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Conservation and Controversy: National Forest Management, 1960–95

ABSTRACT

In the period 1960 to 1995, policies affecting national forest management generated a variety of directions for the planning, management, conservation, and preservation of national forest lands and resources in the Sierra Nevada. The National Environmental Policy Act (NEPA) forced better disclosure of information utilized by the U.S. Forest Service, enhanced public awareness of management issues, and led to increased public involvement in agency decision making. As a result, efforts to increase timber production in Sierra Nevada national forests met with increased public scrutiny as well as political and legal opposition. The National Forest Management Act (NFMA) of 1976 mandated extensive planning to promote effective and efficient conservation of forest resources and to resolve forest management controversies. Demand for increased public timber supplies, however, conflicted with demands for increased recreation and wilderness preservation. Contestation over national forest policies did not begin with NFMA, but the broad scope of land-management planning generated remarkable public attention and controversy. Public opposition to potential impacts on wildlife habitat and other aspects of forest ecosystems and to the increased use of clear-cutting as a timber harvest method led to legal action challenging national forest plans. At present, implementation and interpretation of law and administrative policies have forced the Forest Service to revise forest plans in the Sierra to better incorporate species and habitat requirements as part of its ecosystem-management strategy.

INTRODUCTION

The origin of this research is an invitation by the Sierra Nevada Ecosystem Project (SNEP) to participate in a workshop to assist in determining the role that public policies have played in shaping the ecosystems of the Sierra Nevada. Specifically, several researchers have been asked to respond to the question "Which public policies have been most significant in shaping the ecosystems of the Sierra Nevada as they exist today?" These individuals have been asked to concentrate on the period from 1960 to the present, with the intention that a range of policies and their impacts will be analyzed. I believe that the exercise is a useful one and am delighted to contribute to this inquiry.

My effort to respond to this question will be primarily to address policies and issues associated with national forest management in the Sierra Nevada during the last thirty-five years. While I am aware that public policies have had a multitude of significant effects in many other areas of the Sierra, this chapter will not attempt to address them directly. My approach will concentrate on developing the context for policy implementation in the national forests during this period and discussing the effects and implications of these policies. As a social scientist, I will leave an authoritative determination of impacts and their significance on ecosystems to my colleagues on the SNEP Science Team. As part of the effort to organize thinking about institutional aspects of natural resource sustainability in the Sierra, I offer some thoughts on ancillary issues pertaining to policy implementation. This excursus may prove useful as the Science Team seeks to answer the ques-

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tion posed and to consider its implications. Where feasible, I will refer to other policies that have had significant impacts on the Sierra. Generally, this will be limited to suggesting areas for further research or discussion by others. Discussion pertaining to the impact of policy in the national forests of the Sierra Nevada will focus on forces that shaped the administration of the national forests, the response to public activism surrounding national forest management, and the further implications for conservation and management of the national forests in the Sierra Nevada.

This workshop represents an initial effort to discuss with some precision the role that public policies have played in influencing the conditions of Sierra Nevada ecosystems. Ultimately, statements about policies and their effects on the ecosystem, particularly regarding the current era, must be answered by further study. This analysis should be undertaken in light of the results of the completed SNEP assessments. This point cannot be emphasized too strongly. The social scientists engaged in policy review and analysis are going to present research on various public policies and their environmental effects and impacts. This work will necessarily be based on a general knowledge of conditions at the ecosystem level, as it is presently understood. I also hasten to point out that research to date is based on an understanding of environmental conditions that is clearly imperfect and incomplete. If it were not, SNEP would not be engaged in an assessment, and we might leave to the administrative or legislative process the task of defining a policy that would be consistent with the state of scientific knowledge. After all, it was public and congressional concern about the lack of scientific knowledge, understanding, and consensus as to the ecological health of the Sierra Nevada that led to the articulation of SNEP's research mission. One may naturally anticipate that SNEP's assessments will result in better, more accessible knowledge about the ecological conditions of the Sierra. New information that may be presented in the assessments may change the key points about policy that we glean from our present discussion. Thus, it would prove of substantial value to renew the discussion of policies and their impacts in the Sierra in light of the information to be made available once the assessments are completed. Only then will it be possible to answer the question "Which public policies have been most significant in shaping the ecosystems of the Sierra Nevada as they exist today?" with any degree of accuracy or precision.

PUBLIC POLICY AND RESEARCH: CONTEXT AND IMPLICATIONS

Understanding the influence of policy is an important component of SNEP's assessment of the status of the ecosystems of the Sierra Nevada. Before discussing specific policies, I would like to express some concerns relating to the consideration of policies and their effects. I believe the limits of this kind of enterprise should be understood by the participants in this workshop. Several fundamental issues occur to me. These bear not only on the discussion about policies and their ecological effects and implications but also on the effort to discuss the broader implications of public policy in the Sierra. Ideally, an inquiry into the impact of policies will also consider the influence of social and economic dynamics on policy implementation. Describing these interactions is probably beyond the scope of this workshop. Nevertheless, full comprehension of the policy context depends on an understanding of both formal and informal social and administrative dimensions relating to policy implementation. For this reason, I particularly appreciate the inclusion of social scientists and others with practical experience in policy implementation as part of the SNEP Science Team.

A primary concern regarding the question we are asked to tackle in the policy workshop relates to the ability of individual research projects to adequately assess the role of a particular policy in shaping the ecosystem. Public policies, defined as the sum of law, regulation, administrative programs, and public projects together with their funding and implementation, affect virtually all of the land area and natural resources in the Sierra Nevada. The effect of public policies extends across both time and space, with the results of prior policies exerting an influence on the present status of resources and ecosystems. Equally, effects and implications of environmental policies may extend beyond the specific areas, issues, or programs that they were designed to affect directly. The breadth and depth of policies, and their effects on ecosystems, therefore, are likely to be substantial. As a result, the full extent to which policies have affected and influenced both the current state of the ecosystem and the present fabric of natural resource institutions will be difficult to establish. Given the task and its scope, this exercise will necessarily produce an eclectic and incomplete view of the role that policy has played in shaping ecosystems.

Another cause for concern pertains to difficulties in empirical method. The effects of public policy may appear to be the result of specific policies. Correlation of the operation of a specific policy to a particular effect may appear to be intuitively obvious, but attempting to go beyond this is a difficult task. In reality, attribution of specific causation to policies or establishing their effect with certainty is a difficult task, complicated by the operation of multiple policies and other forces that influence the same resources or ecosystems. In addition, for policy effects for which one hypothesis may be constructed, other possible explanations generally exist—some more or less likely. Specific attribution of the effects of laws, statutes, plans, programs, and projects can thus be a complicated and error-prone enterprise. Observed effects may be the indirect results of obscure policies or unintended by-products of various policy instruments. Precise attribution of effects is therefore a controversial and contentious exercise,

and one that may exceed the capacities of any research design or the capability of even the most zealous researcher.

A variety of public policies that have had significant effects on the environment generally are not characterized by a specific relation to ecosystems, natural resources, or the environment. Examples of this kind pertaining to the Sierra in the last thirty-five years include the development and expansion of Interstate 80, the state highway systems, and the national forest road system. These dramatically improved access to the entire Sierra Nevada and contributed to the concentration of urban, commercial, recreational, and commodity-related development and associated environmental impacts in particular areas of the range. Individually, all of these developments have had significant environmental impacts on the ecosystems in these locations. Another example is the influence of national and state policies related to air quality and pollution control. Although evidence suggests that aerial pollutants are beginning to have profound impacts on the Sierra, the relationship between policies and these impacts is complicated (Cahill et al. 1996) and may be isolated and analyzed only with difficulty.

Additionally, attribution and discussion of public policies and their effects may be complicated by a number of factors. Several ostensibly separate policies may together contribute impacts on a resource or areas, resulting in cumulative effects that are difficult to attribute to a specific policy instrument. In other cases, funding for one of a number of interactive policies may be uneven or irregular, affecting implementation and making it difficult to draw any conclusion as to the success or failure of impact of particular public policies. Finally, in some cases the absence of policy may have implications for the state of the ecosystem that are as significant as or greater than those from policies that we can more easily define and observe. SNEP Science Team members, I believe, have already explored many individual impacts. I am hopeful that individual assessments will capture some of the effects that may be traceable to the presence or absence of certain policy phenomena.

THE NATIONAL FORESTS: POLICIES, CONTEXT, AND IMPLICATIONS

National forest management and its ecological implications in the Sierra Nevada are obvious and important sources of information regarding the impact of public policies on ecosystems in the region. Several reasons compel attention to the role of policy in the management of these lands. A large proportion of the land area of the Sierra Nevada, especially at middle to upper elevations, is national forest land. Policies and planning specifically pertaining to national forest management are the product of a number of laws and administrative policies, including the National Forest Management Act of 1976 (NFMA), U.S. Code, vol. 16, secs. 1600–1614 (1976); the Organic Act of 1897, U.S. Code, vol. 16, secs. 473–482, 551; the Multiple Use–Sustained Yield Act of 1960 (MUSY), U.S. Code, vol. 16, sec. 528 et seq.; the Wilderness Act of 1964; the National Environmental Policy Act of 1969 (NEPA), U.S. Code, vol. 42, sec. 4321 et seq.; the Endangered Species Act (ESA), U.S. Code, vol. 16, secs. 1531–43 (as amended in 1989); as well as other environmental laws, annual appropriations legislation, and a range of administrative policies relating to fire suppression and fuel management. These policies guide a range of activities, which necessarily are likely to have significant environmental effects. The impact of these activities is likely to be felt in the national forests, on adjacent lands, and in ecosystems beyond national forest boundaries. Another reason that national forest management policies are worth special attention pertains to the valuable information that may be obtained by reviewing the impacts and implications of policies explicitly designed to guide the conservation and management for large areas of the Sierra Nevada.

In the Sierra Nevada, national forests fulfill several important varied functions. These forests serve uses representing a wide range of natural resource–related values, including the use of forest resources to produce commodities, such as timber and forage for grazing. The national forests also contain other resources, including water, fish, wildlife, minerals, recreational opportunities, and others. Often these uses conflict or appear to conflict with one another. Natural resource management in the national forests of the Sierra Nevada has been the subject of a great deal of scrutiny and continuing controversy during the past thirty-five years. Concern and contestation regarding Forest Service resource policies did not begin with the enactment of NFMA. It is undeniable, however, that the NFMA land-management planning process, especially at certain key decision points over the last fifteen years, has generated remarkable public interest and caused considerable controversy. The reason for the intense interest in NFMA and its effects has to do with several aspects of the statutory mandate. The law's provisions were intended to reorder national forest management to develop coordinated plans for multiple use and to promote effective and efficient conservation of forest resources. The scope of the law, combined with increased demands on public timber supplies, suggested that NFMA had the potential to propose and implement management activities that would have widespread effects on management of the national forests, including those of the Sierra Nevada. Before analyzing these elements and the impact of NFMA, several earlier policies will be discussed in order to explain the culture of Forest Service administration and to provide a context for the discussion of recent forest policies and their impact on the national forests.

ADMINISTRATION OF THE NATIONAL FORESTS IN THE POSTWAR ERA

During and after World War II, the Forest Service began to focus on increased timber harvesting and other commodity considerations in its overall administration of the national forests. A housing boom had created an unprecedented demand for timber. As private timber was harvested and these supplies declined, industry pressed for expanded timber sales in the national forest to fulfill the demand (Clary 1986). The Forest Service increased timber sales, and as a result, conflicts between timber harvesting and recreation also increased, somewhat tarnishing the agency's reputation.

In the postwar era, Congress recognized that the Forest Service and other land-management agencies were being pressured to meet the needs of a diverse set of recreation users. During this period, land-management policy was still primarily guided by the Organic Act of 1897, which offered little guidance on how to reconcile administration of the national forests with changing public needs. This act stated that the forest reserves, as they were originally known, were to be managed "for the purpose of securing favorable conditions for water flows and to furnish a continuous supply of timber for the use and necessity of the citizens of the United States."

In 1958, Congress created the Outdoor Recreation Resources Review Commission (ORRRC) to review the situation and to make recommendations for meeting recreation needs in 1976 and 2000. The Forest Service supported the work of the ORRRC, because the agency had always encouraged recreational enjoyment in national forests as an adjunct to timber, range, and other uses. The ORRRC made recommendations to Congress that called for increased governmental funding for recreational development and for coordinated planning within agencies to provide better recreational opportunities.

LEGISLATIVE CHANGE

The Multiple Use–Sustained Yield Act of 1960

Throughout the postwar period, the Forest Service was confident of its ability to manage the forest for many different uses, including wilderness. The agency sought legislation that would confirm its authority to manage the expanding array of uses, enabling it to reconcile timber production and other commodity uses with public demands for more recreation opportunities and for wilderness preservation (U.S. Forest Service 1960). The Forest Service recognized that additional support for a range of other uses and activities, including the recreational goals of the ORRRC, would bring additional appropriations, allowing for development of uses that were already present in the national forests. The Sierra Club opposed this initiative, arguing that the Forest Service commitment to timber meant that the agency would not make balanced decisions that recognized the importance of other forest resources (Dana and Fairfax 1980, 203–4). It is also likely that increased friction between the Forest Service and environmentalists over legislation proposed to designate areas of federal land, including some in the national forest, as "wilderness," contributed to this opposition. Despite the opposition, Congress enacted the Multiple Use–Sustained Yield Act in 1960. This law stated that the national forests were to be managed for "the achievement and maintenance in perpetuity of a high-level annual output or regular annual output of the various renewable resources of the national forest without impairment of the productivity of the land." The Forest Service expanded its utilization of planning in order to coordinate various forest uses, or at least to rationalize conflicting uses (Wilson 1978). A Regional Multiple Use Planning Guide was prepared for each region to guide local planning. Forest Land Use Plans were developed for each national forest to guide multiple-use integration and development (Forest Service 1973, sec. 8213). Unit Plans were then completed to tailor management specifically to the conditions of watersheds or large drainage areas ranging in size from fifty thousand acres to several hundred thousand acres. This system essentially ratified Forest Service determinations of the "greatest good for the greatest number." Planning permitted continued timber sales while also allowing the agency to claim that it had become the nation's premier provider of outdoor recreation opportunities.

The Multiple Use–Sustained Yield Act (1960, secs. 528, 529) recognized the importance of a spectrum of resource uses, including "outdoor recreation, range, timber, watershed, and wildlife and fish." The statute also recognized the value and place of wilderness in the national forests. Legislative acknowledgment of these uses permitted the Forest Service to serve the public interest by developing a variety of forest resources and activities appropriate to meet the needs of various uses and groups. Even so, the Forest Service, an organization built on compromise, began to shift its administration in response to the needs of the public. When opposition to Forest Service projects occurred in this era, it could be countered, if not diffused, by locating potentially conflicting uses in another forest area. Culhane (1981, 388–94) argued that the many different interest groups involved tended to counteract each other's power, enabling the Forest Service to pursue a middle course. Timber harvesting could take place in one area, while fishing, hiking, and other recreation uses could be located in another. Compromises allowed resource development activities to continue, with either the support or the acquiescence of interested parties and interest groups.

Forest Service policies in this period were not without critics. Congressional appropriations were primarily oriented toward timber. To some, however, Forest Service administration remained primarily attuned to the most powerful constituencies in the regions it served. Timber and other com-

modity interests proved to be powerful enough to compel attention. Agency policies therefore often appeared to reflect a bias toward timber production rather than attempting to serve some broader conception of the public interest (McConnell 1966) or one more closely tied to a growing constituency of national forest visitors whose interest centered on recreation. Professional foresters, who made up the bulk of agency personnel and its management, had motivations and goals different from those of the timber industry. Despite these tensions, established working relationships between forester and logger, and between the Forest Service and the timber industry, appeared to lend credence to conservationist claims that timber considerations dominated the agency's agenda. In fairness to the Forest Service, however, Congress made continuing budget appropriations in order to expand the agency's timber program. This strongly suggested that Congress believed that Forest Service timber management was consistent with the purpose of furnishing "a continuous supply of timber for the use and necessity of the citizens of the United States" and thus squarely served the public interest.

After MUSY was enacted, the Forest Service slowly began to expand its staff to bring in new kinds of professional expertise. Even so, the preponderance of foresters in the Forest Service and the agency's role in supplying timber to private industry provoked doubt about the "multiple-use" orientation of the agency. The multiple-use philosophy allowed the agency to avoid many management controversies, but as the following discussion indicates, this approach never satisfied important segments of the public.

The Wilderness Act of 1964

Advocates in support of the idea that separate areas should be set aside for wilderness preservation had always opposed the idea of multiple use as the guiding principle for all forest lands. They believed that if wilderness was accorded a status only equivalent to any other use of forest resources, wilderness would necessarily be subservient to timber and other commodity uses when the agency made determinations. Although the Forest Service had already designated many wilderness areas in the national forests,[1] many conservationists did not believe that the agency valued wilderness enough to ensure that the existing "primitive area" designations would survive the timber industry's preference for increased timber harvest levels in national forest lands. The Forest Service claimed this designation was sufficient to ensure that these lands would be managed as wilderness. Some wilderness proponents were unconvinced and sought legislation to make it impossible for the status of these lands to be altered administratively (McCloskey 1966). Some of these lands, located in national forests, national parks, and other federal lands, were to be reserved as wilderness, and the status of additional areas was to be reviewed in the following ten years.

Agency efforts to deflect attention from the wilderness issue failed to divert wilderness supporters from their goal of securing legislative protection for wilderness designations. In 1964 Congress passed the Wilderness Act, despite the opposition of the Forest Service. This statute established a National Wilderness System. Certain lands administered by the federal land-management agencies, including 2.1 million acres of land that previously had been administratively protected by the Forest Service, were designated as "wilderness" or "pristine" areas, with the status of other areas to be reviewed during the following decade. In the Sierra Nevada, a number of areas in national forests, prized for their scenic beauty and recreational value, were reserved. These areas were located mainly in the alpine and subalpine zones. The agencies retained control over wilderness areas under their administration, but the new designation limited uses on these lands. Ironically, the designation permitted no timber harvest on these lands but, subject to presidential review, continued to permit other development, including mining, grazing, and water development. Loss of the range of options that the Forest Service formerly controlled on these lands was something of a blow to agency prestige, because it implied that the agency could not be trusted to preserve this land on its own (Dana and Fairfax, 1980, 227–29).

The National Environmental Policy Act

Enactment of the National Environmental Policy Act (1969) represented a major watershed in public policy. The expression of public concern for environmental values reflected the concern of many individuals in this era. NEPA was intended to ensure that environmental factors would be considered as part of the decision-making process. A major element in the law is the requirement that an environmental impact statement (EIS) be prepared for federal actions having a "significant effect on the environment (National Environmental Policy Act 1969, sec. 102 (2)(c), U.S. Code, vol. 42, sec. 4332)." NEPA, however, did not require that environmentally questionable projects be abandoned, so there was no expectation that preparation of an EIS would lead to dramatic changes in Forest Service proposals or in the policy of multiple use. The EIS, however, requires that the public be provided an opportunity to comment on agency proposals. This element of the law has had a profound impact, both on the decision-making processes of all federal agencies and on the relations of these agencies with the public. Public disclosure of information also provides citizens with an opportunity to challenge these decisions in the political process and in court. Additionally, in some cases, the time required to prepare and to complete the documents required by NEPA has provided another obstacle that has deterred some project proponents. In this way, the procedural aspects of NEPA have exerted a significant influence on a wide range of Forest Service land-management activities and programs.

An early example of the procedural aspects of NEPA requirements and their far-reaching effects is amply illustrated in a celebrated controversy in the Sierra Nevada, where the

proposed development of a ski resort in Mineral King (a relatively undeveloped area, then a part of the Sequoia National Forest) by Walt Disney was ultimately derailed. Although the ski resort had been approved prior to the enactment of NEPA, the Forest Service was faced with a lawsuit challenging its decision. The agency elected to prepare an EIS for the proposed ski resort. The Sierra Club sued, inter alia, to force consideration of the environmental effects on national park resources due to the expansion of the access road (Sierra Club v Morton, 405 US 727 [1972]). Although the lawsuit was later dropped, delays created by the lengthy administrative and legal process ultimately caused the developer to lose interest in the project (Ecology Law Quarterly, 1972, 1976). The demise of the proposed ski resort project meant that Mineral King would remain largely undeveloped. After several years, this area was transferred to Sequoia National Park. The ecological significance of this result was perhaps limited to the preservation of one valley and its environs. Nevertheless, it was perceived as no small victory for conservationists, who were encouraged in their struggle against what they regarded as the tendency of the Forest Service to abandon too quickly its conservation precepts as it sought some compromise in search of the public interest. In contrast, subsequent efforts by conservationists to challenge an EIS prepared for Kirkwood, another ski area in the Sierra, were unsuccessful, and the area was successfully developed.

The Forest Service, in many respects, pioneered the implementation of NEPA, but its experience has not been without some difficulties. Among other early innovations, the agency developed an environmental assessment (EA), a preliminary report used to ascertain probable environmental effects and thereby determine whether preparation of an EIS was required. Nevertheless, in the years immediately after NEPA's enactment, the Forest Service had considerable difficulty in adjusting to the law's requirements. In the first years of NEPA's existence, the early 1970s, seasoned agency managers, almost all of them foresters, generally were not fully aware of the scope and intricacies of EIS requirements, nor were they prepared to supervise a comprehensive consideration of environmental impacts (Taylor 1984, 208). Consequently, on many occasions, the agency concluded that an EA was sufficient and did not insist on preparation of an EIS for certain projects. In some of these cases, the agency's analysis established that some projects, including timber harvests (especially those where clear-cutting was employed), were unlikely to have a "significant impact" on the environment. Additionally, agency determinations of which projects required an EIS tended to exclude many projects from this requirement. Preparation of an EIS entailed an opportunity for public comment but also allowed the Forest Service opportunities to revise the project and to respond to its critics before reaching a final decision. Even when the Forest Service began its early efforts to produce environmental impact statements, several years were required to develop the skills to conduct a full analysis of environmental impacts and to produce an adequate EIS. Reasons for the agency's inability were due in part to initial uncertainty about what preparation of an EIS entailed and also in part to lack of expertise in analyzing environmental impacts. Despite the presence of an array of forestry professionals and other interdisciplinary scientific experts in the Forest Service, the agency could not immediately deploy and utilize professionals who possessed skills appropriate for the preparation of the EIS. As a result, lawsuits successfully challenged agency decisions regarding the preparation of an EIS (Kleppe v Sierra Club, 427 US 390 [1976]).

After suffering losses in court, Forest Service managers recognized that the agency had to learn more about environmental impact analysis and how to prepare an EIS. It took time to recruit and to cross-train experts in disciplines not previously mastered to any significant degree by the Forest Service personnel. Resistance to formal public participation waned as the agency became more familiar with the process. As the agency developed greater interdisciplinary environmental expertise, it was gradually able to handle sensitive projects and to prepare an EIS in a professional and more defensible manner (Taylor 1984).

TIMBER SUPPLY AND THE NATIONAL FORESTS

The forest products industry was also concerned over Forest Service timber sale policies. The struggle to ensure a reliable future timber supply is essential to the stability of the industry. As the demand for timber grew in the concluding years of World War II and in the postwar years, increased cutting on private lands, particularly in the Northwest, led to shortages in the supply of mature timber on these lands. As private timber inventories were logged, some harvested lands were replanted. While these trees were growing, however, the supply of mature timber on private lands declined. In many areas, including California, a portion of the cutover lands were sold or exchanged to the Forest Service to avoid paying for replanting, fire protection, and taxes. The rotational sequence caused other operators to become dependent on the national forests for timber supplies in the middle 1970s. To accommodate this need, the forest products industry pressed for increased timber sales on the national forests (Clawson 1975; Dowdle and Hanke 1985, 85–88). Many foresters and individuals, both inside and outside of the timber industry, argued that harvest levels for the national forests have been and continue to be set substantially below what the national forests can produce on a sustained yield level (Rey n.d.; John Zivnuska, Berkeley, California, personal communication, April 4, 1986).

Industry and its supporters were frustrated by the lack of any national strategy to respond to the demand for timber. In addition to frustration over the low timber volume offered

for sale, the timber industry was also somewhat concerned about the variability in sales levels from year to year. The industry was perplexed by the uncertainties of the political process that necessitates appropriations for Forest Service timber sales. The amount of timber that would be available for harvest in any one year could not be reliably predicted in advance. This was due to the time required to prepare any sizable timber sales. These efforts generally required a sustained budget that would permit an effort to continue over several years, something that was difficult to ensure in advance. Accordingly, varying levels from year to year meant that it was equally difficult for timber interests to plan capital investments to meet market demands.

Several timber supply strategies have been proposed to solve these difficulties. One idea promoted dominant uses and called for zoning public land areas that were primarily suited to a certain commodity use (such as timber, grazing, or mining). Other uses of those areas would be discouraged. This idea surfaced several times, but it never attracted the necessary support to bring it to fruition. The Public Land Law Review Commission (PLLRC), which undertook a comprehensive review of the management of public lands in 1968, recommended, among other things, that areas especially suited for timber production should be established "to manage for the dominant use (United States Public Land Law Review Commission 1970)." This was echoed in 1973 by the President's Advisory Panel on Timber and the Environment (PAPTE). The proposals were made in an earnest attempt to improve the efficiency of management of public lands. However, the emphasis of the proposals on commodities development and production was out of step with the burgeoning environmentalist sympathies that began to color public opinion at the time. As a result, no action was taken, and timber supply remained a central, if unpredictable, aspect of national forest management (Dana and Fairfax 1980, 235). Industry's needs for supplies were largely met from year to year, but its pleas for stability remained unanswered to this point. In California, in the 1970s and 1980s, the Forest Service's Region 5 harvested about 69% of the biological growth from the available timbered national forest lands. The level was higher than in other Forest Service regions. This harvesting was accomplished largely, although not entirely, through selection logging.

THE MONONGAHELA LITIGATION

A lack of willingness on the part of the Forest Service management to respond more forcefully to public concerns about clear-cutting, overcutting, and other silvicultural practices represented a significant miscalculation. In the Sierra Nevada, timber harvesting was largely accomplished by selection logging of mature trees or groups, unlike in the Pacific Northwest. Precisely because conservationists and outdoor recreation enthusiasts in other regions found themselves without recourse in the agency, they sought other means to influence agency decisions. Ultimately, a coalition of interests unhappy over plans to clear-cut an area of the Monongahela National Forest favored for hunting, fishing, and other recreational uses brought suit to enjoin further clear-cutting in the national forest. As a result of the court decision in West Virginia Division of Izaak Walton League of America v Butz (367 FSupp 422 [1973]), Forest Service authority to manage timber was severely impaired. This case centered around the interpretation of the Organic Act of 1897 (codified as amended at U.S. Code, vol. 16, secs. 473–82 and 551, in 1982). The Forest Service argued that these statutes supported its timber harvest practices. The trial court held that the Organic Act prohibited timber harvesting unless the trees were "mature" and individually "designated" and "marked" for harvest. Since the Forest Service was employing silvicultural management methods in direct contravention to this, the agency's system of timber management was effectively halted. This stunned both the Forest Service and the timber industry. It was clearly unacceptable to the timber industry, which depended on the national forests as part of their available supply. The Forest Service appealed the ruling, but the Fourth Circuit Court of Appeals upheld the District Court's opinion (West Virginia Division of Izaak Walton League of America v Butz, 522 F2d 945 [4th Cir 1975]). Although the effect of the ruling was confined to the Fourth Circuit, the implication was that the timber-harvesting program in the national forests, especially in its increasing reliance on clear-cutting, was in jeopardy.

Scientific and technical arguments cited by the Forest Service in support of clear-cutting as part of a properly conducted silvicultural system were of no avail in the face of public opposition and legal challenges. Finally, the Forest Service was unable to ignore or to parry the thrusts of its opponents. In the wake of the Monongahela decision, environmentalists brought similar cases in district courts in South Carolina, Texas, Tennessee, Georgia, Alaska, and Oregon (Dana and Fairfax 1980, 317). The Forest Service faced the prospect of defeat in all of these cases and, as a consequence, the deprivation of management methods on which it had come to rely. Forest Service personnel believed that these practices were essential tools for forest management and did not intend to manage the forests without them. Ultimately, congressional action was required to restore Forest Service authority to use clear-cutting to harvest stands that included immature trees (National Forest Management Act 1976).

THE FOREST AND RANGELAND RENEWABLE RESOURCES PLANNING ACT OF 1974

As the legal challenge in the Monongahela National Forest worked its way through the legal system, earlier efforts to provide for an economically stable management environment resurfaced in connection with proposals for the establishment of a strategic planning program for the nation's forest resources. This culminated in enactment of the Forest and Rangeland Renewable Resources Planning Act (RPA) in 1974 (Public Law 93-378; Statutes at Large 80 (1974): 476), as amended by the National Forest Management Act in 1976 (Public Law 94-588; Statutes at Large 90 (1976): 2949), codified at U.S. Code, vol. 16, secs. 1600–1614 (1982).

The RPA represents an attempt to institute a rational system of strategic planning for public and private natural resources in the United States. The statute provided a strategic framework for economic and physical planning for all forest resources and uses. These included timber, range, minerals, development, wilderness, and a host of other commodities and recreational needs. The statute directed the Forest Service to determine the aggregate national demand for all forest products. Every ten years, the agency was to inventory forest resources and public needs and to produce an "assessment" of the state of public and private forest resources in the United States.

The agency was also to develop a "program" every five years to meet those needs. Using information obtained from the national census along with other economic projections, it projects the future demand for forest resources in the United States. The program outlines the levels of commodities and other goods that can be can be supplied by the nation's forests and allocates a share of national goals to the national forest system. To meet these goals, it proposes a budget for the Forest Service for the next five years. Its recommendations are submitted to the president, who may use them as a guide for appropriation requests for the Forest Service that are submitted to Congress. The budget would reinforce the results of the program by mandating public expenditures designed to reach those goals. However, RPA was intended only to develop a strategic plan. The statute contained no explicit authority to implement the results of the RPA program, deliberately leaving this to the prerogatives of Congress and the president.

Implementation of these results remained subject to existing legislation and other political and administrative forces. Considerable agency resources were devoted to this initiative, which culminated in published reports containing RPA targets and regional disaggregation, showing how much regions such as California were expected to contribute toward achieving national goals established for various categories of forest uses and resources. During the appropriations process, congressional attention often initially focused on the RPA documents, the assessment, and the program but was generally diverted from this focus by the politics of the budget process. As a result, the goals of the RPA were only partially realized over the years. Additionally, enactment in 1976 of the National Forest Management Act amended RPA, establishing a separate land-management planning process. This further complicated strategic planning and budgeting for the Forest Service.

As part of the review of the Forest Service land-management plans (LMPs) (discussed infra), many interested public and private parties commented on the LMPs. Remarks by the state of California and others requested that the Forest Service more strongly consider RPA goals and that the final plans for the Sierra Nevada national forests adopt as regional policy a management strategy that set timber harvest levels closer to the RPA targets. The state of California's comments on the plans for national forests in the Sierra and elsewhere in California went beyond simply discussing timber targets and sought to force the Forest Service to employ an approach that would have led to more careful consideration of a panoply of issues related to national forest planning. These comments were intended to reorient agency planning to employ more integrated views, considering the national forests and their contribution to part of a larger landscape and region. On the question of timber, for example, the state suggested that sustained yield calculations for timber should employ a regional timber inventory, using the stock of timber on both public and private land as the starting point for sustained yield calculations as opposed to that of a single national forest. State concerns also extended to a variety of noncommodity issues, seeking to draw the Forest Service more deeply into planning for watersheds and regions consisting of multiple national forests.

Sympathetic to the tenor of these comments, the Forest Service considered the requests, featuring them prominently in its response to public comment on the plans. Ultimately, however, other criteria contained in NFMA's provisions (discussed infra) and neither RPA's strategic thrust nor its targets controlled land-management planning. Without apparent irony, the final decisions of forest supervisors and other agency managers contained little more than an acknowledgment that RPA's targets called for higher harvest levels that were apparently not to be achieved under NFMA planning.

RPA's impact clearly has been decidedly less than the one intended by its sponsors. Nevertheless, it bears restating that RPA's strategic approach offered the Forest Service and others concerned with forest resources and ecosystems several valuable integrative mechanisms. The RPA related to all three Forest Service functions—the national forest system, research, and state and private forestry. While these tools were not exploited, a strategic planning approach could still prove useful in helping to realize shared goals for the conservation and management of the nation's public and private natural resources. RPA provided a broader planning authority than NFMA and is of potential relevance to emerging regional en-

vironmental planning and management initiatives. This is particularly the case in regions such as the Sierra Nevada, where significant ecological issues extend well beyond the national forests.

An RPA program designed to achieve ecological and other goals inherent in NFMA, carefully thought out and sensibly implemented, may have offered something of considerable value in the present context. This type of strategic plan might have laid the groundwork and enabled more active integration of federal and nonfederal lands in a range of cooperative ventures between different public and private landowners designed to achieve an entire spectrum of forest-related goals, not simply RPA timber targets. These ventures might include watershed and/or multiple national forest planning and regional planning. It is instructive to note that many current initiatives sponsored by the Forest Service and other groups to foster ecologically sensitive management suggest that a cooperative approach is critical, both to the success of these efforts and to the solution of a variety of national forest policy issues.

ROADLESS AREAS AND WILDERNESS, REVISITED

Under the Wilderness Act of 1964, the Forest Service was required to study certain areas to evaluate their potential for inclusion into the wilderness system or for multiple use ("primitive" areas had originally been set aside under the prior "U" regulations established by the Department of Agriculture). The agency undertook this study in 1967, projecting that the study would be completed within ten years. Of its own volition, once the initial study of these lands had been completed, the agency expanded the study to examine the larger remaining roadless areas within the national forests. The progress of this review, known as the Roadless Area Review and Evaluation (RARE), provides another example of an environmentalist challenge to agency initiatives. Conservation groups wanted the agency to pay more attention to recreation and preservation opportunities on the remaining forest land as well.

Upon the completion of the review, which indicated that approximately twelve of fifty-six million acres studied had wilderness potential, these groups remained unsatisfied. They wanted the Forest Service to increase the number of areas and the acreage recommended for wilderness. The Sierra Club immediately sued to enjoin the agency from adopting the results of the study, on the grounds that it was not accompanied by an adequate EIS (Sierra Club v Butz, 3 ELR 20071 [ND Cal 1972]). An out-of-court settlement restricted timber harvest in all roadless areas pending the completion of the EIS. The EIS was released in 1973, but it did not lead to legislative action. The Forest Service subsequently abandoned the first study and embarked on a new study in 1977. This study, known as "RARE II," was released by the president in 1979. Although 65.7 million acres were recommended as potential wilderness, many areas for which the environmentalists sought protection were not included. The adequacy of the RARE II EIS was also challenged, this time by the state of California as well as the Sierra Club and other environmental groups (California v Block, 483 FSupp 465 [ED Cal 1980] 690 F2d 753 [9th Cir 1982]).

To end the policy stalemate, after an interagency review of RARE II, Congress took up the question of the disposition of these roadless areas. The result was a state-by-state review of the wilderness recommendations by Congress. A new series of wilderness bills proposed wilderness designations for additional acreage located in the national forests, in the national parks, and in other public land. In 1979 the first California wilderness bill was introduced by Representative Philip Burton and was subjected to five years of debate before passage in 1984. In a pattern repeated in a number of other western states, this legislation also returned other national forest lands to multiple use and reserved certain other areas for further evaluation as to their suitability as wilderness. Congress considered the Forest Service recommendations and the views of various interest groups and dealt with the decision as a political issue. Although the environmentalists compromised in Congress, accepting less acreage than they had originally sought, the bills that were passed represented further victories by the environmentalists in their struggle to force the government to permanently manage additional acreage as wilderness. This strategy worked much better for the environmentalists than did the administrative process, where they made little headway in persuading the agency to adopt their vision in either RARE or RARE II.

The timber industry, in contrast, was concerned that this initiative would result in the removal of more productive timber lands from the commercial timber base of the national forests. Industry was wary of further diminution of the timber base (Rey n.d.). The timber industry recognized that the national forests must support recreation wilderness and other nonconsumptive uses. Their position was that enough land was already preserved as wilderness, that the remaining timber should be managed as a renewable resource, and that the timberlands in question should be made available for harvest. Industry wanted to prevent more timber from being removed from the national forest's available timber base to ensure that as much timber as possible would remain available for commercial operations.

The wilderness legislation of 1984 led to additional national forest land being removed from the full spectrum of multiple uses. As before, grazing, mining (where already established), water resource development (as permitted by executive order), recreation, and other interventions such as the planting of fish were allowed to continue. In the Sierra Nevada, an additional 1.8 million acres of land in national forest were reserved by the 1984 legislation, again mainly at high eleva-

tion. Notwithstanding this victory, environmentalists remained determined to protect other roadless areas that were not reserved in this round of wilderness legislation. The new wilderness areas, along with the areas reserved by the earlier Wilderness Act of 1964, joined the national parks Yosemite, Sequoia, and Kings Canyon as the largest areas of contiguous forest land in the Sierra not subject to human intervention, save those activities associated with fire suppression.

THE NATIONAL FOREST MANAGEMENT ACT OF 1976

Natural resource management policy for the national forests of the United States has been dramatically restructured over the last twenty years. Environmentalism, public interest litigation, and internal agency and congressional initiatives together worked to force the federal government to respond to public pressure to change traditional management practices of the federal resource management agencies, including the Forest Service.

Background to New Legislation

After the Monongahela decision, Congress considered several measures to restore national forest management authority. Legislative debates reflected a continuing competition in the legislative process between two different visions of forest management. Several bills were introduced in Congress to counter the effects of the legal obstacle to the method of timber sale and harvesting that had been in use by the Forest Service. S. 2926, introduced by Senator W. Jennings Randolph of West Virginia, would have allowed timber harvesting in the national forests only with stringent prescriptions, including provisions that would have limited the size of clear-cuts to a maximum of twenty-five acres and required a 200- to 300-year "rotation," or growth period, for all trees (U.S. Forest Service 1976, 17). A competing bill, S. 3091, presented a management model more deferential to agency expertise. Sponsored by Senator Hubert Humphrey, this bill sought to restore discretionary authority to the Forest Service to employ a broad range of management practices. The bill directed the agency to develop plans that would respond to the diverse conditions encountered in each national forest and provide for management within certain limitations designed to protect the environment. This bill, far more than the others, continued reliance on agency expertise to make management decisions. After considerable debate, this version, modified by certain amendments, was adopted as the National Forest Management Act.

The National Forest Management Act called for the implementation of natural resource planning that would attempt to reconcile public demands relating to resource management and conservation with the need for timber production and other natural resource development. Designed to resolve continuing disputes over national forest management, the new statute, together with other contemporaneous changes in the legal environment, sought to increase Forest Service responsiveness, especially to environmentalism, but also to economic efficiency criteria, through greater legalization of agency procedures. The law's emphasis on planning was intended to modify existing agency resource management policies by developing competence in a variety of scientific disciplines. Interdisciplinary analysis, once fully developed by the agency, was to provide reliable scientific information to assist in resolution of the controversies surrounding national forest management.

Under NFMA, "multiple use and sustained yield" of forest resources remained the focus of national forest management (National Forest Management Act 1976, sec. 2952, sec. 6e1, codified at U.S. Code, vol. 16, sec. 1604e1 [1982]). The premise of the planning process was that agency decisions would respond to natural conditions in the forest and to demands on the natural resources to produce fair and balanced plans. The plans were to be circulated for public comment to permit the agency to respond to public comment and to modify its decisions. Planning contemplated a range of forest management activities and land uses that was substantially the same as had existed prior to the Monongahela decision. Clear-cutting and other harvesting methods that permitted even-aged management were allowed if they could be shown to be the "optimum" silvicultural method. In this respect, the statute did not appear to represent a radical departure from prior management of the national forests. NFMA, however, did incorporate environmental protection into multiple-use planning of public natural resources.[2] Also different in NFMA were the procedures it established requiring the coordination of forest planning, environmental assessment, and public comment on management proposals prior to the initiation of management actions.

Several aspects of NFMA restructured public land management to produce more balanced plans and to reduce the likelihood of legal battles relating to management actions.[3] First, planning was undertaken pursuant to detailed statutory instructions to ensure that adequate consideration was given both to resource protection and to development. Second, building on an idea of interdisciplinary expertise already in use by the Forest Service, the statute directed the agency to develop forest plans using an "interdisciplinary team" consisting of a group of agency scientists and resource professionals with diverse scientific and professional skills. By requiring input from new kinds of "experts," NFMA intended to make certain that the sustainability of forest resources was given full consideration during agency decision making. Third, the law expanded opportunities for public involvement in the planning process, seeking to permit an unprecedented level of public participation in management decisions. These features all promoted new avenues of decision making within

the agency and distinguished NFMA land-management planning from earlier Forest Service management. The impact of these provisions is worth considering because they have shaped the course of national forest management from the enactment of NFMA to the present time.

The origins of NFMA's administrative reforms have to do with the administrative culture of the Forest Service itself. The Forest Service was regarded as an example of the effort to promote expert management in administration (Clarke and McCool 1984, 41–44) and an able player in national politics (Hays 1969). Despite controversies over national forest management, the agency enjoyed an excellent reputation among politicians and social scientists as a model of effectiveness in bureaucratic management (Clarke and McCool 1984, 41–44). After World War II, many aspects of national forest management became controversial. As support for Forest Service management decisions steadily eroded, these decisions were increasingly subject to challenge. Consequently, support for management authority itself also eroded significantly. This legacy makes it particularly intriguing to study administrative change in an agency so rich in tradition and in expertise. Understanding how the reform affected the Forest Service response to NFMA's objectives also provides insights as to the difficulties in ensuring the attainment of any complex set of objectives through legislation and implementation.

NFMA accurately reflected wider political conflicts and uncertainty over goals for public land use. The statute's provisions for management reform contain less than definitive direction and emphasize planning to achieve balanced land-management plans. The implication of this arrangement is that controversies over national forest management that Congress could not resolve would remain. Land-management planning conducted pursuant to NFMA anticipated these conflicts. Planning was intended not to eliminate national forest management controversies but to provide procedures for land and resource planning that would enable conflict resolution and progress toward better management in light of conflict. Three ideas central to administrative reform are contained in NFMA's direction to the Forest Service. First, the relationship between law and administrative behavior is specified in the statutory elaboration of the planning process. Regulations further emphasized full assessment of the forests' capabilities for diverse uses and decision making consistent with that information. The law recognized that Forest Service administrators were charged with more than managing a planning process and that they were policy makers whose decisions could have a significant impact on the condition of the national forests. The statute gave the administrators general guidance in decision making but delegated to agency managers discretion to reach a decision within a range of possible outcomes that would achieve the greatest "net public benefit" (NFMA Regulations). Of course, there were other constraints on administrators. Land-management planning, like many other public programs, is conducted in a highly charged political environment. The political implications of these "administrative" decisions were closely followed by successive executive branch appointees. The Forest Service, therefore, was expected to act with both technical proficiency and sensitivity to public and political opinion.

The procedural reforms associated with planning and the NEPA process forced consideration of information that previously might easily have been undervalued or ignored. Responding to land-management planning requirements for analysis was intended to allow the agency to develop local plans in accord with the statute's substantive goals for resource development and preservation. The new procedures led to considerable changes in agency operation.

The National Forest Management Act implicitly promoted a second principle of administrative reform to ensure a stable management environment that would be responsive to changing public priorities. Even at the time of its enactment, there was considerable skepticism among scholars of public land policy concerning the power of the new law to do so. NFMA, in seeking to promote this goal, fought against an already strong tide of activism. Several concerns are worth mentioning here. First of all, establishing a comprehensive land-use planning system, as done under NFMA, which standardizes analysis and planning direction of natural resources over a very large area, represents a conceptual challenge. On top of this ambitious goal, the expectation that this system would retain flexibility sufficient to permit managers to respond to varying local needs and conditions was perhaps a forlorn hope. Early in the planning process, some doubt was expressed that any Forest Service management policy requiring assent of the public could succeed, as long as those who opposed it could find a method to block implementation of agency plans (Behan 1981, 802, 805). This statement later proved to be fairly prophetic.

Second, the National Forest Management Act explicitly recognized the continuing validity of multiple-use management. The Forest Service sought to employ this philosophy to satisfy the needs of timber and other commodity interests while also attempting to satisfy environmentalist concerns. At the same time, NFMA implicitly acknowledged that prior multiple-use management did not sufficiently accomplish this objective. The newly constructed procedures in national forest planning intended to respond to environmental constituencies without sacrificing the virtues of the established management system. To those familiar with recent public land management in the United States, who had come to view controversy as the normal condition for public land policy making, the effort to blend these conflicting aims was a formula that would achieve only added conflict and inefficient use of publicly owned natural resources (O'Toole 1988; Stroup and Baden 1983; Rosenbaum 1984). Nevertheless, the ambiguity inherent in NFMA's mission made land-management planning the subject of continuing scrutiny by public land scholars, activists, and others.

A third idea inherent in the administrative reform of the era focused on demands to increase representation and par-

ticipation in government is well illustrated on NFMA's emphasis on public participation in planning. Public involvement was intended to reorient administrative decision making from a strict reliance on expert management toward decision making that resembled a political dialogue between the administrator and the public (Reich 1985; Handler 1988; Friedmann 1987). Efforts to draw the public into the planning process resulted from a tacit recognition that forest-planning decision making, although dependent on Forest Service expertise, had political implications. Out of necessity, planning required agency consideration of public opinion during all stages of the process. NFMA land-management planning employed various types of public participation so that wherever possible disagreements over administrative decisions would be settled expeditiously. Public participation allowed the public and interest groups to comment on agency proposals. The Forest Service experimented with innovative techniques, such as negotiation, that blurred distinctions between public involvement and conflict resolution in order to resolve specific policy disputes (Wondolleck 1988), drawing on collaborative approaches to settling policy questions utilized in public land management, and in other administrative and regulatory settings (Fiorino 1988; Sullivan 1984; Burton 1991).

NFMA: Impact of Land-Management Planning in the Sierra Nevada

In the middle to late 1980s, the Forest Service produced land-management plans (LMPs) calling for expanded utilization of practices, such as even-aged management, that had already generated considerable controversy. Armed with statutory language that allowed what remained to be a controversial practice, the plans clearly laid out the future of every area within the national forest. Several important elements in the plans in the Sierra illustrate some significant differences from the policies previously guiding national forest management.

Forest Service land-management planning proposed to greatly accelerate clear-cutting in many regions, including the Sierra Nevada. Overall, this reflected an apparent emphasis on enhanced productivity on national forest lands devoted to timber production. This included some related silvicultural methods, such as seed tree cutting and overstory removal. As a result of this policy, the new plans proposed significant increases in clear-cutting in the Sierra during the middle 1980s. Data from national forest timber sales reflects this increase (Verner et al. 1992, 240–41). The rationale for this increase was that many forest stands were mainly composed of mature or overmature trees, well past their peak growth period. Planning documents presented to the public suggested that as these stands were cleared and replanted, growth would increase, allowing the forest to supply more timber. Some conversion of forest types were proposed. Mixed stands, containing conifer and hardwood, were to be logged and replanted as conifer (generally pine) stands. This was apparently part of an effort to improve timber yield. Similarly, other stands, in which white fir had increased due to the effects of earlier timber harvests and fire suppression, were to be harvested and replanted to resemble more closely the mix of species that had occurred before human intervention.

Many foresters were sympathetic to the goals of the Forest Service. Where a natural mix of species had been or was being eclipsed by the growth of white fir and the harvesting of older stands, they regarded the initiative as an effort to restore the forest landscape. This group viewed the LMPs as moving the national forests much closer to the model of a regulated forest, an ideal of scientific forestry that allows both greater productivity of forest lands and better modeling of timber growth. Environmental critics of land-management plans viewed these arguments as insufficient either to justify the increased use of clear-cutting or to increase harvest levels. Prior to the adoption of the LMPs, these practices had already been introduced in many areas in the Sierra Nevada. In the years immediately following the approval of the LMPs, utilization of these practices significantly increased.

Exceptions may be seen in the way this practice was adapted and applied to clear-cut areas around the giant sequoia trees located in Sequoia National Forest. Ironically, although justified in part by Forest Service managers as a method to leave the giant sequoias intact while promoting sequoia regeneration, these timber sales were regarded by some as proof of irresponsible stewardship in these relatively rare areas. They became one of the single most visible aspects of the changes actually implemented as a result of land-management planning. This controversy, one of apparent ecological significance, sparked appeals and lawsuits and led eventually to the mediated settlement agreement (MSA), which is being explored in greater depth elsewhere by SNEP.

Chiefly, the changes in national forest management in the Sierra had to do with increased intensity of management activities, such as clear-cutting, rather than the wholesale adoption of new forest practices. However, when the scope and intensity of these actions were laid out in the plans, it became clear that the character of many areas would change drastically under the hand of management. Predictably, some of the same individuals and organizations that the Forest Service faced in earlier struggles over clear-cutting and wilderness resurfaced to battle the Forest Service again.

OTHER NEW STATUTES AND THEIR IMPLICATIONS

During this period, several other newly enacted statutes also significantly modified the Forest Service prerogatives. Although the implications of these laws in the national forests of the Sierra Nevada will not be examined here in any depth, it is important to understand that these laws dramatically altered federal prerogatives with respect to natural resource

planning and management. The Federal Land Policy and Management Act, as amended (U.S. Code, vol. 43, secs. 1701–84 [1976]) (FLPMA), directed the Bureau of Land Management (BLM) to undertake comprehensive land and resource planning for the public lands similar in scope to what NFMA required for the national forests. At the same time FLPMA revised and modified authorities related to the entire Forest Service lands program, altering management of rights of way, acquisition, small tracts of noncontiguous land, etc. The law also revised the administration of the minerals programs of the Forest Service and BLM.

The Federal Water Pollution Control Act (U.S. Code, vol. 33, sec. 1251 et seq. [Clean Water Act]) and the Clean Air Act transferred to the states the authority to regulate practices on federal lands, provided the state had obtained approval for its own program to enforce these laws. For the first time, air- and water-quality standards, as well as the authority to issue permits for a range of regulated activities, applied to federal lands, limiting federal prerogatives on public land. Forest Service discretionary authority in planning is also subject to the operation of other laws with which public forest management must also comply. The Clean Water Act requires that the activities likely to affect the quality of certain water systems must be conducted under approved procedures, or "best management practices." The Forest Service's interpretation of its responsibility in California under this law was challenged in court, resulting in the modification of certain management actions (Northwest Cemetery Protective Association v Peterson [764 F2d 581 (9th Cir 1985)]).

The Federal Wild and Scenic Rivers Act (U.S. Code, vol. 16, secs. 1271–87) is another statute with specific mandates and established standards that the Forest Service was required to take into account in the preparation of its land-management plans.

CONSERVATION OF THE CALIFORNIA SPOTTED OWL

Reshaping Resource Planning and Management in the Sierra Nevada

The present legal environment for resource management in the national forests is principally comprised of three statutes, NFMA (1976), NEPA (1969), and the Endangered Species Act (1989) (ESA). The legal requirements for protection for plant and animal species contained within these laws is significant enough to have played an important role in the evolution of federal and state resource management. More precisely, it is clear that procedural requirements for national forest planning have substantive effects. Legal protections for sensitive species contained within these laws, and their regulatory progeny, operate to modify any Forest Service land-management plan that fails to take account of the needs of the species or to provide for its habitat requirements. Scientific analysis intended to help administrators make decisions consistent with the law may effectively dictate policy choices that have profound effects for forest management.

The California spotted owl (Strix occidentalis occidentalis), one of three subspecies of spotted owls, is related to the northern spotted owl (Strix occidentalis caurina) and the Mexican spotted owl (Strix occidentalis lucida) (American Ornithologists' Union 1983). The California spotted owl's range extends from the Pit River (at the northern end of the Sierra Nevada) southerly through the Sierra Nevada, along the central Coast Range south of the Golden Gate, and throughout the forested areas of southern California, including the higher montane regions. The majority of California spotted owl habitat in the Sierra Nevada is within national forests, entirely within the Pacific Southwest Region (Region 5) of the Forest Service (the range of the northern spotted owl lies mostly in the Cascade Mountain system and includes part of both the Pacific Northwest Region and the Pacific Southwest Region of the Forest Service). In the late 1980s, Forest Service management practices for both the northern and California spotted owls sought to preserve small areas of owl habitat, known as Spotted Owl Habitat Areas (SOHAs). The SOHA strategy permitted partial timber harvesting in parts of SOHAs not immediately adjacent to nest trees. Lands outside of SOHAs also were utilized for nesting, roosting, and foraging by the owls, but the SOHA policy did not affect timber harvests on the remainder of forest lands. A more complete explanation of the SOHA strategy can be found in U.S. Forest Service 1993a, III-1-2.

Research conducted on the northern spotted owl raised the possibility that the SOHA strategy did not sufficiently protect owl habitat and that the continued use of clear-cutting was detrimental to the spotted owl. As the Interagency Scientific Committee study on the northern spotted owl was nearing completion in 1989, research indicated that the existing management strategy would not sufficiently ensure the survival of the northern spotted owl and that its continued use would lead to further decline in northern spotted owl numbers (Thomas et al. 1990, 427). The Fish and Wildlife Service (FWS) listed the northern spotted owl as a "threatened" species under the ESA in June 1990. The Mexican spotted owl was also listed under the ESA (Federal Register 58, no. 49 [16 March 1993]: 14248–71). The research suggested that the SOHA policy and subsequent administrative actions employed to protect the habitat of the California subspecies also were inadequate and were as vulnerable to legal challenge as those employed for the conservation of the northern spotted owl.

The Forest Service had already designated the California spotted owl as a "sensitive species." This required an internal evaluation of any plans or projects to determine their effects on the spotted owl. Yet there were few demographic or ecological studies specific to the California subspecies. Accordingly, the lack of biological information made it difficult to justify any change in management guidelines or to offer

guidance as to what type of habitat management should be adopted. This uncertainty caused some concern among resource managers and the public. NFMA and its regulations require that the Forest Service maintain viable populations of native and select non-native wildlife species (Code of Federal Regulations, vol. 36, sec. 219.19 [1988]). The Forest Service instituted a new policy, known as cumulative effects analysis (CEA), to supplement the SOHA strategy. CEA called for specific consideration as to how individual projects would affect owl habitat in relation to habitat conservation measures generally required for known or probable owl sites for pairs or resident single owls (Verner et al. 1992). Environmental groups continued to express concerns about the adequacy of the conservation measures and challenged Forest Service decisions to continue using the SOHA strategy for management of owl habitats. Eventually, environmental groups filed a number of administrative appeals challenging a number of timber sales in the region (e.g., "Appeal of the Tahoe National Forest Land Management Plan," Natural Resources Defense Council, 15 March 1991).

The decision of the Forest Service was to attempt to resolve the controversy by pursuing a remedy without waiting for the results of the administrative and legal process. This development may be regarded as the clearest signal that the land-management plans were not going to be fully implemented. The new policy precluded any large-scale use of clear-cutting or other methods intended to achieve even-aged management strategies for the Sierra. The law's mandates, especially the element of the regulations requiring the Forest Service to ensure that its plans would provide a "minimum viable population" of forest species, ultimately worked to ensure that NFMA's implementation did not lead to the wholesale changes in the forest that the Forest Service had proposed.

Developing a New Management Strategy

In June 1991, in response to growing public concern about the status of the California spotted owl, state and federal agencies convened the "California Spotted Owl Assessment and Planning Team ('Steering Committee')." The goal of this group was to assess the status of the owl and explore alternative management strategies that would conserve the subspecies and its habitat. The steering committee, co-chaired by Ron Stewart, then regional forester for the Pacific Southwest Region, and Douglas Wheeler, secretary of the Resources Agency of California, included representatives from the Resources Agency, the Forest Service, the California Department of Forestry and Fire Protection (CDF), the National Park Service (NPS), the Fish and Wildlife Service (FWS), the Bureau of Land Management (BLM), the Board of Forestry (BOF), and the Department of Fish and Game (DFG). Observers from county government, and nongovernmental observers from environmental groups, timber and forest products industries, and several other organizations were also invited to attend. Agency representatives agreed to plan the implementation of conservation measures, especially those required if the subspecies were to be listed under the ESA. The charter for this project directed federal and state natural resource agencies to

> work cooperatively . . . to assess local research, inventory and monitoring information for the . . . spotted owl [and that as] more information becomes available . . . agencies will continue to work cooperatively to incorporate other species and habitat needs into a long-term ecosystem planning strategy for the Sierra and Southern California ecosystems ("California Spotted Owl Assessment and Planning Team," ms., 14 May 1991).

The steering committee immediately created two teams, a "technical team" to provide expertise in avian biology and ecology and a "policy implementation planning (PIP) team" to provide policy and economic analysis. The project was to produce several results:

- a review by the technical team of the status of the California spotted owl, to be published as a technical report
- recommendations by the technical team for a management strategy to maintain viable populations of the owl, including an assessment of alternative measures considered
- analysis by the PIP team of socioeconomic effects resulting from the implementation of the management recommendations of the technical team, including an "evaluation of alternative institutional strategies" and regulatory applications to be considered for adoption by state and federal agencies

The technical team evaluated several alternative management strategies for the owl. The team analyzed the status of the owl and offered a set of recommendations, known as the "CASPO report," to the steering committee in May 1992. Following a period of review and comment, the report, "The California Spotted Owl: A Technical Assessment of Its Current Status," was published in late 1992 (Verner et al. 1992). A review of the impacts of this policy may be found in Ruth and Standiford (1994). The scientific analysis suggested that existing policy measures used to protect the spotted owl and its habitat were inadequate. The technical team investigated the loss of suitable habitat in the Sierra Nevada. The team noted that suitable owl habitat probably was once more extensive and concluded that habitat loss has been caused by even-aged silvicultural practices and catastrophic fire. Their research attributed further diminution in habitat to the activities of miners and sheepherders in the nineteenth century (Verner et al. 1992, 10–11, 225, 232–33, 240–41, 248–53). The team noted that in the present era current land-management policy called for increased clear-cutting and other forms of regeneration harvests. The emphasis within the plans on harvesting large-diameter trees was also viewed as detrimental

by the technical team (J. K. Verner, project leader, Wildlife Monitoring and Range Research, USFS, Pacific Southwest Research Station, personal conversation with the author, July 22, 1993). These harvests removed forest structures upon which the owl was dependent. Under the LMPs for the Sierra Nevada national forests, the technical team estimated that the amount of suitable habitat would further decline at a rate of 229,000 acres per decade (Verner et al. 1992, 11 and chap. 13). The team also emphasized that suppression of fire had accelerated the accumulation of fuels and significantly increased the likelihood of fires that would destroy timber stands, including those essential to the spotted owl. The technical team concluded that these management actions had detrimental effects on spotted owl habitat and proposed an interim strategy of thinning and fuel management to begin to address these problems (Verner et al. 1992, chap. 1).

CURRENT POLICY FOR THE NATIONAL FORESTS IN THE SIERRA NEVADA

To adopt the CASPO recommendations as management policy, the agency complied with planning and public participation requirements of NFMA (1976) and NEPA that must be completed prior to making changes in management direction. Pursuant to NEPA, the Forest Service prepared the "California Spotted Owl Sierran Province Interim Guidelines Environmental Assessment" (EA) (U.S. Forest Service 1993a, III-1-2). The EA incorporated substantially all of the CASPO management recommendations into an interim management plan for the Sierra Nevada national forests. The regional forester's decision amended the regional guidelines for land management in the seven Sierra Nevada national forests. This procedure satisfied the requirements of NEPA, as these amendments were judged to be nonsignificant actions (U.S. Forest Service 1993b, DN-13-15) (Cal. Owl NOI). On January 13, 1993, the regional forester formally adopted the plan as management direction for these national forests.

This decision was not immediately accepted by the entire steering committee. A number of administrative appeals filed by timber interests, and others brought by affected counties, challenged the adequacy of the EA. In addition, members of the steering committee representing state and federal agencies alleged that the Forest Service decision to change policy abrogated the interagency agreement and departed from the exercise of shared authority they believed to be implicit in the owl assessment process. The Forest Service argued that there was no breach of this agreement, maintaining that it was clear that the long-term survival of the population of the owl could not be assured if existing policy permitting extensive clear-cutting and other forms of regeneration harvests remained in force. The Forest Service noted that the data submitted in the technical team's report left no choice: The agency was legally required to revise its management policy. The agency maintained that the steering committee's involvement in the development of policy pertaining to national forests was strictly advisory. At the same time, the agency agreed to remain part of the interagency process as it continued the preparation of the EIS.

Members of the steering committee representing the state of California found themselves in an awkward position. They fully understood and accepted the Forest Service's desire to avoid a legal challenge to its management policies. Nevertheless, state support for the California Spotted Owl Assessment had always been conditioned on the principle that in this process, the federal government had an obligation to consider the implications of conservation planning and management for national forest lands on the larger region in which they were situated. Ten years earlier, similar concerns motivated the state to comment on Forest Service plans, suggesting that the land-management plans needed to more fully consider regional effects and a more cooperative regional approach to planning. For their part, state officials had recognized the dramatic changes in theories pertaining to natural resource conservation and management. Evidence of the state's support for a more ecologically integrated, regional approach to management is reflected in the state's strong support in the drafting, adoption, and implementation of the "Memorandum of Understanding on Biological Diversity" (The Resources Agency 1992). Accordingly, state officials sought to better integrate measures to conserve habitats for multiple species while maintaining the viability of local economies into Forest Service planning and decision making. Although the state's views of how these goals should be accomplished have provoked criticism, from both environmental groups and commodity groups, the state continues to articulate these same concerns. It may be argued that the Forest Service's failure to pay heed to state concerns regarding the land-management planning process of the prior decade led to increased state support for initiatives to focus more local and regional attention on Forest Service planning. These initiatives include the California Spotted Owl Assessment, the Council on Biological Diversity, Sierra Nevada Research Planning (SNRP), and the Sierra Nevada Ecosystem Project itself.

At the present time, early in 1996, the Forest Service continues to revise the "Draft EIS: Managing California Spotted Owl Habitat in the Sierra Nevada National Forests of California" (U.S. Forest Service 1995) (DEIS). The DEIS will more fully address conservation planning for the broader suite of species living in the Sierra Nevada (Cal. Owl NOI), eventually permitting the Forest Service to revise its management policies. Currently, forest management activities in the national forests of the Sierra must continue to conform to the CASPO policies as articulated in the Cal. Owl NOI. These are subject to change upon adoption of the final EIS.

LESSONS FOR THE FUTURE

Until quite recently, environmental and natural resource–related policies operated without explicitly considering the ecosystem as a point of reference for policy formation, implementation, or evaluation. It is certainly true that some policies implemented in the Sierra Nevada by the Forest Service have had profound effects upon the landscape and, most probably, the state of Sierran ecosystems. As mentioned above, other policies—some of them largely or entirely unrelated to natural resources—have also had significant impacts on the ecosystems of the Sierra Nevada. The point of this retrospective policy analysis is not solely to establish that certain public policies positively or negatively affected ecosystems in the Sierra Nevada. Nor is it just an opportunity to call attention to those policies that the SNEP Science Team believes should be favored or avoided in the future. This retrospective, and indeed, the Sierra Nevada Ecosystem Project itself, provides a larger opportunity to review the operation of environmental and natural resource–related policies and should help to reflect on the complexity of the institutional setting surrounding the implementation of these policies. This approach will materially assist the SNEP Science Team, public officials, and the public in understanding and evaluating existing and proposed policies.

SUMMING UP NFMA'S IMPLEMENTATION AND ITS IMPACT: SUBSTANTIAL OR UNDERWHELMING?

Implementation of bold land-management initiatives proposed by the Forest Service, such as even-aged management, upon a landscape where almost any large-scale activity apparently has the potential to cause substantial environmental impacts, was unsuccessful. Examination of Forest Service policy, of the operation of NFMA, and of recent extraordinary efforts to resolve continuing controversies over natural resource management demonstrates that much of the opposition to Forest Service plans has been due to the inability of the agency to satisfy the ecological protection provisions of federal law and policy. Despite the mandate of national forest management policies to implement an ecological approach to natural resource planning, conservation, and management, the Forest Service has generally not been able to do so. Until comparatively recently, most successful agency policy initiatives tended to be responses to single-purpose functional demands, such as timber, range, or recreation. Implementation of NFMA, despite explicit requirements for the protection of ecosystem attributes and functions, has had only limited success in incorporating an ecological approach into its general land and resource planning. Forest Service efforts to comply with these requirements continue to face political and budgetary directives that complicate resource management. Conflicting directions often appear to be supported by elements within NFMA itself.

Political and social activism related to dissatisfaction with national forest management activities remains another important force, leading to political challenges and to heightened legal scrutiny of Forest Service decisions. In many instances, activists are able to draw on elements of NFMA that tend to support a particular position. The agency, in contrast, generally must try to balance the operation of a particular provision with that of other goals within NFMA. In many instances it has done so only to find that a decision will not meet with legal or regulatory approval. Scientific and technical knowledge are essential components of decision making, but this expertise has not solved the riddle of how to meet either the demands of NFMA's several conflicting forest management goals or the conflicting demands of the public. Satisfying these objectives, especially habitat conservation and commodities production, has forced the Forest Service to promulgate policies that are effectively compromises intended to arrive at a decision that reconciles several conflicting objectives. Forest Service actions continue to face certain scrutiny, which quickly translates into opposition if the agency displays a lack of attention to legal or administrative mandates pertaining to environmental protection. The outcome—unintended by the Forest Service—is that implementation of plans and management activities poised to have a substantial impact on the ecosystem were prevented from being fully implemented.

The intense public attention focused on NFMA has been an understandable source of frustration to many Forest Service managers. Public involvement in resource planning translated into administrative and legal mechanisms to influence national forest planning, however, represents a self-correcting mechanism for policies that do not comply with the intent of the law and its attendant regulations. Imperfect and unsatisfactory as it may appear, the ongoing Forest Service's effort to conserve the California spotted owl is an example of the process at work. Simultaneously, however, experience during the recent decades with the transient nature of Forest Service policies strongly suggests that policies established to provide for management of the Sierran national forests have not yet successfully ensured long-term sustainability for the natural resources and ecosystems. Irrespective of an ongoing search for solutions, the Forest Service has been unable to implement either broad policies or land-management plans that survive longer than a few years (Yaffee 1994; Ruth 1990). No proposal for managing the national forests of the Sierra Nevada thus far has elucidated a strategy that will demonstrably satisfy the ecological, socioeconomic, legal, and political criteria by which these policies are judged. Producing land-management plans that respond to current national forest management priorities in the Sierra Nevada—providing for habitat and species conservation while promoting fuel

management and commodities production—continues to be a difficult technical problem. Achieving solutions, of course, is complicated by various conflicting views among key public actors, both individuals and groups, as to what methods will best accomplish particular goals. Recognition of the difficulty in integrating ecological, technical, and social concerns into a successful management plan is part of the motivation for the Sierra Nevada Ecosystem Project. Public concerns regarding the management and conservation of national forest ecosystems will not be resolved by the SNEP Science Team or by direct application of its final report. The fruits of the project, the scientific assessment and the scenarios developed by the Science Team, however, should provide a useful step in the search for solutions.

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NOTES

1. As early as 1929, at the instigation of foresters within the agency, areas in the national forests had already been removed from harvesting and other management activities. This practice originated with the "L-20" regulation in 1929, which allowed the Forest Service to protect certain "primitive areas." This authority was expanded and more precisely defined in 1939 with the "U" regulations. Over the objections of commodity users, additional land was removed at this time. Three different types of designations were established. Regulation U-1 defined "wilderness" as unroaded, undeveloped tracts 100,000 acres or more. These areas were to be designated by the secretary of agriculture. Areas that had similar characteristics but were smaller in size could be set aside as "wild" areas by the chief forester. A third category allowed tracts of 100,000 acres or more to be designated by the chief forester as roadless areas to be managed for recreation "substantially in their natural condition." See Dana and Fairfax (1980, 157–58).
2. Senator Humphrey's original bill was amended to provide legislative assurances to conservation interests that required the Forest Service to eschew certain extractive resource policies. One provision required the use of a sustained yield forestry practice known as "nondeclining even flow." This provision mandated that timber sales from each forest were to be "equal to or less than a quantity which can be removed from such forest on a sustained yield basis: Provided, That, in order to meet overall multiple use objectives, the Secretary may establish an allowable sale quantity for any decade which departs from the projected long-term average sale quantity that would otherwise be established. . . . [S]uch planned departures must be consistent with the multiple-use management objectives of the land management plan" (sec. 11). Although this practice had already been adopted by the Forest Service in 1973 (see earlier discussion), the amendment committed the agency to plan timber harvest levels on each forest at a rate that was sustainable indefinitely.

   The timber industry and many economists opposed this provision. In their view, nondeclining even flow was too restrictive because it prevented major variations in the allowable cut on a national forest that could increase economic returns while still meeting sustained timber yield goals. To accommodate this objection, the final version of the bill allowed for exceptions from the "non-declining even flow" policy in order to achieve multiple-use goals. This arrangement was emblematic of the design for national forest planning. This compromise enabled Congress to delegate discretionary authority to the Forest Service to operate within certain limits. This also allowed Congress to defer responsibility to the Forest Service for many controversial decisions regarding the determination of management priorities, land allocations, and levels of commodity development and other resource uses.
3. As a precursor to new national forest planning, NFMA contained several provisions intended to remove the threat of delays resulting from legal challenges to new planning. The statute provided that existing plans for an area would remain in force until a new land-management plan was adopted. Primarily, this meant the unit plans and timber management plans and other special use plans developed under the auspices of the Multiple Use–Sustained Yield Act of 1960. This allowed the Forest Service to continue to manage the national forests as it had before the National Forest Management Act, pending the completion of the new plans. Notwithstanding the decision in the Monongahela case, this provision tacitly permitted the use of clear-cutting on the forests, pending the release and final approval of the National Forest Management Act plans, including the period during which a new plan might be appealed. In order to remove any further doubt as to whether clear-cutting was permitted, section 11 of the statute explicitly repealed the language of the 1897 Organic Act, which had stipulated that trees could not be harvested unless the trees were "mature" and individually "designated" and "marked."

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