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ABSTRACT

As reflected in the National Wildlife Refuge System Improvement Act of 1997 and the National Forest Management Act of 1976, undefined biodiversity mandates and related ecological concepts are increasingly appearing in the federal laws governing the public lands. One question that arises is whether such general statutory provisions can be translated into enforceable legal standards and policies. The U.S. Fish and Wildlife Service, the Forest Service, and other federal agencies have promulgated extensive policies and rules incorporating new biodiversity and ecological integrity obligations into their planning and decision processes. This article assesses the effectiveness of these efforts, inquiring whether the agencies have established clear management priorities, embraced well-accepted ecosystem management principles, and ensured meaningful accountability. Despite several promising steps, the agencies have thus far been reluctant to adopt a rigorously prescriptive ecological management regime. Nonetheless, these nascent legally mandated excursions into biodiversity conservation and ecosystem management are providing valuable lessons in how to translate new scientific ideas into viable planning and management protocols on the public lands.

Biological diversity and related ecological concepts are inexorably being integrated into federal laws and policies governing the nation's public lands. Congress has twice incorporated explicit ecological management requirements into the organic legislation for individual public land agencies, once in the National Forest Management Act of 1976 (NFMA), and again in the National Wildlife Refuge System.
Improvement Act of 1997. Both the Forest Service and the U.S. Fish and Wildlife Service (FWS), in an effort to give more specificity to these statutory terms, have converted them into regulations and policies that cover over 285 million acres of federally owned lands. Elsewhere, the National Park Service has incorporated biodiversity-related standards into its management policies, while the Bureau of Land Management (BLM) has acknowledged the need to plan and manage on an ecosystem basis. With ecological concepts becoming more commonplace in federal statutes, regulations, and policies, the need to translate them into effective legal standards is ever more evident.

Despite the growing prevalence of such mandates, the notion of managing public lands to achieve ecological objectives remains controversial. Many critics do not believe that technical terms like biological diversity, environmental health, and ecosystem integrity can be converted into meaningful or workable standards that can be used to administer the federal estate. Others object to any management standard that appears to give priority to maintaining or restoring ecosystems. And yet others see the movement toward ecological


7. Allan K. Fitzsimmons, Why a Policy of Federal Management and Protection of Ecosystems Is a Bad Idea, 40 LANDSCAPE & URBAN PLANNING 195 (1998); Robert Lackey,
management as a transparent attempt to extend federal management priorities and authority beyond the existing boundary lines onto adjacent state and privately owned lands. Given the prevailing political climate, including the current Bush administration’s revisions to earlier Clinton administration ecological management policies, these criticisms should be taken seriously and addressed head-on. Agency efforts to translate diversity and ecological integrity into regulations and policies provide a good starting point for assessing just how viable these scientific concepts are as legal standards.

This article will examine the various statutes, regulations, and policies that incorporate biological diversity, environmental health, and related standards into public land planning and management processes. It begins by identifying where these terms appear as legal standards and by reviewing how the various agencies, particularly the Forest Service and the FWS, have sought to give meaning to them. It then analyzes these implementation efforts, employing such criteria as clarity of priorities, consistency with ecological management principles, and accountability, to assess whether these new standards really portend any meaningful difference on the ground. The article concludes by noting the broader implications these efforts may hold for public land law and policy.

I. THE PUBLIC LAND AGENCIES AND ECOLOGICAL STANDARDS

A. The Forest Service’s Diversity Mandate

Throughout much of its history, the Forest Service has exercised discretionary management authority over the national forests, as personified by the Multiple Use-Sustained Yield Act of 1960. That

changed, however, when Congress passed the National Forest Management Act of 1976, which not only sought to constrain the Forest Service’s timber-first propensities but also imposed extensive new resource planning obligations on the agency. Congress included a then-unique biodiversity provision in the NFMA, mandating 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....” The NFMA further instructed the Forest Service, with the assistance of a Committee of Scientists, to promulgate planning regulations to implement this new diversity provision along with the other prescriptive standards that were incorporated into the new statute. The NFMA marked the end of the agency’s unbridled oversight of the national forests.

Although the NFMA’s diversity mandate is shrouded in generality and qualifying language, the Forest Service has on three occasions adopted regulations translating the statutory terms into more precise management requirements. The initial NFMA diversity regulations were finalized in 1982; they mostly tracked the statutory language, including numerous qualifying phrases lifted from the legislation itself. Forest managers were required, for example, to “provide for diversity of plant and animal communities and tree species consistent with the overall multiple-use objectives of the planning area.” With such tempered language, these regulatory provisions proved largely unenforceable. Most courts, confronted with alleged diversity violations, either found no concrete standards to apply or chose to defer to agency discretion. But the Forest Service also promulgated a


12. 16 U.S.C. § 1604(g)(3)(B) (2000). This section goes on to address diversity within tree species even more specifically: “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.” Id.


14. 36 C.F.R. § 219.26 (1999); see also 36 C.F.R. § 219.27(g) (1999) (requiring that “[m]anagement prescriptions, where appropriate and to the extent practicable, shall preserve and enhance the diversity of plant and animal communities...”). These initial NFMA regulations were first promulgated in 1979, but then promptly revised in 1982. National Forest System Land and Resource Management Planning, 47 Fed. Reg. 7678 (Feb. 22, 1982); see Wilkinson & Anderson, supra note 1, at 43–44.

more specific and mandatory viability regulation: "Fish and wildlife habitat shall be managed to maintain viable populations of existing native and desired non-native vertebrate species in the planning area." It defined a "viable population" as "one which has the estimated number and distribution of reproductive individuals to insure its continued existence is well distributed in the planning area." And it required "well distributed [habitat] so that those individuals can interact with others in the planning area." Unlike the diversity regulation, the viability provision was neither qualified nor tempered.

The courts, however, have reached varying results interpreting this viability regulation, giving it legal teeth but limiting its potential reach. Most courts have concluded that the language established explicit regulatory standards that limited not only the agency's planning authority but its project level decisions too. In the Pacific Northwest spotted owl litigation, the courts ruled that the regulation obligated the Forest Service not only to ensure the viability of "listed" endangered species (the spotted owl), but also to ensure that other species were not extirpated by its logging activities. The courts also have held that the viability regulation required the Forest Service to ensure adequate well-distributed habitat for indicator species and to monitor species population trends.

But other courts have minimized the Forest Service's diversity obligations, choosing instead to defer to the agency's expertise. In *Sierra Club v. Marita*, for example, the Seventh Circuit Court of Appeals refused to incorporate conservation biology principles into the NFMA

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17. Id.
18. Id.
21. See Bosworth, 372 F.3d 1219; Sierra Club v. Martin, 168 F.3d 1, 6-8 (11th Cir. 1999); Forest Guardians v. United States Forest Serv., 180 F. Supp. 2d 1273, 1276 (D.N.M. 2001); see also Idaho Sporting Cong. v. Rittenhouse, 305 F.3d 957, 972-73 (9th Cir. 2002) (distinguishing the Ninth Circuit's earlier *Inland Empire* decision, infra note 23, because the Forest Service's own data indicated changed habitat conditions since the forest plan was finalized).
regulations, observing that "conservation biology is not a necessary element of diversity analysis" and citing the Forest Service's superior technical competence in making such policy-oriented decisions. In another ruling, the Ninth Circuit expressly deferred to the agency's own interpretation of its viability obligations, holding that the Forest Service was not obligated to census species on its lands, but could instead just provide adequate habitat to support a minimum number of reproductive individuals. In short, the original diversity and viability regulations have proved judicially enforceable but only to a limited and uncertain extent.

In 2000, the Forest Service revised its NFMA planning regulations. The Clinton administration, committed to instilling a new ethic in the public land agencies, oversaw these revisions with an eye toward codifying emergent ecological management principles. The 2000 NFMA regulations, which prioritized "ecological sustainability" as the agency's core mission, relied heavily on the ecological sciences, promoted landscape scale planning, encouraged broad-scale coordination among interested parties, and incorporated monitoring and other adaptive management concepts into the planning process. Seeking to expand the scale of Forest Service planning, the 2000 diversity regulation required agency officials to identify and evaluate diversity at both an ecosystem and species level. As used in the regulations, "ecosystem diversity" encompassed vegetative, water (including aquatic and riparian systems), soil, and air resources as well as focal species, defined as those species that provide insights into the larger ecological system. “Species diversity” referred to "the number, distribution, and geographic ranges of plant and animal species, including focal species and species-at-risk that serve as surrogate measures of species diversity.” By regulation, the planning process must describe the current state of

22. 46 F.3d 606, 620–21 (7th Cir. 1995).
23. Inland Empire Pub. Lands Council v. United States Forest Serv., 88 F.3d 754 (9th Cir. 1996); see also Ind. Forest Alliance v. United States Forest Serv., 325 F.3d 851, 861 (7th Cir. 2003); Colo. Envtl. Coalition v. Dombeck, 185 F.3d 1162, 1168–69 (10th Cir. 1999). But see cases cited, supra note 21.
28. 36 C.F.R. § 219.20(a)(2) (2004). The regulation also provides that "species-at-risk and focal species must be identified for the plan area." Id.
ecosystem and species diversity, risks to each level of diversity, the
cumulative effects of human and natural disturbances, and the role of
national forest lands in the larger landscape. To ensure ecosystem
diversity, the agency must "provide for maintenance or restoration of
the characteristics of ecosystem composition and structure within the
range of variability that would be expected to occur under natural
disturbance regimes of the current climatic period." To ensure species
diversity, the agency must "provide for ecological conditions...[with] a
high likelihood...of supporting over time the viability of native and
desired non-native species well distributed throughout their ranges within
the plan area...." Although the 2000 planning regulations acknowledged
new ecological sustainability management obligations, it was unclear
whether the new ecosystem-level planning requirements established
enforceable substantive standards.

The Bush administration, believing that the 2000 revisions were
too detailed and prescriptive, has issued a third revised version of the NFMA
planning regulations that significantly curtails the Forest Service's diversity and other ecological management obligations. Most

30. Id. § 219.20(b)(1). Certain exceptions from this standard were permitted where the ecosystem was no longer within its natural range of variability, where such information was unavailable, or where such maintenance of the ecosystem was unacceptable. Id. § 219.20(b)(1)(ii)-(v).
31. Id. § 219.20(b)(2)(i). The regulation then defined what constitutes a well-distributed species and addressed how the agency should handle disjunctive species populations within the planning area. Id. It also obligated the agency to contribute to viability efforts when particular species either faced threats from outside national forest lands or otherwise could not be secured within the planning area. Id. § 219.20(b)(2)(ii)-(iv).
32. See Orlemann, supra note 24, at 376-84; cf. Houck, supra note 9, at 885-87 (concluding that an earlier draft version of the NFMA planning regulations was not legally enforceable). See infra notes 97-102 and accompanying text for further analysis of this point.
34. The Bush administration released its final revised NFMA planning regulations after this article was in page proofs. National Forest System Land Management Planning, 70 Fed. Reg. 1023 (Jan. 5, 2005). The 2005 revised regulations not only significantly alter the Clinton administration's 2000 planning approach but also depart substantially from the administration's 2002 draft rules. See National Forest System Land and Resource Management Planning, 67 Fed. Reg. 72,770 (Dec. 6, 2002). In particular, the final rule's sustainability and related diversity provisions adopt a very different approach than was reflected in the earlier draft proposal. These new provisions are described and analyzed in the article to the extent practicable at this point in the editorial process. For the Forest Service's 2005 revised planning regulations, see 36 C.F.R. §§ 219.1-219.16 (2005); National
notably, the 2005 regulations reject the Clinton administration's view that ecological sustainability takes priority on national forest lands, mandating instead that these lands must be managed jointly for social, economic, and ecological sustainability.35 The 2005 sustainability-diversity regulation is both vague and imprecise, merely providing that "the overall goal of [ecological] sustainability is to provide a framework to contribute to sustaining native ecological systems by providing ecological conditions to support diversity of native plant and animal species in the plan area."36 Though ostensibly retaining the Clinton administration's dual level ecosystem and species diversity analysis requirement, the 2005 regulation views "ecosystem diversity [as] the primary means by which a plan contributes to sustaining ecological systems," and requires that "plan components must establish a framework to provide the characteristics of ecosystem diversity in the plan area."37 Agency officials may make specific provision for species diversity but only if the plan's ecosystem diversity provisions are deemed inadequate, and then only for "specific threatened and endangered species, species of concern, and species of interest, consistent with the limits of agency authorities, the capability of the plan area, and overall multiple use objectives."38 Absent from the new regulations are any more-specific species diversity obligations or any population census or monitoring obligations.39 In fact, the rule does not define "species diversity," but rather focuses on community diversity, defined as "the distribution and relative abundance or extent of plant and animal


36. 36 C.F.R. § 219.10(b) (2005), 70 Fed. Reg. at 1059. In addition, the 2005 rules provide that agency officials "must take into account the best available science" in the planning process, which includes documenting how science was interpreted, applied, and used to evaluate uncertainties and risks. 36 C.F.R. § 219.11(a) (2005), 70 Fed. Reg. at 1059.
37. Id. The 2005 regulations define "ecosystem diversity" as "the variety and relative extent of ecosystem types, including their composition, structure, and processes within all or a part of an area of analysis." 36 C.F.R. § 219.16 (2005), 70 Fed. Reg. at 1061.
39. The regulations, however, require the Forest Service to establish a monitoring program, though without specifying exactly what the agency must monitor. 36 C.F.R. § 216(b) (2005), 70 Fed. Reg. at 1056-57; see infra notes 165-175 and accompanying text for further discussion of monitoring as part of adaptive management. See also Lawsuit Says [Forest Service] Must Take Comments on Planning Change, PUBLIC LANDS NEWS, Oct. 29, 2004, at 3 (citing a September 29, 2004, Bush administration interpretive rule relieving national forests of any obligation to gather population data on indicator species under the 1982 viability regulation).
communities and their component species, including tree species, occurring within an area.” Tacitly acknowledging the imprecision of these new provisions, the Forest Service observes that it will incorporate further guidance on meeting the rule’s ecological sustainability goals in the Forest Service Manual and other agency directives.

Overall, the Bush administration’s 2005 planning regulations represent a determined effort to minimize the Forest Service’s legal obligations and hence the opportunity to challenge agency planning decisions. The agency readily acknowledges this shift in planning philosophy, characterizing the new regulations as a “paradigm shift” designed to make forest planning “more strategic and less prescriptive in nature.” To accomplish this, the rules emphasize the adaptive nature of the planning process, noting throughout that planning decisions—whether framed as desired conditions, objectives, guidelines, or suitability determinations—are contingent and not final decisions approving projects or activities. Rather than employing well-accepted National Environmental Policy Act (NEPA) environmental impact statement (EIS) procedures to prepare forest plans, the rules categorically exclude the planning process from NEPA requirements, relying instead upon a new evaluation and documentation process as well as public involvement requirements to gather and analyze necessary planning information. Consistent with the emphasis on adaptive management, the 2005 regulations set forth express but vaguely defined monitoring and comprehensive evaluation requirements, and also create an entirely new Environmental Management Systems (EMS) procedure designed to audit individual forest’s overall environmental performance. In sum, the revisions eliminate an array of legal

41. 70 Fed. Reg. at 1056.
42. 36 C.F.R. § 219.3(a), 70 Fed. Reg. at 1056.
43. 36 C.F.R. §§ 219.3(b), 219.7(a)(2), 70 Fed. Reg. at 1056, 1057.
44. 36 C.F.R. § 219.4 (2005), 70 Fed. Reg. at 1056. This revision to the traditional forest planning process, wherein forest plans were regularly accompanied by EISs, is predicated upon the Forest Service’s re-characterization of forest planning as a contingent or strategic process that rarely results in on-the-ground environmental impacts, and the related concern that EISs have ordinarily still been required for individual project or activity decisions, thus converting NEPA documentation into a redundant, process-laden exercise. See 70 Fed. Reg. at 1030–33.
47. 36 C.F.R. § 219.5 (2005), 70 Fed. Reg. at 1056. The new EMS system is modeled on an international standard (ISO 14001) but is otherwise undefined in the new rules, though further direction should be forthcoming in Forest Service directives. See also Edward A.
requirements that attached to the 1982 and 2000 planning regulations, and instead establish untested self-audit and public oversight provisions as accountability measures.

B. The U.S. Fish and Wildlife Service and Its Ecological Mandate

In the convoluted legal history of the national wildlife refuge system, Congress has periodically tried to give coherence to a system that has grown by accretion through myriad presidential, administrative, and congressional additions. In 1966, more than 60 years after President Theodore Roosevelt unilaterally proclaimed the nation’s first wildlife refuge, Congress adopted the Refuge Administration Act, which consolidated the various refuge units into a single system and established a comprehensive management mandate governing the diverse uses extant on individual refuges. Notwithstanding this legislation, the refuges continued to confront persistent resource controversies and related habitat degradation problems, which eventually prompted Congress to adopt new organic legislation for the refuges. The National Wildlife Refuge System Improvement Act of 1997 (Improvement Act) clarified the refuge system mission, established a new comprehensive conservation planning process, and admonished the U.S. Fish and Wildlife Service to “ensure that the biological integrity, diversity, and environmental health [i.e., ecological integrity] of the System are maintained for the benefit of present and future generations of Americans.” Faced with translating these undefined statutory terms


52. 16 U.S.C. § 668dd(a)(4)(B) (2000). I will use the term “ecological integrity” as a shorthand reference to the three Improvement Act statutory standards—biological integrity, biological diversity, and environmental health—even though the FWS decided
into meaningful management standards, the FWS, after public notice and comment, adopted detailed policies to guide both planning and management on its refuge lands. Put simply, the FWS policies impose a duty on refuge managers for the "consideration and protection of [a] broad spectrum of fish, wildlife, and habitat resources found on refuges and associated ecosystems." 53

The FWS's policy statement describes its new ecological integrity responsibilities in conventional scientific terminology. The term "biological diversity" is defined comprehensively as "[t]he variety of life and its processes, including the variety of living organisms, the genetic differences among them, and communities and ecosystems in which they occur." 54 The term "biological integrity" refers to "biotic composition, structure, and functioning at genetic, organism, and community levels...including the biological processes that shape genomes, organisms, and communities." 55 And the term "environmental health" is defined as the "[c]omposition, structure, and functioning of soil, water, air, and other abiotic features...including the natural abiotic processes that shape the environment," which thus encompasses the non-organic


53. U.S. FISH & WILDLIFE SERV., supra note 3, 601 FW 3.3; Policy on Maintaining the Biological Integrity, Diversity, and Environmental Health of National Wildlife Refuge System, 66 Fed. Reg. at 3818; see also U.S. FISH & WILDLIFE SERV., supra note 3, 601 FW 3.7; Policy on Maintaining the Biological Integrity, Diversity, and Environmental Health of National Wildlife Refuge System, 66 Fed. Reg. at 3818 (providing that "wildlife conservation is the singular [refuge] mission" and that "biological integrity, diversity, and environmental health are critical components of wildlife conservation"); U.S. FISH & WILDLIFE SERV., supra note 3, 601 FW 3.15; Policy on Maintaining the Biological Integrity, Diversity, and Environmental Health of National Wildlife Refuge System, 66 Fed. Reg. at 3821 (providing that "we will, first and foremost, maintain existing levels of biological integrity, diversity, and environmental health at the refuge scale").


components of an ecosystem. To sharpen these terms as management standards, the FWS references them to "historic conditions" defined as the "composition, structure, and functioning of ecosystems resulting from natural processes" that prevailed in the refuges "prior to substantial human related changes to the landscape." Cognizant that refuges exist within a larger landscape, the FWS obligates managers to "consider their refuges' contribution to...[ecological integrity] at multiple landscape scales," including the ecosystem, national, and international levels.

To implement these new ecological integrity management responsibilities, the FWS policies require that refuge managers assess the current refuge conditions as measured against historic conditions, undertake appropriate actions to maintain and (where appropriate) restore ecological integrity, and then monitor the results of their efforts. To promote biological integrity, the FWS must first determine "the extent to which biological composition, structure, and function has been altered from historic conditions" and then manage to prevent further losses. To ensure biological diversity, the FWS first evaluates diversity at multiple taxonomic levels (class, family, genus, species, and subspecies) and at various landscape scales (refuge, ecosystem, national, and international), and then seeks "to maintain populations of breeding individuals that are genetically viable and functional" and "to maximize the size of habitat blocks and maintain connectivity between blocks." To meet its environmental health obligations, the FWS focuses on maintaining the abiotic composition, structure, and function of refuge ecosystems to provide a viable habitat that can support resident

60. U.S. FISH & WILDLIFE SERV., supra note 3, 601 FW 3.10A; Policy on Maintaining the Biological Integrity, Diversity, and Environmental Health of National Wildlife Refuge System, 66 Fed. Reg. at 3819–20. These management actions can include activities that mimic flooding, fires, grazing, and other natural processes.
species. Yet, because these management objectives may occasionally conflict, the FWS policies allow refuge managers to compromise environmental health to achieve biological diversity objectives. In combination, these three statutory standards (as refined by agency policy) focus refuge management on the ecosystem as a whole in order to achieve the Improvement Act's explicit wildlife conservation and habitat protection priorities.

C. Other Agencies and Related Mandates

The National Park Service is primarily a nature preservation agency, much like the FWS. Under the National Parks Organic Act, the Park Service is responsible for managing the national parks to "conserve the scenery and the natural and historic objects and the wild life therein and to provide for the [public] enjoyment...by such means as will leave them unimpaired for the enjoyment of future generations." Dating from 1916, this organic mandate contains an unambiguous species preservation obligation, though it is not framed in contemporary biodiversity conservation or similar ecological terms. The Park Service, like the FWS, has implemented its resource management responsibilities through a policy statement that was subjected to public notice and comment. The revised 2001 Management Policies document states that "natural resources will be managed to preserve fundamental physical and biological processes, as well as individual species, features, and plant and animal communities." It provides that the agency "will try to maintain all the components and processes of naturally evolving park


63. U.S. FISH & WILDLIFE SERV., supra note 3, 601 FW 3.11; Policy on Maintaining the Biological Integrity, Diversity, and Environmental Health of National Wildlife Refuge System, 66 Fed. Reg. at 3820. Refuge managers, may, for example, chemically "poison" a water body to eliminate an invasive species that threatens native species.


66. NPS MANAGEMENT POLICIES, supra note 4, § 4.1, available at http://www.nps.gov/policy/mp/chapter4.htm; see also id. § 4.4.1 (providing that the NPS "will maintain as parts of the natural ecosystems of parks all native plants and animals," including "all five of the commonly recognized kingdoms of living things").
ecosystems, including the natural abundance, diversity, and genetic and ecological integrity of [native] plant and animal species." To achieve these ecological preservation goals, the agency will minimize intervention into natural processes and manage across administrative boundaries, acknowledging that parks exist in larger landscapes. When park ecosystems have been disturbed, the agency will attempt to restore missing native species and to "re-establish natural functions and processes in human-disturbed components of natural systems." Thus, building upon its historic commitment to nature preservation, the Park Service has construed its statutory conservation mandate to incorporate modern ecological concepts into its resource management responsibilities.

The Bureau of Land Management, like the Forest Service, is a multiple-use agency that has long been engaged in producing resources for human consumption, mainly minerals and livestock forage. The BLM's organic mandate is found in the Federal Land Policy and Management Act of 1976 (FLPMA), which provides for multiple-use management of the unreserved public lands. The FLPMA defines "multiple-use" to include "wildlife and fish, and natural scenic, scientific and historical values"; it obligates the BLM to engage in "harmonious and coordinated management of the various resources without permanent impairment of the productivity of the land"; and it enjoins the BLM to "take any action necessary to prevent unnecessary or undue degradation of the lands." Unlike the Forest Service's organic legislation, the FLPMA does not contain an explicit biodiversity conservation or similar statutory provision; rather, any BLM legal obligation to pursue ecological management concepts must be stitched

67. Id. § 4.1.
68. Id.; see also id. § 4.4.2 (providing that, "whenever possible, natural processes will be relied upon to maintain native plant and animal species, and to influence natural fluctuations in populations of these species").
69. Id. § 4.1.4; see also id. § 4.4.1.1 (noting that "plants and animals found within parks are genetically parts of species populations that may extend across park and non-park lands" and committing the agency to "work with other land managers to encourage the conservation of...species outside parks").
70. Id. §§ 4.1, 4.1.5.
73. But see 43 U.S.C. § 1701(a)(8) (2000) (declaring that "it is the policy of the United States that...the public lands be managed in a manner that will protect the quality of...ecological...values...[and] provide food and habitat for fish and wildlife...".)
together from an array of environmental laws, including its general FLPMA, NEPA, and Endangered Species Act obligations. During the Clinton administration, the BLM embraced ecosystem management as agency policy, committing "to safeguarding the ecological sustainability of the public's lands...[b]y conserving the diversity and protecting the integrity of the land...[t]o ensure that present and future generations continue to derive economic, recreational, social, cultural, and aesthetic benefits from the public lands." The BLM also promulgated rangeland health regulations that incorporated ecological standards into its livestock management program and revised the agency's planning policies to embrace land health standards and collaborative multi-jurisdictional planning. In sum, though not driven by express biodiversity conservation or similar statutory mandates, the BLM nonetheless has seen fit to begin integrating general ecological concepts and principles into its management policies.

Congress has also begun to incorporate ecological management standards into site-specific public land legislation. The Steens Mountain Cooperative Management and Protection Act of 2000 is one such instance. In overlaying a unique Cooperative Management and Protection Area on 425,500 acres of BLM lands in southeastern Oregon,

74. This combination of laws is what the courts ultimately relied on to compel the BLM to adopt an ecosystem management approach for its Oregon and California timberlands in the Pacific Northwest's spotted owl controversy. See Seattle Audubon Soc. v. Lyons, 871 F. Supp. 1291, 1311 (W.D. Wash. 1994) (sustaining the Northwest Forest Plan with the observation, "Given the current condition of the forests, there is no way the agencies could comply with the environmental laws without planning on an ecosystem basis"); see also Lane County Audubon Soc'y v. Jamison, 958 F.2d 290 (9th Cir. 1992) (enjoining logging on BLM lands on ESA grounds). See generally Robert B. Keiter, Beyond the Boundary Line: Constructing a Law of Ecosystem Management, 65 U. COLO. L. REV. 293 (1994).

75. BUREAU OF LAND MGMT., DEP'T OF THE INTERIOR, ECOSYSTEM MANAGEMENT IN THE BLM: FROM CONCEPT TO COMMITMENT 1 (1994). Significantly, these policy statements were never converted into binding legal regulations, nor were they subjected to public notice and comment, which means the agency may not be legally bound by them. See infra notes 176-180 and accompanying text.


77. LAND USE PLANNING HANDBOOK, supra note 5, at II-1, II-2.

78. It must be noted, however, that the Bush administration has pursued a very different management agenda for the BLM, particularly refocusing the agency on energy production. See U.S. DEP'T OF THE INTERIOR ET AL., SCIENTIFIC INVENTORY OF ONSHORE FEDERAL LANDS' OIL AND GAS RESOURCES AND RESERVES AND THE EXTENT AND NATURE OF RESTRICTIONS OR IMPEDIMENTS TO THEIR DEVELOPMENT (2003), available at http://www.doi.gov/epca/ (last visited Nov. 7, 2004).

Congress stated that the purpose of the new area was "to conserve, protect, and manage the long-term ecological integrity of Steens Mountain for future and present generations." The statute defines "ecological integrity" to mean "a landscape where ecological processes are functioning to maintain the structure, composition, activity, and resilience of the landscape over time, including...[successional plant community complexes] and the maintenance of biological diversity, soil fertility, and genetic interchange." The legislation requires preparation of a comprehensive management plan with "measurable management objectives...to ensure the ecological integrity of the area," a monitoring program "so that progress towards ecological integrity objectives can be determined," and coordination with private landowners and others. The fact that the Steens Mountain act involved BLM lands further illustrates the degree to which ecological management concepts are gaining credibility and acceptance.

To be sure, public land legislation like the Steens Mountain statute with its "ecological integrity" standard is still unique. Most place-based legislation continues to use traditional language that not only enumerates permitted uses, but also avoids such terms as biological diversity or ecosystem integrity. But site-specific legislation provides both Congress and the agencies an opportunity to experiment with new

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80. Id. § 460nnn-12. Besides limiting uses to those consistent with the statute's "ecological integrity" standard, the Steens Mountain legislation prohibits commercial timber harvesting (except for ecological restoration or maintenance purposes or for public safety), permits livestock grazing to continue subject to cancellation of some permits, severely limits off-road motorized travel, and emphasizes restoration of the historic fire regime on a landscape scale for the Western Juniper species. Id. § 460nnn-23. The statute also withdraws federal lands within the area from future mineral location or leasing. Id. § 460nnn-81.

81. Id. § 460nnn(5)(A). On plant communities, the statute contemplates maintaining "a complex of plant communities, habitats and conditions representative of variable and sustainable successional conditions[.]

82. Id. § 460nnn-21(b)-(c). To help promote cooperative management, the statute establishes a Steens Mountain Advisory Council with a diverse membership (including federal, state, and local representatives from different user groups) and obligates the Secretary of the Interior to consult with the council on the preparation and implementation of the management plan. Id. § 460nnn-51-nnn52. In addition, the statute authorizes creation of a Science Committee to provide advice on management issues. Id. § 460nnn-53.

83. For additional examples where Congress has incorporated ecological integrity and similar terms into public land and environmental legislation, see Robert L. Fischman, The Meanings of Biological Integrity, Diversity, and Environmental Health, 44 NAT. RESOURCES J. 989, 1006-07 (2004).

ecological standards in discrete areas without risking the potentially more disruptive and controversial effects of systemic reforms.

II. ANALYSIS AND ASSESSMENT

As ecological concepts begin to appear in federal public land and natural resources law, an important question is whether these concepts can be translated into meaningful standards. To answer this question, it is instructive to examine how the Forest Service and FWS are interpreting and applying these new terms, either through rulemaking or other policy-making processes.\(^{85}\) This entails assessing whether they have established clear management priorities, embraced well-accepted ecosystem management principles, and ensured meaningful accountability. Though not exhaustive of how one might evaluate the new ecological policy regime, these criteria nonetheless speak to the efficacy of these science-based terms as credible legal standards. The assessment results contain lessons for how such standards might be framed to guide and constrain the various public land agencies as they confront their increasingly complex and prescription-laden statutory responsibilities.

A. On Establishing and Enforcing Priorities

A fundamental principle of legal drafting is that the governing rules must be stated in a clear and precise manner so those affected will know and understand what the law requires.\(^ {86}\) In the case of public lands, a primary concern is whether the prevailing management standards articulate clear priorities among competing resource uses so managers can develop appropriate plans and readily resolve potential conflicts. The immediate questions are twofold: how to integrate ecological conservation objectives into the management agenda and whether these objectives take precedence over extractive development, recreational access, or other competing resource claims. To make this assessment, the relevant statutory terms, implementing regulations, agency policies, and background statutory and regulatory structure must

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85. This section of the article will focus on the Forest Service and FWS. Because they each have an explicit ecological mandate in their organic legislation, they have each developed extensive biodiversity and ecological management policies either through rulemaking or policy statements, and they embody the quite different multiple-use and preservation traditions that are so deeply embedded in the various federal land management agencies.

all be examined. In other words, the standards at issue must be understood both as freestanding provisions and in the broader legal context.

When incorporating ecological standards into the organic statutes governing the public land agencies, Congress ordinarily has spoken in general undefined terms while continuing to endorse the agencies' traditional missions. In the case of the Forest Service, the 1976 NFMA inserted a hitherto untested diversity obligation into the agency's newly created planning responsibilities, but also qualified it with extensive "multiple-use" and "to the degree practicable" language. Nonetheless, the NFMA's legislative history reveals that Congress—faced with a crisis over the agency's uncontrolled clearcut logging practices—was intent on constraining the Forest Service's single-use (timber) focus, avoiding forest conversions, and enhancing wildlife and other forest resource values. In the case of the FWS, the 1997 Improvement Act's tripartite ecological integrity mandate is set forth in unqualified language, requiring that "the Secretary shall ... ensure ... the biological integrity, diversity, and environmental health of the System." Moreover, the Improvement Act redefines the national wildlife refuge system mission in explicit wildlife conservation terms. But in both cases, Congress chose not to further define these ecological terms, leaving it to the agencies—through rulemaking or otherwise—to give more specific meaning to them. In contrast, the 2000 Steens Mountain legislation introduced a new "ecological integrity" management standard, which was then statutorily defined in terms of

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87. Indeed, the NFMA expressly reaffirmed the Forest Service's multiple-use mission. 16 U.S.C. § 1604(e)(I) (2000).

88. Wilkinson & Anderson, supra note 1, at 290-96 (concluding that "when the [biodiversity] section is read in light of the historical context and overall purposes of the NFMA, as well as the legislative history of the section, it is evident that [it] requires Forest Service planners to treat the wildlife resource as a controlling, co-equal factor in forest management and, in particular, as a substantive limitation on timber production"). This view of the biodiversity provision has also been routinely endorsed by the courts, though they also have granted the Forest Service considerable discretion in implementing it. See, e.g., Sierra Club v. Martin, 168 F.3d 1, 4 (11th Cir. 1999); Neighbors of Cuddy Mountain v. United States Forest Serv., 137 F.3d 1372, 1380-81 (9th Cir. 1998); Seattle Audubon Soc. v. Moseley, 798 F. Supp. 1484, 1489 (W.D. Wash. 1992), aff'd sub nom. Seattle Audubon Soc. v. Espy, 998 F.2d 699 (9th Cir. 1993). See generally COGGINS & GLICKSMAN, supra note 15, § 20:15.


90. Id. § 668dd(a)(2); see also id. § 668dd(a)(3)(A). The Improvement Act also prioritizes wildlife-dependent recreation as an important refuge use. Id. § 668dd(a)(3)(C). In addition, the Improvement Act reaffirms the preexisting "compatibility" standard for determining whether other activities can continue in individual refuges. Id. § 668dd(d)(3); see Fischman, supra note 2, at 547-63.
maintaining biological diversity and ecological processes at a landscape scale. Though only three examples, it is noteworthy that Congress has expanded its ecological statutory terminology, increasingly spoken in unequivocal terms, and begun to define legislatively the relevant terms—all of which may signal growing congressional comfort with the idea of such standards.

Of course, most of the real work in translating these general statutory terms into management priorities and meaningful standards has occurred at the agency level, either through implementing regulations or policy statements. As a threshold matter, the delegation doctrine does not impose any significant limitation on Congress's use of general, undefined statutory standards to frame the agencies' management responsibilities. More importantly, the so-called *Chevron* doctrine vests the agencies with broad authority to translate general statutory directives into legally binding regulations or legally persuasive policies, so long as the agency's interpretation is plausible and does not run afoul of congressional intent. Under *Chevron*, the key question is whether the courts should defer to the agency's interpretation of its statutory responsibilities, as expressed in implementing regulations or policies.

The answer turns, in large part, on the difference between agency regulations and policies. Because the Forest Service has promulgated formal regulations in conformity with relevant Administrative Procedures Act notice and comment rulemaking procedures, the agency's interpretation of its statutory obligations merits judicial deference under the *Chevron* principle, so long as it is consistent with congressional intent. Inasmuch as the first and third versions of the NFMA regulations are framed in rather general terms that track the statutory multiple-use language, the courts are likely to defer to these constructions of the agency's management responsibilities.


93. See Natural Res. Def. Council v. Chevron USA, Inc., 467 U.S. 837, 842-45 (1984) (providing that Congress's intent controls interpretation of statutes governing administrative agencies, but if the "statute is silent or ambiguous with the respect to the specific issue," then the courts should defer to an agency's "permissible construction of the statute"); see also United States v. Mead Corp., 533 U.S. 218 (2001); Skidmore v. Swift & Co., 323 U.S. 134 (1944).

But the Clinton era regulations, which expressly elevated ecological sustainability to a priority position, raise a much closer legal question. In contrast, the FWS's ecological standards are embodied in policies (not formal regulations) that lack the force of law, which means *Chevron* deference is not required. Instead, the FWS's interpretation of its ecological policies is merely "entitled to respect" to the extent that it is persuasive. Because the agency is ordinarily the initial arbiter whenever a decision interpreting these statutory obligations is challenged, these deference doctrines are important and vest the responsible agency with considerable power.

The Forest Service, faced with a statutory directive to develop regulations implementing the NFMA, has drafted three distinct diversity regulations that have defined the agency's biological conservation responsibilities quite differently. The original 1982 version shrouded most of the regulations in qualifying phrases lifted directly from the NFMA legislation, which left the agency with few specific legal obligations. But that was not true of the viability rule; it was framed in mandatory terms, unambiguously requiring the maintenance of "viable populations of native and desired non-native species" as well as "well-distributed" habitat to facilitate species interaction. The Clinton administration's subsequent version of the Forest Service's diversity regulation was both more encompassing (expanding the agency's diversity obligations to the ecosystem level) and more specific (defining species diversity as "the number, distribution, and geographic ranges of plant and animal species, including focal species and species-at-risk"). Critics worried, however, that the regulation's complexity not only rendered it difficult to implement on the ground, but also potentially unenforceable in judicial proceedings. Significantly, though the Bush administration's 2005 revisions to the sustainability regulation continue to provide for dual level (ecosystem and species)
analysis, the new version emphasizes ecosystem diversity, notably limits the agency’s species diversity maintenance obligations, and employs such qualifying language as “consistent with...the capability of the plan area and overall multiple use objectives.”102 In short, the Forest Service’s evolving diversity regulations continue to acknowledge its diversity obligations, but they no longer establish specific and, thus, enforceable protective duties, either at the planning or project levels.

The FWS’s ecological integrity policy states that the refuge system’s primary mission is “wildlife conservation” and that “biological integrity, diversity, and environmental health are critical components of wildlife conservation.”103 Taking its new organic management responsibilities seriously, the policy provides that the FWS “will, first and foremost, maintain existing levels of biological integrity, diversity, and environmental health at the refuge scale.”104 It does so in large measure by integrating the “goals and objectives for maintaining and restoring the [ecological integrity] of the refuge” into the comprehensive conservation planning process.105 Moreover, the new ecological integrity policy incorporates the concept of ecological restoration, though the policy contemplates multi-scale restoration efforts only so long as “it is feasible and supports fulfillment of refuge purposes.”106 The agency, however, has not bound itself to achieve these ecological goals; rather, it uses nonbinding terminology like “we will strive to” in defining its

102. 36 C.F.R. § 219.10(b), 70 Fed. Reg. at 1059. More specifically, the 2005 regulation states that “ecosystem diversity is the primary means by which a plan contributes to sustaining ecological systems.” Id. But if the forest plan’s components and ecological diversity provisions do not adequately ensure “appropriate ecological conditions for specific threatened and endangered species, species-of-concern, and species-of-interest, then the plan must include additional provisions for these species....” Id. This evident shift away from a species-focused, viable population diversity requirement is justified by the Forest Service’s experience that it is not always possible to ensure species viability within the confines of a national forest, that it is impractical to analyze all species or even surrogate species, and that it will divert attention from an ecosystem approach to land management. 70 Fed. Reg. at 1029.


refuge management responsibilities. Refuge managers, for example, must only "strive to maintain populations of breeding individuals that are genetically viable and functional." Although this qualified language may be a necessary concession to the uncertainties associated with biological management, it also minimizes the agency's overt legal commitments to what is otherwise an enlightened scientific management policy statement.

A related legal concern—shared by the Forest Service and the FWS—is how to integrate these ecological management obligations with their other organic statutory mandates. Under the NFMA, the Forest Service's planning obligations are guided by the agency's overall multiple-use mission, which Congress specifically reaffirmed in that 1976 legislation. The original viability regulation, however, served as an effective limitation on the agency's multiple-use options, as illustrated by the court injunctions halting logging during the spotted owl litigation. Based on this experience, the Clinton administration's 2000 NFMA planning regulations gave priority to ecological sustainability over economic and social sustainability for forest management purposes, evoking heavy criticism from opponents who argued that the agency's multiple-use mandate created no such hierarchy. Embracing different priorities, however, the Bush administration's 2005 revisions have placed ecological, social, and economic sustainability on an equal footing, thus reasserting the productive dimensions of the national forest mission. Whether the Clinton administration's ecological sustainability


110. See supra note 20 and accompanying text for a brief discussion of the spotted owl litigation.


112. See COMMITTEE OF SCIENTISTS REPORT, supra note 111, at 83 (dissenting views of Roger A. Sedjo); Sedjo, supra note 101; Jim Geisinger, Nonscience from the Committee of Scientists, 97 J. OF FORESTRY 24 (1999); see also ALAN K. FITZSIMMONS, DEFENDING ILLUSIONS: FEDERAL PROTECTION OF ECOSYSTEMS 182–89 (1999); Flick & King, supra note 8, at 9.

113. National Forest System Land and Resource Management Planning, 67 Fed. Reg. 72,770, 72,799 (proposed Dec. 6, 2002); see also id. at 72,783 (explaining the differences between the 2000 rule and the proposed rule in their treatments of sustainability and diversity).
priority could have withstood legal challenge under the *Chevron* doctrine is an open question. Faced with “sustainability” language in the Multiple Use-Sustained Yield Act, an array of overlapping environmental laws, and over a decade of intensive litigation experience, the courts may well have deferred to the agency’s revised interpretation of its management priorities. If so, then the path is clear for the Forest Service to prioritize biodiversity conservation as a paramount national forest resource management objective.

The FWS’s 1997 organic refuge management legislation reaffirms the historic role of wildlife refuges in accommodating a variety of human uses. The Improvement Act requires the agency to give priority to wildlife-dependent recreational uses and to allow other uses on the refuges, but only so long as these uses are compatible with the refuge purpose and overall mission of the refuge system. Under the FWS’s ecological integrity policy, wildlife-dependent recreation and other uses are permitted if refuge managers determine that they meet the statutory compatibility standard, with the burden of proving compatibility placed on the proponent of the use. Although individual refuge

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115. See generally Keiter, supra note 74.

116. See Keiter, supra note 9, at 87–113.


118. 16 U.S.C. § 668ee(i) (2000) (defining “compatible use” to mean “a wildlife-dependent recreational use or any other use of a refuge that, in the sound professional judgment of the Director, will not materially interfere with or detract from the fulfillment of the mission of the System or the purposes of the refuge”); see U.S. FISH & WILDLIFE SERV., supra note 3, 601 FW 3.7G, 3.18 (integrating the “ecological integrity” policy and “compatibility” requirements); Policy of Maintaining the Biological Integrity, Diversity, and Environmental Health of the National Wildlife Refuge System, 66 Fed. Reg. 3810, 3813 (Jan. 16, 2001); see also Fischman, supra note 2, at 532–38.

119. Final Compatibility Policy Pursuant to the National Wildlife Refuge System Improvement Act of 1997, 65 Fed. Reg. 62,484, 62,489 (Oct. 18, 2000) (codified at U.S. FISH AND WILDLIFE SERVICE MANUAL, 603 FW 211.B) (stating that the FWS’s compatibility policy places the burden of proving compatibility on the proponent of the use and directs the refuge manager to assess the cumulative impacts of proposed uses, including potential impacts emanating from similar uses on adjacent lands). In an effort to minimize potential compatibility problems, the FWS’s biodiversity policy authorizes spatial and temporal zoning. U.S. FISH & WILDLIFE SERV., supra note 3, 601 FW 3.7G; Policy of Maintaining the
enabling documents may authorize recreational and other uses, the FWS must also determine that the proposed use is compatible with the overall wildlife conservation mission of the refuge system.\textsuperscript{120} In the event of conflict, however, the refuge purpose will prevail over the system mission,\textsuperscript{121} which could undermine ecological integrity management objectives in those instances where refuge enabling documents contemplate such intensive human uses as energy exploration, livestock grazing, or water impoundments.\textsuperscript{122} Put simply, ecological integrity management goals can be subordinated to inconsistent, expressly authorized refuge uses.

No assessment of public land management priorities can ignore the overarching influence of the powerful Endangered Species Act (ESA).\textsuperscript{123} The ESA gives priority to conserving species listed on the endangered species registry, not only vesting the FWS with an effective veto over any federal agency action that might jeopardize a protected species,\textsuperscript{124} but also prohibiting anyone from taking these species.\textsuperscript{125} The ESA and the related NFMA and Improvement Act biodiversity provisions operate as complimentary legal mandates, all aimed toward protecting species and the ecosystems they depend upon.\textsuperscript{126} The agencies, accordingly, should view their respective biodiversity statutory mandates as granting them both the responsibility and the authority to help forestall future endangered species listings through appropriate management of their own lands. Aggressive and effective management of endangered species is crucial to the future of the National Wildlife Refuge System.

\textsuperscript{120} National Wildlife Refuge System Improvement Act of 1997, 16 U.S.C. § 668dd(a)(3) (2000); see also id. § 668dd(a)(2) (stating the mission of the refuge system). Moreover, the compatibility policy emphasizes that "inherent in fulfilling the System mission is not degrading the ecological integrity of the refuge." Final Compatibility Policy Pursuant to the National Wildlife Refuge System Improvement Act of 1997, 65 Fed. Reg. at 62,489.


\textsuperscript{122} See Fischman, supra note 2, at 592-612 (describing various sources of refuge enabling documents and the provisions contained therein).


\textsuperscript{126} See Seattle Audubon Soc’y v. Evans, 771 F. Supp. 1081 (W.D. Wash. 1991), aff’d 952 F.2d 297 (9th Cir. 1991); Seattle Audubon Soc’y v. Moseley, 798 F. Supp. 1473 (W.D. Wash. 1992), aff’d sub nom. Seattle Audubon Soc’y v. Espy, 998 F.2d 699 (9th Cir. 1993). Moreover, the courts have required land management agencies to undertake additional consultation with the FWS on land use plan revisions whenever a new species is listed under the ESA. Pac. Rivers Council v. Thomas, 30 F.3d 1050, 1056 (9th Cir. 1994).
implementation of the biodiversity mandates can, in effect, serve as an insurance policy against the prospect of third party regulation by the FWS and the concomitant loss of management flexibility. Recognizing this, the Forest Service’s 2005 revised regulations oblige agency officials to “provide appropriate ecological conditions” for threatened and endangered species and for other species facing possible listing, but only if they are not otherwise protected by the plan’s ecological diversity provisions, and then only when “consistent with...overall multiple use objectives.”127 Relatedly, the FWS’s ecological integrity policy acknowledges that, contrary to refuge diversity goals, single species management may sometimes be necessary to meet endangered species legal obligations and to ensure biodiversity at the ecosystem or national landscape scale.128 Thus, though biodiversity conservation efforts on the public lands will ordinarily compliment endangered species management, the ESA’s strictures will prevail in the event of a conflict between the two.

B. Ecological Management Principles

As ecology has worked its way into federal law and policy, the concepts of biodiversity conservation and ecosystem management have become intertwined but also have sown confusion. It is no wonder that the public land agencies, given undefined biodiversity and related statutory responsibilities, have turned to ecological management

127. 36 C.F.R. § 219.10(b)(2) (2005), 70 Fed. Reg. at 1059. In fact, the only species-based diversity obligations that the 2005 revised rules impose on the Forest Service are for ESA-listed species and for “species-of-concern” (defined as those facing possible ESA listing), as well as for “species-of-interest” (defined as those that might be useful to achieve multiple-use objectives). Id.; see also 36 C.F.R. § 219.16 (2005), 70 Fed. Reg. at 1061, for relevant definitions of these terms. The Clinton administration’s 2000 NFMA planning regulations specifically included species-at-risk as part of the agency’s species diversity assessment and conservation obligations, and also required the agency to implement conservation agreements designed to protect ESA-listed species. 36 C.F.R. § 219.20(a)(ii) (2004) (species-at-risk); Id. § 219.20(b)(3)(i) (plan decisions must provide for actions in conservation agreements). The 1982 NFMA planning regulations included threatened and endangered species as potential “management indicator species.” National Forest System Land and Resource Management Planning, 47 Fed. Reg. 43,026 (Sept. 30, 1982).

128. U.S. FISH & WILDLIFE SERV., supra note 3, 601 FW 3.10A(3); Policy of Maintaining the Biological Integrity, Diversity, and Environmental Health of the National Wildlife Refuge System, 66 Fed. Reg. 3810, 3820 (Jan. 16, 2001); see also U.S. FISH & WILDLIFE SERV., supra note 3, 601 FW 3.10B(1); Policy of Maintaining the Biological Integrity, Diversity, and Environmental Health of the National Wildlife Refuge System, 66 Fed. Reg. at 3820 (providing for distinct population segments, in accordance with ESA mandates); U.S. FISH & WILDLIFE SERV., supra note 3, 601 FW 2.11C; Policy of Maintaining the Biological Integrity, Diversity, and Environmental Health of the National Wildlife Refuge System, 66 Fed. Reg. at 3822 (creating a non-native species exception for ESA purposes).
concepts in an effort to fulfill these new obligations. To a remarkable
degree, both the Forest Service and FWS have incorporated widely
accepted ecosystem management principles into their respective
biodiversity conservation policies.129 Most notably, both agencies have
significantly expanded the spatial and temporal scales of their planning
efforts, begun to address transboundary resource management
problems, and endorsed adaptive management strategies. By doing so,
key ecosystem management principles are becoming embedded in the
workaday vocabulary and activities of the public land agencies.

Scale is an important concept in ecological management, both in
spatial and temporal terms. As a spatial matter, biodiversity can perhaps
best be understood in hierarchical terms. It consists of genes (found in
individual organisms), separate species, populations (an assemblage of
species), ecosystems (the environment hosting both animals and plants),
and landscapes (which include multiple ecosystems).130 Ecosystems are
also complex entities, consisting of components (inhabiting organisms),
structures (physical life form patterns), and functions (energy flows).131
Biodiversity conservation efforts typically must encompass these
hierarchical dimensions of biodiversity and interrelated ecosystem
processes, which has significantly expanded the geographical scale for
planning and management.132 As a temporal matter, ecosystems are
dynamic and evolve over time, sometimes unpredictably owing to fires,
floods, droughts, and other natural events.133 During the past couple
centuries, human disturbance has greatly accelerated the rate of
ecological change, significantly altering most ecosystems and
simultaneously imperiling species survival too.134 Historical time is

129. For a discussion of ecosystem management principles, see KEITER, supra note 9, at
72–73, and HANNA J. CORTNER & MARGARET A. MOOTE, THE POLITICS OF ECOSYSTEM

130. See COMM. ON NONECONOMIC & ECON. VALUE OF BIODIVERSITY, NAT'L. RES.
COUNCIL, PERSPECTIVES ON BIODIVERSITY: VALUING ITS ROLE IN AN EVER CHANGING WORLD
20–37 (1999); REED F. NOSS & ALLEN Y. COOPERRIDER, SAVING NATURE'S LEGACY:
PROTECTING AND RESTORING BIODIVERSITY 313 (1994); OFFICE OF TECH. ASSESSMENT, U.S.
CONG., supra note 54, at 3.

131. See Ariel E. Lugo et al., Ecosystem Process and Functioning, in 2 ECOLOGICAL
STEWARDSHIP: A COMMON REFERENCE FOR ECOSYSTEM MANAGEMENT 219 (N.C. Johnson et
al. eds., 1999); Norman L. Christensen et al., The Report of the Ecological Society of America
Committee on the Scientific Basis for Ecosystem Management, 6 ECOLOGICAL APPLICATIONS 665,

132. See NOSS & COOPERRIDER, supra note 130, at 93–98; KEITER, supra note 9, at 49–54,
65–75.

133. See generally DANIEL B. BOTKIN, DISCORDANT HARMONIES: A NEW ECOLOGY FOR THE

134. See also Brian Czech, A Chronological Frame of Reference for Ecological Integrity and
therefore an important consideration in any ecological management endeavor; it serves as a measuring standard for understanding ecological conditions before human-induced changes altered the landscape, and it provides a basis for estimating the trajectory (or rate) of change that was the historical norm.

The Forest Service's 2000 diversity regulations incorporated important spatial and temporal scale considerations into the agency's planning processes, which initially ignored many of these concerns. Indeed, the original NFMA diversity regulations focused primarily on two dimensions of ecological scale: individual species and their immediate habitat needs. Ecosystem considerations were not fully integrated into planning, though management indicator species were used to monitor the impact of management activities on "selected biological communities or on water quality." The original regulations also limited the agency's planning responsibilities to within national forest boundaries, with little attention given the larger ecological context or overall ecosystem conditions. Moreover, the original NFMA diversity regulations did not reference species diversity to any particular historical period or time frame; rather, the regulations measured animal and plant diversity against "that which would be expected in a natural forest" with no further explanation of what "natural" might mean.

The Clinton era regulations, however, significantly expanded the scale of forest planning efforts, including biodiversity conservation obligations. The 2000 regulations provided for planning at the national, regional, forest, and project level, including the use of broad-scale assessments to expand the geographical scope of forest planning efforts. The ecological sustainability regulation stated that "the planning process must include development and analysis of information regarding [ecosystem diversity and species diversity] at a variety of spatial and temporal scales [including] geographic areas such as bioregions and watersheds, scales of biological organization such as communities and species, and scales of time ranging from months to

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137. 36 C.F.R. § 219.27(g) (1999).
138. 36 C.F.R. § 219.3(b) (2004).
139. Id. § 219.5(a), .20(a); see also id. § 219.12 (providing for collaboratively developed landscape goals).
centuries."¹⁴⁰ The same regulation also expanded the Forest Service's planning obligations beyond individual species and habitats to embrace ecosystem diversity, requiring analysis of ecological processes (including natural disturbance processes) at relevant spatial and temporal scales.¹⁴¹ Species diversity evaluations were also framed in terms of "identifying ecological conditions needed to maintain species viability over time."¹⁴² With respect to temporal scale concerns, the 2000 regulations required forest managers to estimate the range of variability for ecological change, and stated that "plan decisions affecting ecosystem diversity must provide for maintenance or restoration of the characteristics of ecosystem composition, structure within the range of variability that would be expected to occur under natural disturbance regimes of the current climatic period...."¹⁴³ In short, the Forest Service's 2000 NFMA regulations were sensitive to integrating ecological scale concerns into forest planning and management, basically tracking the contemporary scientific understanding of ecosystems, ecological interactions, and evolutionary patterns.

In contrast, the Bush administration's revised 2005 planning regulations reflect little sensitivity to spatial or temporal scale concerns. Focused on minimizing the prescriptive impact of the planning regulations, the 2005 revisions do not obligate the Forest Service to plan at any particular scale or to identify any particular time frame for assessing ecological conditions. The new regulations instead vest Forest Service officials with broad discretion to define the relevant "area of analysis" during the planning process, which may vary depending on the issue.¹⁴⁴ The regulations, though, do admonish agency officials to "provid[e] ecological conditions to support diversity of native plant and animal species in the plan area."¹⁴⁵ This is to be done by promoting "ecosystem diversity," which seemingly contemplates ecological scale planning efforts;¹⁴⁶ yet the sustainability obligation only applies within the "plan area," which extends only to the national forest boundaries.¹⁴⁷ And with the NEPA EIS requirement eliminated from forest planning, agency officials are no longer legally obligated to address cumulative

¹⁴⁰  Id. § 219.20(a).
¹⁴¹  Id. § 219.20(a)(1)(i).
¹⁴²  Id. § 219.20(a)(2)(ii).
¹⁴³  Id. § 219.20(b)(1).
¹⁴⁴  36 C.F.R. § 219.16 (2005), 70 Fed. Reg. at 1061 (defining "area of analysis" to extend beyond the plan area).
¹⁴⁷  36 C.F.R. § 219.16 (2005), 70 Fed. Reg. at 1061 (defining the term "plan area" as applying only within national forest boundaries).
impacts in the planning process. In addition, the new regulations make no effort to address the temporal dimensions of ecological planning; they merely reference "diversity" to "native plant and animal species in the plan area" without further defining how a "native" determination is to be made. Unless these important spatial and temporal scale issues are addressed in the forthcoming Forest Service directives that will embellish these new planning rules, agency officials have little guidance on how to meet their new "ecological diversity" obligations under this otherwise ill-defined ecosystem approach to forest planning.

The FWS's ecological policies also incorporate contemporary spatial and temporal scale concerns into refuge management. By defining biological integrity, diversity, and environmental health in terms of ecological conditions and processes, the FWS's policy perforce expands refuge planning responsibilities to a larger geographic scale. Specifically, the policy provides that "refuge managers will consider their refuges' contribution to [ecological integrity] at multiple landscape scales." To meet this responsibility, managers must identify the refuge's purposes within the ecosystem and consider its "importance to refuge, ecosystem, national, and international scales of biological integrity, diversity, and environmental health." Besides maintaining ecological integrity at the refuge scale, the FWS must also "restore lost or degraded elements of [biological integrity] at all landscape scales where it is feasible and supports fulfillment of refuge purposes." To inject temporal scale considerations into refuge planning, the policy states, "the highest measure of [ecological integrity] is viewed as those intact and self-sustaining habitats and wildlife populations that existed during historic conditions." The "historic conditions" standard is then used to

148. See supra note 44 and accompanying text. In explaining its NEPA revisions, the Forest Service indicates that it will account for cumulative effects in the planning process through the mandated comprehensive evaluation, annual plan monitoring requirements, and a required five year review of the comprehensive evaluations. 70 Fed. Reg. at 1033. Moreover, cumulative effects will be evaluated using traditional NEPA protocols (EISs or EAs) when proposed projects or activities are evaluated. 70 Fed. Reg. at 1033.

149. See supra notes 54-56 and accompanying text for definitions of these terms.


151. U.S. FISH & WILDLIFE SERV., supra note 3, 601 FW 3.9A, 3.9D; see also id. 601 FW 3.10B(2) (requiring refuge managers to evaluate biodiversity at various landscape scales).

152. Id. 601 FW 3.15A. Notably, the FWS has qualified its refuge restoration obligations by "feasibility" and "fulfillment of refuge purposes" language.

153. Id. 601 FW 3.10. "Historic conditions" are defined as the "composition, structure, and functioning of ecosystems resulting from natural processes that we believe, based on
assess current ecological conditions and as "a frame of reference in which to develop [management] goals and objectives."\textsuperscript{154} The overall objective is to "ensure that our management activities result in the establishment of a community that fits within what we reasonably believe to have been the natural successional series, unless doing so conflicts with accomplishing refuge purpose(s)."\textsuperscript{155} Although the FWS, in accordance with the Improvement Act, has qualified its management obligations with references to individual refuge purposes, these provisions nonetheless significantly expand the geographic and temporal scale of refuge planning and decision processes.

Both agencies have acknowledged the need for planning to extend beyond existing public land boundaries, reflecting an evolving federal understanding of ecological scale realities. For the Forest Service, this extraterritorial planning concern was best captured in the 2000 planning regulations, which provided for cooperatively developed landscape scale goals, coordination among federal agencies, and involvement with state and local governments, Native American tribes, and private landowners,\textsuperscript{156} though no provision tackled how to resolve conflicts with adjacent landowners or managers. The Bush administration’s 2005 revisions have notably deleted any reference to landscape-scale planning efforts, though they still promote collaborative planning efforts with other federal agencies and governmental entities, along with affected communities, groups, and persons.\textsuperscript{157} The FWS’s sound professional judgment, were present prior to substantial human related changes to the landscape." Id. 601 FW 3.6D.

\textsuperscript{154} Id. 601 FW 3.12A. In contrast to the Forest Service, the FWS utilizes a somewhat different temporal measurement ("historic conditions" rather than "range of variability") to define its ecological management responsibilities. Regardless, several critics object to the use of any historical standard as a basis for contemporary natural resource management goals or objectives. See, e.g., WILDERNESS AND POLITICAL ECOLOGY: ABORIGINAL INFLUENCES AND THE ORIGINAL STATE OF NATURE (Charles E. Kay & Randy T. Simmons eds., 2002); Thomas M. Bonnicksen et al., Native American Influences on the Development of Forest Ecosystems, in 2 ECOLOGICAL STEWARDSHIP: A COMMON REFERENCE FOR ECOSYSTEM MANAGEMENT, supra note 131, at 439. See generally Wallace Covington et al., Ecosystem Restoration and Management: Scientific Principles and Concepts, in 2 ECOLOGICAL STEWARDSHIP: A COMMON REFERENCE FOR ECOSYSTEM MANAGEMENT, supra note 131, at 601; STEPHEN BUDIAINSKY, NATURE’S KEEPERS: THE NEW SCIENCE OF NATURE MANAGEMENT (1995).

\textsuperscript{155} U.S. FISH & WILDLIFE SERV., supra note 3, 601 FW 3.12D.


\textsuperscript{157} 36 C.F.R. § 219.9 (2003), 70 Fed. Reg. at 1058-59. The 2005 regulations also specifically instruct Forest Service planners to engage adjacent private landowners in the planning process. Id. § 219.9(a) (2005). See also 70 Fed. Reg. at 1029 (noting that the final rule does “not explicitly require[e] analysis of ecosystem diversity at multiple temporal and spatial scales, analysis of disturbance regimes, or analysis of the landscape context” but that “appropriate guidance will be included in the Forest Service directives”).
extraterritorial refuge management policies reflect not only its understanding of landscape dynamics, but also the need to address and minimize external threats to refuge conditions. Emphasizing the agency’s preference to cooperatively resolve transboundary refuge problems, the ecological integrity policy outlines a progressive set of strategies that managers might pursue ranging from direct discussions and local zoning meetings to potential legal action. Neither agency, however, addresses the underlying question of federal authority over adjacent lands, preferring instead to endorse collaborative strategies for resolving potential resource conflicts. Whether this process-based approach to external threat problems will relieve the wildlife refuges or other public lands of these transboundary problems remains to be seen.

From an ecological perspective, the principal reason to extend the spatial planning scale is to enhance wildlife habitat by minimizing fragmentation on the landscape. Conservation biologists have convincingly demonstrated that the long-term maintenance and restoration of biodiversity is dependent upon an expansive and interconnected network of nature reserves designed to withstand major disturbances and to facilitate genetic interchange among disjunct populations. Even on the western federal lands, few areas (including the relatively small and dispersed national wildlife refuges) meet these aspirational conservation goals, which means an array of public land


159. Significantly, the draft FWS policy on external threat problems contemplated aggressive legal action by the agency: “If these [voluntary cooperative] efforts fail to protect the refuge, refuge managers should request the Office of the Solicitor for assistance in pursuing civil remedies, such as an injunction or damages, just as any other landowner would.” Draft Policy on Maintaining the Ecological Integrity of the National Wildlife Refuge System; Notice, 65 Fed. Reg. 61,356, 61,362 (Oct. 17, 2000). The final version, however, merely states that the FWS “may take action within the legal authority available to the Service and with full respect to private property rights.” U.S. FISH & WILDLIFE SERV., supra note 3, 601 FW 3.20(D); Policy on Maintaining the Biological Integrity, Diversity, and Environmental Health of the National Wildlife Refuge System, 66 Fed. Reg. 3810, 3823 (Jan. 16, 2001). On the general question of federal authority over privately owned lands adjacent to public lands, see Peter A. Appel, The Power of Congress “Without Limitation”: The Property Clause and Federal Regulation of Private Property, 86 MINN. L. REV. 1 (2001).

160. See generally CONTINENTAL CONSERVATION: SCIENTIFIC FOUNDATIONS OF REGIONAL RESERVE NETWORKS (John Terborgh & Michael E. Soule eds., 1999); Noss & COOPERRIDER, supra note 130; see also Reed F. Noss, Some Suggestions for Keeping National Wildlife Refuges Healthy and Whole, 44 NAT. RESOURCES J. 1093 (2004).

161. See Noss & COOPERRIDER, supra note 130, at 69–84; William D. Newmark, Legal and Biotic Boundaries of Western North American National Parks: A Problem of Congruence, 35 BIOLOGICAL CONSERVATION 197, 198, 204–06 (1985); William D. Newmark, Extinction of Mammal Populations in Western North American National Parks, 9 CONSERVATION BIOLOGY
designations and private land holdings must be knit together into a viable ecosystem complex. Without mentioning the term "fragmentation," both the Forest Service's NFMA regulations and the FWS's new refuge policies seem to acknowledge a role for coordinated and ecologically intact landscape management. Under the 2005 NFMA sustainability regulation, the Forest Service must "provide[ec]ological conditions...to support diversity of native plant and animal species in the plan area," which, by inference, can involve addressing ecosystem diversity at a landscape scale.\(^\text{162}\) Even more directly, the FWS's conservation planning policy endorses an ecosystem approach to planning that puts wildlife first,\(^\text{163}\) while its ecological integrity policy requires refuge managers to "consider their refuges' contribution to [ecological integrity] at multiple landscape scales."\(^\text{164}\) Thus, though federal public land officials may have little direct authority over adjacent lands, they cannot ignore cross-boundary activities that could isolate or

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162. 36 C.F.R. § 219.10(b) (2005), 70 Fed. Reg. at 1059. The 2005 sustainability regulation focuses on ensuring “ecosystem diversity” that is defined in terms of the “area of analysis,” which by definition can extend beyond national forest boundaries. See 36 C.F.R. § 219.16 (2005), 70 Fed. Reg. at 1061. In contrast, under the 2000 NFMA “species diversity” regulation, Forest Service officials were required to “provide for ecological conditions that the responsible official determines provide a high likelihood that those conditions are capable of supporting over time the viability of native and desired non-native species well-distributed throughout their ranges within the plan area.” 36 C.F.R. § 219.20(b)(2) (2004). Moreover, the regulation provided that “[a] species is well distributed when individuals can interact with each other in the portion of the species range that occurs within the plan area.” Id. Near the end of the Clinton administration, the Forest Service released a controversial roadless area conservation rule that was designed, in large measure, to further minimize fragmentation of undisturbed national forest lands in order to enhance biodiversity resources. See 36 C.F.R. 294.12 (2004); U.S. FOREST SERV., FOREST SERVICE ROADLESS AREA CONSERVATION FINAL ENVIRONMENTAL IMPACT STATEMENT (2000); Kootenai Tribe of Idaho v. Veneman, 313 F.3d 1094, 1105 (9th Cir. 2002); Wyoming v. United States Dep't of Agric., 277 F. Supp. 2d 1197, 1206–12 (D. Wyo. 2003). Significantly, a recent study concludes that national forest roadless lands correspond very closely to the habitat needs of ESA-listed species. See Colby Loucks et al., USDA Forest Service Roadless Areas: Potential Biodiversity Conservation Reserves, 7 CONSERVATION ECOLOGY 5, 8 (2003), available at http://www.consecol.org/vol7/iss2/art5.

163. See U.S. FISH & WILDLIFE SERV., supra note 3, 602 FW 1.3 (putting wildlife first); id. 602 FW 1.4 (providing for ecological integrity); id. 602 FW 1.7 (providing for regional and ecosystem plans); id. 602 FW 3.3C (ecosystem approach to planning).

164. See U.S. FISH & WILDLIFE SERV., supra note 3, 601 FW 3.7C, D; Policy on Maintaining the Biological Integrity, Diversity, and Environmental Health of the National Wildlife Refuge System, 66 Fed. Reg. 3810, 3818 (Jan. 16, 2001); see also U.S. FISH & WILDLIFE SERV., supra note 3, 601 FW 3.9D (requiring consideration of "the refuge's importance to refuge, ecosystem, national, and international scales of [ecological integrity]"); id. 601 FW 3.15A (providing for ecological restoration, if feasible, at all landscape scales).
fragment their own lands to the detriment of national ecological conservation goals.

Adaptive management has become a critical dimension of ecological management—one that has potentially far-reaching legal consequences. Because the science accompanying ecological management is often experimental, adaptive management contemplates contingent or provisional resource management decisions, which are then subject to revision to accommodate scientific uncertainty. This involves establishing baseline conditions, monitoring, reevaluation, and adjustment to reflect changes in scientific knowledge as well as evolving human concerns.\(^{165}\) Under the NFMA and the Improvement Act, both the Forest Service and FWS must revise their respective plans if conditions change significantly.\(^{166}\) Because resource management plans have legal consequences,\(^{167}\) both agencies face NEPA and ESA compliance issues whenever they revise existing plans to address new scientific information or changed circumstances.\(^{168}\) Not surprisingly, the Forest Service and FWS, each of which are subject to statutory inventorying and monitoring requirements,\(^{169}\) have incorporated adaptive management protocols into their planning and decision-making processes. The Bush administration’s 2005 revised regulations contain only general monitoring and evaluation provisions,\(^{170}\) while the FWS’s comprehensive conservation planning policy incorporates explicit monitoring, evaluation, and revision provisions.\(^{171}\) Significantly, the

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167. Id. §§ 668dd(e)(1)(E), 1604(i).

168. See, e.g., Friends of the Clearwater v. Dombeck, 222 F.3d 552, 556–58 (9th Cir. 2000); Pac. Rivers Council v. Thomas, 30 F.3d 1050, 1053 (9th Cir. 1994).


171. See U.S. FISH & WILDLIFE SERV., supra note 3, 602 FW 3.4(7), (8); Refuge Planning Policy Pursuant to the National Wildlife Refuge System Administration Act as Amended by the National Wildlife Refuge System Improvement Act of 1997, 65 Fed. Reg. 33,892, 33,914–15 (May 25, 2000); see also U.S. FISH & WILDLIFE SERV., supra note 3, 601 FW 3.19(c);
lower courts have found that inventory and monitoring commitments contained in forest plans are legally enforceable.\(^{172}\) A similar result can be expected for the refuges, inasmuch as the Improvement Act contains a monitoring requirement\(^{173}\) and renders conservation plans legally binding documents. But drawing upon its Northwest Forest Plan experience,\(^{174}\) the Forest Service’s 2005 planning regulations minimize the scope of its legal monitoring commitments as well as its potential exposure to legal liability for failing to meet these commitments.\(^{175}\) Nonetheless, adaptive management is now a legally required dimension of national forest and national wildlife refuge management.

C. Accountability

To ensure implementation of these new ecological management principles, the law governing the public land agencies must also provide for accountability. Without meaningful oversight or enforcement procedures, those charged with implementing ecological standards retain the license to ignore them at will. As illustrated by the northern spotted owl litigation and other such controversies, the realistic threat of administrative appeal or judicial review is essential if new management protocols are to make any real difference on the ground. The key questions are whether the new ecological management standards create enforceable legal obligations, and whether effective administrative or judicial review opportunities are available. Two related matters also

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174. After initially committing to monitor a large number of species for biodiversity purposes, the Forest Service eventually reduced its monitoring program for efficiency purposes. See U.S. FOREST SERV. & BUREAU OF LAND MGMT., FINAL SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT FOR AMENDMENT TO THE SURVEY & MANAGE, PROTECTION BUFFER, AND OTHER MITIGATION MEASURES, STANDARDS AND GUIDELINES (2000).

175. See 36 C.F.R. § 219.3(b) (2005), 70 Fed. Reg. at 1056 (providing that “plans do not...create any legal rights”); see also supra note 170 and accompanying text.
merit attention: whether the recent concern over "analysis paralysis" is warranted, and whether the proliferating collaborative conservation movement is subject to meaningful accountability.

The initial question is whether the ecological integrity regulations or policies create legally binding standards that constrain agency actions. The answer for the Forest Service would seem to be straightforward. As a formal regulation, the NFMA diversity rules are binding on the agency,176 which has found its management options circumscribed in several cases enforcing the 1982 regulations.177 But the Bush administration, in an effort to minimize the Forest Service's legal vulnerability, does not precisely define its diversity obligations in the 2005 planning regulation revisions, opting instead to incorporate these details in the agency's manual and directives.178 For the FWS, its ecological policies are not obviously binding on the agency, because they were not promulgated as formal regulations but rather as policies. The courts have split over whether agency policy manuals and similar sources are legally binding. One court has expressly ruled that the refuge manual does not bind the FWS because it lacks the requisite formality that accompanies notice and comment rulemaking.179 But other courts, including the influential D.C. Circuit Court of Appeals, have taken a more pragmatic view and inquired whether the agency intended to be bound by a management policy document.180 Thus, despite the attention given to ecological principles and diversity-related concerns, the agencies may be free to ignore them without fear of judicial reprisal, effectively rendering them mere enlightened statements of intent without real legal significance.

176. Chrysler Corp. v. Brown, 441 U.S. 281, 297 (1979) ("[P]roperly promulgated agency regulations have the 'force and effect of law.'").

177. See, e.g., Seattle Audubon Soc' y v. Espy, 998 F.2d 699, 701–02 (9th Cir. 1993); Sierra Club v. Martin, 168 F.3d 1, 2 (11th Cir. 1999); Forest Guardians v. United States Forest Serv., 180 F. Supp. 2d 1273, 1281–82 (D.N.M. 2001).

178. 70 Fed. Reg. at 1029; see also supra notes 36–40 and accompanying text, which describes the vagueness and imprecision of the 2005 revised sustainability-diversity regulation.


The initial check on agency authority is often an administrative appeal, which has become quite controversial in the public land context. As part of their public participation processes, the Forest Service and other agencies have established internal administrative appeal opportunities to review management decisions for legal conformity and policy consistency. But Congress, concerned that the administrative appeal process was being abused to delay agency decisions, has tightened the Forest Service's internal appeal processes, first through omnibus legislation, and then through more targeted limitations involving forest thinning projects. Moreover, in its revised 2005 NFMA planning regulations, the Forest Service has replaced its traditional administrative appeal process with a new pre-decisional review opportunity that not only reduces the internal levels of review available but also limits the category of persons entitled to object to planning decisions. In contrast, the FWS does not provide any opportunity for administrative appeal of refuge planning decisions. Neither the Improvement Act nor the new comprehensive conservation planning policies make provision for administrative review; instead, dissatisfied constituents must seek judicial review of any planning decisions with which they disagree. Whatever the reason for these different administrative review policies, the courts will also play an

181. See COGGIN & GLICKSMAN, supra note 15, § 7:21; see also Appeals, Litigation, and Forest Policy, 102 J. OF FORESTRY 8, 8-50 (2004) (containing a series of articles related to appeals, litigation, and forest policy).
185. 36 C.F.R. § 219.13 (2005), 70 Fed. Reg. at 1059-60. In short, the 2005 regulations establish a new 30-day pre-decision review procedure that is only available to those persons who participated with written comments in the planning process. A reviewing officer must render a prompt written response to the objections, which constitutes the agency's final decision on any plan objections. Id. The regulations, however, treat objections to forest plan revisions and amendments differently than appeals of site-specific project decisions, which are subject to the agency's usual administrative appeal rules. Id. § 219.13(a)(1) (2005), 70 Fed. Reg. at 1059. The Clinton administration's 2000 regulations made a similar distinction. 36 C.F.R. §§ 219.32-219.33 (2004).
186. Perhaps the different approaches merely reflect the different constituencies and management options confronting the two agencies. With its more open-ended multiple-use mandate, the Forest Service faces an extraordinarily diverse and contentious constituency as well as a wide array of resource management options and demands. In contrast, the FWS confronts a more homogenous (though still contentious) constituency and has a more
important role in shaping ecological integrity policies for both the national forests and refuges.

Indeed, the federal judiciary has assumed a vital role in contemporary public land law and policy notwithstanding recurrent institutional competence concerns. Under the Administrative Procedures Act, agency planning and project decisions are subject to judicial review for conformance to the law and to ensure against arbitrariness. With the courts actively enforcing environmental and other laws, both the agencies and Congress have chafed under the heightened oversight, citing the need for greater efficiency and less procedural complexity. In the case of the Forest Service, Congress has on several occasions significantly curbed judicial review opportunities. The 1995 Salvage Logging rider estopped the courts from reviewing timber harvest decisions for compliance with the NFMA, NEPA, or the ESA, while the 2003 Healthy Forests Restoration Act contains several procedural and remedial limitations on the courts. In the case of the FWS, judicial review affords the only real oversight of the agency’s ecological integrity and related planning decisions, with the refuge plan and the accompanying Record of Decision constituting an administrative record that the courts may scrutinize for substantive and procedural regularity. Given the relative paucity of court decisions on refuge

limited range of resource management options under its predominantly preservation-oriented mandates.

187. 5 U.S.C. § 706 (Supp. I 2001). Judicial review serves myriad agency accountability functions: it can give meaning and consistency to vague or unclear statutory standards, clarify sometimes complex procedural requirements, ensure regularity and fairness, and serve as a constant reminder to agency officials that they are subject to the rule of law. See generally GEORGE C. COGGINS ET AL., FEDERAL PUBLIC LAND AND RESOURCES LAW 284–321 (5th ed. 2002). But see Norton v. S. Utah Wilderness Alliance, ___ U.S. __, 124 S. Ct. 2373 (2004); Ohio Forestry Ass’n v. Sierra Club, 523 U.S. 726 (1998), both calling into question the reviewability of public land agency planning decisions and commitments.


189. Healthy Forests Restoration Act of 2003, 16 U.S.C. § 6501 (West Supp. 2004). In brief, the Healthy Forests Restoration Act limits the venue for judicial review to the federal court located in the district where the proposed thinning project will occur, encourages the federal courts to review such challenges expeditiously, limits the length of preliminary injunctive relief, and provides general guidance for weighing the equities for injunctive relief. Id. § 6516.

190. Moreover, the “compatibility” regulations of the FWS are legally binding on the agency; they require the FWS to develop a written record supporting its compatibility decisions, which are then subject to judicial review.
management policy, Congress has shown no interest in limiting judicial oversight of the FWS's planning or management decisions. Based on the Forest Service's experience, the technical nature of ecological integrity policies will not deter the courts from reviewing implementation challenges. Rather, unless constrained by Congress, the judiciary has proven repeatedly that it has both the authority and capacity to enforce such obligations.

Within the public land agencies, legal accountability has given rise to a growing concern over legal complexity. Besides complying with their own individual (and increasingly more prescriptive) organic mandates, the agencies must also adhere to a plethora of cross-cutting environmental laws, including NEPA and the ESA. Agency officials, particularly in the Forest Service, believe that the combination of these laws has resulted in "analysis paralysis." They assert that the courts, by insisting on rigorous compliance with an array of NEPA and ESA procedural requirements, have essentially disabled them from implementing even well-conceived decisions for fear of judicial intervention. Accordingly, in its revised 2005 NFMA planning regulations, the Forest Service has dramatically reduced the agency's NEPA obligations by categorically excluding forest plans from NEPA documentation requirements and postponing any EIS analysis until site-specific project decisions are made. For its part, the FWS has avoided


193. See, e.g., Blue Mountains Biodiversity Project v. Blackwood, 161 F.3d 1208, 1211 (9th Cir. 1998); League of Wilderness Defenders v. Marquis-Brong, 259 F. Supp. 2d 1115, 1119-20 (D. Or. 2003); Pac. Rivers Council v. Thomas, 30 F.3d 1050, 1051-53 (9th Cir. 1994).

194. 36 C.F.R. § 219.4 (2005), 70 Fed. Reg. at 1056; see also Department of Agriculture, Forest Service, National Environmental Policy Act Documentation Needed for Developing, Revising, or Amending Land Management Plans; Categorical Exclusions, 70 Fed. Reg. 1062 (Jan. 5, 2005). The rationale for this NEPA categorical exclusion is that forest plans are contingent and do not ordinarily authorize ground-disturbing projects or activities. And even with a forest plan EIS, the Forest Service has ordinarily still done extensive additional NEPA analysis at the project stage. 70 Fed. Reg. at 1063-64; Ohio Forestry Ass'n v. Sierra Club, 523 U.S. 726, 733 (1998); Norton v. S. Utah Wilderness Alliance, _ U.S. _, 124 S. Ct. 2373, 2382 (2004). Of course, by postponing full NEPA compliance until the project stage, it
the EIS issue, providing only that "appropriate NEPA documentation" must be prepared in conjunction with refuge plans.\textsuperscript{195} Any reduction in NEPA or ESA compliance, however, runs the risk that the agencies could overlook or misinterpret important scientific information, as occurred repeatedly in the Forest Service's rush to salvage fire-damaged timber in the Pacific Northwest.\textsuperscript{196} And by focusing on NEPA compliance at the project level, the agencies may effectively reduce the scale of their environmental analysis. More troubling, this reduction in environmental compliance obligations overlooks (or discounts) the fact that it has been the aggregate environmental laws, as interpreted by the courts, that have convinced the agencies to begin taking their ecological management obligations seriously.\textsuperscript{197} Put bluntly, the rush toward less law and greater efficiency may well diminish the full impact of this new generation of ecological standards and science.

In recent years, the public land agencies have engaged in an array of informal collaborative management arrangements in an effort to improve their decision processes and to reduce the level of controversy. Operating in the shadow of the law, these new collaborative arrangements (or partnerships) find their sanction in occasional statutory references to public involvement or interagency coordination.\textsuperscript{198} Drawing upon this legal foundation, the Forest Service's 2005 planning regulations expressly mandate public involvement throughout the planning process and impose related collaboration and coordination obligations without defining exactly how agency officials must


\textsuperscript{197} See KErrER, supra note 9, at 118–22; Houck, supra note 9, at 891. See also COMMITTEE OF SCIENTISTS REPORT, supra note 111, at 145–46.

proceed.\textsuperscript{199} Although the Improvement Act also contains public involvement and coordination provisions,\textsuperscript{200} the FWS has not explicitly embraced collaborative conservation arrangements in its refuge planning policies, which are mostly framed in general terms.\textsuperscript{201} In any event, the informal nature of these collaborative partnerships raises serious fairness and accountability concerns, some of which are addressed in the law.\textsuperscript{202} The Federal Advisory Committee Act (FACA) imposes important procedural requirements on collaborative initiatives when non-federal participants are involved,\textsuperscript{203} while the \textit{NPCA v. Stanton} ruling admonishes that agency officials cannot relinquish their decision authority to such entities.\textsuperscript{204} Thus, though collaborative initiatives may

\textsuperscript{199} 36 C.F.R. § 219.9(a) (2005), 70 Fed. Reg. at 1058. More specifically, the rule states that agency officials “must use a collaborative and participatory approach to land management planning” and that they “shall involve the public in developing and updating the comprehensive evaluation report, establishing components of the plan, and designing the monitoring program.” \textit{Id}. But it then gives agency officials “the discretion to determine methods and timing of public involvement opportunities.” \textit{Id}. And unlike the Clinton administration’s 2000 planning regulations, which emphasized collaborative ecosystem scale planning, the 2005 revisions make no reference to cooperatively developed landscape goals. 36 C.F.R. § 219.12 (2004).


\textsuperscript{201} See \textit{U.S. Fish & Wildlife Serv., supra} note 3, 602 FW 3.3(F), (H), 3.4(C) (providing for public involvement and coordination in the conservation planning process); \textit{id}. 602 FW 3.5(C)(5)(e) (providing for public involvement in NEPA planning processes); see also \textit{id}. 601 FW 3.20; Policy on Maintaining the Biological Integrity, Diversity, and Environmental Health of the National Wildlife Refuge System, 66 Fed. Reg. 3817, 3822 (Jan. 16, 2001) (noting that the FWS “desire[s] cooperative resolutions” in disputes with adjacent landowners).

\textsuperscript{202} On the advent of collaborative partnerships and similar arrangements in natural resource policy, see generally \textsc{Ronald D. Brunner} \textit{et al., Finding Common Ground: Governance and Natural Resources in the American West} (2002); \textsc{Julia M. Wondolleck} \& \textsc{Steven L. Yaffee, Making Collaboration Work: Lessons from Innovation in Natural Resource Management} (2000); \textit{Across the Great Divide: Explorations in Collaborative Conservation and the American West} (Philip Brick et al. eds., 2001); and \textsc{Bradley C. Karkkainen, Collaborative Ecosystem Governance: Scale, Complexity, and Dynamism, 21} \textit{Va. Envtl. L.J.} 189 (2002).


\textsuperscript{204} 54 F. Supp. 2d 7, 17–21 (D.D.C. 1999); \textit{see also Keiter, supra} note 9, at 244–58; \textsc{Sydney Cook, Revival of Jeffersonian Democracy or Resurgence of Western Anger? The Emergence of Collaborative Decision Making, 2000} \textit{Utah L. Rev.} 575, 588.
help facilitate ecological planning and management efforts, engagement in these ad hoc initiatives does not relieve the agencies from their substantive legal obligations and may even inject more law into the process.

III. IMPLICATIONS FOR THE FUTURE

It would be blinking at reality to ignore or depreciate the growing incidence of biodiversity conservation and related ecological terms in the laws governing the public lands. Congress has not only incorporated several such provisions into various organic and enabling statutes, but these provisions are becoming more detailed and prescriptive. Among the four principal public land agencies, only the BLM lacks clear biodiversity conservation responsibilities as part of its management mission. Moreover, Congress has begun to acknowledge a role for ecological restoration on the public domain, both on the heavily used multiple-use lands as well as the preserved lands. To be sure, Congress is still strongly wedded to the traditional missions of the agencies; the NFMA reinforces the Forest Service’s multiple-use mandate, while the Improvement Act defers to original refuge purposes to resolve resource conflicts. But even then, Congress has instructed the agencies to employ ecological principles in their planning and decision processes, providing an opportunity to test scientific management on the public domain. Although counterexamples persist, the trend in federal public land legislation is toward the increased use of biodiversity standards as well as ecological management principles—all reflecting a growing congressional comfort with ecology as a basis for managing the public domain.

For their part, the public land agencies have used their administrative authority to incorporate ecological standards and principles into their policy agendas. Few now dispute that the public land agencies have both the legal direction and the authority to undertake ecological planning and management experiments, whether on the multiple-use or preservation lands. Drawing upon general organic act language, as well as an array of environmental laws, the

205. See supra notes 71–74 and accompanying text. Of course, the Endangered Species Act imposes significant biodiversity conservation obligations on the BLM along with the other agencies. See supra notes 123–128 and accompanying text.

agencies have consciously elevated biological considerations in their decision processes. During the Clinton administration, the Forest Service not only legally bound itself to ecological management policies through formal rules, but it also sought to give ecological sustainability priority in managing the national forests. The FWS, confronted with the Improvement Act’s explicit ecological integrity mandate, has promulgated detailed policies that employ conservation biology theory to guide refuge management. The Park Service and the BLM, to a greater and lesser extent, also followed suit through various policy documents, though the BLM’s efforts have been curtailed by the vicissitudes of contemporary politics, particularly the current Bush administration’s emphasis on energy development. The fact that the agencies have employed different legal tools—rulemaking versus policy statements—to undertake these new commitments should help further define the appropriate role of law in developing a robust ecological management program.

One cannot discount the role of the judiciary in ensuring agency adherence to the rule of law on the public lands. Despite sometimes outright political resistance, the courts have propelled the public land agencies toward more ecologically sensitive management policies and helped elevate biodiversity conservation in agency decision processes. Not only was the judiciary instrumental in bringing about the Northwest Forest Plan, but the courts have compelled the agencies to broaden the scale of their NEPA environmental analyses and to take their ESA species protection obligations seriously. Though often a painful process for the agencies and their constituents, judicial oversight invests the various biodiversity and ecological integrity statutory mandates, agency regulations, and policy statements with real meaning, converting them into meaningful management prescriptions for which the agencies are accountable. The courts, undeterred by contrary institutional capacity arguments, have not hesitated to intervene when the agencies have disregarded legally mandated ecological concerns, which is a testament to the ability of the law to accommodate complex scientific concepts in statutory language and judicial opinions. Notwithstanding the asserted “process predicament,” both the courts and the agencies have

207. See KEITER, supra note 9, at 80-113, 118-22; see also supra notes 19-20 and accompanying text.
209. See supra notes 192-197 and accompanying text.
gradually begun to clarify ambiguous statutory and regulatory language, thus rendering these diverse laws into a more functional whole. Through this process, the courts should help reduce the uncertainty and complexity of the present legal regime. The results can only hasten the ongoing merger between ecology and the law.

One of the most significant developments in public land policy is the expanded scale at which planning and management decisions are being framed to address ecological realities on the ground. During the Clinton administration, the federal agencies undertook several major regional planning initiatives, including the Northwest Forest Plan, Sierra Nevada forest plan amendment process, and the ambitious Interior Columbia Basin Ecosystem Management Plan.210 Driven by a combination of court rulings, interrelated legal and regulatory mandates, and well-documented ecological concerns, these regional planning initiatives (mostly involving multiple-use lands) have helped reveal the benefits and problems associated with such efforts. Most obviously, regional planning has allowed the agencies to address biodiversity concerns at the relevant ecological scale, which not only enabled them to lift an injunction blocking timber harvesting in the Pacific Northwest forests,211 but also to avoid an ESA listing for the California spotted owl in the Sierra Nevada forests.212 These efforts have also spawned an array of community-based collaborative conservation initiatives, creating an alternative forum for addressing difficult transboundary resource management issues before they escalate into court challenges or legislative donnybrooks.213

But problems are evident too. Unsettled legal issues have accompanied these new regional planning initiatives, including tough NEPA and ESA compliance questions that arise when management decisions cascade from the regional to the unit level (i.e., individual national forest or wildlife refuge) and then to individual projects. The Northwest Forest Plan experience illustrated the need for realistic biodiversity monitoring standards,214 while the Interior Columbia Basin Ecosystem Management Project imbroglio revealed the necessity for

210. These various initiatives are discussed and referenced in KEITER, supra note 9, at 96–105, 162–69, 278–84.
212. See 12-Month Finding for a Petition to List the California Spotted Owl (Strix occidentalis occidentalis), 68 Fed. Reg. 7580 (Feb. 14, 2003); see also KEITER, supra note 9, at 274–85.
213. Examples of these collaborative initiatives can be found in BRICK ET AL., supra note 202, at 77–160; see also KEITER, supra note 9, at 244–58.
214. See supra notes 169–172 and accompanying text.
realistic (and politically palatable) boundaries for any regional planning effort.\textsuperscript{215} And as the agencies seek to articulate workable management standards, critics have questioned whether it is possible to remove human activity from the ecological equation by using a historical reference point as a contemporary management goal.\textsuperscript{216} Yet, by confronting these difficult issues, the agencies have an opportunity to fine-tune their emergent ecological management strategies and to define an appropriate role for science in resource decisions.

The trajectory of public land policy may be toward ecologically-oriented management, but politics have retarded these efforts and even derailed some initiatives. Besides acknowledging new biodiversity conservation obligations and expanding the scale of their planning efforts, the agencies are utilizing the ecological sciences in their decisions, employing adaptive management strategies, and undertaking various collaborative conservation initiatives to define acceptable resource management goals. It is premature, however, to conclude that Congress—merely by inserting biodiversity language into a few organic statutes and elsewhere—has reoriented the basic missions of the national forests, national wildlife refuges, or other public lands. With legislation like the Healthy Forests Restoration Act,\textsuperscript{217} Congress has recently diminished the role of law on the public lands, and an array of revisionist congressional bills would further reduce ecology’s role in public land policy.\textsuperscript{218} Moreover, the Bush administration seems intent on blunting these new ecological management efforts too, particularly in the case of the multiple-use agencies. The Forest Service’s revised 2005 NFMA planning regulations have extracted the legal teeth from the biodiversity regulation, jettisoned longstanding NEPA EIS analysis requirements, and otherwise de-legalized the planning process—all in an apparent effort to enhance agency discretion, reduce official accountability, and minimize judicial oversight. At the same time, the vocabulary of ecosystem management has largely disappeared from the BLM. Because both the FWS and the Park Service have used policy documents to chart their own ecological management course, the Bush administration faces few real legal hurdles if it were to revise these policies to minimize the role of ecology in their decision processes. But the organic statutes cannot be ignored, which in the case of the national

\begin{footnotesize}
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\item \textsuperscript{215} See Keiter, supra note 9, at 167.
\item \textsuperscript{216} See supra note 154 and accompanying text.
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wildlife refuges should ensure a continuing commitment to species preservation and science-based management.

Despite the growing influence of ecological science in public land policy, it would be a mistake to overestimate its importance or role. Though science has long been associated with natural resource policy (dating at least from Gifford Pinchot's storied embrace of scientific utilitarianism), inescapable political realities also have long shaped public land policy, creating a palpable tension between professional scientists and their politically attuned management counterparts.\(^2\) That tension persists yet today, reflected in the prevailing skepticism over the role of "experts" in setting management priorities and making resource allocation decisions. Many observers distrust the scientific conclusions emanating from the agencies,\(^2\) while others fear that individual scientists may be driven as much by their personal values as by neutral professional standards.\(^2\) Laws like NEPA and the various organic planning statutes help temper this dilemma by enabling citizens to inject public values into agency decision processes and to challenge underlying scientific conclusions. Yet science can serve as an antidote to politics as usual too. The ecological sciences often provide managers with a clear sense of the biological limitations (or sideboards) that might constrain their decision options. Science can be employed as a counterweight to economic assertions, which are often invoked to justify environmentally damaging management decisions. Grounded in objective analysis and experimental rigor, science ordinarily yields quantifiable results that are every bit as sound and compelling as the quantitative monetary predictions associated with economic analysis, even if the two disciplines do not yield commensurate results. In short, even though the ecological sciences may not dictate priorities on the public lands, they enable us to understand and evaluate the trade-offs at stake to maintain or restore the biological capacity that sustains the landscape.

The uneasy road ahead reflects the difficulty inherent in translating complex scientific concepts into workable legal standards to ensure a sustainable public land base. To deny the inevitable tensions

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\(^2\) See Lackey, supra note 7, at 28; Jim Burchfield, Finding Science's Voice in the Forest, in Across the Great Divide: Explorations in Collaborative Conservation and the American West, supra note 202, at 238.
between ecology, law, and politics is to deny the intense demands now being placed on the public lands, regardless of their formal designation. The nascent legally mandated excursions into biodiversity conservation and ecological management are providing us with a sense of how to translate new scientific ideas into viable planning and management protocols on the public lands. Though disagreement may persist over relative resource priorities as well as management techniques, the task at hand is to ensure that ecological concerns are addressed in an effective and efficient manner. The FWS's ecological integrity policies along with the Forest Service's stuttering ecological management initiatives are a useful start, even as contemporary politics has diminished the Forest Service's regulatory commitment to ecological management. Yet, unless we pay close attention to the lessons of ecology, we may find our biological heritage imperiled, even on the expansive public lands. The law can and should be employed to avoid that fate.