Stumbling to Johannesburg: The United States' Haphazard Progress Toward Sustainable Forestry Law

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Stumbling to Johannesburg: The United States’ Haphazard Progress Toward Sustainable Forestry Law

by Robert L. Fischman

This Article addresses how well forestry law in the United States promotes sustainable development, with special attention to the trends of the past decade. The role of law in shaping forest management decisions has been a contentious issue in this recent period, and forestry has been at the forefront of public concern about sustainability of natural resource management generally. Therefore, the problems and opportunities for forestry law to promote sustainable development are indications of the weaknesses and strengths of the overall U.S. legal regime.

This Article focuses on forestry, as opposed to forests or the forest sector of the economy. As Prof. Jeff Romm has observed, sustainable forestry is a “social process rather than a forest condition.” Though the ecological health of the forests themselves is a critical aspect of sustainable forestry, it is but one of the three axes along which sustainable forestry should be measured. Economic viability and social responsibility are equally important dimensions of sustainability.

Conceiving forestry as a process rather than a condition is particularly helpful in evaluating the role played by law in promoting sustainability. Because law is an important method society employs to resolve disputes, it concerns itself primarily with process. Though the process established through forestry law can promote sustainability, extra-legal ecological, economic, and social forces dominate the outcomes. This Article emphasizes those areas where law can serve as a catalyst for sustainability, but it is important to acknowledge at the outset that law is often a follower rather than a leader of changes in forestry.

After describing the goal of sustainable forestry, the Article turns to its main concern, an evaluation of the way the law shapes forestry in the United States. The basic structure of forestry law, firmly established prior to 1992, provides the background against which to discern recent trends. The fundamental principles of property ownership and administrative law undergird most forestry law in the United States. They also create distinctive differences between the regimes governing public and private forestry. The discussion in the subsequent section evaluates in greatest detail those areas of U.S. law related to sustainable forestry that experienced significant changes in the past decade. This evaluation asks whether they contribute to or hinder sustainable development in forestry. The Article concludes with a set of recommendations to incorporate more effectively principles of sustainable development into U.S. forestry law.

Overall, the United States has made halting steps in law reform and implementation toward forest sustainability. On private lands, where most forestry occurs, a slight strengthening of state forest practice laws and increased promotion of best management practices (BMPs) have improved the legal regime, but these changes tend to be overwhelmed by market forces. Until water pollution control, most likely through total maximum daily load (TMDL) requirements, begins to force abatement and mitigation of nonpoint source runoff, private forest owners will not face significantly heightened incentives for sustainable practices. On the other hand, new certification systems for sustainable practices have begun to reshape market demand. On public lands, law has curbed many of the least sustainable practices through endangered species protections and sustainability/viability requirements in binding resource management criteria. Adaptive management, though implemented more in rhetoric than reality, is beginning to receive a boost through required monitoring of performance goals in the Government Performance and Results Act (GPRA). Unfortunately, though, public participation in federal forest management through administrative appeals, judicial review, and environmental impact statements (EIS) has declined.

In the coming decade, the United States should strengthen its legal mechanisms for promoting public participation, citizen enforcement, best forestry management practices, and landscape-level planning. These recommendations are top priorities for facilitating sustainable development. Existing property, market, and administrative regimes can all be deployed in the service of more sustainable forestry by flexibly demanding that environmental performance indicators be achieved through mitigation, ecosystem services, and adaptive management.

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[Editors’ Note: In June 1992, at the United National Conference on Environment and Development (UNCED) in Rio de Janeiro, the nations of the world formally endorsed the concept of sustainable development and agreed to a plan of action for achieving it. One of those nations was the United States. In September 2002, at the World Summit on Sustainable Development, these nations will gather in Johannesburg to review progress in the 10-year period since UNCED and to identify steps that need to be taken next. In anticipation of the Rio + 10 summit conference, Prof. John C. Dernbach is editing a book that assesses progress that the United States has made on sustainable development in the past 10 years and recommends next steps. The book, which is scheduled to be published by the Environmental Law Institute in June 2002, is comprised of chapters on various subjects by experts from around the country. This Article will appear as a chapter in the book. Further information on the book will be available at www.eli.org or by calling 1-800-433-5120 or 202-939-3844.]

2. Hal Salwasser et al., An Ecosystem Perspective on Sustainable Forestry and New Directions for the U.S. National Forest System, in Defining Sustainable Forestry, supra note 1, at 44.
The law can and should play a role in the transition to sustainable forestry in the United States. This is an important task for us because forest ecosystems cover one-third of the area of the United States, and two-thirds of that forestland is productive enough to have value as commercial timberland.5 Also, the United States consumes one-third and produces one-quarter of the world’s timber products.6 Therefore, the sustainable development of U.S. forestry will have an important influence not just on our environment and society, but on the rest of the world as well. In addition to securing the ongoing supply of timber products, the task of promoting sustainable forestry is important because we rely on forests for watershed maintenance, pollution abatement, climate control, jobs, and recreation. Historically, the United States succeeded in stemming egregious forestry practices over a century ago and, partly as a result, there is a strong tradition in forestry on which to build a model for sustainability that will offer lessons in other areas.

**Sustainable Forestry: The Goal**

Forestry, which concerns itself with managing and using forests, is but one component of the forest sector of the economy, which includes transportation, processing, manufacturing, and marketing wood products. This Article excludes a host of sustainability issues in the forest sector of the economy that are not directly related to management of forests themselves. Pollution generated in the processing of wood products to manufacture a range of goods, “from telephone poles to telephone books and from plywood to rayon,”7 is beyond the scope of this Article, which focuses on forest management. But, it is important to note that innovations in manufactured products and retail trends in the forest sector of the economy alter demands that shape forest management.

Though there are other forest products, such as mushrooms, of regional economic significance, wood for lumber and paper is by far the most important forest material for the U.S. market.8 Outdoor recreation on forest lands is growing at a much greater rate than any other use.9 And, this recreation generates significant investment and employment.10 Some commentators have argued that the most important recent trend on public forest lands has been the replacement of commodity production with recreation as the dominant use.9 However, recreation (especially motorized recreation using all-terrain vehicles and snowmobiles), like logging, increasingly conflicts with ecological recovery goals.11

Other goods and services of the forests, such as biodiversity and flood/drought abatement, provide economic benefits. But, they are not actively traded in the current forest sector market. As I discuss below under the section entitled Forest Conservation Incentives, this is beginning to change for such services as carbon sequestration and water purification. Apart from measurable economic benefits, though, scenic beauty, biodiversity, and wild attributes are among the most valued products of forests.11

One of the great challenges to promoting ecological, economic, and social sustainability in forestry is defining indicators of success. This Article assesses the changes in U.S. forestry law since the 1992 signing of Agenda 21 at the Rio Earth Summit (United Nations (U.N.) Commission on Environment and Development) vis-à-vis sustainability, but the challenges faced by the United States do not correspond exactly to the framework established in Agenda 21. For instance, Agenda 21 does not have a chapter that deals comprehensively with forestry. Instead, the sustainable forestry commitments primarily flow out of three chapters in the section on conservation and management of resources for development: integrated approach to the planning and management of land resources (Chapter 10), combating deforestation (Chapter 11), and conservation of biological diversity (Chapter 15).12 In addition, virtually all of the Agenda 21 chapters dealing with socioeconomic concerns (Section I), strengthening the role of stakeholders (Section III), and implementation (Section IV) speak to the legal issues affecting forestry. Therefore, this Article consolidates a wide range of relevant concerns found throughout Agenda 21 into a discussion of the sustainability of forestry law, without specific reference to particular objectives and activities specified in the Agenda 21 chapters.

More relevant to evaluating U.S. forestry than Agenda 21 is the set of principles for sustainable development of forests

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5. Nels Johnson & Daryl Ditz, Challenges to Sustainability in the U.S. Forest Sector, in Frontiers of Sustainability: Environmentally Sound Agriculture, Forestry, Transportation, and Power Production 191, 214 (Roger Dower et al. eds., 1997).
8. Id. at 66.
12. The Agenda 21 (nonbinding) agreement is found at U.N. Conference on Environment and Development, U.N. Doc. A/CONF.151.26 (1992), available at http://www.un.org/esa/sustdev/agenda21text.htm (last visited Jan. 10, 2002). The deforestation chapter comes closest to addressing the issues addressed in this chapter, especially in the following chapter program areas: Sustaining the Multiple Roles and Functions of All Types of Forests, Forest Lands, and Woodlands, id. at 11.1-11.9; and Enhancing the Protection, Sustainable Management, and Conservation of All Forests, id. at 11.10-11.19. For a discussion of the application of the deforestation chapter of Agenda 21 to the Forest Service, see Susan Bucknum, The U.S. Commitment to Agenda 21: Chapter 11—Combating Deforestation—The Ecosystem Management Approach, 8 Duke Envtl. L. & Pol’y F. 305 (1998). Other chapters in the conservation and management section of Agenda 21 that are peripheral relevant to aspects of U.S. forestry include managing fragile ecosystems: sustainable mountain development (Chapter 13), promoting sustainable agriculture and rural development (Chapter 14), and protection of the quality and supply of freshwater resources: application of integrated approaches to the development, management and use of water resources (Chapter 18).
that the Rio Earth Summit adopted. Some of the principles focus on international aid from the developed world to developing countries. Others speak in such broad generalities as to be useless as measures of sustainability. However, the nonbinding principles include a number of elements that respond directly to current controversies in the U.S. legal system. For instance, Principle 2 discusses procedural requirements, including opportunities for stakeholder participation in forestry decisions and “timely, reliable and accurate information.” Principle 6 calls for comprehensive assessment of forest values and the improvement of methodologies for evaluation. Principle 8 establishes goals of integration of forest management with management of adjacent areas to mitigate the ills of fragmentation and protection of “ecologically viable representative or unique examples of forests.” And, Principle 13 urges nations to incorporate environmental costs and benefits into market mechanisms. It is through application of these principles that law can facilitate movement toward the ecological, economic, and social goals of sustainable forestry.

Since 1992, the United States has participated in nonbinding, multinational (regional) efforts to identify criteria for sustainable development in temperate and boreal forestry. The most important of these projects is the Montreal Process, involving the United States and 11 other nations. The endorsement of seven basic criteria in the 1995 Santiago Declaration by the Montreal Process nations established a framework for defining sustainability. The criteria, each of which have several quantitative or narrative indicators, are: conservation of biological diversity; maintenance of productive capacity of forest ecosystems; maintenance of forest ecosystem health; conservation and maintenance of soil and water resources; maintenance of forest contribution to global carbon cycles; maintenance and enhancement of long-term multiple socioeconomic benefits to meet the needs of society; and legal, institutional, and economic framework for forest conservation and sustainable management.

This Article concentrates on the issues associated with the seventh criterion. Even more difficult than defining criteria and their indicators for sustainability is acquiring data to monitor the actual practices of U.S. forestry and the actual conditions of forests. The federal government and a handful of nongovernmental organizations monitor basic trends. However, the United States has no comprehensive, ongoing monitoring program of forest sustainability. Since the 1930s, the federal government has maintained a “forest inventory and analysis” database, but it focuses on information related primarily to the commercial productivity of forest stands: species, size, and health of trees; total tree growth, mortality, and removals by harvest; and forest landownership. More recently, the U.S. Forest Service has begun a “forest health monitoring” program to enhance this data with information more relevant to sustainability concerns: tree crown condition, lichen community composition, soils, ozone indicator plants, complete vegetative diversity, and coarse woody debris.

On the physical condition of forests, we know for certain that the total area of forests in the United States (about one-third of the nation’s area) has changed little in the past decade. Acreage loss occurs primarily through suburban development. Reforestation of marginal agricultural lands is the primary source of new forest acres. Forestry itself does not result in much net change in forest area. However, sustainability cannot be measured simply by forest area. Data on species diversity, forest structure, water quality, and many other dimensions of ecological sustainability are not cumulated nationally for forests in a way that invites evaluation of changes since 1992. Information on economic viability and social responsibility are even more elusive, though the timber and recreation industries do provide some information on the contributions of forestry to the U.S. economy.

Therefore, in evaluating the legal trends of the past decade and making recommendations for future reforms, this Article relies on the processes and institutions established through legislative, executive, and (to a lesser extent) judicial activities. As Kenneth L. Rosenbaum has observed, “[s]ociety’s use of resources changes as understanding, knowledge, and technology change, making sustainable development a moving target.” This Article focuses on the law that shapes and channels society’s use of resources rather than identifying a particular target. Legal mechanisms promoting sustainable development will be characterized not by a linear process of “ready, aim, fire.” Instead, prompt, adaptive flexibility will best respond to the dynamic changes in society, ecosystems, and our limited understanding of them. Because forestry in the United States is characterized most prominently by decentralized decisionmaking of disparate landowners, the analysis be-

14. See, e.g., id. (princs. 7, 10 & 11).
15. See, e.g., id. (princs. 1(a), 3(a), & 4).
16. Id. (princ. 2).
17. Id. (princ. 6).
18. Id. (princ. 8).
19. Id. (princ. 13).
24. The Forest Service, however, does intend to monitor the indicators in the Santiago Declaration under the GPRM. See infra note 42 and accompanying text.
26. Id.
The analysis pays close attention to the key indicators of sustainability supporting the legal and institutional criterion of the Montreal Process: property rights, forest planning, public participation, best practice codes, enforcement, and monitoring.29

**U.S. Law: The Means**

The scope of this Article is the range of laws that affect forest management decisions.29 The forest includes not only the trees, but also the water, soil, and wildlife associated with the trees. Therefore, laws governing the non-woody components of forests, such as endangered species or water quality are important pieces of the sustainability puzzle.

This section begins with a description of the law directly governing forest administration on public lands. In contrast, privately owned forests are more insulated from public priorities due to the decisionmaking autonomy afforded through private property rights.30 Nonetheless, regulations and conservation incentives do shape forestry on private lands. These same regulations and incentives, when not preempted by federal law, may also indirectly affect public land forestry.

**Public Forests**

The most important developments in the law governing public forests have come from administrative innovation using existing statutes. Indeed, statutory law has remained virtually unchanged during the past decade. In particular, the substantive federal regulatory standards governing public forest lands moved substantially toward sustainability principles. Ecosystem management, protection of roadless areas, and the restoration of ecological integrity all have received renewed emphasis in the decade since Rio. Coupled with related performance measures under the GPRA, public forest managers are poised to be held accountable for meeting the goals of sustainable development. This progress, however, is threatened by the prospect of the revocation of key rules and initiatives by the Bush Administration, congressional insistence on high commodity production targets, and reduced opportunities for public participation. Since 1992, opportunities for citizens to challenge agency decisions or to participate in EIS have diminished. This has dampened the progress toward sustainability despite some high-profile experiments in collaborative process.

Public forests account for 42.4% of the forest area in the United States,31 and they have contributed disproportionately to sustainability through demonstration programs and innovative practices. Public forests are owned and managed by the federal, state, and local governments.32 In general, the more local the forest administration, the less formal the standards governing decisionmaking. The substantive and procedural criteria in federal statutes and regulations are the most detailed, rule-bound set of management prescriptions. Many state and local agencies charged with public forest management have much greater discretion to make decisions unchecked by written standards or public appeals.

Because state legislatures and Congress delegate site-specific forestry decisions to agencies, administrative law dominates the implementation of public forestry. Such basic principles as the need for an agency to document its rationale for a decision in an administrative record, the right of the public to acquire agency records, the discretion of agencies to use their expertise and experience, and the limited scope of judicial review of agency decisions all shape the process of forest use and preservation on public lands.

Though the national forests comprise the flagship system for public forestry, it is important to recognize that other federal public land management agencies, such as the Bureau of Land Management (BLM), National Park Service (NPS), and U.S. Fish and Wildlife Service (FWS) also manage public forestlands. Some of these lands, such as national parks and wilderness areas, experience little or no logging. Nonetheless, even recreation, such as off-road vehicle or snowmobile use, may impair the ecological health of forests and raise concerns of economic viability and social responsibility.33 The Forest Service and the BLM dominate federal public forestry both in terms of the intensity of timber management and area of forest.34 Regardless of the general, statutory management regime, all federal agencies adopted during the past decade some form of ecosystem management to fulfill their conservation obligation.35

Substantive management mandates for public forests vary considerably. Some public forest lands, most notably some western states’ school trust lands, are managed to maximize financial return. These forests face decisionmaking incentives similar to corporate timberlands. However, unlike corporate forest managers, the state school land trustees often have a fiduciary duty to sustain the value of the resources for the public over the long-term. This fiduciary duty supports the intergenerational obligations of sustainable development.36

Other public forest lands are bound by protective mandates. For instance, national wildlife refuges are managed “to sustain and, where appropriate, restore and enhance healthy populations of fish, wildlife, and plants utilizing . . . methods and procedures associated with modern scientific resource programs.”37 Most public land statutes impose


29. For an excellent, detailed treatment of U.S. law governing forestry, see Kenneth L. Rosenbaum, Timber, in SUSTAINABLE ENVIRONMENTAL LAW 575 (Celia Campbell-Meinh et al. eds., 1993).

30. Some 57.6% of forest land in the United States is privately owned. Of this, only 13.7% is managed directly by the forest industry. See RPA ASSESSMENT, supra note 7, at 11; RPA ERRATA, supra note 23, at 1.

31. Id.

32. The public forest distribution breaks down as follows: 78% federal, 19.1% state, and 2.9% county and municipal. Id.

33. Forest Service Decisionmaking, supra note 10, at 61.

34. The Forest Service manages 46.4% and the BLM manages 15.3% of all public forests, including nonfederal public lands. Id.


some condition on development that avoids long-term impairment of resources.

Most public forest lands, however, are managed under the general principle of multiple-use, sustained-yield (MUSY), pioneered originally by the Forest Service but now employed more widely on public forest lands. In many respects, the MUSY principle is superbly suited to promote sustainable development.\(^{38}\) It allows for market activities, especially extractive enterprises, to coexist with conservation restrictions in order to secure the long-term benefits of renewable resources. It discourages exploitation of resources that exhausts supply for short-term benefit. In practice, though, MUSY has tilted toward maintaining commodity outputs at the expense of ecological integrity. This historic tilt has been challenged over the past decade, most notably in the National Forest System.

The Forest Service began in the late 1980s to change its application of MUSY in the wake of the controversy over logging old growth public forests in the Pacific Northwest. After over a decade of large volumes of timber harvesting, the national forests in the region had depleted most of their old growth habitat. Indicator species of old growth, such as the northern spotted owl, began to slide toward extinction. As a result of public outcry and a series of judicial injunctions, the Forest Service established the New Perspectives program to sponsor research and management that would explore sustainable alternatives to the commodity-driven approach to MUSY.\(^{39}\) Though small in scale, New Perspectives was an important precedent for blending ecological, economic, and social concerns into a sustainable forestry practice.

After the Rio Summit and the inauguration of President William J. Clinton, the Forest Service began a slow, but steady, shift toward general sustainable development principles. The most important legal vehicle for promoting this change is the GPRA, which was enacted in 1993. The legislation required all agencies to set both long- and short-term, measurable performance objectives and to conduct periodic assessments and revisions.\(^{40}\) This spurred the Forest Service to employ adaptive management to monitor and evaluate its activities based on parameters related to such sustainability criteria as health of the land, quality of water, and user satisfaction.\(^{41}\) The sustainable forestry measures that the Forest Service established into its GPRA plan came, in part, from President Clinton’s 1993 directive to achieve sustainable forest management and from the Santiago Declaration of 1995, under which the Forest Service employs 7 criteria and 67 indicators of forest sustainability.\(^{42}\) These criteria include conservation of biological diversity, maintenance of the productive capacity of forest ecosystems, maintenance of forest ecosystem health, and “maintenance and enhancement of long-term, multiple socioeconomic benefits to meet the needs of societies.”\(^{43}\) Though the Forest Service has been required to prepare strategic plans and to monitor forest trends since the 1974 Resources Planning Act (RPA),\(^{44}\) the GPRA process has breathed new life into a program that had been eclipsed by the 1976 unit-level planning mandates of the National Forest Management Act (NFMA).\(^{45}\) The new sustainability criteria and indicators of MUSY will change public forest management, with the national forests leading the way as the flagship system. As Prof. James Q. Wilson noted in his classic study of bureaucracy, measured outcomes tend to “drive out work that produces unmeasured outcomes.”\(^{46}\) The monitoring and public reporting of the GPRA, married to the forest sustainability indicators, hold great promise to take the weak, but good, intentions of ecosystem management policies and make them transparent and accountable.\(^{47}\)

While the U.S. Congress set the Forest Service on the path of adaptive management to achieve sustainable development through the GPRA, it nonetheless continues to intervene in forestry to push commodity outputs (especially timber sales). Appropriation measures may set timber output targets or contain riders exempting certain timber sales from laws promoting sustainable development. For instance, the 1995 Rescission Act exempted many timber sales from the normal procedural requirements of environmental impact analysis and substantive requirements described below under the NFMA and the Endangered Species Act (ESA).\(^{48}\) It also severely limited judicial review to determine whether these “salvage” timber sales complied with applicable legal requirements.\(^{49}\)

Because MUSY requires balancing the costs and benefits of a diverse array of forest uses (such as timber, range, recreation, and water and ecological protection), it gives great discretion to public officials. Nonetheless, some substantive and procedural standards, discussed below, bind even the broadest MUSY agency. However, the trend in the past decade of administrative law has been to reduce the ability of citizens to appeal forest management decisions. This trend hampers sustainable development by making it more difficult for citizens to ensure that an agency takes their views into serious consideration. Despite a recent reprieve from the U.S. Supreme Court,\(^{50}\) citizen standing to challenge the sustainability of public agency decisions steadily declined.

\(^{38}\) RPA Assessment, supra note 7, at 1.


\(^{40}\) JAMES Q. WILSON, BUREAUCRACY 155 (1989).


during the past decade. The allied doctrine of ripeness also served to insulate agency actions, such as national forest unit-level management planning, from judicial review to determine whether the Forest Service met its substantive and procedural requirements.

Substantive Standards

The National Environmental Policy Act (NEPA)

NEPA expressed Congress’ intention to steer the United States toward the principles we today know as sustainable development. Though best known for its procedural requirements, described below, NEPA contains an important substantive policy declaration. The Supreme Court has been consistently clear in holding that courts will not enforce the substantive terms of this section against agencies. However, the policy remains federal law, which agencies are bound to follow regardless of whether judicial review is available. Indeed, NEPA itself mandates that agencies interpret and administer their authorities “to the fullest extent possible” in accordance with the substantive policies described below.

James McElfish has highlighted this language to argue that the substantive parts of NEPA “are not mere sentiments, but positive law, binding on . . . all federal agencies.”

The substantive mandate of NEPA has two parts. Both of them support sustainable development. First, the statute declares federal policy to “use all practicable means and measures, including financial and technical assistance, in a manner calculated . . . to create and maintain conditions under which man and nature can exist in productive harmony.” The use of the term “productive” to modify harmony suggests the relationship between ecological and socioeconomic goals that are married in sustainable development.

Second, the statute declares that “it is the continuing responsibility of the Federal Government to use all practical means, consistent with other essential considerations of national policy,” to meet six goals, including:

1. fulfill the responsibilities of each generation as trustee of the environment for succeeding generations;
2. . . .
3. attain the widest range of beneficial uses of the environment without degradation . . . .

These goals create a fiduciary duty to future generations, anticipating the Brundtland Commission’s definition of sustainable development as meeting the “needs of the present without compromising the ability of future generations to meet their own needs.”

Giving a voice to the future in deliberations of forestry is one of the chief hurdles on the path toward sustainable forestry.

Resource Management Laws

In addition to general NEPA principles, public forests must meet enforceable, substantive standards described in resource management statutes or developed by agencies in regulations. An enforceable, substantive standard provides a counterweight to the discretion normally exercised by public forest managers to make decisions based on their expert, site-specific judgments. It provides a benchmark for public and judicial oversight of public forestry. Special circumstances, such as fire danger or insect infestation, generally justify departures from the mandates of substantive standards.

Again, it is the law governing national forests that offers the preeminent example of substantive standards. National forests contain the greatest acreage of forest and harvest the largest volume of timber. The statutes and regulations providing substantive standards for national forest management contain the greatest level of detail. And, reforms to the standards promulgated in 2000 were the most important administrative development relating to sustainability during the past decade.

A key constraint on public land forestry relating to ecological sustainability is the definition of lands suitable for logging. Land with special preservation status or inadequate density of trees is often removed from plans for active timber management. Soil, slope, and watershed conditions may also limit or remove logging as an option in some public forests. Mandates prohibiting irreversible damage or undue degradation to the environment may prompt these, or even more specific restrictions. For instance, the NFMA (governing national forest lands) specifically requires assurance that logging be limited to lands that can be adequately restocked within five years after harvest.

The practice of clearcutting, a type of logging which produces an even-aged forest stand, can be controversial due to its environmental and aesthetic effects. Public forestry rules may limit clearcutting to certain, optimal situations.
In addition to the method used to harvest timber, public forest managers may face limitations on the timing of the harvest. Rules governing the maturity of trees, or stands of trees, seek to prevent premature logging. These and other timing restrictions are designed to sustain local economies and moderate boom/bust cycles by requiring that the volume of timber removed from a forest remain relatively constant over time. Regulations or forest plans themselves may cap the allowable volume of timber to be logged from a particular area.

Finally, economic sustainability may constrain harvesting on lands where the cost of logging greatly exceeds its benefits. Determining the actual costs and benefits of logging, however, is a contentious exercise. For instance, in remote areas, roads may need to be constructed before logging will be profitable. The proper amortization of these roads, the appropriate allocation of the benefits between loggers and recreationists who might use the roads after logging, and the adverse environmental effects are difficult determinations in evaluating the economic sustainability of logging.

In many areas, public forestry has reduced biodiversity by converting forests from ecosystems dominated by native species to plantations dominated by a few (often exotic) commercially valuable tree species. Forest biodiversity may also be reduced when old growth forests are liquidated so that only younger forests, with different biological structures and niches, remain. Standards for the maintenance and restoration of biological diversity in the national forests go beyond the regulatory requirements pertaining only to species at imminent risk of extinction. Congress requires the Forest Service to establish regulatory guidelines to ensure that forest management provides for “diversity of plant and animal communities,” subject to certain limitations and the overall MUSY mandate. With the exception of the diversity mandate for the National Wildlife Refuge System, this provision is the strongest substantive ecological diversity standard in the public land statutes. However, the degree of its strength in promoting sustainable forestry depends on how the Forest Service interprets it.

The Forest Service’s interpretation of the diversity standard as well as its other substantive management mandates is currently in flux. To implement the substantive statutory standards, the Forest Service promulgates regulations that guide both forest-unit land and resource management plans (LRMPs) as well as particular forestry projects, such as timber sales. The 1982 regulations that shaped the first two generations of forest plans called for the maintenance of “viable populations of existing native and desired non-native vertebrate species.” The Forest Service accomplished this by selecting management indicator species and monitoring them. The Forest Service retained a great deal of discretion in implementing this system of ensuring diversity, even when its plans did not reflect the best scientific methods. And, the Forest Service has a poor record of performing promised monitoring and evaluation. Nonetheless, the regulatory standard served as a backstop to prevent many unsustainable forest management proposals.

In 2000, after years of wrangling over LRMP regulatory revisions, the Forest Service promulgated a new framework for planning that makes ecological, social, and economic sustainability the overall goal of national forest management. More significantly, the rule establishes maintenance and restoration of ecological sustainability as the first priority for management. The 2000 LRMP revisions required national forest management decisions to “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” except under certain conditions demanding increased scrutiny of decisions. The 2000 rule also provided for social and economic analyses of a range of uses, values, products, and services to meet the other components of sustainability. Collaborative procedures for public involvement are an important part of the 2000 LRMP regulation’s socioeconomic approach to sustainability. The Bush Administration, however, has postponed the effective date of the 2000 rule and indicated that it will alter the regulations. The Bush Administration plans to jettison the sustainability framework.

65. See, e.g., id.
66. See, e.g., id. §1604(m) (culmination of mean annual increment requirement).
67. See, e.g., id. §1611 (nondeclining even-flow requirement).
71. Pub. L. No. 105-57, §§5(a)(4)(B), 11 Stat. 1255 (1997) (requiring that the refuge ensure the maintenance of “biological integrity, diversity, and environmental health” without permitting the deviations from this principle that the Forest Service’s mandate includes).
That action would be a step backwards for sustainability in public forestry.

Another area in which a Clinton Administration rule to bolster ecological protection of forests will likely be repealed before it has substantial effects on public forestry is the maintenance of roadless areas. The Clinton rule prohibited logging and road building in many roadless areas of the national forests.85 As the FWS has noted in its land management policies, habitat fragmentation is a threat to biological integrity.86 Sustaining forest ecosystems requires large, contiguous blocks of forests.87 The roadless area rule would protect many of the remaining unfragmented areas of the national forests to the benefit of forest interior-dependent species. The Bush Administration, however, has signaled its intent to repeal the Forest Service roadless rule.88

Procedural Standards

More so than substantive standards, which are rare outside of national forest management, procedural requirements distinguish forestry on public lands. Most public forests are governed by procedures that require, at a minimum, an evaluation of the environmental effects of proposed forestry projects. This environmental impact analysis model, applied in the forestry setting, often involves some degree of public participation, interdisciplinary analysis, and evaluation of alternative approaches to meet goals. On the federal level, both the requirements of NEPA and the authorizing statute for the land management agency combine to provide specific avenues for public participation and define the topics discussed in the analysis. In some cases, an agency may prepare a single document meeting both the NEPA analysis requirement and the agency’s resources planning mandate.89 Many states have analogous environmental impact analysis requirements.90

Further strengthening the connection between environmental impact analysis and sustainable development, NEPA requires agencies to “utilize a systemic, interdisciplinary approach which will insure the integrated use of natural and social sciences...in decisionmaking.”91 NEPA requires an EIS for “major Federal actions, such as resource management plans or timber sales, significantly affecting the quality of the human environment.”92 Agencies prepare environmental assessments (EAs) to determine whether an action triggers the EIS requirement. The most controversial issue in public forestry NEPA compliance is whether an agency should prepare an EIS or whether it may prepare an EA that finds the proposed action to have no significant impact.93 The trend over the past decade has been a decline in the number of EIS as agencies increasingly use EAs as “mini-EISs.”94 Although the Forest Service provides for some public comment on its EAs, most agencies do not.95 Most of the content requirements for EIS do not apply to EAs. The mitigation that agencies sometimes include in their administrative record to reduce the impact of their proposals below the level of significance can contribute to ecological sustainability. But, in general, the ebb of EIS preparation denies the public an important vehicle for participation and allows agencies to conduct projects with less care taken to analyze the full range of consequences. Moreover, the retreat from EIS preparation parallels a retreat from programmatic analysis of broad policies and over wide areas. Lack of programmatic guidance frustrates sustainable development because it makes planning of actions across whole watersheds and ecosystems more difficult.

Beyond the minimum procedural requirements of environmental impact analysis, many public forest management regimes require comprehensive planning. Planning may occur at a variety of levels: national, regional, and forest unit. Forest unit planning (such as the development of Forest Service LRMPs) generally includes basic guidelines for forestry projects, and zoning the forest land to identify areas where different uses may be permitted. To the extent that substantive standards apply, planning will be an important vehicle for ensuring compliance. In “tiering,” a comprehensive, planwide environmental analysis that successfully identifies the issues and effects of anticipated projects reduces the need for project-level evaluation.96 A comprehensive forest unit plan may serve as a foundation for “tiering” subsequent, site-specific projects, including logging. Authorizing statutes for all of the federal forest land management agencies now require ongoing, unit-level planning.

The most contentious EIS content requirements include the range of alternatives considered in detail by the agency, the adequacy of the cumulative and indirect effects analysis, and inclusion of obtainable, but not available, information.97 During the past decade, the U.S. Environmental Protection Agency (EPA), in its role as reviewer of all EISs, has developed increasingly specific guidance to promote miti-

83. 66 Fed. Reg. 3244 (Jan. 12, 2001) (rule limiting the construction of new roads and logging on 58.5 million acres of inventoried roadless areas in 120 national forests).
87. See, e.g., COUNCIL ON ENVIRONMENTAL QUALITY, THE NATIONAL ENVIRONMENTAL POLICY ACT: A STUDY OF ITS EFFECTIVENESS AFTER TWENTY-FIVE YEARS 14 (1997) (describing how the BLM combines EIS with the RMPs, mandated by the BLM’s organic act, into single documents) [hereinafter AFTER TWENTY-FIVE YEARS].
91. Cf. Glisson v. U.S. Forest Serv., 138 F.3d 1181, 28 ELR 21053 (7th Cir. 1998); Newton County Wildlife Ass’n v. Rogers, 141 F.3d 803, 28 ELR 21125 (8th Cir. 1998); Sierra Club v. U.S. Forest Serv., 46 F.3d 835, 25 ELR 20799 (8th Cir. 1995) (finding EAs for proposed timber sales adequate to meet NEPA requirements) with Idaho Sporting Congress v. Thomas, 137 F.3d 1146, 28 ELR 21044 (9th Cir. 1998); National Audubon Soc’y v. Hoffman, 132 F.3d 7, 28 ELR 20318 (2d Cir. 1997); Alaska Wilderness Recreation & Tourism Ass’n v. Morrison, 67 F.3d 723, 26 ELR 20065 (9th Cir. 1995) (finding EAs for proposed timber sales inadequate to meet NEPA requirements).
92. Id.
93. Id.
94. See 40 C.F.R. §1508.28.
95. See, respectively, 40 C.F.R. §§1502.14 (range of alternatives), 1508.7 (cumulative impacts), 1508.8(b) (indirect effects), and 1502.22 (information).
Forestry Regulation

The most significant developments in regulating forestry activity have come through programs aimed at protecting water quality and imperiled species. While state laws governing forest practices have moved only slightly toward sustainable development principles, they often incorporate standards from water pollution law. The state development of TMDLs for water bodies finally began during the past decade, and this will promote forestry practices that better abate sedimentation. Endangered species protection had a greater impact on forestry than any other regulatory program. Both terrestrial and aquatic species on the brink of extinction have altered the volume, pattern, and method of logging on private as well as public lands. On private lands, habitat conservation plans (HCPs) under the ESA are becoming a common method of sustaining habitat while accommodating timber production. Though the basic tools of federal endangered species protection certainly require sharpening, they did profoundly shift the conventional practice of forestry toward sustainability. U.S. law is just starting to grapple with landscape-level planning, especially for the protection of riparian corridors and coastal areas.

Forestry, especially where it involves logging, is regulated in the same manner that other land disturbing activities are. So, many of the laws regulating forestry are the same ones that regulate agriculture and industry. In addition, though, jurisdictions may have specialized regulations tailored to the concerns presented by forest management. This section considers these specialized forest practices rules first, and then other regulation of forestry aimed at protecting the quality of media and conserving particular target resources. Forestry regulation may be implemented through the direct application of standards, or the indirect incorporation of standards through permits or government-approved management plans. Forestry regulation applies broadly to private lands and, if not preempted, to public forests as well.

Since 1922, the Supreme Court has interpreted the “takings clause” of the Fifth Amendment to the U.S. Constitution to limit the extent of governmental regulation of property without providing just compensation. Because trees and other plants are part of the fee simple estate, there may be limits, not yet reached, to the extent of uncompensated forestry regulation. In contrast, wild animals and water, though they can be reduced to ownership, are historically less susceptible to private control and more subject to regulations concerning their conservation.

In the same year that the United States signed Agenda 21, the Supreme Court endorsed a view of property that treats land as a passive entity, doing nothing until transformed by development. Laws protecting the functioning productive ecosystems, therefore, are vulnerable to compensation takings claims where they eliminate the market value of even a segment of land. In the subsequent decade, the Supreme Court, the U.S. Court of Federal Claims, and the Court of Appeals for the Federal Circuit have continued to regard economic uses of land as the basic source of land’s value. Government regulation of forest land to provide habitat for endangered species, or to maintain ecosystem services, such as water purification, therefore continues to be vulnerable to takings challenges.

Forestry Practices

There is no federal forestry practices law other than the rules governing forestry on public lands. Regulation of forestry on nonfederal lands, like land use control, is a function primarily of state government. Approximately 75% of the states have some kind of regulation of forest practices. Constitutional supremacy preempts the application of these state forest practices laws to federal public land forestry.

Although comprehensive planning is required for forestry practices less often on private (than public) land, many states employ substantive standards. Prof. Paul Ellefson, who has tracked state forest practices laws for over two decades, categorizes the substantive standards found increasingly in state regulation of forestry: timber harvesting standards (including limits on clearcutting, logging on steep slopes, debris disposal, and other activities associated with logging), transportation standards (including road, trail, and landing construction and maintenance to abate erosion and control sedimentation), reforestation standards (including protecting riparian areas, sensitive species habitat, wetlands, and steep slopes). The trend in the past decade has been toward slow increases in the level of regulation of logging on private lands to support long-term, public objectives related to sustainability (especially where practices affect water quality).

Some jurisdictions, especially local governments, zone regions for different forms of forestry having a range of impacts. Laws may limit or prohibit commercial forestry in-

101. See, e.g., Loveladies Harbor, Inc. v. United States, 28 F.3d 1171, 24 ERL 21072 (Fed. Cir. 1994).
102. See, e.g., Tulare Lake Basin Water Storage Dist. v. United States, 49 Fed. Cl. 313, 31 ERL 20648 (Fed. Cl. 2001) (restrictions on withdrawal of water to provide sufficient river flow for fish at risk of extinction constituted a taking of water rights).
104. U.S. CONST. art. VI.
105. Ellefson et al., supra note 103, at 425.
environmental protection areas or residential zones. Zoning may be overlaid directly on a land use map, or it may flow from protection of specially designated resources, such as rivers (generally) or specific outstanding bodies of water.

**Media**

Much of the effort of environmental law focuses on abating discharge of pollution into the media of water, air, and soil. The pollution control laws, therefore, sometimes shape forestry decisions. States implement most media-specific pollution control regulation through state law approved by EPA under federal legislation. This system of cooperative federalism allows states some flexibility in tailoring regulations and goals to local circumstances as long as the states adhere to the minimum federal standards. Unlike state control of forest practices, state pollution control rules generally apply to federal agencies. Water pollution law is the most important medium-based regulation affecting forestry. Forestry-related discharges to air and land are less important and are combined in a single subsection.

**Water**

Water pollution control law in the U.S. has historically concentrated on abating discharges from point sources, “discernable, confined and discrete” conveyances. The regulatory focus on point sources, especially industrial facilities and sewage treatment works, has yielded significantly improved water quality. The greatest threat today to water quality comes from diffused surface runoff, called nonpoint source pollution. It is not strictly regulated under federal law and the state programs, and it is difficult to monitor and control. Most of the water pollution caused by forestry, especially logging and recreation, is nonpoint source sedimentation. Even careful logging may denude portions of a forest stand and increase the amount of soil erosion, which results in the deposition of sediment in rivers and lakes. Sediment is the principal pollutant impairing the nation’s rivers and streams.

Sedimentation prevents many fish and bottom-dwelling aquatic organisms from breeding or surviving. Logging may also increase surface water temperature by removing shading vegetation. In addition, application of herbicides and other pesticides in forestry may result in the runoff of toxic residue into water. Pesticide use is often regulated by special pesticide certification and control programs.

Currently, the federal government offers some conservation incentives in the form of grants to reward practitioners of forestry practices that minimize sedimentation. However, there is no direct federal regulation. Federal law does compel states to adopt comprehensive plans to control nonpoint sources of pollution that contribute to nonattainment of water quality standards. States generally adopt BMPs, which are similar to the substantive standards for forest practices dealing with timber harvesting and transportation. In most states, compliance with BMPs is voluntary unless required under a forest practices law. BMPs, which are a form of best available technology as applied to nonpoint source pollution, will vary from region to region. Examples of BMP topics include standards for forest road and skid trail design and their closing; constructing, using, and closing log landings; stream crossings; equipment operation; and weed control. States participating in the Coastal Zone Management Act face more stringent federal requirements to abate nonpoint sources of water pollution.

Federal law requires all states to establish water quality standards that describe the ambient conditions under which a body of water should be considered clean. When waters of a state fall short of the standards, then the state must establish a budget of contaminants, TMDLs, and allocate the assimilative capacity of the water to the sources of degradation. The most important development in water pollution control law during the past decade has been the awakening of the long-neglected TMDL requirement, triggered in large part by citizen suits against states.

As states start to face the difficult task of limiting nonpoint source pollution to meet water quality standards, they may begin to require BMPs. The Forest Service, which, under federal law, must ensure that forestry on its lands does not contribute to nonattainment of water quality standards, requires BMPs for logging operations. Often, nonpoint sources are responsible for most of the contamination preventing the attainment of water quality standards. However, because these sources are not directly regulated, states often place greater abatement burdens on point sources, which may not discharge without a permit under federal law. As explored below under the section entitled Forest Conservation Incentives, that will encourage point source dischargers to offer financial incentives to nonpoint source managers, such as forest landowners, to improve practices at a cost lower than the point source could achieve for the same level of abatement.

Road building and other activities incidental to forestry that disturb soil and vegetation may involve the direct modification of waters through the discharge of fill material. Fill is commonly used to convert wetlands to dry ground more suitable for construction of roads and other facilities. Forestry involving the discharge of dredged or fill material presents the only circumstance in federal water pollution law where forestry activities on private land may require a permit.

106. 33 U.S.C. §1362(14), ELR Stat. FWPCA §502(14) (Clean Water Act (CWA)).
108. Id. at 6.
111. Id.
115. See generally Houck, supra note 98 (a masterful study of the TMDL program).
117. Road building and logging, in and of themselves, are not point sources. But, point source discharges may occur in the course of these activities. See, e.g., Newton County Wildlife Ass’n v. Rogers, 141 F.3d 803, 28 ELR 21125 (8th Cir. 1998).
permit. However, logging or clearing trees on wetlands are often available for simple road crossings and culvert placement. However, logging or clearing trees on wetlands (such as bottomland hardwood or mangrove swamps) typically requires an individual permit. “Normal” silvicultural practices that do not involve the conversion of land from forested wetland to some other use, such as cropland or commercial/residential development, are exempt from these permit requirements.

Air and Land

Although pollution from forestry most directly harms water, discharges to air and deposits on land may nonetheless be subject to regulation. Prescribed burning is the only area of forestry typically regulated by air pollution laws. It is also one of the few areas of forestry law for which state common law may be relevant, through nuisance or negligence liability. Regulation of burning generally requires adoption of control measures akin to the BMPs for water pollution abatement. In addition to concerns about health threats from the emission of particles, carbon monoxide, and toxic chemicals, burning control measures may also address visibility impairment.

Deposit of wastes on land plays a minor role in forestry. Regulation typically seeks to ensure that old equipment, leftover pesticides, and other spent material are not simply left to degrade on-site and leach dangerous contaminants. A hodgepodge of federal laws, many implemented through state programs under cooperative federalism, governs these terrestrial pollution aspects of forestry.

Target Resources

Regulation of forestry is site-dependent. When forestry occurs in areas where the law targets certain resources for protection, then special, stringent standards apply. This section first considers endangered species, targeted by federal law for protection wherever they occur. Next, it considers, under the rubric “ecosystems,” larger scale protection targets, such as riparian zones or forest landscapes. Increasingly, in all areas of target resource protection, forestry may be permitted to harm some aspect of the target resource in exchange for a conservation program that preserves, maintains, or restores a larger or more important segment. Both state and federal programs are increasingly active in this area of regulation.

Species

In addition to the indicator species that may be adopted by a public forest management regime to monitor substantive environmental standards, certain other species receive direct protection. These target species bring special regulations wherever they are found, including in forests. Common types of target species that enjoy protection are game animals, migratory birds, and endangered organisms. Where regulations protect the forest habitat of animals, forestry must be adjusted accordingly or an exemption sought. Regulations preventing adverse modification of existing habitat are more common than regulations requiring restoration of ecological conditions in the forest that favor target species. Some target aquatic species, such as freshwater fish, may dwel downstream of a forest but nonetheless constrain forest management because they are adversely affected by changes in sedimentation or water temperature caused by logging.

Of all the laws protecting target species, the ESA is both the most stringent and the most important in shaping sustainable forestry. Those species listed by the FWS or the National Marine Fisheries Service (the Services) in rulemakings finding that they are at high risk of extinction receive protection through affirmative recovery mandates and through proscriptions to ensure their survival. Over one-half of all listed species under the ESA depend on forest ecosystems, including the northern spotted owl, the red cockaded woodpecker, and many runs of anadromous fish. All federal agencies have a duty to use their authorities to contribute to recovery and some land management agencies actively participate in recovery plans. In addition, federal agencies must engage in a consultation process to ensure that any action authorized, funded, or carried out, including forestry plans, not jeopardize the continued existence of a species listed under the ESA.

Also, the ESA prohibits anyone from harming endangered animals. Because harm includes “significant habitat modification or degradation where it actually kills or in-

121. See, e.g., Avoyelles Sportsmen’s League v. Marsh, 715 F.2d 897, 13 ELR 20942 (5th Cir. 1983).
126. See id. §§1536(a)(2), ELR STAT. ESA §7(a)(2).
127. See id. §§1532(19), 1538(a)(1), ELR STAT. ESA §3(19), 9(a)(1).
The ESA affects forestry even on private lands where endangered species occur. For instance, logging in suitable nesting habitat for the listed marbled murrelet, in an area where many birds were detected displaying nesting behavior, constitutes prohibited harm of the bird.129

The Ninth Circuit found that impairment of breeding by logging habitat does actually injure birds.130 The court also found that demonstrating past or present harm is not necessary for injunctive relief under the ESA; imminent threat of future harm can be a basis for an order prohibiting a harm-causing activity.131

The most significant development in the conservation of endangered species on forest lands this past decade has been the shift in the emphasis of the ESA program from interagency coordination and prohibitive policy to incidental take permitting. Despite its inclusion in the ESA since 1982, the incidental take permitting authority was little used prior to 1992. During this period, the prohibition on harm was generally viewed as a line that could not be crossed. In the past decade, however, the prohibition became the incentive for people to come to the Services and propose habitat conservation plans in order to engage in activities resulting in incidental take.132

Viewed from this perspective, implementation of the ESA shifted to a pollution control model.133 Just as the Clean Water Act (CWA) prohibition on the “discharge of any pollutant”134 operates primarily as a basis for requiring dischargers to conduct their activities in accordance with permits, the ESA prohibition against take became a basis for closer regulation of habitat degradation. Just as the discharge prohibition functions as a tool primarily to control rather than eliminate the addition of pollutants to water (though elimination is a stated objective of the CWA)135 the take prohibition now functions as a tool to control habitat degradation rather than prevent it.

The HCP136 is the part of the permit that has received the greatest attention because, in part, its name promises a comprehensive approach to recovery. Unfortunately, the incidental take permit program has not been implemented to realize fully this potential. To receive an incidental take permit, an applicant must prepare an HCP that discusses the impacts on the listed species, steps taken to minimize and mitigate the impacts, funding, and alternatives rejected.137

Congress created the incidental take permit program in 1982 at the request of a coalition of developers, municipal governments, and a local environmental organization that had reached an agreement to allow some harm to the endangered species.138 Permits covering large-scale developments, such as the San Bruno agreement, continue to include HCPs hammered out by multiple parties and involving the public.

On the other hand, though, the Services issue many permits with less broad public participation.139 Some large, single-landowner forestry HCPs result from entirely private negotiations between the owner and the Services.140 Although the ESA requires an opportunity for public comment on a permit application,141 it is difficult to inject new information, interests or ideas once the draft HCP has been negotiated.142

The ESA provides the Services broad discretion to create requirements for HCPs that may be “appropriate,”143 but the Services have limited the standard for approving HCPs to the “no jeopardy” threshold.144 This threshold ensures only that the permit not “appreciably reduce the likelihood of the survival and recovery” of the species in the wild.145 Affirmative contribution to recovery is not a requirement.146 Courts have accepted the Services’ interpretation that “the appreciably reduce the likelihood of the survival and recovery” standard, like the jeopardy standard, requires only that survival not be significantly impaired.147 A number of comments...
mentators have identified this survival standard as an important weakness of the ESA permitting program. 148

The other incidental take permit standard that has generated considerable controversy is the requirement that the applicant “minimize and mitigate” the impact of the incidental take “to the maximum extent practicable.” 149 This requirement, along with the requirement that the HCP demonstrate a source of adequate funding, has been the basis for the only two significant judicial remands of incidental take permits. 150 These cases show that substantive standards limit the latitude accorded the parties in the permit negotiation. They aid endangered species advocates, who are often unable to participate in the permit negotiations and must rely on judicially enforceable standards to advance their interests.

Characteristic of the Clinton Administration initiatives to promote more HCPs and incidental take permits is the “no surprises” policy. This policy provides incidental take permit holders with long-term security. Through the life of the permit, which may run up to a century, the “no surprises” assurance means that no changed circumstance or new information about a species covered by the HCP will create any additional obligation for the permittee. That means that a permittee will not be liable for additional land or financial compensation beyond the level of mitigation that was negotiated for in the HCP. The public and the Services bear the risk of unforeseen circumstances. 151 Defenders of the policy argue that certainty is among the most important characteristics of a permit that induces participation in the HCP program. 152 Opponents counter that the policy freezes in untested and largely unmonitored assumptions about biology in situations where flexible adaptive management is more appropriate. 153

More than any other law, the ESA has spurred both on-the-ground changes in forestry and experiments in multi-party collaborative management of habitat. Though the Services have implemented the ESA less stringently than they should, the experience of the past decade nonetheless demonstrates the importance of enforceable, specific substantive standards in promoting movement toward sustainable development. Without the threat of ESA liability, agencies, local governments, and forest landowners would not be working so closely together to restore ecological integrity. The challenge in the decade ahead will be to extend the innovations spurred by the ESA to forestlands that do not host listed species.

Ecosystems

Though ecosystem integrity, ultimately, is the foundation of sustainable development, there is little protection of ecosystems, as such, through regulation. Generally, U.S. law addresses ecosystem protection through other programs, such as the ESA, that use more easily measured indicators of success or failure. Nevertheless, a few ecosystem scales have emerging programs for their protection. This section first considers riparian zones and then the larger-scale landscapes that support ecosystem integrity.

Riparian protection may be accomplished through water pollution control of fill activities. There is a great deal of overlap between riparian zones and wetlands. However, riparian areas may also be protected through target resource regulations. Riparian strips may be specially designated for protection due to their productivity, their habitat value, their size, or their uniqueness. Logging in these areas may be prohibited or restricted under federal land management standards or under state forest practices rules. Many states protect these riparian areas through floodplain or floodway protection laws, which often require permits. 154 State regulations, guidelines, and BMPs for forestry in riparian zones include specification of the zone width, residual tree standards, and logging operation specifications. 155 Where aquatic species, such as salmon, are protected, their habitat needs will often spur riparian area conservation.

Target landscapes encompass a diverse array of places with a broad spectrum of special regulations. In addition to the public land areas, such as parks, with special protections, some protected landscape overlays include private forests. Often the landscapes center around core river corridors, coastal areas, or migration routes. The landscapes may be targeted for their scenic, historic, or ecological attributes. Special standards, such as wider riparian buffers, may be applicable in these zones. Also, special procedures or permits may be required before logging may proceed. However, forests themselves are not generally targets of ecosystem protection, despite the dramatic decline in many forest ecosystem types. 156

San Bruno Mountain HCP and stating the ESA’s requirement as “not appreciably reducing the likelihood of the survival of the species”).


151. Habitat Conservation Plan Assurance (No Surprises) Rule, 63 Fed. Reg. 8859 (Feb. 23, 1998); HANDBOOK, supra note 132, at 3-29. This provision is mitigated somewhat by the “five-point policy.” 65 Fed. Reg. 35242 (June 1, 2000).


153. See, e.g., John Kostyack, The Need for HCP Reform: Five Points of Consensus, 16 ENDANGERED SPECIES UPDATE 47, 50-51 (1999); Kostyack, Surprise!, supra note 142, at 19; Parenteau, supra note 148, at 293-301; Sheldon, supra note 148, at 319-20. The most comprehensive study of HCPs to date, conducted by the American Institute of Biological Sciences and the National Center for Ecological Analysis and Synthesis, found insufficient data to support the commitments in many HCPs. PETER KAREIVA ET AL., USING SCIENCE IN HABITAT CONSERVATION PLANS (1999), available at http://www.nceas.ucsb.edu/projects/hcp (last visited Jan. 10, 2002). The report also found that most HCPs lack adequate monitoring and cover areas too small for effective ecosystem management. Id.

154. See, e.g., IND. CODE §14-28-1-20.2(B)(ii) (2000) (prohibiting construction or maintenance of structures, deposits, or excavations in floodplains that “[r]esult in unreasonably detrimental effects upon the fish, wildlife, or botanical resources”).


156. See REED F. NOS & R.L. PETERS, ENDANGERED ECOSYSTEMS: A STATUS REPORT ON AMERICA’S VANISHING HABITAT AND WILDLIFE (1995) (documenting declines greater than 70% of over two dozen forest types, including spruce fir forests in the southern Appalachians, longleaf pine forests of the southeastern coastal plane, and coastal redwood forests in California).
Therefore, forest ecosystem protection depends on the presence of some other target resource.

As the recent U.S. Forest Service Resources Planning Act assessment notes, “[p]arcelization of private ownerships will continue to be a management challenge with landscape-level planning becoming more difficult and habitat associated with edge effects becoming more plentiful because of increased fragmentation of forest cover.” 157 Though landscape-level planning has received encouragement through ecosystem management policies and collaborative planning experiments, fragmented administrative jurisdictions create challenges for landscape protection as well. 158 Many state and federal agencies have adopted watershed planning approaches to address comprehensive landscape management issues, 159 but regulation is rare.

Forest Conservation Incentives

In most jurisdictions, even those with binding regulations governing forestry, the law provides positive incentives to encourage good stewardship. Forest conservation incentives are more politically acceptable to landowners and promote more cooperation than regulation, but are limited in their power by fiscal constraints. These conservation incentives apply principally to private lands. While tax incentives to reward sustainable development seldom counteract market forces, forest certification programs have established a basis for consumers to express their support for sustainability through purchasing decisions.

Many jurisdictions create incentives through tax abatements as rewards for good forest stewardship. Tax abatement refers to a reduction in the assessed valuation for property or in the taxation rate. Because forests are a form of real estate, the existing tax methods for valuing property are convenient tools to effect forest conservation. Moreover, enforcement through tax laws is often easier than through regulation because eligible landowners must come forward to register with the government for preferential treatment. Tax abatements seek to provide a counter-incentive to the landowner tempted to liquidate her timber for short-term gain.

The simplest and oldest forest tax abatements reward landowners who manage forests sustainably. These basic tax abatements seek to stimulate wood production, conserve soils, and (in some areas) promote filter strips and windbreaks. Typically, they require a certain level of stocking or a specific rotation period, and a guarantee that the land will not be developed for nontimber use for a certain number of years. Often the tax programs require a commitment to use BMPs in adhering to a forest plan, controlling erosion, and maintaining a healthy forest.

More recently, tax abatements have been modified or supplemented in order to provide incentives for forest owners to allow public hunting and fishing access. These abatements seek to counter the modern trend of diminishing recreational access to private forests. 160 Some jurisdictions have special tax categories for land managed as wildlife habitat. Most unusual are tax abatements for forest management aimed at maintaining biological diversity. In rare instances, a tax credit may be offered for tree harvests subject to special regulations to conserve target resources, such as endangered salmon.

Forest conservation generally requires long-range planning. Some governments offer subsidies, through either cost share or technical assistance, for landowners to develop and implement a forest management plan. Although most planning programs are designed to promote maximum sustained-yield forestry, others may be concerned with providing wildlife habitat.

In addition to the conservation incentives deriving from government grants or tax policy, forest management is shaped by market economics. Law plays an important role in creating markets that provide forest owners with incentives for sustainable forestry. For instance, federal drinking water standards, set under the Safe Drinking Water Act, 161 provide an incentive for the city of New York to promote forest conservation in the watersheds that supply drinking water to the city’s reservoirs. 162 Faced with a choice between spending over $5 billion to construct and maintain a filtration plant, or spending $1.5 billion in watershed acquisition and conservation incentives, the city chose the latter. The market for the water purification services of forest ecosystems derives, in large part, from the law requiring expensive filtration if the water running off the land fails to meet federal purity standards. Though the market facilitating payment to private forest owners or purchase of forests for water purification has not yet emerged except in isolated cases, compliance with water quality standards may increasingly spur such incentives. As states and point source dischargers come to terms with TMDL compliance, they will offer to pay forest landowners for water purification services resulting in more sustainable practices. Forest conservation will often be the least cost option for reducing or abating pollution.

Similarly, as other states (and, possibly) the federal government join Oregon and Massachusetts in regulating the emission of carbon dioxide, 163 law will create a demand for the carbon sequestration services of forests. Tree planting, forest preservation, and sustainable forest management are all techniques that can be employed to offset carbon loading of the atmosphere. 164

Finally, market certification of sustainable forest management is a new development of the past decade. Certification provides consumers with information about the forestry practices from which wood products derive. If consumers are willing to pay a premium for wood grown from sustainable forests, as they do for organically grown food, then for-

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157. RPA Assessment, supra note 7, at 2. See also id. at 28.
160. RPA Assessment, supra note 7, at 64.
164. Johnson & Ditz, supra note 5, at 241 (citing Mark C. Trexler & C. Haugen, Keeping It Green: Tropical Forestry Opportunities for Mitigating Climate Change (1995)).
est managers will have financial incentives to practice sustainable development.

Two certification systems dominate the U.S market. The Sustainable Forestry Initiative (SFI), a program sponsored by the forest and paper trade association, relies on timber owners themselves to report annually on progress toward higher forestry standards relating to reforestation, water quality, wildlife habitat, and visual aesthetics. The SFI has enrolled over 50 million acres. In contrast, the Forest Stewardship Council (FSC), an independent, nonprofit coalition of environmental groups, citizens, economic development organizations, and the timber industry, sponsors third parties who conduct audits of forestry practices. The FSC develops standards, requires management plans, and has 40 million acres of forests enrolled. In general, the FSC standards (which prohibit clearcutting) are more stringent than the SFI standards. The Home Depot, the largest home-improvement retailer in the United States, has adopted the FSC program for its “green” line of wood products. Commitments to certification by large buyers, such as The Home Depot, will hasten the movement of forest management toward the sustainability standards. Forest certification will likely continue to grow in importance as a conservation incentive in the coming decade. The FSC’s stricter standards and independent, third-party certification makes it a better vehicle for promoting sustainable development in forestry. Nonetheless, even the FSC emphasizes traditional stand-level forest management rather than landscape-level biodiversity concerns.

Recommendations

If there is any area of resource management in which the United States should be a leader in sustainable development law, it is forestry. After all, it was out of concern for the conservation of forests that the United States established the first comprehensive management program for a system of public lands, in 1897. That mandate, for what came to be known as “sustained-yield” management, is the taproot for the modern movement toward sustainable development. The utilitarian aim to provide the greatest good for the greatest number (social responsibility) and to sustain the production of forest goods over time (intergenerational equity and stewardship principle of sustainable development) is the taproot for the modern movement toward sustainable development. The founding modern environmental statute, NEPA, contains substantive calls for sustainable development both in blending environmental and socioeconomic objectives and in expressing concern for fulfilling obligations to future generations. The true power of NEPA, though, is its creation of a process, environmental impact analysis, to move toward sustainability. In addition to NEPA, the regulatory statutes of the 1970s, especially water pollution control and endangered species protection law, substantially bolstered the nation’s institutional and legal capacity to achieve sustainable development. To fulfill this promise, however, the United States must return to some first principles of environmental law, beginning with a revitalization of the substantive policy objectives of NEPA.

Despite this strong foundation, forestry law has not yet responded adequately to the current challenges of sustainable forest management. One reason is the strong tradition of landowner autonomy on private forest lands, as reflected in takings law and the limited regulation of forest practices. This means that a shift in federal policy toward sustainable development does not translate directly into changed forestry practices. Sustainable development must await cultural change and incremental incorporation of sustainability principles in the existing regulatory regimes. The United States can consolidate the gains and reverse the losses in the struggle to move forestry toward greater sustainability by learning from the experiences surveyed in this Article.

Judicial trends limiting public access to courts for review of agency compliance with law, parochial congressional riders bypassing authorizing statutes, and the decline in the preparation of EIS all run counter to the stakeholder participation principle of sustainable development. Aspects of the HCP program, the hallmark of the past decade of endangered species protection, also make public involvement for sustainable development difficult. Though the constitutional aspects of the judicial developments may be beyond the reach of Congress to reverse, legislation can help in these areas by establishing better and binding procedures. Presidential leadership alone could restore NEPA to the forefront of sustainable development.

On the other hand, this same past decade has ushered in ecosystem management policies for public forests, and sustainability indicators monitored through adaptive management and the GPRA. Both adaptive management and the GPRA will help fulfill the sustainability principle to provide “timely, reliable and accurate information.” Adaptive management responds to dynamic ecological characteris-


166. Jenkins & Smith, supra note 165, at 64.


169. The Act of June 4, 1897, 30 Stat. 34, commonly called the National Forest System “organic act,” established uniform management and administration of forest reserves, today’s national forests.

170. Strategic Plan, supra note 38, at 1.

171. Congress continues to set unrealistically high goals for timber production that are not compatible with the standards in authorizing legislation. Forest Service Decisionmaking, supra note 10, at 63-65.

172. Statement of Forest Principles, supra note 13 (princ. 2); Santiago Declaration §4.1, supra note 28.


174. Statement of Forest Principles, supra note 13 (princ. 2); Santiago Declaration §4.1, supra note 28.
which supports ecosystem integrity, economic viability, and social responsibility. The short-term success of this movement will hinge, in large part, on the fate of the 2000 forest planning regulations and the 2001 roadless area rule. These two recent reforms constitute the single most important positive development in the application of substantive standards to promote sustainable development of public forests. As the first decade under Agenda 21 comes to a close, the Bush Administration will determine the fate of these administrative reforms that make maintenance and restoration of ecological sustainability the first priority for national forest management. The Administration should reverse its stated intentions and support the new Forest Service rules.

The new LRMP regulations are so important, in part, because large-scale, e.g., forestwide, planning is needed to implement ecosystem management. Large scales are more likely to encompass ecosystem functions and flows and can best support planning to: minimize forest fragmentation; bridge pollution control and resource management objectives; and allow sufficient flexibility in mitigation trading for ecological services. Regionwide HCPs, programmatic EIS, and landscape-level watershed plans are early efforts in a project that will require steady encouragement over the coming decades.

As consumers continue to incorporate their concern about sustainable development into their purchasing decisions, third-party certification of forest products will increase in importance. Though this aspect of promoting sustainability does not have a strong legal component, law reformers looking ahead to the coming decade should ensure, at least, that there are no legal barriers to the communication of information about the forests and workers from which consumer products derive. As participants in markets, governments should throw their purchasing weight behind the FSC program. This will be an important boost especially as certification moves from a focus on building materials to paper products. Certification is an excellent method for fulfilling the forest sustainability principle to integrate environmental costs and benefits into market mechanisms.

Looking ahead beyond the incremental reforms needed in the next 10 years, the United States should prepare for more difficult legal transformations to promote sustainable forestry development. The long-term challenges are not specific to the forestry field. They include campaign finance reform to reduce the disproportionate influence of large corporations, evolution of judicial understanding of property to update expectations about the productive value of ecosystems, and the establishment of more inviting avenues for public participation in and challenge to decisions affecting sustainability.

They also contribute to the fulfillment of the sustainable forestry principle calling for the integration of forest management with management of adjacent areas to mitigate the ills of fragmentation and protection of “ecologically viable representative or unique examples of forests.” Id. (princ. 8).

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