Service's diversity preservation methods in the national forests, particularly the Seventh Circuit's approach to the diversity mandate in the *Marita* case. Part IV analyzes the Forest Service's proposed rule change for land and resource management planning and its implications for biological diversity conservation. The Comment concludes in Part V that NFMA and its current regulations impose on the Forest Service substantive duties to provide for diversity. However, when reviewing the performance of these duties, and when faced with ecosystem science issues that even ecologists do not fully understand, courts typically defer to the Forest Service's expertise. Adoption of the proposed rule would divest the diversity mandate of substantive meaning.

II. A SHORT HISTORY OF FOREST MANAGEMENT

Legal regulation of forest practices in North America predates the birth of the United States.²⁶ Early forest regulations addressed such topics as fire and the preservation of live oak, a resource needed for ship building.²⁷ Congressional involvement in forest regulation began in earnest in the latter part of the nineteenth century,²⁸ and the first proposal to set aside forested lands for preservation appeared in 1872.²⁹ Increasing support for forest conservation led to the passage of the 1891 Creative Act,³⁰ which marked the beginning of the national forest system.³¹

A. Forest Regulations Before 1976

The Creative Act authorized the President to create national forest reserves by withdrawing forested lands from the public domain.³² However, the Act failed to provide for regulation of those reserved lands. In

²⁴ *Id.*

²⁵ *Id.* at 18,895. Under this approach, no circumstances would require genetic studies to determine population viability. *Id.* at 18,895-96.

²⁶ James L. Huffman, *A History of Forest Policy in the United States*, 8 ENVTL. L. 239, 241 (1978) (noting that early colonists were subject to tree-cutting and timber-exporting regulations).

²⁷ *Id.* at 241-42. The oak preservation program, which even included reforestation provisions, ultimately was abandoned due to ship design changes and the availability of new resources. *Id.* at 241.

²⁸ *Id.* at 244 (referring to legislation designed to promote the growth of forest trees, introduced in the 39th, 40th and 41st Congresses).

²⁹ H.R. 1463, 42d Cong., 2d Sess. (1872), reprinted in CONG. GLOBE, 42d Cong. 970 (1872).

³⁰ Act of Mar. 3, 1891, ch. 561, 26 Stat. 1095 (repealed 1976).

³¹ Huffman, *supra* note 26, at 258.

³² Act of Mar. 3, 1891, ch. 561, 26 Stat. 1095, 1103 (repealed 1976).

1897 Congress passed the Organic Administration Act (Organic Act),³³ which established standards for managing the forest reserves. Additionally, the Organic Act announced the purposes for which the national forests were established: "to improve and protect [forested lands] . . . or [to] . . . secur[e] favorable conditions of water flows, and . . . a continuous supply of timber"³⁴

The Organic Act was the legal foundation for forest management in the United States until 1960 when Congress passed the Multiple-Use Sustained-Yield Act (MUSYA).³⁵ During that time, public demands on national forests outpaced resource planning efforts.³⁶ The Forest Service attempted to alleviate the problem by developing land use plans, but the content of those plans was wholly discretionary and extremely variable.³⁷ Congress acknowledged the problem of competing uses by codifying in MUSYA additional purposes for establishing national forests.

The purposes listed in MUSYA supplemented those set forth in the Organic Act and included "outdoor recreation, range, timber, watershed, and wildlife and fish."³⁸ While the Act required the Forest Service to manage national forests for multiple uses,³⁹ it lacked a substantive standard to guide decision making. The Act simply required that the Forest Service give the various resources "due consideration" when managing national forest lands,⁴⁰ a directive that the agency translated into increased management planning efforts.⁴¹ As a result, while MUSYA appropriately recognized the validity of multiple uses for forest resources, its broad language provided no concrete guidelines for resolving land-use disputes among

³³ Act of June 4, 1897, ch. 2, 30 Stat. 34 (codified as amended at 16 U.S.C. §§ 473-482, 551 (1994)).

³⁴ 16 U.S.C. § 475 (1994).

³⁵ Pub. L. No. 86-517, 74 Stat. 215 (codified at 16 U.S.C. §§ 528-531 (1994)).

³⁶ See generally WILKINSON & ANDERSON, *supra* note 3, at 19-29 (discussing forest policy and practice from 1897 to 1960). The increased demand on forest resources was particularly burdensome in the decade before MUSYA. *Id.* at 28-29. During that time, special interests such as lumber and conservation groups increasingly advocated using national forest lands for their own preferred uses, a sort of "single use" approach. *Id.* at 29.

³⁷ *Id.* at 29 ("Planning decisions . . . were based on the intuitive judgments of forest supervisors and district rangers concerning the best use for each part of the forest.").

³⁸ 16 U.S.C. § 528 (1994).

³⁹ *Id.* § 529. The Act defines "multiple use" as:

The management of all the various renewable surface resources of the national forests so that they are utilized in the combination that will best meet the needs of the American people; making the most judicious use of the land for some or all of these resources or related services over areas large enough to provide sufficient latitude for periodic adjustments in use to conform to changing needs and conditions; that some land will be used for less than all of the resources; and harmonious and coordinated management of the various resources, each with the other, without impairment of the productivity of the land, with consideration being given to the relative values of the various resources, and not necessarily the combination of uses that will give the greatest dollar return or the greatest unit output.

Id. § 531(a).

⁴⁰ *Id.* § 529.

⁴¹ WILKINSON & ANDERSON, *supra* note 3, at 30-32.

various interest groups.⁴² The Act also failed to provide a yardstick by which to measure agency compliance with the goals of the legislation.⁴³

Beginning in the mid-1960s, the public and Congress became increasingly concerned over excessive clearcutting on national forests.⁴⁴ These concerns led to the 1970 Bolle Report, which was a critical analysis of the Forest Service's land management practices.⁴⁵ The Bolle Report in turn led to the 1971 Senate investigatory hearings on clearcutting, the so-called "Church Hearings."⁴⁶ Like the Bolle Report, the Church Hearings criticized the Forest Service's overreliance on clearcutting and overemphasis on timber production.⁴⁷ The resulting Church Guidelines, though never enacted,⁴⁸ proposed significant limits on timber harvesting, "including the size of clearcuts, a regeneration requirement, and protection for soil and watersheds."⁴⁹

The last major piece of forest management legislation enacted prior to NFMA was the Forest and Rangeland Renewable Resources Planning Act of 1974 (RPA).⁵⁰ RPA was an attempt to improve forest management policy by requiring the Forest Service to plan on a nationwide basis.⁵¹ Specifically, RPA required the Forest Service to prepare three types of documents: 1) a Renewable Resource Assessment;⁵² 2) a Renewable Resource

⁴² John P. Hogan, Comment, *The Legal Status of Land and Resource Management Plans for the National Forests: Paying the Price for Statutory Ambiguity*, 25 ENVTL. L. 865, 870 (1995). In fact, "congressional endorsement of multiple use has created the archetypal 'special interest' legislation. . . . [F]ederal agencies frequently capitulate to [pressure from special interest groups] because of the lack of standards governing . . . decisionmaking." Michael C. Blumm, *Public Choice Theory and the Public Lands: Why "Multiple Use" Failed*, 18 HARV. ENVTL. L. REV. 405, 407 (1994).

⁴³ Rick Applegate, *The Multiple Use Planning Process: Descent Into the Maelstrom?*, 8 ENVTL. L. 427, 429 (1978) (noting that the Act is "entirely too discretionary" and thus does not promote agency accountability).

⁴⁴ For a discussion of the change in the national environmental climate during the mid-1960s and early 1970's, see Jack Tuholske & Beth Brennan, *The National Forest Management Act: Judicial Interpretation of a Substantive Environmental Statute*, 15 PUB. LAND L. REV. 53, 60-64 (1994).

⁴⁵ The Bolle Report, entitled "A University View of the Forest Service," was compiled by Professor Arnold Bolle and other University of Montana faculty at the behest of Senator Lee Metcalf (D-Mont.). The report criticized the Forest Service's management of the Bitterroot National Forest in Montana for overemphasizing timber production and ignoring the multiple use mandate. WILKINSON & ANDERSON, *supra* note 3, at 139-40.

⁴⁶ "Clear Cutting" Practices on National Timberlands: Hearings Before the Senate Committee on Interior and Insular Affairs, 92nd Cong. (1971) [hereinafter *Church Hearings*]. Senator Frank Church (D-Idaho) chaired these hearings. WILKINSON & ANDERSON, *supra* note 3, at 138.

⁴⁷ See, e.g., *Church Hearings*, *supra* note 46, at 174-76 (testimony of Arnold W. Bolle, Dean of the School of Forestry at the University of Montana). For an overview of the hearings, see WILKINSON & ANDERSON, *supra* note 3, at 141-47.

⁴⁸ After the passage of NFMA, but prior to the completion of forest plans, the Church Guidelines served as interim standards for certain land management practices including timber harvesting. WILKINSON & ANDERSON, *supra* note 3, at 159.

⁴⁹ Tuholske & Brennan, *supra* note 44, at 62.

⁵⁰ Pub. L. No. 93-378, 88 Stat. 476 (codified as amended at 16 U.S.C. §§ 1600-1614 (1994)).

⁵¹ Tuholske & Brennan, *supra* note 44, at 63.

⁵² 16 U.S.C. § 1601(a) (1994). This Assessment is prepared every ten years. *Id.*

Program;⁵³ and 3) an Annual Report.⁵⁴ Shortly after RPA's passage, and before its efficacy could be determined, litigation involving the Monongahela National Forest in West Virginia led to the Fourth Circuit's determination that the Organic Act prohibited clearcutting in national forests.⁵⁵ Congress responded to that decision by enacting NFMA.⁵⁶

B. The National Forest Management Act of 1976

NFMA includes both procedural and substantive provisions.⁵⁷ The procedural provisions provide the framework for national forest planning by requiring the development of forest plans for units of the National Forest System.⁵⁸ NFMA's substantive provisions⁵⁹ include maintaining biological diversity,⁶⁰ preserving land productivity,⁶¹ permitting increased timber harvesting under certain conditions,⁶² determining suitable lands for timber harvest,⁶³ and imposing limits on even-aged management.⁶⁴ The requirement to maintain biological diversity is potentially the most important of these substantive standards.

1. NFMA Diversity Mandate

NFMA requires the Forest Service to

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, and within the multiple-use objectives of a land management plan adopted pursuant to this section, provide, where appropriate, to the degree practicable, for steps to be taken to preserve the diversity of tree species similar to that existing in the region controlled by the plan.⁶⁵

Notably, the statute does not define diversity. In fact, the statute's diversity provision does not clearly reveal "any concrete legal standard[]" for ensuring biological diversity.⁶⁶ The fact that the diversity provision's

⁵³ *Id.* § 1602. The Program, a long-range planning document, is due every five years. *Id.*

⁵⁴ *Id.* § 1606(c). The Annual Report compares actual activities with expected activities, those that had been proposed under the Program. *Id.*

⁵⁵ *West Va. Div. of the Izaak Walton League of America v. Butz*, 522 F.2d 945, 949-50 (4th Cir. 1975).

⁵⁶ WILKINSON & ANDERSON, *supra* note 3, at 155.

⁵⁷ Tuholske & Brennan, *supra* note 44, at 66.

⁵⁸ 16 U.S.C. § 1604(a) (1994).

⁵⁹ The Church Guidelines provided the framework for NFMA's substantive provisions. See Tuholske & Brennan, *supra* note 44, at 62; WILKINSON & ANDERSON, *supra* note 3, at 138-39.

⁶⁰ 16 U.S.C. § 1604(g)(3)(B) (1994).

⁶¹ *Id.* § 1604(g)(3)(C).

⁶² *Id.* § 1604(g)(3)(D).

⁶³ *Id.* § 1604(g)(3)(E).

⁶⁴ *Id.* § 1604(g)(3)(F). Even-aged management involves applying "a combination of actions that results in the creation of stands in which trees of essentially the same age grow together." 36 C.F.R. § 219.3 (1996).

⁶⁵ 16 U.S.C. § 1604(g)(3)(B) (1994).

⁶⁶ WILKINSON & ANDERSON, *supra* note 3, at 296.

language derived from two separate bills⁶⁷ may explain some of its ambiguity.⁶⁸ The provision emerged from a Senate bill aimed at "elevat[ing] wildlife and ecological values in relation to timber"⁶⁹ and discouraging forest type conversions,⁷⁰ and a House bill designed to prohibit monoculture.⁷¹ Thus, the diversity mandate embodies those three separate directives.

2. NFMA's Implementing Regulations

NFMA required the Forest Service to develop implementing regulations with the guidance of a committee of non-agency scientists.⁷² This "Committee of Scientists," charged with the task of translating NFMA into regulations, referred to the diversity mandate as "one of the more perplexing issues."⁷³ Ultimately, the committee defined diversity and developed substantive standards, including viability and management indicator species requirements, for its maintenance.

a. Diversity

The NFMA regulations define diversity as "[t]he distribution and abundance of different plant and animal communities and species within the area covered by a land and resource management plan."⁷⁴ The Committee of Scientists preferred this simple, straightforward definition over a complex, mathematical diversity formulation.⁷⁵ In adopting its definition, the committee noted that the complex diversity formulations then available would not further the NFMA goal of maintaining biological diversity.⁷⁶ The committee emphasized the importance of further scientific research, however, and the need for coordination among researchers and the agency to facilitate the incorporation of up-to-date information into forest management policies.⁷⁷

⁶⁷ S. 3091, 94th Cong. (1976); H.R. 15069, 94th Cong. (1976). According to Wilkinson and Anderson, the Senate bill was the basis for the first part of the provision, up to "overall multiple use objectives," and the House bill provided the rest of the provision. WILKINSON & ANDERSON, *supra* note 3, at 171.

⁶⁸ See Hogan, *supra* note 42, at 873 (noting that "the price of legislative compromise can be ambiguity in statutory provisions").

⁶⁹ WILKINSON & ANDERSON, *supra* note 3, at 171 (discussing concerns of Senator Hubert Humphrey (D-Minn.)); see also S. CONF. REP. 94-1335, at 6, 27 (1976) (discussing diversity goals of NFMA).

⁷⁰ WILKINSON & ANDERSON, *supra* note 3, at 171-72 (discussing concerns of Senator Dale Bumpers (D-Ark.)).

⁷¹ WILKINSON & ANDERSON, *supra* note 3, at 173; see also H.R. CONF. REP. 94-1735, at 6, 27 (1976) (discussing diversity goals of NFMA).

⁷² 16 U.S.C. § 1604(h)(1) (1994).

⁷³ Final Report of the Committee of Scientists, 44 Fed. Reg. 26,599, 26,608 (May 4, 1979).

⁷⁴ 36 C.F.R. § 219.3 (1996).

⁷⁵ 44 Fed. Reg. at 26,609 ("We advised that a simple dictionary definition be adopted, i.e., that diversity means variety.")

⁷⁶ *Id.* ("[T]he present diversity indices would divert attention from the objective of considering variety throughout the planning process.")

⁷⁷ *Id.* ("Numerous projects are now under way that are expressly designed to deal with . . . maintenance of diversity . . . [I]t is vital that there be close and effective coordina-

The NFMA regulations incorporate the diversity directive into specific management requirements. First, they require the Forest Service to consider diversity throughout the planning process and to collect quantitative inventory data necessary for this evaluation.⁷⁸ Further, the agency must "preserve and enhance [biodiversity] . . . so that it is at least as great as that which would be expected in a natural forest."⁷⁹ Also, the regulations disfavor decreases in diversity; they "may be prescribed only where needed to meet overall multiple-use objectives."⁸⁰ These management prescriptions reflect the Committee of Scientists' view that "the regulations should go beyond a narrow and limited restatement of the [NFMA] language . . . to assure that the Forest Service shall indeed 'provide for diversity.'"⁸¹

b. Viability

The NFMA regulations direct the Forest Service to manage habitat to maintain viable vertebrate populations.⁸² The regulations specify that a viable population has an adequate "number[] and distribution of reproductive individuals to insure its continued existence."⁸³ The agency must maintain sufficient well-distributed habitat to support such populations.⁸⁴

c. Management Indicator Species

The Forest Service's regulations require the agency to select "certain vertebrate and/or invertebrate species . . . as management indicator species."⁸⁵ This requirement is related to the viable population regulation, because the agency monitors changes in a Management Indicator Species (MIS) population to estimate population dynamics for other species in the land planning area.⁸⁶ An MIS thus is a sort of surrogate, without which

tion between these research efforts and planning operations in the National Forest system.").

⁷⁸ 36 C.F.R. § 219.26 (1996).

⁷⁹ 36 C.F.R. § 219.27(g) (1996).

⁸⁰ *Id.* Planned type conversions require further justifications and analyses. *Id.*

⁸¹ 44 Fed. Reg. at 26,609.

⁸² Neither NFMA nor its diversity definition use the term "viability." Tuholske & Brennan, *supra* note 44, at 68-69. However, the term "minimum viable population" is well known in the field of conservation biology where it refers to a "threshold . . . number of individuals . . . that will insure . . . that a population will persist in a viable state for a given interval of time." Michael E. Gilpin & Michael E. Soulé, *Minimum Viable Populations: Processes of Species Extinction*, in CONSERVATION BIOLOGY 19, 19 (Michael E. Soulé ed., 1986). Interestingly, the phrase may have "come into vogue" because of NFMA. *Id.*

⁸³ 36 C.F.R. § 219.19 (1996).

⁸⁴ *Id.* ("[H]abitat 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.").

⁸⁵ 36 C.F.R. § 219.19(a)(1) (1996).

⁸⁶ *Id.* ("[MIS] shall be selected because their population changes are believed to indicate the effects of management activities.").

assessing the viability of all vertebrate populations would be a Sisyphean task.⁸⁷

III. LEGAL CHALLENGES UNDER NFMA

Legal challenges to forest plans often involve the diversity provision in NFMA. Typical challenges include allegations that the Forest Service did not comply with the viability regulation,⁸⁸ or more general allegations that the agency failed to provide adequately for diversity.⁸⁹ Challenges in the latter category often occur in response to even-aged management techniques.⁹⁰ The courts review the allegations employing the highly deferential arbitrary and capricious standard of the Administrative Procedure Act.⁹¹ This standard of review is especially deferential "when questions of scientific methodology are involved."⁹²

A. *Litigation Involving the NFMA Viability Regulation*

In a case involving the viability of northern spotted owl populations, a district court in the Ninth Circuit interpreted the NFMA diversity provision to impose a substantive standard.⁹³ The plaintiffs challenged the legality of a forest management plan that did not insure the viability of species associated with late-successional forests.⁹⁴ The Forest Service responded that the forest plan had to insure only the viability of the owls.⁹⁵ The district court framed the issue in terms of whether the Forest Service legally could adopt a management plan that protected one vertebrate species to the detriment of others.⁹⁶ The court then concluded that the agency could not adopt such a plan, as the NFMA diversity requirement "confirms the Forest Service's duty to protect [all] wildlife."⁹⁷ The diversity requirement thus functioned as a substantive limit on agency actions.

Another district court in the Ninth Circuit interpreted the diversity provision as a standardless guide to agency actions. In *Oregon Natural Resources Council v. Lowe*,⁹⁸ the plaintiffs challenged the Winema forest plan, claiming it failed to insure the viability of species inhabiting old

⁸⁷ See WILKINSON & ANDERSON, *supra* note 3, at 299-300.

⁸⁸ See *infra* Part III.A.

⁸⁹ See *infra* Part III.B.

⁹⁰ See *id.*

⁹¹ See 5 U.S.C. § 706(2)(A) (1994).

⁹² *Inland Empire Pub. Lands Council v. United States Forest Serv.*, 88 F.3d 754, 760 (9th Cir. 1996) (reviewing the Forest Service's construction of 36 C.F.R. § 219.19).

⁹³ *Seattle Audubon Soc'y v. Moseley*, 798 F. Supp. 1484 (W.D. Wash. 1992). For a thorough discussion of the northern spotted owl litigation, see Victor M. Sher, *Travels With Strix: The Spotted Owl's Journey Through the Federal Courts*, 14 PUB. LAND L. REV. 41 (1993) and Steven L. Yaffee, *Lessons about Leadership from the History of the Spotted Owl Controversy*, 35 NAT. RESOURCES J. 381, 385-401 (1995).

⁹⁴ *Seattle Audubon Soc'y*, 798 F. Supp. at 1488.

⁹⁵ *Id.*

⁹⁶ *Id.*

⁹⁷ *Id.* at 1489.

⁹⁸ 836 F. Supp. 727 (D. Or. 1993), *aff'd*, No. 93-36025, 1997 WL 106954 (9th Cir. Mar. 12, 1997).

growth forests.⁹⁹ The court first noted that MUSYA grants the Forest Service wide discretion in managing the national forests.¹⁰⁰ Comparing NFMA with MUSYA, the court stated that NFMA grants the Forest Service similar discretion, as it "imposes procedural requirements, designed to assure that the agency documents how it intends to manage national forests in accordance with [multiple-use] principles."¹⁰¹ It then upheld the forest plan as not arbitrary or capricious.¹⁰²

In the most recent appellate decision on this issue, proposed timber sales in the Kootenai National Forest withstood a viability challenge brought by environmental groups.¹⁰³ The plaintiffs in *Inland Empire Public Lands v. United States Forest Service* were concerned about the effect of the proposed sales on the viability of sensitive forest species.¹⁰⁴ Their specific allegations were premised both on concepts of population biology and ecosystem science, as they advocated studying species populations, population dynamics, and the connectivity of the forest habitat.¹⁰⁵

The court in *Inland Empire* first acknowledged that the viability mandate "applie[d] with special force to 'sensitive' species."¹⁰⁶ Regardless, the manner in which the agency satisfied such a requirement was entitled to deferential review, particularly because "questions of scientific methodology [we]re involved."¹⁰⁷ Operating within this construct, the court determined that the Forest Service's habitat provisions were reasonable. It was not arbitrary and capricious behavior to 1) rely on "reasonable assumptions" in making management decisions; 2) settle for "less rigorous analysis" for species unlikely to be affected by management activities; and 3) forego analysis of a species' "nesting and feeding habitat requirements" when the requisite data did not exist.¹⁰⁸ The court thus deferred to Forest Service scientists, even though the viability of sensitive species was at stake.

B. Litigation Involving the NFMA Diversity Regulations

In *Sierra Club v. Espy*,¹⁰⁹ the Fifth Circuit vacated a lower court's determination that the "monoculture created by clear-cutting . . . is contrary to NFMA-mandated bio-diversity."¹¹⁰ The *Espy* case involved a chal-

⁹⁹ *Id.* at 729. Plaintiffs specifically alleged the plan failed to protect the marten, three woodpecker species, and the northern goshawk. *Id.* at 730.

¹⁰⁰ *Id.* at 733.

¹⁰¹ *Id.*

¹⁰² *Id.* at 734. For a critical analysis of the court's "unquestioning judicial review" in *Lowe*, see Tuholske & Brennan, *supra* note 44, at 73-74.

¹⁰³ *Inland Empire Pub. Lands v. United States Forest Serv.*, 88 F.3d 754 (9th Cir. 1996).

¹⁰⁴ *Id.* at 757 (listing the lynx, boreal owl, flammulated owl, black-backed woodpecker, fisher, bull charr, and west-sloped cutthroat trout as species of concern to plaintiffs).

¹⁰⁵ *Id.* at 760.

¹⁰⁶ *Id.* at 759.

¹⁰⁷ *Id.* at 760.

¹⁰⁸ *Id.* at 761-62.

¹⁰⁹ 38 F.3d 792 (5th Cir. 1994).

¹¹⁰ *Sierra Club v. Espy*, 822 F. Supp. 356, 364 (E.D. Tex. 1993), *vacated and remanded*, 38 F.3d 792 (5th Cir. 1994).

lenge to the use of even-aged logging techniques in Texas national forests.¹¹¹ The lower court interpreted NFMA as allowing even-aged management only in exceptional circumstances.¹¹² It further stated in bold language that NFMA's diversity provision clearly limited land management practices by recognizing "natural resources . . . as substantive limitations on the particular logging practices that can take place in these forests."¹¹³ In contrast to the district court's bold language, the Court of Appeals stated that the decision to utilize even-aged management was within the Forest Service's discretion.¹¹⁴ While acknowledging that NFMA limits the agency's discretion, perhaps in the form of the NFMA viability regulation,¹¹⁵ the court declined to define NFMA's protective boundaries. Instead, the court simply held that the challenged activities clearly did not exceed the statute's outer bounds.¹¹⁶

Other district courts also have determined that the Forest Service is not acting contrary to the NFMA diversity regulations when it uses even-aged management techniques. For example, in *Krichbaum v. Kelley*,¹¹⁷ plaintiffs unsuccessfully challenged clearcutting in the George Washington National Forest. The district court responded that the NFMA statutory and regulatory scheme lacked a clear substantive biodiversity mandate¹¹⁸ and did not require measuring diversity in comparison with "naturally occurring forest ecosystems."¹¹⁹ In a similar case involving clearcutting in the Ouachita National Forest, plaintiffs unsuccessfully argued that the Forest Service had disregarded the NFMA diversity requirements.¹²⁰ The district court disposed of the lengthy list of alleged violations by stating that the plaintiffs' arguments "demonstrate mere disagreement with agency methodology" without demonstrating that the methodology was irrational.¹²¹

In contrast to these cases, the Sixth Circuit recently held in *Sierra Club v. Thomas*¹²² that clearcutting in Ohio's Wayne National Forest was contrary to NFMA's "protective spirit."¹²³ Plaintiffs had argued before the district court that the forest plan, which prescribed even-aged manage-

¹¹¹ *Id.* at 358-59.

¹¹² *Id.* at 363-64.

¹¹³ *Id.* at 364.

¹¹⁴ *Sierra Club v. Espy*, 38 F.3d at 800. According to the court, NFMA "protection means something less than preservation of the status quo but something more than eradication of species . . . [which] is just the type of policy-oriented decision Congress wisely left to the discretion of the . . . Forest Service." *Id.*

¹¹⁵ *Id.* at 800-01 ("The regulations implementing NFMA provide a minimum level of protection by mandating that the Forest Service manage fish and wildlife habitats to insure viable populations of species in planning areas.")

¹¹⁶ *Id.* at 801.

¹¹⁷ 844 F. Supp. 1107, 1109 (W.D. Va. 1994), *aff'd*, 61 F.3d 900 (4th Cir. 1995).

¹¹⁸ *Id.* at 1114.

¹¹⁹ *Id.* at 1115.

¹²⁰ *Sierra Club v. Robertson*, 810 F. Supp. 1021, 1028 (W.D. Ark. 1992), *aff'd on merits, but vacated for lack of standing*, 28 F.3d 753 (8th Cir. 1994).

¹²¹ *Id.*

¹²² 105 F.3d 248 (6th Cir. 1997).

¹²³ *Id.* at 252.

ment for 80% of the forest, failed to provide for biodiversity.¹²⁴ The district court, however, noted that the Wayne was "not a natural forest" due to historical land use practices that had included clearcutting.¹²⁵ That fact, coupled with the court's position that "[d]iversity is not the controlling principle in forest planning," led the district court to uphold the forest plan as "well within the discretion vested in the Forest Service."¹²⁶

The Sixth Circuit's reversal of that decision did not focus specifically on the issue of diversity. Rather, in what was described by one member of the panel as a "largely undocumented broadside against the Forest Service,"¹²⁷ the majority held that the forest plan was arbitrary and capricious because the "planning process was improperly predisposed toward clearcutting."¹²⁸ Whereas the plaintiffs had criticized the Forest Service for failing to acknowledge the value of biodiversity associated with "natural" forests,¹²⁹ the Sixth Circuit's decision criticized the Forest Service for "undervaluing the recreational value of wilderness."¹³⁰ According to the court, the Forest Service was biased towards timber interests, which led to the agency violating NFMA by treating clearcutting "as if it were the statutory rule, rather than the exception."¹³¹

The cases discussed above reveal that NFMA's goal of maintaining biodiversity is difficult to enforce. NFMA diversity and viability challenges to Forest Service activities, challenges that involve complicated resource management issues, are usually unsuccessful. Rather than critically reviewing challenged Forest Service activities, courts usually defer to agency expertise, thereby sanctioning agency discretion in interpreting the statute and its regulations. While some might question such seemingly lax oversight, judicial deference to agency scientists should be expected due to the uncertainty surrounding ecosystem science.¹³² Ecologists recognize that "[e]cosystems are not only more complex than we think, but more complex than we *can* think."¹³³ As such, ecosystem management is best construed by an agency dedicated to the task.

¹²⁴ *Sierra Club v. Robertson*, 845 F. Supp. 485, 501 (S.D. Ohio 1994), *rev'd, remanded sub nom. Sierra Club v. Thomas*, 105 F.3d 248 (6th Cir. 1997).

¹²⁵ *Id.* at 502.

¹²⁶ *Id.* at 502-03.

¹²⁷ *Sierra Club v. Thomas*, 105 F.3d at 252 (Batchelder, J. concurring).

¹²⁸ *Id.* at 250-51.

¹²⁹ *Sierra Club v. Robertson*, 845 F. Supp. at 501.

¹³⁰ *Sierra Club v. Thomas*, 105 F.3d at 252.

¹³¹ *Id.*

¹³² See Walter Kuhlmann, *Wildlife's Burden*, in *BIODIVERSITY AND THE LAW* 189, 192 (William J. Snape III ed., 1996) ("When scientific predictions are saddled with admissions of limited data, limited understanding, and long-term effects subject to a considerable range of outcomes, all dependent on the geographic scale chosen for the analysis, it becomes difficult to persuade a court that the issues are sufficiently palpable and that there is any urgency to the plaintiffs' claims.")

¹³³ Reed F. Noss, *Some Principles of Conservation Biology, As They Apply to Environmental Law*, 69 *CHI.-KENT L. REV.* 893, 898 (1994) (quoting ecologist Frank Egler, who probably borrowed the idea from J.B.S. Haldane, an evolutionary biologist). Jack Ward Thomas, recently retired Chief of the Forest Service, mirrored this sentiment when he stated, "[i]t is increasingly apparent that ecological processes are not as well understood nor as predict-

C. *The Seventh Circuit's Sierra Club v. Marita Decision*

The deferential interpretation of the Forest Service's duty to provide for diversity under NFMA persisted in a recent appellate decision. In *Sierra Club v. Marita*, the plaintiffs directly confronted the issue of scientific methodology in ecosystem management.¹³⁴ The *Marita* case centered around the allegations of environmental groups and conservation biologists that forest plans for two Wisconsin National Forests, the Chequamegon and the Nicolet, inadequately protected biodiversity. Conservation biology principles mandate setting aside large habitat areas to protect biodiversity.¹³⁵ Rather than leaving large areas of forest intact, however, the two forest plans divided the forested lands into a patchwork of habitats.¹³⁶ Thus, plaintiffs argued that the plans threatened the maintenance of biodiversity and were inconsistent with NFMA's diversity requirements.¹³⁷

The primary issue in *Marita* was whether NFMA required the Forest Service to apply conservation biology principles in its forest planning process.¹³⁸ The Forest Service maintained that it had considered such principles but declined to apply them to the Chequamegon and the Nicolet forests, in part because conservation biology theories were too uncertain as applied to forest management in Wisconsin.¹³⁹ In its opinion, the court avoided discussing the merits of conservation biology as a science. Instead, relying on the NFMA Committee of Scientists' decision to not adopt any particular method for diversity maintenance,¹⁴⁰ the court held that "conservation biology is not a necessary element of diversity analysis insofar as the regulations do not dictate that the service analyze diversity in

able as had been assumed by natural resource managers Ecologists now understand that ecological responses to management actions may vary widely" Jack W. Thomas, *Stability and Predictability in Federal Forest Management: Some Thoughts From the Chief*, 17 PUB. LAND & RESOURCES L. REV. 9, 10 (1996); see also Kuhlmann, *supra* note 132, at 191 ("[A]n ecosystem approach has . . . its disadvantages. First, the structure and function of affected ecosystems are terribly complex. Much is unknown about how ecosystems work.").

¹³⁴ 46 F.3d 606, 610 (7th Cir. 1995).

¹³⁵ See Michael E. Soulé, *The Effects of Fragmentation*, in CONSERVATION BIOLOGY, *supra* note 82, at 233-36, for an overview of the detrimental effects of habitat fragmentation. See King, *supra* note 18, at 159-62, for a short introduction to conservation biology, including a listing of factors that contribute to the loss of biodiversity.

¹³⁶ *Sierra Club v. Marita*, 46 F.3d at 610.

¹³⁷ *Id.*

¹³⁸ For an interesting discussion of behind-the-scenes factors at work in the case, see Kuhlmann, *supra* note 132, at 190-91. Kuhlmann states, for example, that plaintiffs pursued the conservation biology approach not only because they viewed the discipline as a mechanism for protecting many species simultaneously, but also for more pragmatic reasons: they were well-versed in its doctrine and the forest ecosystems in question lacked keystone species on which to hinge a more specific challenge. *Id.*

¹³⁹ *Sierra Club v. Marita*, 46 F.3d at 618-19. *But see* King, *supra* note 18, at 162 (stating that conservation biology theories were generally accepted and agreed upon at that time).

¹⁴⁰ Final Report of the Committee of Scientists, 44 Fed. Reg. 26,599, 26,609 (May 4, 1979) ("[W]e believe it impossible to write regulations which are specific on how . . . [diversity maintenance] is to be done in all regions, in a wide variety of vegetation types, and with a wide range of natural and human factors to consider.").

any specific way."¹⁴¹ Thus, the Seventh Circuit concluded that the Forest Service's failure to apply conservation biology theories in forest plan development did not constitute arbitrary or capricious neglect of NFMA's diversity requirements.¹⁴²

The Seventh Circuit's *Marita* decision delineated a question that is central to the NFMA diversity debate: should courts defer to the Forest Service's scientific expertise, and if so, to what extent? Conservation biology, the discipline at issue in *Marita*, is dedicated to addressing precisely the types of concerns that led to the passage of NFMA.¹⁴³ Thus, whereas previous challenges to Forest Service actions were mere disagreements as to confusing methodologies,¹⁴⁴ the *Marita* plaintiffs arguably were advocating something more fundamental. Conservation biology principles, unlike diversity indices or mathematical formulae for determining minimum viable populations, describe factors responsible for the structure and functioning of ecosystems. Land management plans that disregard basic organizing principles may conflict with NFMA's biodiversity mandate and thus be entitled to less deferential review.

Ultimately, the Seventh Circuit chose not to address whether the teachings of conservation biology could be construed as more than mere methodology. The Seventh Circuit did not shirk its judicial duty; its decision simply recognized that courts should not assess the validity of conservation theories. Ecosystems *are* more complex than we can think.¹⁴⁵ Moreover, our comprehension of their complexity is colored by our values and by policy considerations.¹⁴⁶ Certainly, these limitations apply to agency scientists as well as to judges. Equally certainly, a limited understanding does not absolve agency scientists of responsibility for striving to understand ecosystem intricacies. But "[w]hile understanding ecosystem structure and function is a task difficult enough to humble the finest scientist, it seems even more daunting to the finest legal minds."¹⁴⁷ Thus, amidst the uncertainty surrounding diversity and viability in our national forests, one thing becomes clear: given our current state of knowledge, it often *is* appropriate to defer to the forest service's scientific expertise in implementing NFMA.

¹⁴¹ *Sierra Club v. Marita*, 46 F.3d at 620. See Robert B. Keiter, *Conservation Biology and the Law: Assessing the Challenges Ahead*, 69 CHI.-KENT L. REV. 911 (1994), for a discussion of how the science of conservation biology is straining the American legal system.

¹⁴² *Sierra Club v. Marita*, 46 F.3d at 620.

¹⁴³ See 44 Fed. Reg. at 26,608.

¹⁴⁴ See discussion *supra* Parts III.A-B.

¹⁴⁵ See Noss, *supra* note 133 and accompanying text.

¹⁴⁶ See *infra* notes 157-58 and accompanying text.

¹⁴⁷ Kuhlmann, *supra* note 132, at 192.

IV. THE FOREST SERVICE'S PROPOSED RULE CHANGE FOR LAND AND RESOURCE MANAGEMENT

Perhaps in response to numerous legal challenges to forest plans,¹⁴⁸ the Forest Service recently proposed a rule that would change the regulations governing land and resource management planning.¹⁴⁹ The rule would incorporate the evolving concepts of ecosystem management into the forest planning process.¹⁵⁰ A commitment to sustainable ecosystems would be the first principle guiding resource decisionmaking and management.¹⁵¹

A. *The Ecosystem Management Concept*

Ecosystem management represents an integrated approach to maintaining the biological integrity of ecological systems.¹⁵² While the term lacks a precise definition,¹⁵³ its concepts are generally accepted and agreed upon.¹⁵⁴ Some basic tenets of ecosystem management include 1) a focus on protecting and restoring biological integrity; 2) consideration of the spatial and temporal scales at which ecological processes occur; 3) recognition of the importance of continued research and monitoring; 4) recognition that humans are an integral part of any ecosystem; 5) acknowledgement of the need for interagency coordination and cooperation due to the transboundary nature of ecosystems; and 6) acceptance of flexible management policies.¹⁵⁵ The focus on biological integrity signifies an holistic approach encompassing not only biodiversity at its various levels, but also the ecological processes necessary to ecosystem function.¹⁵⁶ Although these features of ecosystem management are biocentric, human

¹⁴⁸ See Thomas, *supra* note 133, at 19 ("Court rulings are proliferating and creating continuing chaos in our attempts to carry out land management activities. Agency decisionmakers spend as much or more time with lawyers as with natural resource management personnel.").

¹⁴⁹ National Forest System Land and Resource Management Planning, 60 Fed. Reg. 18,886 (1995) (to be codified at 36 C.F.R. pts. 215, 217, 219) (proposed Apr. 13, 1995).

¹⁵⁰ *Id.* at 18,889.

¹⁵¹ *Id.*

¹⁵² Keiter, *supra* note 141, at 928-29. The concept is not new, as its substance was described in the writings of Aldo Leopold approximately fifty years ago. Mollie Beattie, *Biodiversity Policy and Ecosystem Management*, in *BIODIVERSITY AND THE LAW*, *supra* note 132, at 11, 11. For an historical look at the concept's development, see R. Edward Grumbine, *What is Ecosystem Management*, 8 *CONSERVATION BIOLOGY* 27, 28-29 (1994). See also Richard Haeuber, *Setting the Environmental Policy Agenda: The Case of Ecosystem Management*, 36 *NAT. RESOURCES J.* 1, 3-5 (1996).

¹⁵³ Keiter, *supra* note 21, at 300.

¹⁵⁴ Keiter, *supra* note 141, at 928-29.

¹⁵⁵ *Id.*

¹⁵⁶ See, e.g., James R. Karr, *Measuring Biological Integrity: Lessons from Streams*, in *ECOLOGICAL INTEGRITY AND THE MANAGEMENT OF ECOSYSTEMS* 83, 87-91 (Stephen Woodley et al. eds., 1993). Biodiversity comprises diversity at the level of genes, populations/species, communities/ecosystems and landscapes. *Id.* at 89-91. The ecological process components of biological integrity include "a myriad of interactions ranging from energy flow and nutrient dynamics to evolution and speciation." *Id.* at 89.

values permeate the concept.¹⁵⁷ Thus, one suggested working definition is: "Ecosystem management integrates scientific knowledge of ecological relationships within a complex sociopolitical and values framework toward the general goal of protecting native ecosystem integrity over the long term."¹⁵⁸

Ecosystem management is a logical step in the evolution of public land policy.¹⁵⁹ However, its advent does not herald the demise of the individual species approach.¹⁶⁰ Management of individual species remains an important tool in an ecosystem-level approach, because populations often are sensitive indicators of environmental stress.¹⁶¹ Thus, population monitoring may provide early warning signals of threats to ecological integrity. As discussed below, however, the Forest Service's proposed ecosystem management approach retreats from population-level studies.

B. The Sustainable Ecosystem Approach of the Proposed Rule

The announced goal of the proposed rule for land and resource management planning is to satisfy the NFMA diversity mandate by "main[ain]tain[ing] or restor[ing] the sustainability of ecosystems."¹⁶² According to this approach, a sustainable ecosystem automatically provides for biodiversity,¹⁶³ essentially obviating the need for a diversity mandate. The Forest Service's sustainability concept comprises seven key issues.¹⁶⁴ This subpart discusses three of those themes: 1) adoption of sustainable ecosystems as a standardless goal; 2) adoption of a "coarse filter/fine filter" approach; and 3) a focus on habitat rather than populations. This subpart also discusses the two options for providing diversity described by the proposed rule.¹⁶⁵

¹⁵⁷ Grumbine, *supra* note 152, at 31 ("[H]uman values play a dominant role in ecosystem management goals.").

¹⁵⁸ *Id.*

¹⁵⁹ Keiter, *supra* note 21, at 296; see also WILSON, *supra* note 7, at 283 ("[T]he primary focus [in thinking about biodiversity] has moved from species to the ecosystems in which they live."). According to one author, "[a]t least 18 federal agencies currently are exploring the concept of ecosystem management and its implications for their activities." Haeuber, *supra* note 152, at 2.

¹⁶⁰ Noss, *supra* note 133, at 900 ("[M]anagement of individual species on a population or metapopulation level remains a necessary part of any conservation strategy.").

¹⁶¹ Judy L. Meyer, *The Dance of Nature: New Concepts in Ecology*, 69 CHI.-KENT L. REV. 875, 885 (1994).

¹⁶² National Forest System Land and Resource Management Planning, 60 Fed. Reg. 18,886, 18,892 (1995) (to be codified at 36 C.F.R. pts. 215, 217, 219) (proposed Apr. 13, 1995).

¹⁶³ *Id.*

¹⁶⁴ *Id.* at 18,892-94. These include 1) adoption of sustainable ecosystems as a goal; 2) recognition of the relationship between sustainable ecosystems and meeting the needs of people; 3) adoption of "coarse filter/fine filter" approach; 4) clear intent to seek to prevent listing of species under the Endangered Species Act; 5) emphasis on strengthening cooperation and sharing of professional expertise; 6) focus on habitat rather than populations; and 7) use of best available information.

¹⁶⁵ *Id.* at 18,894-96.

1. Sustainable Ecosystems as a Goal

The Forest Service approach would recognize sustainable ecosystems as a standardless goal.¹⁶⁶ This discretionary approach would hinder public participation in the planning process by allowing the agency to determine what constitutes a sustainable ecosystem and to select methodologies for achieving sustainability.¹⁶⁷ Under this approach, the Forest Service would necessarily retain the discretion to determine when the goal is reached. Moreover, determination of sustainability would not necessarily entail a concrete measure of diversity.¹⁶⁸

2. Coarse Filter/Fine Filter Approach

The coarse filter/fine filter concept is based on the idea of ecological integrity. According to the proposed rule, if sustainability involves maintenance of ecosystem function, composition and structure, then a strategy promoting sustainability will satisfy the needs of most species.¹⁶⁹ This is the "coarse filter" that "catches" most species. Additionally, the Forest Service proposal recognizes that some species will have additional or more specialized needs, thus requiring a "fine filter" approach.¹⁷⁰ For example, a species listed as threatened or endangered would receive extra protection.¹⁷¹ Within the context of a standardless sustainable ecosystem paradigm, however, it is unclear how resource managers would know whether species were slipping through the coarse filter.

3. Habitat, Not Populations

The Forest Service proposes to manage habitat rather than populations.¹⁷² The agency would focus on habitat capability, including "the quantity, quality, and distribution of habitats needed by a species."¹⁷³ This proposal is premised on the idea that factors beyond the agency's control affect populations.¹⁷⁴ It is not necessarily consistent with the idea of sustainable ecosystems because it would recognize habitat capability as a goal unto itself. In fact, providing habitat having the potential for support-

¹⁶⁶ *Id.* at 18,892 ("[N]othing in the proposed rule . . . establishes a concrete standard regarding ecosystem sustainability or diversity.").

¹⁶⁷ See generally *id.* (discussing agency discretion).

¹⁶⁸ *Id.* ("This discretionary, goal-oriented approach to diversity and maintenance of sustainable ecosystems is consistent with the statutory basis for forest planning and the NFMA diversity provision . . .").

¹⁶⁹ *Id.* at 18,893.

¹⁷⁰ *Id.*

¹⁷¹ *Id.*

¹⁷² *Id.* at 18,894. This approach is dependent upon adoption of one of the proposed diversity options, Option I. See *infra* Part IV.B.4.

¹⁷³ *Id.*

¹⁷⁴ *Id.* Such factors include "disease, predation, hunting or fishing pressures, natural cyclical changes and conditions occurring or actions being taken outside the plan area." *Id.*

ing a species would be a rather wasteful undertaking if the species itself was genetically impoverished.¹⁷⁵

4. Diversity Options

The Forest Service's proposed rule describes two alternative ways a forest plan may provide for diversity. Option I focuses on the habitat needs of sensitive species.¹⁷⁶ A "sensitive species" is any animal, plant, fungus or lichen that 1) occurs on National Forest lands and 2) falls within certain recognized categories.¹⁷⁷ Option II mirrors the current diversity regulations and focuses on species viability.¹⁷⁸ The proposed rule suggests Option I as the preferred regulatory text.¹⁷⁹

Option I and Option II have five major differences. First, unlike Option II, Option I does not use the term "viability."¹⁸⁰ The omission of this word represents the agency's attempt to abandon an approach "which is subject to . . . varying interpretations and expectations."¹⁸¹ Specifically, the Forest Service maintains that NFMA, a statute that nowhere mentions viability, does not mandate that the agency insure the viability of populations.¹⁸² In fact, if interpreted literally, such a mandate is impossible to satisfy, because it derives from the human concepts of risk analysis and time frame.¹⁸³ Because the viability concept is laden with these artificial values, viability is not something that can be insured, and a mandate to do so is unreasonable.¹⁸⁴ Also, the Forest Service considers "viability" to be

¹⁷⁵ See, e.g., M.S. Common & T.W. Norton, *Biodiversity, Natural Resource Accounting and Ecological Monitoring*, in BIODIVERSITY CONSERVATION 87, 102 (C.A. Perrings et al. eds., 1995) (discussing scientific literature suggesting that "the maintenance of genetic diversity and heterozygosity in natural populations should provide the best strategy for facilitating evolutionary flexibility and the persistence of species").

¹⁷⁶ 60 Fed. Reg. at 18,894.

¹⁷⁷ *Id.* at 18,894, 18,922. The species must be either a Category 1 Candidate Species, a species appropriately identified by the Network of Natural Heritage Programs and Conservation Data Centers, or both a Category 2 Candidate Species and a species appropriately identified by the Network of Natural Heritage Programs and Conservation Data Centers. *Id.*

¹⁷⁸ See *supra* text accompanying notes 74-87.

¹⁷⁹ 60 Fed. Reg. at 18,895-96 (discussing the differences between Option I and Option II); see also Kelly Nolen, *Residents at Risk: Wildlife and the Bureau of Land Management's Planning Process*, 26 ENVTL. L. 771, 834 n.596 (1996) (describing the proposed revision as "short-sighted" because it "would apply only to those species whose populations are already at risk").

¹⁸⁰ 60 Fed. Reg. at 18,895.

¹⁸¹ *Id.*

¹⁸² *Id.*

¹⁸³ See, e.g., Gilpin & Soulé, *supra* note 82, at 19 (explaining that the "minimum viable population" concept "implies that there is some threshold for the number of individuals . . . that will insure (at some acceptable level of risk) that a population will persist in a viable state for a given interval of time").

¹⁸⁴ 60 Fed. Reg. at 18,895 ("As a practical matter . . . a requirement to 'insure' viable populations . . . envisions an outcome impossible to be guaranteed by any agency, regardless of the analytical resources marshalled.").

an ambiguous, evolving term that currently envisions complicated scientific analyses not in use at the time of regulation drafting.¹⁸⁵

Second, Option I is easier to implement than Option II because while the latter would require complex viability analyses as under the current regulatory scheme, Option I would rely on the habitat focus discussed above.¹⁸⁶ Option I envisions agency personnel collecting habitat capability data rather than conducting more costly and analytically intensive scientific viability studies.¹⁸⁷ In fact, Option I would never require long-term genetic diversity studies.¹⁸⁸

A third difference between the two Options is that Option I applies to more taxa. Whereas Option II applies only to vertebrates, Option I laudably would include all animals, plants, fungi, and lichens.¹⁸⁹ Notably, though, Option I applies only to those species at risk range-wide.¹⁹⁰ This relates to a fourth difference between the Options: they have different goals. Option II's goal is to insure population viability, while Option I's goals are to prevent Endangered Species Act (ESA) listings of sensitive species and to prevent extermination of sensitive species from the planning area.¹⁹¹ Finally, unlike Option II, Option I abandons the MIS approach.¹⁹²

Regardless of the Forest Service's purpose in revising its land and resource management regulations, two things are certain about the proposed rule. First, its embrace of sustainable ecosystems represents a new and holistic approach to natural resource management. Second, as proposed, the agency's sustainable ecosystem concept requires some fine-tuning. For example, rather than abandoning the population level approach, the proposed revision might incorporate population studies within the ecosystem management paradigm. By its very nature, however, ecosystem management is an evolving concept. Adaptive management, one of the paradigm's core concepts,¹⁹³ will enable resource managers to fine tune their methodologies, particularly as new information changes our understanding of ecological processes.

¹⁸⁵ *Id.* (noting the "extensive and expensive amount of scientific expertise, data, and technology" needed for modern viability assessments).

¹⁸⁶ *Id.* at 18,895-96; see also *supra* text accompanying notes 172-175.

¹⁸⁷ 60 Fed. Reg. at 18,895-96.

¹⁸⁸ *Id.* at 18,896.

¹⁸⁹ *Id.*

¹⁹⁰ *Id.* ("[A] . . . 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. . . ."). For a discussion of the potential role of population diversity in the effort to maintain species diversity, see Gretchen C. Daily & Paul R. Ehrlich, *Population Extinction and the Biodiversity Crisis*, in BIODIVERSITY CONSERVATION, *supra* note 175, at 45, 48-51.

¹⁹¹ 60 Fed. Reg. at 18,896. Excluding species that are at risk only in a portion of their range from sensitive species categorization should make Option I's goal easier to attain.

¹⁹² *Id.*; see *supra* text accompanying notes 85-87.

¹⁹³ See *supra* text accompanying note 155.

V. CONCLUSION

The diversity requirement of NFMA, as interpreted in the Forest Service regulations, appears to impose on forest managers a substantive duty to provide for diversity. While the area of acceptable activities circumscribed by the statute is somewhat amorphous, the limits imposed by the statute's implementing regulations, particularly the viability regulation, are less tenuous. A forest manager must consider diversity, maintain and enhance diversity, and maintain viable populations of vertebrate species. Upon closer inspection, however, the scientific uncertainty associated with the terms "diversity" and "viable population" blur the resource manager's duties, or perhaps more accurately, the methodology by which a resource manager performs those duties. Thus, according to most courts, forest managers have wide discretion in translating natural resource management duties into the specifics of forest plans.

In reviewing the Forest Service's performance of its substantive duties under NFMA, the courts have been seemingly lax enforcers. While a district court in the Ninth Circuit recognized the NFMA viability regulation as a standard of substance, and the Fifth Circuit similarly suggested that the viability regulation might limit agency activities, the Seventh Circuit failed to recognize potentially viable challenges to two forest plans. The source of this seemingly uncritical approach, however, is inherent in the nature of the task. Natural resources exist as parts of complex ecological systems, systems that defy a thorough understanding, even to those dedicated to studying their intricacies. Recognizing this, courts simply have deferred to the expertise of the agency to whom Congress delegated the complex task of managing our nation's forests.

Despite the judiciary's deferential stance when faced with NFMA challenges to forest plans, the Forest Service has proposed a rule change that would debilitate the NFMA diversity mandate. While the proposed rule rightly focuses on ecosystem-level management, it would replace substantive standards with wholly discretionary guidelines. Moreover, the proposal advocates abandoning the viability regulation entirely. Such a rule would essentially eliminate viable court challenges to Forest Service decision making on anything other than procedural grounds.

At the time of writing, almost two years have elapsed since the Forest Service proposed to revise its land and natural resource management rules under NFMA.¹⁹⁴ While the agency maintains its commitment to moving towards an ecosystem-based management scheme,¹⁹⁵ the status of the proposed revision remains uncertain. In any event, the eventual movement from an individual species approach to an integrated ecosystem manage-

¹⁹⁴ The proposed rule was published in the *Federal Register* on April 13, 1995. 60 Fed. Reg. at 18,886.

¹⁹⁵ See 61 Fed. Reg. 62,010, 62,020 (Nov. 29, 1996) (describing the proposed revision as an important part of an ongoing effort "to clarify and simplify the planning process").

ment model is likely.¹⁹⁶ Perhaps, in the end, it will all come down to trust in agency expertise:

A revolution in conservation thinking during the past twenty years . . . has led to this perception of the practical value of wild species. Except in pockets of ignorance and malice, there is no longer an ideological war between conservationists and developers. Both share the perception that health and prosperity decline in a deteriorating environment.¹⁹⁷

If one agrees with this statement, then the current and future status of diversity under NFMA may not be troublesome. If one doubts the existence of such harmony, sleepless nights may lie ahead.

¹⁹⁶ See Haeuber, *supra* note 152, at 19-24 (speculating about the future of the ecosystem management concept). Haeuber notes that "[a]fter all, the problems . . . [ecosystem management] is meant to address are far from resolved." *Id.* at 24.

¹⁹⁷ WILSON, *supra* note 7, at 282.