
Chapter 3

**The Goals of National Forest
Management and Planning**

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The Goals of National Forest Management and Planning

Beginning in 1975, Forest Service timber sale practices were successfully challenged in several lawsuits (the first and best known being the "Monongahela Decision"), on the grounds that the agency was violating specific provisions of the 1897 Forest Service Organic Act. The Forest Service argued that scientific evidence and 70 years of experience justified their practices, but the court held that only Congress could change the legal restrictions on selling timber. In the National Forest Management Act of 1976 (NFMA), Congress eliminated the restrictive provisions of the 1897 Organic Act, provided substantial guidance to the Forest Service for preparing land and resource management plans for units of the National Forest System, and required public participation in determining management direction. It was hoped that an open planning process could resolve local controversies at the local level, and get Congress and the courts out of local, detailed national forest management.

To date, Forest Service planning under NFMA has not fulfilled this vision. Controversy, litigation, and congressional involvement abound in management of the national forests. In the South, clearcutting is prohibited near red-cockaded woodpecker colony sites in the national forests. Administrative appeals in the northern Rocky Mountains have delayed enough timber sales to cause a timber supply squeeze for some sawmills. A Wyoming sawmill sued to try to guarantee minimum Forest Service timber supplies under a timber management plan, but lost and was subsequently closed. Controversy over road construction has led Congress to consider, and sometimes to enact, substantial changes in road construction appropriations (292).

The current forest management controversy with the greatest impact is over the national forests of the Pacific Northwest—how much timber to sell, and/or how much ancient forest to reserve from harvesting for the protection of the northern spotted owl and the old-growth Douglas-fir ecosystem. As plans for the national forests in western Washington and Oregon were being developed (long after the target date

specified in NFMA), courts enjoined timber sales which might threaten the owl's existence. Congress acted to continue the timber sale program while the U.S. Fish and Wildlife Service considered protecting the owl under the Endangered Species Act. (The owl was subsequently determined to be threatened, according to the provisions of that act.) Courts have since ruled portions of the congressional intervention to be unconstitutional.

Some have characterized these problems as regional battles over the control of resources. In places where commodity production is being curtailed, some users, Members of Congress, and agency employees assert that national forest management is gridlocked. Congress has been asked to consider legislation to overhaul the system. Some proposals would prohibit clearcutting, others would add guidance on forest plan implementation, still others would prevent judicial review of Forest Service decisions. Some observers have suggested that many of the problems result primarily from the belief that NFMA planning could resolve controversies, and that repealing NFMA would resolve at least some of the current difficulties (18). Others go further, suggesting that the experiment in public land and resource ownership is a failure, and that radical reform of the system is the only solution (41). Nonetheless, many believe that the current planning process, with improvements, is still appropriate.

PURPOSE AND ORGANIZATION

These problems and proposals led Congress to ask OTA for an assessment of the technological, biological, social, and economic dimensions of the forest planning process established under NFMA. To assess these aspects of the NFMA planning process, one must first examine the purposes of national forest management: multiple use and sustained yield, as defined in law. These goals are examined from their historical development, from their philosophical basis, and from their implications for management.

¹*West Virginia Division of the Izaak Walton League, Inc. v. Butz*, 367 F. Supp. 422; 522 F. 2d 945 (4th Cir. 1975).

After examining the management goals, this chapter describes the strategic nature of the NFMA planning process. Strategic planning is a useful standard for examining the NFMA planning process for two reasons. First, although Congress did not expressly create a strategic planning process for the national forests, national forest planning is part of the strategic planning process created in the Forest and Rangeland Renewable Resources Planning Act of 1974 (RPA).² Congress clearly intended the RPA process to be strategic planning (259), and thus implicitly intended strategic NFMA planning by making the land and resource management plans for the national forests a part of the RPA Program (section 6(a)).

Second, a public strategic planning process is an effective approach for identifying organizational goals for a government agency. NFMA established an open, public process for setting management direction for the national forests. Forest plans are to describe that direction by identifying goals for conditions and outputs, together with: 1) the standards and guidelines for management activities, 2) the proposed and possible actions, and 3) the financial resources necessary to fulfill those goals. Strategic planning is an appropriate criterion for assessing national forest land and resource management planning under NFMA.

The subsequent chapters of this report assess specific aspects of the planning process—legal context, social dimensions, biological aspects, planning technologies, economic considerations, and organizational characteristics. The principal criterion for examining these aspects is how they contribute to strategic national forest planning, both in theory and in practice. The last chapter concludes this assessment by reviewing the relationship between strategic NFMA planning and the Forest Service’s national planning effort under RPA.

NATIONAL FOREST GOALS: MULTIPLE USE AND SUSTAINED YIELD

Historical Development

Creation of the National Forests

Numerous devastating natural disasters, often in conjunction with extensive logging, occurred in the United States during the late 1800s. Huge wildfires swept through logged-over lands in New England and in the Lake States in 1871, 1881, and 1891; the 1871 Peshtigo fire killed 1,500 people in Wisconsin (32, 200). Timber cutting on public lands was illegal, but the timber protection laws were routinely flouted (291). Furthermore, major floods of the late 1880s were blamed on widespread deforestation (190). These events led Congress, in 1891, to grant the President authority to reserve important public domain lands, but Congress did not authorize efforts to protect the reserves.

In 1897, in response to President Grover Cleveland’s substantial forest reservations, Congress indirectly guided management of the forest reserves (renamed the national forests in 1907) by limiting the purposes for which the President could reserve forest lands. Reserves were to exclude lands more valuable for mineral extraction or for agriculture, and could only be established:

... to improve and protect the forest within the boundaries, or for the purpose of securing favorable conditions of water flows, and to furnish a continuous supply of timber for the use and necessities of citizens of the United States, . . .

This was the principal congressional direction for the purposes of reserving lands and managing reserved lands, and has come to be known as the Forest Service Organic Act. The act also authorized the agency to regulate the “occupancy and use [of the reserved lands] and to preserve the forests thereon from destruction.”

²NFMA was substantially an amendment to the Forest and Rangeland Renewable Resources Planning Act of 1974 (RPA—Act of Aug. 17, 1974; Public Law 93-378, 88 Stat. 476; 16 U.S.C. 16001614). RPA, as enacted, required the Forest Service to prepare land and resource management plans for units of the National Forest System, using an interdisciplinary approach to integrate physical, biological, economic, and other sciences. NFMA added substantial guidance for public participation and for relevant considerations in the planning process. These land and resource management plans are often called forest plans, and the process is typically called forest or NFMA planning.

³This section addresses the historical development of legislation providing the management goals for the national forests. Ch. 4 Will examine the detailed legal requirements of these laws.

The floor debate over this act strongly indicates that the primary intent was to protect the forests and the downstream water flows.⁴ Wood was to be made available to settlers and to miners who needed the timber locally, but providing wood for loggers was not a consideration in establishing forest reserves. Senator John Lockwood Wilson of Washington noted:

... the timber lands withdrawn [that are more than 25 miles from Puget Sound] do not contain merchantable timber. They have only their value, if any, for mining purposes (326).

Senator George Laird Shoup of Idaho, in arguing for permission to sell timber from the reserves, added:

... We do want to protect and will protect our timber if the reserves are only established in the right place. But, Mr. President, our farmers and our miners are entitled to a sufficient quantity of timber for domestic purposes (233).

Thus, Congress was clearly concerned about the local community impacts of reserving Federal forest lands. In the subsequent century, the national forests have become an important source of wood for the lumber and plywood needed in home building and other uses. Nonetheless, the principal concerns in establishing the forest reserves were for protecting the lands and waters while making a continuous supply of timber available.

Following the transfer of the reserves to the Department of Agriculture in 1905, the management activities of the new Forest Service (created when the Forestry Division of the Department of the Interior's General Land Office was merged with the Department of Agriculture's Bureau of Forestry) generally focused on land and resource protection. The first efforts were to protect the forests from wildfires and from trespass (illegal timber cutting and homesteading), and to control grazing, which had been unregulated by the Department of the Interior (329). The Forest Service based its efforts on the broad, general provision in the 1897 Organic Act permitting the Secretary of Agriculture "to regulate their [the forest reserves'] occupancy and use and to preserve the forests thereon from destruction . . ." The livestock industry challenged the Forest Service's right to regulate use and charge fees, but the

agency's position was upheld by the U.S. Supreme Court in 1911 (240).

In 1911, Congress also authorized the Forest Service to acquire lands for the National Forest System. The Weeks Law authorized land acquisition to protect water flows; acquiring land to provide timber was not authorized until the Clarke-McNary Act of 1924. Many of the national forest lands in the eastern half of the country were acquired under the Weeks Law, and, unlike those in the west, many had been denuded or severely degraded before the Federal Government acquired them. Thus, in origins and biological and cultural histories, the eastern national forests are quite different from the national forests in the west.

In summary, the concept of using the national forests in many ways was implicit from the very beginning. When use levels were low, conflicts among users were minor and could be managed by separating uses. Public discussion of the compatibility of uses did not begin until after the National Park Service was created in 1916. In the following years, the Park Service tried, sometimes successfully, to gain control of prime Federal recreation sites. The Forest Service countered Park Service efforts by arguing that proper management of the various land uses could provide both recreation and commodity extraction, that "multiple use" was preferable to "single use."

The Multiple-Use Sustained-Yield Act of 1960

The debate with the Park Service and disagreements with ranchers continued to simmer until about 1950. Then, during the next decade, several conditions and events led the Forest Service to believe in the need for legislative sanction to define the purposes of the national forests and to preserve Forest Service discretion in managing those lands.

The demand for the goods and services provided by the national forests began to change after World War II. Livestock grazing had been the major use of the reserves when the Forest Service began managing the lands, but livestock use of the national forests peaked in 1920 and has slowly declined since (298). In contrast, recreation and timber harvesting began slowly, then accelerated after World War II. (See box 3-A.) While timber harvesting increases some

⁴Typically, committee reports carry more weight as indicators of the intent of Congress than does the floor debate, but no committee reports were filed on the 1897 act, because it was an amendment to an appropriations bill. This was a common practice at that time, because the appropriations committees did not exist until the 1920s. Appropriations bills were developed by what are now known as authorizing committees.

Box 3-A—Livestock Grazing, Recreation Use, and Timber Production Trends in the National Forests

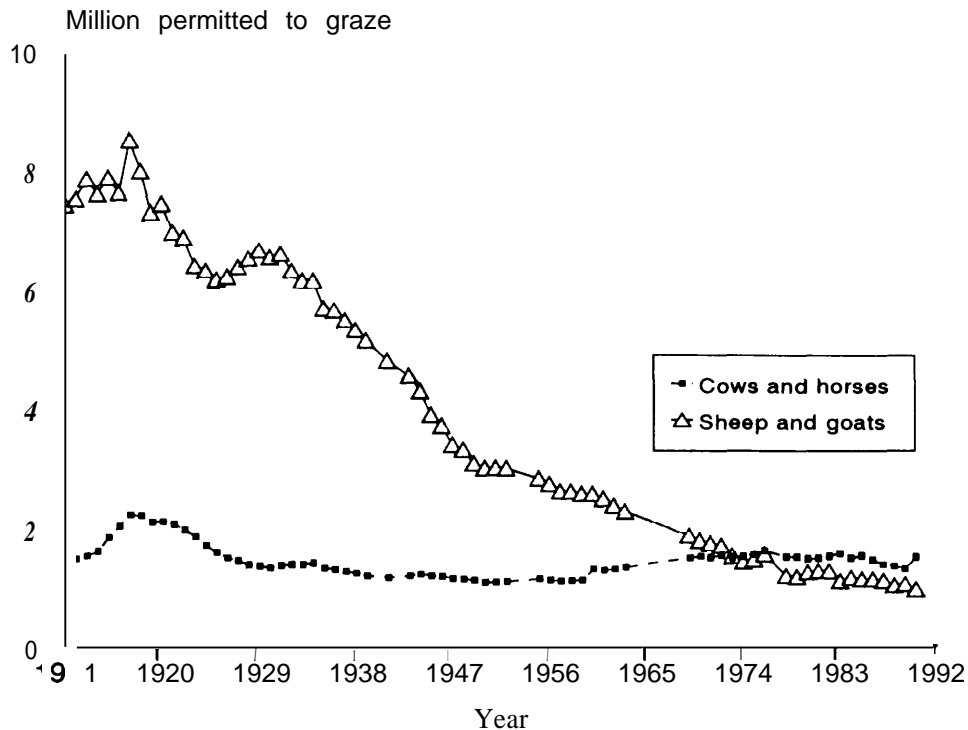
Livestock grazing was the most important use of the forest reserves when the lands were transferred in 1905 from the Department of the Interior to the Forest Service in the Department of Agriculture. Livestock grazing continued to increase for the next 15 years, but has slowly declined since 1920. (See figure 3-1.)

Recreation in America has undoubtedly increased since World War II. (General recreation data are unavailable to show the magnitude or consistency of the increase.) National forest recreation use was generally below 10 million visitors annually prior to 1946, but climbed to about 25 million in 1950, and rose to more than 100 million visitor-days by 1961.¹ Recreation use has continued to climb, exceeding 250 million visitor-days in 1989. (See figure 3-2.) This is not to suggest that all uses have increased equally. Motorized recreation, travel to destination resorts, and backcountry hiking increased as the Nation's transportation system improved, as leisure time increased, and as the Wilderness System expanded. However, demographic and other changes have shifted recreation uses toward shorter but more frequent and less strenuous activities (199, 235).

Timber harvesting in the national forests also increased substantially after 1950. Before World War II, national forest timber harvests averaged less than 1 billion board feet (BBF) annually. In 1950, 3.5 BBF were harvested, and this rose annually, reaching 12.1 BBF by 1966. (See figure 3-3.) In contrast to the continued growth in recreation use, national forest timber sales and harvests have generally ranged between 9 and 13 BBF annually since 1960, with no discernible long-term trend. Lumber and plywood production has increased slowly over this period (see figure 3-4), suggesting that national forest timber displaced private and other public timber in the 1950s. Since 1960, harvests of private and other public timber may have fueled the increased production, but improved technology-greater product output from the same amount of timber input-has also contributed to the increased lumber and plywood production.

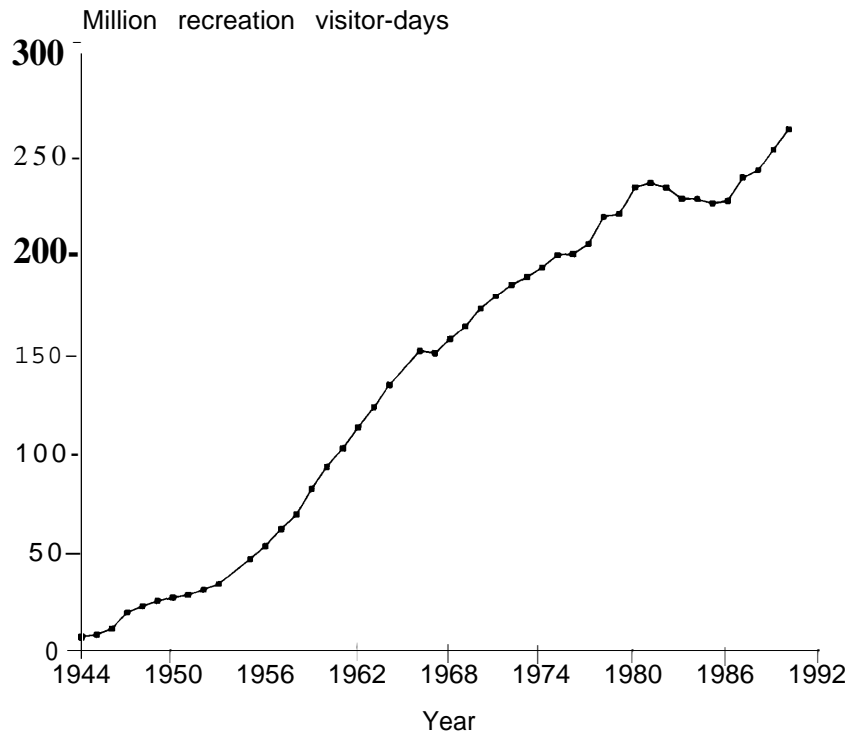
¹Recreation use was measured in visits prior to 1965, and has been measured in visitor-days since 1965. However, the change in measure is apparently insignificant for reporting the trends in recreation use, as shown in figure 3-2 (74).

Figure 3-1—Grazing in the National Forests



SOURCE: U.S. Department of Agriculture, Forest Service, *Report of the Forest Service* (Washington, DC: U.S. Government Printing Office, annual series).

Figure 3-2—Recreation Use of the National Forests



SOURCE: U.S. Department of Agriculture, Forest Service, *Report of the Forest Service* (Washington, DC: U.S. Government Printing Office, annual series),

recreation opportunities it limits other opportunities and values. The simultaneous increase in the Forest Service timber program and in national forest recreation use in the 1950s and early 1960s probably magnified the conflicts over national forest management.

Ranchers tried to increase their influence in determining livestock permit numbers, fees, and other matters, and convinced Senator Frank Barrett of Wyoming to introduce a bill to this effect in 1953 (329). In the same Congress, the timber industry pushed for industry selection of public timberland as compensation for private timberland flooded by Federal dam projects (329). Although these efforts were unsuccessful, they indicated an interest in partitioning the national forests among interest groups.

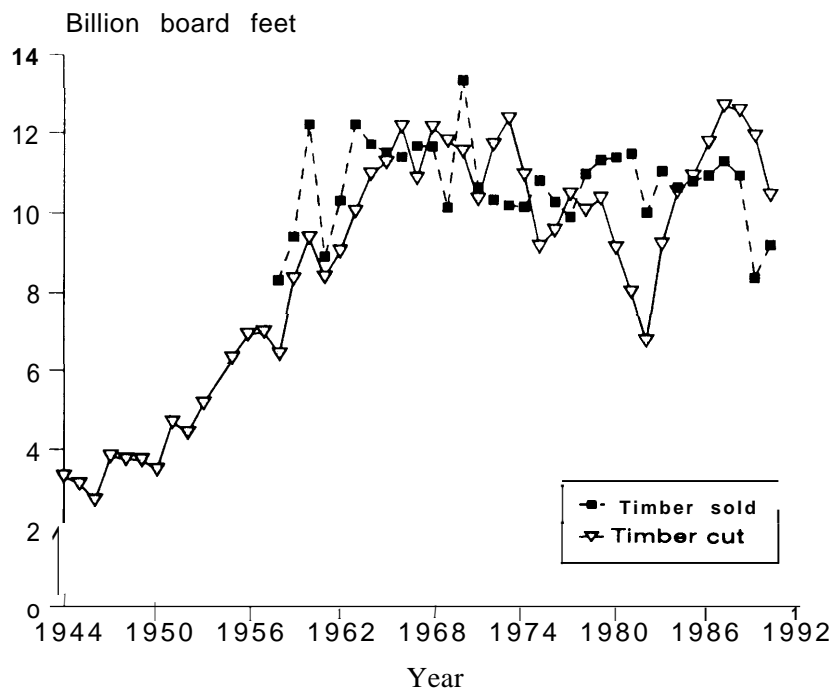
Another effort to reduce Forest Service discretion began in 1955: the first bill to establish a wilderness system was introduced. The Forest Service was surprised by the bill, because it had administratively established a system of wilderness, wild, and primi-

tive areas in the National Forest System, beginning in 1924. However, administrative boundary modifications and pressures to expand national forest timber harvests led some to believe that statutory protection was necessary to preserve undeveloped areas in the national forests. (See the following section on the Wilderness Act.)

Then, in 1956, the Park Service launched Mission '66 to increase the size of the National Park System substantially. This was seen as a threat to the national forests, since many parks had been created from national forest lands. Furthermore, President Dwight D. Eisenhower supported Mission '66, but the Forest Service was unable to obtain financial support for its countermeasure, Operation Outdoors.

Taken together, these events and conditions led the Forest Service to believe in the need for legislative blessing of their existing management direction. The multiple-use legislation proposed by the Forest Service won only lukewarm support. Few outside the agency believed it was necessary, although several conservation groups endorsed it.

Figure 3-3-Forest Service Timber Sale Program



SOURCE: U.S. Department of Agriculture, Forest Service, *Report of the Forest Service* (Washington, DC: U.S. Government Printing Office, annual series).

However, opposition was also muted. The timber industry initially opposed new legislation, believing the Forest Service Organic Act gave timber production more prominence than the multiple-use bill. The industry offered a substitute directing stronger financial considerations in national forest management. Other potential opponents, such as the Sierra Club and The Wilderness Society, generally stayed clear of the debate, focusing their attentions on statutory wilderness protection. Thus, after a relatively brief and mild struggle, the Forest Service was rewarded with the Multiple-Use Sustained-Yield Act of 1960 (MUSYA), stating that:

... the national forests are established and shall be administered for outdoor recreation, range, timber, watershed, and wildlife and fish purposes. The purposes of this Act are declared to be supplemental to, but not in derogation of, the purposes for which the national forests were established as set forth in the Act of June 4, 1897 . . .

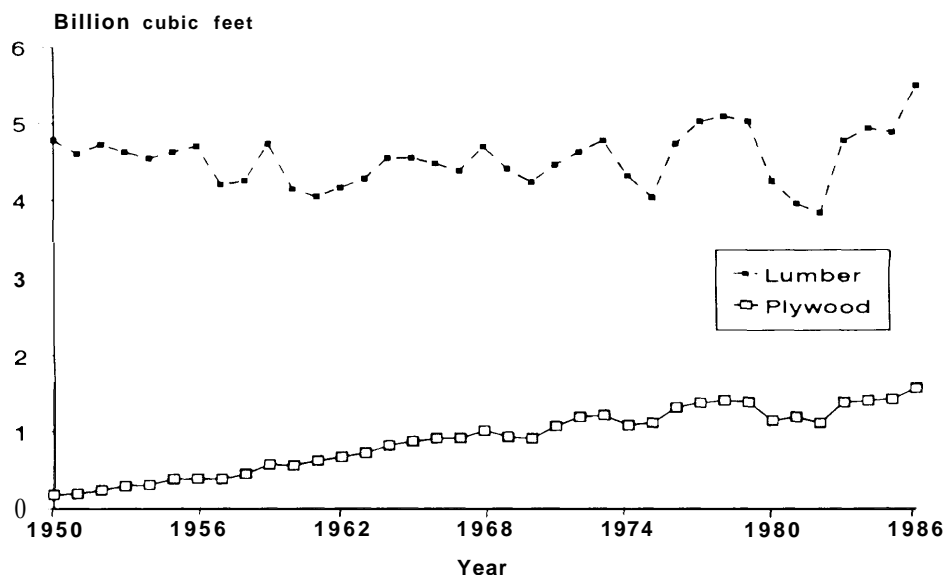
... The establishment and maintenance of areas of wilderness are consistent with the purposes and provisions of this Act.

In enacting MUSYA, Congress essentially sanctioned Forest Service management to provide a broad array of natural resource uses and outputs, while protecting the land and resource base of those uses and outputs. Congress accepted the agency's legislative proposal, because the proposal did not change national forest management direction or congressional oversight or authority. MUSYA expanded upon the national forest purposes set forth in the Organic Act and together they provide broad direction and substantial agency discretion for managing the National Forest System.

The Wilderness Act

The Forest Service had long recognized the value of keeping some lands undeveloped. In 1924, under its general administrative authority, the agency set aside the Gila Wilderness in New Mexico, and subsequently established a system of wilderness, wild, and primitive areas. However, some observers were concerned about the administrative authority to modify area boundaries and about increasing pressures to expand national forest timber harvests, and proposed statutory protection for specific undeveloped lands in the national forests.

Figure 3-4—U.S. Lumber and Plywood Production



SOURCE: U.S. Department of Agriculture, Forest Service, *An Analysis of the Timber Situation in the United States: 1989-2040, Part 1: The Current Resource and Use Situation*. draft [by Haynes, R.W.] (Washington, DC: U.S. Government Printing Office, 1989), p. A-67.

Events in the Boundary Waters Canoe Area of northern Minnesota illustrate the concerns. After World War II, the Forest Service proposed several large, long-term timber sales in the area, over long-standing local opposition. This led local conservationists—and eventually Senator Hubert Humphrey of Minnesota—to believe that timber from all national forest lands would be harvested, except where harvesting was prohibited by law (329). Comparable situations elsewhere led conservation groups, which had supported the Forest Service against the ranchers and loggers, to support the idea of statutory wilderness protection.

The Forest Service included a provision in the Multiple-Use Sustained-Yield Act of 1960, noting that “the establishment and maintenance of areas of wilderness are consistent with the purposes and provisions of this Act. However, wilderness proponents were still not satisfied, and the Wilderness Act creating the National Wilderness Preservation System was enacted in 1964.

The Wilderness Act provides more explicit guidance for managing the designated areas than the

Organic Act and MUSYA do for the other National Forest System lands. The Wilderness Act generally prohibits commercial activities and road and facility construction in the designated areas. Compatible commercial activities (e.g., outfitter services) were exempted, and grazing and other nonconforming uses (especially motorized access) were generally allowed to continue, if those uses had been established before the area was designated as wilderness. Furthermore, valid existing mineral rights were protected, and the act permitted new rights to be established for about 20 years (specifically, until Dec. 31, 1983). In essence, the Wilderness Act prohibited timber harvesting, new recreation facilities, and new motorized access in the areas designated as wilderness by Congress.

The Forest and Rangeland Renewable Resources Planning Act of 1974

RPA was enacted because of concerns about short-sighted, political decisions for the Nation’s renewable resources. At that time, public trust in government was deteriorating—the Watergate scandal was breaking and Vietnam War protests were

expanding. Congress was reasserting control over the Executive Branch—for example, the Congressional Budget and Impoundment Control Act (which preceded RPA by a month) reestablished congressional control of the budget, following impoundments (nonspending of appropriations) by the Nixon Administration. Senator Hubert Humphrey, the principal sponsor of RPA, asserted that the administration's short-term spending priorities were short-changing renewable resource management.

RPA established an open, strategic planning process by which the Forest Service would address the long-range renewable resource situation in four documents. First, an Assessment produced every 10 years would examine resource conditions, trends in supply and demand, and opportunities to invest in resource production. Then, every 5 years, a program would establish the direction for all Forest Service activities, to respond to the trends and opportunities identified in the Assessment. The Program was to be consistent with the principles set forth in MUSYA and in the National Environmental Policy Act of 1969 (NEPA). Thus, Forest Service activities under the RPA Program are to provide for multiple uses and sustained yields, and the Forest Service is to include users and other interested parties in setting national direction for Forest Service activities. A Presidential Statement of Policy, which accompanies each Program, would then be used to guide the annual budget requests. Finally, an Annual Report would assess Forest Service accomplishments and progress in implementing the program.

RPA also required the Forest Service to prepare "land and resource management plans for units of the National Forest System. These plans were to be coordinated with other Federal, State, and local planning processes, and were to be developed using 'a systematic interdisciplinary approach to achieve integrated consideration of physical, biological, economic, and other sciences.' The plans were considered part of the RPA Program, and thus were to be consistent with MUSYA and NEPA. Thus, RPA confirmed MUSYA as the management principle for the national forests, and essentially established the requirement for public participation in national forest planning.

The National Forest Management Act of 1976

NFMA was enacted primarily in response to several lawsuits. The initial suit⁵ successfully argued that clearcutting in the Monongahela National Forest violated the Forest Service timber sale authority in the 1897 Organic Act. The lower court decision was upheld by the 4th Circuit Court of Appeals in August 1975. Then, in December, the Federal District Court of Alaska extended this decision to the long-term timber sale contracts in Alaska.⁶ In July 1976, a preliminary injunction followed the same logic to halt clearcutting in the National Forests in Texas.⁷ Several other lawsuits were filed in late 1975 and in 1976 to stop clearcutting in the national forests. The timber industry and the Forest Service argued that clearcutting was a sound timber management tool, and that a ban would devastate the timber economy. If all the litigation were successful, Forest Service timber sales would probably have fallen by half (261). However, in the Monongahela case, the Court of Appeals stated that it could only apply the existing law; if the law was an anachronism, it was up to Congress, not the courts, to remedy the situation.

The lawsuits challenging clearcutting were only one expression of growing public dissatisfaction with national forest management. The 1970 Belle Report (264) described problems on the Bitterroot National Forest in western Montana. The Senate Committee on Interior and Insular Affairs held extensive hearings on clearcutting around the country in 1971, and issued recommendations for Forest Service clearcutting in a committee report, commonly known as the Church Clearcutting Guidelines (265). In 1970, the Forest Service had on its own initiative begun a review of the wilderness potential of many national forest roadless areas (RARE I), but this review was halted in 1972 because of litigation charging the Forest Service had been arbitrary in selecting the areas to be reviewed (294). Forest Service management was, in essence, being challenged in many ways and places.

Bills were introduced to make a simple, technical correction to the Organic Act, making it legal to clearcut timber in the national forests. However, Congress chose to respond to the full range of public

⁵*West Virginia Division of the Izaak Walton League, Inc. v. Butz*, 367 F. Supp. 422; 522 F.2d 945 (4th Cir. 1975).

⁶*Zieske v. Butz*, 406 F. Supp. 258.

⁷*Texas Committee on Natural Resources v. Butz*, Civil Action No. 'H-76-268-CA

concerns about national forest management, rather than just address the immediate problem. Upon introducing NFMA, Senator Hubert Humphrey of Minnesota stated that:

Time has demonstrated that we need more than a new prescription for selling timber. We need a fundamental reform in managing all of the resources associated with forested land of the national forest system . . .

To me it is not enough that we modernize the methods by which timber is sold. This bill does much more. Its basic purpose is to assure that the multiple uses are realized and their yields are sustained. This bill seeks to strengthen resource management so that it is ecologically effective (120).

Because RPA required land and resource management plans for units of the National Forest System, Congress chose to guide the local planning process by amending RPA. This option also fit with Congress' intent to retain the basic direction for the National Forest System, as set forth in the Organic Act and MUSYA. NFMA was intended to assure balanced use and protection of all the resources, today and tomorrow. As noted in the Senate Committee Report:

The role of the Forest Service in the management of the National Forest System is to act as a steward of the land . . .

Timber production and sale are important aspects of the overall management of the National Forest System lands. However, they are not the sole objectives of management planning . . .

The other resources of the forests, wildlife and fish habitats, water, air, esthetics, wilderness must be protected and improved. Consideration of these resources is an integral part of the planning process. . .

It is, therefore, time for Congress to act in order to insure that the resources found in our National Forests can be used and enjoyed by the American public, now and in the future (261).

Senator Humphrey described the relationship among NFMA, RPA, and MUSYA by noting that "The Forest and Rangeland Renewable Resources Planning Act and these amendments are intended to be fully compatible with the principles of the Multiple-Use Sustained-Yield Act, and, in fact, to provide further direction in the implementation of that act" (120).

Much of NFMA is an amendment to the land and resource planning requirement of RPA. Some amend-

ments provide considerations for management. For example, section 6(k) specifies consideration of physical, economic, and other pertinent factors in determining the suitability of land for timber production. NFMA also establishes standards and guidelines for planning. For example, section 6(f)(2) requires the plan to reflect proposed and possible actions, including the planned timber sale program, and section 6(g)(2)(A) directs the Forest Service to identify lands suitable for resource management. Section 6(g)(3) directs guidelines to achieve the goals of the RPA Program, while subsection (A) specifies the consideration of the economic and environmental aspects of resource management systems, and subsection (F)(ii) requires an assessment of potential environmental, biological, esthetic, engineering, and economic impacts of each timber sale. In addition, section 6(1) requires estimates of long-term benefits and costs and a representative sample of government returns and expenditures associated with the sale of timber.

NFMA also establishes standards and guidelines for assuring protection of the resources of the national forests. Examples include providing for a diversity of plant and animal communities (section 6(g)(3)(B)); prohibiting irreversible soil, slope, and watershed damage (section 6(g)(3)(E)(i)); assuring adequate reforestation within 5 years (section 6(g)(a)); protecting waters, wetlands, and riparian areas (section 6(g)(3)(E)(iii)); limiting the size of clearcuts (section 6(g)(3)(F)(iv)); revegetating roads unless the need for a permanent road is specified in a road plan (section IO(b)); and generally limiting timber sales to a quantity that can be harvested annually in perpetuity on a sustained-yield basis (section 13(a)). Thus, NFMA requires many considerations, standards, and guidelines in planning for the management of the national forests under MUSYA.

While the Organic Act and MUSYA define the parameters of management, and NFMA details considerations, standards, and guidelines, NFMA is not a set of prescriptions for national forest management. RPA and NFMA establish a planning process that leaves substantial management discretion with the agency. Furthermore, NFMA clearly intended that management, as set forth in the forest plans, respond to the desires and concerns of the people, as expressed locally and through the national strategic planning process under RPA. NFMA explicitly requires "public participation in the development,

review, and revision of land management plans . . .’ RPA and NFMA planning are also to be conducted in accordance with NEPA, and NEPA also requires that Federal agencies consider public input in decisionmaking.

In sum, NFMA emerged in response to lawsuits that would have substantially reduced Forest Service timber sales. However, Congress chose to provide guidance for the required forest management plans, rather than enact only management prescriptions or a technical correction to the timber sale authority. The guidance is mostly in the form of planning considerations and standards and guidelines for analyzing, reporting, and protecting the quality of resources and the environment. NFMA was also intended to assist in producing the high-level of sustainable outputs required under MUSYA. NFMA leaves the Forest Service with substantial Forest Service discretion in managing the national forests, but requires the agency to consider public interests and concerns, and directs that the forest plans be prepared in accordance with NEPA. Thus, the Organic Act and MUSYA provide a framework for managing the national forests, while NFMA and NEPA essentially direct that local resource conditions and public desires and concerns be considered in determining the details,

Philosophical Basis for Government Ownership

There are two, interrelated reasons for government ownership and management of forests and rangelands and of renewable resources: 1) the production of one resource output can affect other resources, and 2) many resource uses are not currently marketed. Forests and rangelands clearly produce more than just one output or value; a forest, for example, can simultaneously grow timber, provide food and cover for wildlife and livestock, and yield water for human use, land animals, and fish. Activities to modify one aspect of the forest will affect other uses and values. For example, thinning a timber stand to increase timber growth might also increase water yields and forage production, but might decrease wildlife cover and water quality. This interrelationship among outputs is generally known as joint production.

Joint production can be a problem for natural resource management, because many resource values are not marketed. (See box 3-B.) Timber is the only national forest output priced in a competitive market,⁸ and even for timber, the Forest Service does not respond to market signals in traditional ways (increasing sales when prices and/or profits rise, and decreasing sales when prices and/or profits fall). For other national forest resources, markets are not used to set prices or to signal appropriate operations and investments.

While markets can improve production efficiency, efficiency was explicitly rejected as the guiding principle for managing the national forests. In debating MUSYA, the House Committee on Agriculture did not even consider a timber industry proposal to base management direction on financial considerations (329); instead, MUSYA directed that management need not be ‘the combination of uses that will give the greatest dollar return or the greatest unit output.’ Implicitly, Congress recognized the limitations of markets in providing a balanced mix of resource values, and accepted the Forest Service bill making multiple use and sustained yield the appropriate directions for national forest management.

Congress maintained this philosophy in enacting NFMA. As a result of the Belle Report (264) and other evidence of uneconomical timber investments, the Senate included a financial standard (production costs less than economic returns) for lands with timber production as a management goal. A similar provision was considered and rejected by the House Committee on Agriculture and on the floor of the House. The substitute, agreed upon by the conference committee and accepted by both Houses, requires consideration of economic (and other) factors in determining lands not suited for timber production, and then allows timber salvage sales and sales to protect multiple-use values on lands not suited for timber production. Section 6(1)(1) of NFMA also requires the Forest Service:

... to provide information on a representative sample basis of estimated expenditures associated with reforestation, timber stand improvement, and sale of timber from the National Forest System, and shall provide a comparison of these expenditures to

⁸Not all national forest timber is sold in competitive markets. From 1973 to 1979, 25 percent of timber sales (including more than half of all sales in the central and southern Rocky Mountains) received only one bid (288). (Such data are not published regularly, and more recent data are not available.) In areas where one-bid sales are common, Forest Service timber sale appraisals, rather than competition, determine timber prices.

the return to the Government resulting from the sale of timber . . .

However, NFMA does not proscribe agency actions or require responses based on the comparison of costs and revenues.

What Is Multiple Use?

MUSYA defines multiple use as:

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

This definition of multiple use is not very useful for determining the proper management of the national forests. The only goal is to meet the needs of the people, while the only limitation is to protect the productivity of the land. In addition, multiple-use management is to consider relative resource values, but maximizing returns or outputs is not to be the sole basis for determining management. (This last provision was apparently a response to the timber industry's proposal for the multiple-use bill to emphasize financial considerations in Forest Service management decisions.)

Joint Production or a Dominant-Use Patchwork?

The concept of multiple use encompasses two distinct views about managing to produce outputs and uses: joint production and patchwork of dominant uses. As noted above, joint production recognizes that forests and rangelands are ecosystems that can produce more than just one use or output of value—they provide wildlife habitat, yield water, can be used for recreation, and produce timber and

forage for livestock.⁹ Management of one use or value will affect the others; for example, a clearcut yields timber, generally increases water flows, augments forage for livestock and wildlife, and provides access to new areas for some types of recreation, but may also degrade water quality and eliminate wildlife cover and certain recreation opportunities, at least temporarily.

While joint production is clearly an accurate view of the ecological interactions on forests and rangelands, it is difficult to apply the concept to land management. Despite the long-standing recognition of joint production, our understanding of the relationships among resource values is incomplete. The biological and social sciences have, to date, provided only a fragmentary picture of the ecological interactions for a given site. Furthermore, seemingly minor variations in activities or locations can cause substantially different interactions among resources depending on soil types, the nature and condition of surrounding sites, and other factors. Finally, no objective way exists to determine whether the net result of management actions on all of the current and future uses and outputs is desirable. Economics (usually benefit-cost analysis) is often used to evaluate the results, but the limits of economic analysis combined with the limits of our knowledge of biological and social interactions make such an evaluation incomplete, at best. (See ch. 8.)

Another view of multiple-use management, a patchwork of dominant uses, provides clearer direction for land managers. Under this approach, lands are divided into management units, and each unit is managed to produce more (or higher quality) of the dominant use(s) or output(s) while maintaining environmental and resource quality standards. Despite the visceral reaction of many to the concept of dominant-use management, this approach to achieving multiple use is clearly consistent with MUSYA. The phrases “judicious use of the land for some or all of these resources” and “some land will be used for less than all of the resources” suggest that the Forest Service (which drafted the definition) believed that multiple use could be achieved by separating conflicts in space. Furthermore, some uses must be separated, because they are incom-

⁹It should be noted that, in different situations, multiple use may mean something other than the broad variety of uses and outputs commonly associated with forests and rangelands. In the mineral industries, for example, multiple use means allowing more than one type of mineral extraction from a site, with no reference to other uses. Thus, in certain circles, oil drilling on a hardrock mining claim is multiple use, even if no other uses occur (329).

Box 3-B—Privatization of Federal Lands

Since the late 1970s, some have questioned the validity of the historic justification for Federal land and resource ownership. Classical economics, dating back to a century before Adam Smith, asserts that governments should minimize their interference with private land allocation and production decisions, because government interference necessarily reduces optimal output (211). Citing this theoretical **base**, “**sagebrush rebels**” and others have argued for privatization—the disposal of the national forests (and other Federal lands) by selling or transferring the land to individuals and organizations in the private sector (45, 180). This approach would end or at least limit Federal land ownership, and rely principally on private market responses to consumer demands for determining resource use and protection. A less draconian form of market responsiveness, called marketization, would retain Federal ownership, but seek to reap the benefits of private markets by rewarding Forest Service managers for responding to consumer demands (187). This would require establishing markets for many uses and outputs that are not currently marketed or that are subsidized.

Benefits of Market-Based Decisions

Markets have two principal strengths for guiding land and resource management decisions. First, markets **provide** unmistakable signals of individual consumer demands. Market prices of goods and services fluctuate to balance supply and demand by allocating available supplies among consumers. High prices reflect strong demand, while low prices show weak demand. Similarly, price changes show changing demands, with prices rising when demand is increasing (or supply is falling) and prices falling when demand is decreasing (or supply is rising).

The second strength of markets results from the clarity of the signals about supplies and demands: markets lead to efficient production among the marketed resources. Prices and production costs determine the most profitable operations and investments. Assuming that managers respond to profits, actions will be shifted to producing the most profitable goods and services—those with high prices (strong demand) relative to the cost of production. These shifts to greater production of the most profitable resources will increase supplies and thus eventually reduce prices. Ultimately, managers responding to the price and profit information will achieve the most profitable balance among all the marketed resources.

Limitations of Market-Based Decisions

The primary limitation to using markets for land and resource management decisions is that many uses and values are not marketed. Sometimes, pricing decisions have intentionally been made outside markets. For example, as a society, the American people have generally chosen **not** to charge a market price for the right to fish or hunt. Similarly, the established fee for grazing livestock on Federal lands is substantially below the calculated fair market

patible; few people want to picnic or camp in a recent clearcut, for example. Thus, a dominant-use patchwork is, in some cases, necessary.

Applying a dominant-use patchwork for managing the national forests is not without difficulties. Our incomplete knowledge of ecological and social interactions also restricts multiple-use management under this view, although less detailed understanding is needed for setting environmental and resource quality standards and for monitoring results to assure that standards are met. However, determining standards is not a technical process. It is a social process, with the affected and interested individuals and groups defining the minimum acceptable standards. Defining the patches—which lands are managed for which uses—is also not a purely technical process. Most lands can be managed for various uses, emphasizing timber production, water produc-

tion, wildlife production, etc. Furthermore, some lands that are highly effective at producing one value (e.g., timber) might also be highly effective at producing another (e.g., wildlife), and joint management of the values might produce more of both than would be produced in a dominant-use patchwork. The ability of sites to produce conflicting values—e.g., wood and undisturbed ecosystems—is the heart of the controversy over preserving old-growth Douglas-fir forests in western Washington and Oregon. Thus, although technical production is an important consideration in determining the dominant use for a patch of forest or rangeland, the demands and desires of the affected and interested individuals and groups must also be considered.

In reality, multiple-use management is more complicated than either joint production or a dominant-use patchwork suggests, and ‘multiple-use manage-

value of grazing (181, 281). Often, uses are subsidized to ensure availability to all, particularly for recreation. Market proponents argue that subsidies will lead to overuse, and that price can be used to efficiently allocate the supplies among potential consumers. However, price uses wealth and income for allocating use, while other allocation mechanisms, such as lotteries and first-come-first-served, may be more equitable (61). Thus, for some resource uses, society (through its elected representatives) has chosen subsidies and alternative allocation schemes.

High transaction costs limit the effectiveness of some resource markets (31). For some resources, the cost to enforce market transactions is quite high; for example, the current easy access to national forests makes it difficult to ensure payment of the fair market value for dispersed recreation. Furthermore, the numerous highways and inholdings bring in many visitors whose primary purpose is not visiting the national forest. A similar difficulty is being able to relate increased outputs to management activities. For example, increased water flow may result from managerial efforts, but it also may simply result from additional precipitation; such uncertainty (together with existing water rights law) may make it difficult for the Forest Service to charge for the increased water flow. Thus, difficulties in collecting market prices for the resource outputs produced may limit the use of markets for guiding management of the national forests.

In addition, the collective-goods nature of some resources may prevent the creation of markets (31). Collective goods are provided for everybody, if they are provided at all, because people cannot be excluded from receiving the benefits. Such benefits usually result not from the use of the goods or services, but simply from their existence; thus, collective goods are also called nonuse values and it is impossible to establish markets for them. For example, endangered species are collective goods, because much of their value is derived from knowing they exist, rather than from using them. This is not to say that everybody wants the collective good; some people undoubtedly get little personal benefit from knowing spotted owls exist. However, markets work because each buyer can choose the amount of the specific goods or services bought, whereas the collective nature of nonuse values prevents each American from choosing the amount of the collective good bought. Moreover the benefits of collection goods (existence) cannot be withheld from those who don't pay.

Externalities are a third limitation to using markets for land and resource management decisions. Markets involve transactions between buyers and sellers, but occasionally transactions harm people who are not involved in the transaction. For example, when a landowner sells timber, the buyer and the seller are involved in the transaction, but others—recreationists, sightseers, downstream water users, etc.—may be affected by the timber sale. If all resource uses and outputs were sold in equally efficient markets, the externalities would be resolved within the marketplace. However, the high transactions costs for some resources and the collective-goods nature of other resources prevent establishing equally efficient markets for all resources. Therefore, externalities would plague purely market-based guidance for land and resource management.

ment” has come to mean either approach or a combination of the two. Early Forest Service management apparently focused on the dominant-use patchwork approach—use levels were relatively low, and conflicts were managed simply by separating users. As timber harvesting and recreation use increased after World War II, managing the conflicts became increasingly important and increasingly difficult. While the Forest Service still manages some conflicts by separating users in space and time, it also attempts to accommodate other values by modifying dominant-use management. Such modifications to dominant use may reflect the joint-production nature of forest and rangeland outputs and values, but they are only assumed to approximate joint production.

In practice, joint production and dominant-use patchwork can lead to quite different management

activities for a given site. The phrase, “multiple-use management, therefore, provides little guidance for land management, and can be very misleading when used to describe management direction. As recently as 1989, Henry Vaux noted the lack of agreement on the meaning of multiple use:

Why such an apparent conflict in meanings? Because the symbol [multiple use] has at least some validity in describing these disparate forms of forest management . . .

Even in an economic context, multiple use maybe interpreted in more than one way.

Thus, “multiple use” has multiple interpretations, meaning different things to different people. To some, multiple use necessarily includes use of commodity resources (timber, livestock forage, minerals). Areas where such uses are proscribed, such as recreation sites and wilderness areas, there-

fore are not considered multiple-use areas. However, others have noted that such areas still yield water and are used for recreation and by wildlife (99), while clearcuts effectively eliminate recreation use of the harvest site, at least temporarily. It is unclear which **uses** or how many **uses are necessary** for an **area** to be managed under multiple use.

Thus, although multiple **use assures** consideration of the various resource values and suggests **that a** balance among the values is appropriate, its multiple meanings and various interpretations, together with the technical difficulties of estimating joint production relationships, limit its usefulness for explaining or defending alternative management practices.

Confusion in the Act

One source of confusion in practicing multiple-use management is the **list** of purposes for **administering** the national forests under MUSYA—“outdoor recreation, range, timber, watershed, and wildlife and fish purposes. This list combines uses, outputs, resources, and land classes as the purposes for administering the national forests. (See table 3-1.)

This combination of purposes was not accidental. The terms were selected to assure a particular order in an alphabetical (and therefore neutral) listing (56, 329). Recreation had to come first, to combat Park Service efforts to obtain national forest lands and to show that commodity production was not the first and foremost purpose of national forest management. Then, a land classification-range-was used instead of livestock g-razing or forage, to assure that this commodity use was not listed first. Timber was selected to achieve centrality (and implicitly neutrality), although forestry has been (and sometimes still

is) used to describe timber production (53), and wood products are the end use; however, forestry or wood products would have meant listing this purpose first (emphasizing it) or last (denigrating it), neither of which was desired. Watershed was chosen, both to include soil resources implicitly and because other Federal agencies (e.g., the Bureau of Reclamation and the Army Corps of Engineers) are responsible for providing water. Finally, wildlife and fish—rather than the more natural phrase, fish and wildlife, or the more comprehensive term, animals—was used to assure last place in the listing, because States have primary jurisdiction over animal management and because the U.S. Fish and Wildlife Service shares Federal responsibility for animal management. Thus, although the listing of purposes used in MUSYA was a hodgepodge of uses, outputs, resources, and lands, it was politically expedient.

The odd mixture of uses, outputs, resources, and land classes in MUSYA has contributed to the confusion over what multiple-use management is. Multiple use suggests an emphasis on uses, or perhaps on outputs. However, the definition focuses on managing resources and protecting the productivity of the land, and specifically prohibits selecting the combination of uses that would maximize returns or outputs. A focus on managing resources suggests a more integrated, ecological approach to management than would result from a focus on producing uses and outputs (17). MUSYA does not clearly define the proper focus for Forest Service efforts, and the resulting management thus mixes resource protection with use and output production without defining the balance among resource values.

Table 3-1—Uses, Outputs, and Resources Corresponding to the Purposes Listed in the Multiple-Use Sustained-Yield Act of 1960 (MUSYA)

Purpose in MUSYA	Human use	Resource output	Resource base
Outdoor recreation ,	Leisure activities	None	Facilities, access, and acceptable land
Range	Animal products	Forage	Forage-producing plants and grazable land
Timber.	Wood products	Timber	Trees and harvestable land
Watershed	Water, hydro power	Water	Precipitation, soil, and protective vegetation
Wildlife and fish	Hunting, fishing, birdwatching, etc. (i.e., recreation)	Animals	Animals and their habitat requirements (food, cover, etc.)

SOURCE: Office of Technology Assessment, 1991.

What Is Sustained Yield?

MUSYA defines sustained yield as:

... the achievement and maintenance in perpetuity of a high-level annual or regular periodic output of the various renewable resources of the national forests without impairment of the productivity of the land.

This definition is much more useful than the definition of multiple use for determining national forest management. Goals are defined more clearly: the productivity of the land is to be maintained, while producing a high level of annual (or periodic) outputs forever. As with a trust fund (see box 3-C), this implies producing a high annuity while protecting and enhancing the forest's assets. This definition is also consistent with the original management direction for the national forests enacted in the 1897 Organic Act—that the lands are protected, that water flows are secure, and that timber supplies are continuous.

Historically, sustained yield has been applied mostly to timber. Providing a sustained timber supply was a European forestry tradition imported to America at the turn of the century (188). In particular, Gifford Pinchot wanted to show that timberlands could be managed profitably for continuous production, demonstrating that the cut-and-run practices of the timber industry were unnecessary (188, 327). Congress has, at various times, given direction to provide continuous timber supplies—in the 1897 Organic Act for the forest reserves, in the 1937 O & C Act¹⁰ for managing certain Federal timberlands in western Oregon, and in the 1944 Sustained Yield Act¹¹ authorizing special units of Federal timberland to be managed to provide timber for specific local communities.

Sustained yield has also been applied to managing rangelands and fisheries. The Wilderness Act implies sustainability for natural processes in describing wilderness as “an enduring resource” and in prohibiting most developments. Nonetheless, MUSYA appears to be the first time that sustained yield was broadly applied to **all** renewable resource values, and this was probably done in part to counter Park Service efforts to become the premier Federal recreation agency. Regardless of why it was pro-

posed, the concept of sustained yield of all resources may have been the most persuasive reason for congressional support for MUSYA (56).

There are three limitations to implementing sustained-yield management in the national forests: 1) the physical/biological bias of the approach, 2) the limits of knowledge, and 3) the resource focus. First, sustained yields are determined by the physical and biological productivity of the sites, with little or no regard for the relative value of those yields. Essentially, this view assumes that producing more must be better, regardless of the costs and the impacts on other values. Bowes and Krutilla(31) noted that the Forest Service has an “institutional focus on the stability of harvest levels and on biological criteria for timber treatments . . .” NFMA perpetuates this view in section 6(m) by identifying the “culmination of mean annual increment”—the age of maximum average physical production—as the standard for harvesting timber. Thus, sustained yield focuses on perpetuating supplies by restricting uses and outputs to growth or carrying capacity.

Furthermore, as discussed above, the biological and social sciences have provided an incomplete picture of the relationship between outputs (yields) and the resource base. Current resource outputs can be used to estimate productivity, but current productivity is an imperfect predictor of permanently sustainable production levels. For example, current timber growth rates can be estimated and used to determine appropriate harvest levels, but timber harvests probably alter growth rates by changing hydrologic patterns and soil nutrients and microfauna. Furthermore, using one resource affects the current and future productivity of other resources. Timber harvests, for example, can alter (increasing or decreasing) both short-term and long-term water yields, forage production, and animal populations. The limits of knowledge about ecological and social relationships make it difficult, if not impossible, to guarantee the sustained yield of all the resources at this time.

Finally, the supply and production emphasis necessarily focuses on the uses and outputs of individual resources (17). This focus has two effects. First, it inhibits ecosystem management. Managers tend to focus on producing and protecting individual

¹⁰O & C Act of 1937, Act of Aug. 28, 1937, ch. 876 (50 Stat. 874; 43 U.S.C. 1181a).

¹¹Sustained Yield Forest Management Act, Act of Mar. 29, 1944, ch. 146 (58 stat. 132; 16 U.S.C 583).

Box 3-C-The National Forest System as a Natural Resource Trust Fund

The National Forest System was established to provide continuous and permanent natural resource benefits. In the Forest Reserve Act of 1891 and the Organic Act of 1897, Congress authorized reserving lands from the large-scale clearcutting that allegedly caused downstream flooding and destructive wildfires. The term reserve has a double meaning. In addition to meaning something saved for future use or special purpose, a reserve is also “capital held back from investment by a bank or company in order to meet probable or possible demands. Thus, reserve can also suggest capital assets held to provide for future needs. It is possible that Congress chose the term reserve to convey both meanings: saving the land from timber cutting to preserve water quality and establishing the capital needed to provide for future demands.

Regardless of congressional intent in choosing the term reserve, the National Forest System is, in some ways, comparable to a trust fund. The Organic Act established continuous timber supplies as one of the purposes for forest reserves. The Multiple-Use Sustained-Yield Act of 1960 requires the Forest Service to maintain the productivity of the land. Such direction indicates Congress' desire that the productivity of the national forests be protected, much as the assets of a trust fund are maintained.

The eastern national forests complicate the view of national forests as a trust fund. In contrast to the western national forests, with their substantial reserves of timber and expanses of lands, the eastern national forests **were** acquired largely from cut-over lands, without enormous capital assets to be reserved. Subsequent management of these lands has enhanced the **asset** value of the eastern national forests, and illustrates the possibilities for management to improve the asset base. Thus, the history of the eastern national forests can also be seen as a Forest Service success in natural resource trust management.

Managing a trust fund illustrates the dilemma posed for managing the national forests. A trust fund is to generate annuities for the beneficiaries, but the assets must be protected and enhanced, to assure future annuities. Similarly, the national forests are to provide for today's uses and outputs, but the productive base (the lands, resources, and ecosystems) must be managed to assure that the uses and outputs can be sustained in the future. In both cases, managers are responsible for maintaining and enhancing the assets. Annual benefits are important, but preserving the productive assets is paramount.

In both the National Forest System and trust funds, moreover, professional managers are responsible for protecting the assets and producing the annuities and must also be responsive to the needs of the beneficiaries. At times, the beneficiaries may choose to forgo some annuities, to increase future annuities or for some moral or ethical reason. For example, a trust fund's beneficiaries may instruct the fund's managers to terminate certain investments, even though the managers may believe them to be desirable assets. Thus, while the managers are responsible professionals, the beneficiaries may prefer a mix of assets and annuities that is less than optimal, as defined by the professional.

The “annuities” of the National Forest System include not only uses and outputs, some of which are difficult to quantify (see box 8-A, p. 145), but also some nonuse values. Many people, for example, cherish various aspects of relatively undisturbed ecosystems. Furthermore, different balances of uses, outputs, and nonuse values yield different distributions of benefits. For example, building and/or maintaining campgrounds provides little direct benefit to the timber industry (although the workers may use the campgrounds) or to backpackers; wilderness may benefit backpackers, but provides little value for loggers or for snowmobiles. In contrast to a traditional trust fund, with its financial annuities, no simple, technical measure exists to determine the optimum level and mix of values provided from forests and rangelands.

Finally, the Forest Service is required by law, to provide the public with opportunities to participate in the national forest planning process. Thus, the public both benefits from and influences the management of the National Forest System. This contrasts with traditional trust funds, where the beneficiaries are relatively isolated from trust management. Nonetheless, trustees are to be prudent managers of the assets, and for a government agency with assets and annuities that are difficult to quantify, prudence dictates that the beneficiaries be directly involved in deciding about the annuities to be provided and the assets to be maintained and improved.

¹*The American Heritage Dictionary of the English Language* (Boston, MA: American Heritage Publishing Co. & Houghton Mifflin Co., 1969), p. 1106.

resources, rather than on integrating the protection and use of ecosystems. Under this focus, multiple use will more likely be a dominant-use patchwork, rather than joint production, with coordinated management of individual resources rather than truly integrated resource management.

When MUSYA was enacted, protection was considered necessary only to ensure that uses and outputs could be sustained. However, people today also value naturalness, and many wish to see natural ecosystems protected. The recognition of such nonuse values is at least part of the controversy over national forest management in the Pacific Northwest and elsewhere.

NATIONAL FOREST PLANNING: ACHIEVING THE GOALS

Planning Direction and Framework

What, then, are the goals for managing the national forests and how can they be achieved? The Organic Act and MUSYA frame the goals effectively. National forest management is to accommodate uses, produce outputs, and sustain ecosystems, with uses and outputs constrained to sustainable levels. Furthermore, as stated in MUSYA, management is to provide “the combination that will best meet the needs of the American people . . .” Thus, the proper mix of values is, essentially, determined by the 1) the physical and biological capabilities of the lands, and 2) the economic, social, and personal interests of affected and concerned individuals and groups.

Planning for the management of the national forests is the means of achieving those goals. Planning is done whenever activities are proposed. The first Forest Service “plans” were simple land allocation decisions to separate conflicting uses. More formal planning began after World War I, and expanded following World War II, especially to organize and coordinate the expanding timber program. By about 1960, the Forest Service recognized the need for integrated planning to coordinate the multiple uses of the various resources. However, planning efforts were still primarily internal, technical approaches to resolving problems and determining direction.

The first legal requirement for national forest planning was enacted in RPA. The principal purpose

of RPA was to establish a national strategic planning process for America’s renewable resources (259). RPA also directed the Forest Service to prepare integrated land and resource management plans for units of the National Forest System. Because these plans were deemed part of the RPA program, they were to be developed in accordance with MUSYA and NEPA.

NFMA substantially amended the RPA direction for forest planning by adding numerous considerations and requirements to be met in the planning process. However, NFMA provided no additional guidance on how to determine the mix of resource uses, outputs, and protection.

Strategic Planning for the National Forests

Taken together, the Organic Act, MUSYA, NEPA, RPA, and NFMA provide the framework for managing the national forests. The Organic Act and MUSYA established the foundation—that the Forest Service is to accommodate uses and produce outputs while sustaining the ecosystems upon which the uses and outputs are based—but they did not identify the mix or balance of uses, outputs, and protection. Instead, MUSYA implicitly acknowledged that the proper mix is determined by people’s needs, as expressed through public participation and through legal requirements, and that the mix can change over time. NEPA provided a framework for disclosing intended actions and the possible consequences of those actions to the public. RPA required integrated land and resource management plans, and NFMA then established several management considerations and requirements, and specified public involvement in developing, amending, and revising management plans.

These laws implicitly direct strategic planning for the national forests. Forest planning is an open process to set goals for the conditions of and outputs from the national forests, to identify standards and guidelines for activities, and to describe the actions and funding needed to achieve the goals. The public is to participate in setting technically and politically feasible condition and output goals for Forest Service managers. However, forest plans must also be consistent with the strategic direction set in RPA planning.

Setting Direction

Strategic planning is a process for establishing management direction for an organization. In business, it defines the concept of the firm, and reflects the social, economic, and political setting within which it operates. For a Federal agency, strategic planning begins with a clear statement of the agency's mission, defining what service the agency provides and who the clients/beneficiaries are. The Forest Service's current motto—Caring for the Land and Serving People—is an overgeneralized direction to accommodate uses and produce outputs while protecting lands and sustaining ecosystems.

The most widespread problem in strategic planning is vague goals (101). Goals must be specific enough to provide real direction for managers and concrete enough to measure success. A broad, imprecise goal, such as "optimize the balance of resource values," is subject to widely different interpretations. It gives managers no objective basis for evaluating the impacts and tradeoffs of their various options; different managers could conceivably undertake diametrically opposed actions under such general, unspecific guidance. The concrete goals in a forest plan would identify the quality, quantity, cost, and time of the uses, outputs, and conditions that are feasible and desirable, establishing a clear direction for managing the resources and ecosystems of the national forest and specific measures to evaluate performance.

Forest plans generally have not provided such a description of forest management goals. The size and complexity of a national forest may make it virtually impossible to provide a comprehensive, detailed description of the quality, quantity, cost and timing of all uses, outputs, and conditions. Rather, a manageable set of goals could be established by focusing on key issues and concerns, explaining how management will affect pivotal sites, produce important outputs, and protect critical lands, resources, and ecosystems. Furthermore, the forest plan could describe how management is likely to be different from what was occurring before the plan was adopted. The Forest Service has recognized this point, and the 1981 Advanced Notice of Proposed Rulemaking (287) proposes incremental (rather than zero-based) revisions for forest planning. Nonetheless, by focusing on issues as well as on management changes, strategic forest plans can both guide the agency and inform the public.

The Irrationality of Strategic Planning

Strategic planning is messy and imprecise, rather than rational and scientific (241). It necessarily involves considering many feasible directions and selecting the one that best fits the organization's character and clientele. No precise, rational, scientific systems exist for making the selection, no calculus of inputs and outputs can determine the right choice. Rather, strategic planning means selecting the mission that will work best for a particular organization, with its current mix of employees and customers; for a different organization or at a different time, a different option might be preferable. Furthermore, because the public is both the "owner" of government assets and the client of agency programs, a government agency must consider public and political needs and desires in strategic planning.

The imprecision of strategic planning contrasts with early expectations about NFMA planning. Many, inside and outside the agency, believed that NFMA planning "would essentially be a scientific process" (276)—that enough facts and the right computer model would lead to the "right" answers for how to manage the national forests. The Forest Service has recognized the limitations of a rational, scientific process for forest planning in its recent internal critique of NFMA planning (276). However, even from the outset, some observers have noted that national forest planning was inherently political, and that a technical, scientific process could not lead to acceptable plans (3, 49, 79). Despite these early warnings, the Forest Service is only now acknowledging that forest planning is dominated by public concerns and interests.

In forest planning, some form of public agreement—working consensus, informed consent, etc.—is necessary, if the plans are to be implemented. At times, consensus and the middle-ground are not feasible, and the Forest Service must make a decision that necessarily favors one group or another. Regardless, the decisions and the rationale for those decisions must be explained in plain, nontechnical English. Decisions are also more likely to be accepted, if the public and the line managers have been involved in the process, understand the limits of the resources, and see that consensus cannot be reached. One common objection to forest planning is that the public doesn't understand how and why decisions were made (277).

To participate fully and constructively, people need to know what will be decided in the plan, what decisions will be postponed, and where and when those decisions will be made (277). Public involvement in strategic forest planning is necessarily an ongoing process, throughout the preparation and implementation of the plans. The planning regulations should specify how plan decisions are to be treated during implementation, and under what conditions plans are to be amended.

Furthermore, the discussions among the Forest Service and the public should focus on the important issues and desires. Needs and desires may be expressed as concern over particular sites, interest in achieving certain output levels, or desire to have areas or resources protected or preserved. The Forest Service has recently noted that plans are more successful if the full range of needs is considered—emotional and symbolic needs, as well as economic and community needs and organizational needs (276). Regardless of how they are expressed the public's needs, desires, concerns, issues, and interests must all be addressed in every step of preparing and implementing strategic forest plans.

The Information Base

Planning for a desired future requires some understanding of the present, including the peculiarities of an organization—its structure, its personnel, its customers, and its owners or board of directors. Strategic forest planning would take stock of the national forest lands and resources, the Forest Service workforce, the interested publics, and the American people and Congress.

Inadequate information is a common problem in strategic planning (101). Complete data will not “solve” forest planning problems, because strategic planning is not scientific, with data and computers to get the “right” answers. In addition, measures for some outputs and conditions will always be imprecise. Nonetheless, strategic planning depends on an analysis of the current situation—the resource conditions and trends and the public's concerns and desires. Knowing the starting point is essential to determining the actions necessary to achieve the goals. An inadequate “situation audit” would restrict the value of the forest plan as a guide to present and future Forest Service actions, because the starting point is uncertain.

The incomplete data on ecosystem conditions, especially the lack of information on resource quality, in the RPA Assessment has been noted elsewhere (259). Data inadequacies in national forest planning are described in ch. 6 of this report. Data must not only be complete, they must also be timely. Outdated resource information in NFMA planning has been described as a serious problem (1), and Congress has provided temporary protection from judicial review to forest management decisions based on outdated information (28). Furthermore, sometimes even the issues being considered in forest planning are out of date, and no longer reflect the current concerns (1). The outdated information on resources and concerns principally results from the long timeframe required to develop the first round of forest plans, and might not be a continuing problem if the plans can be revised more expeditiously. Nonetheless, the timeliness of information, as well as its completeness and accuracy, must be addressed explicitly in the planning process.

The assessment of the current situation is a necessary precursor to examining options and opportunities in forest planning. Inventories must respond to the issues and concerns for each forest, to assure that relevant data are collected, and that time and money are not spent gathering unnecessary information. The Forest Service has not been consistently successful in identifying relevant data needs early in the planning process; for example, although the northern spotted owl was identified as an indicator species for old-growth Douglas-fir habitats in the early 1980s, the inventory of spotted owls and their habitat was not begun until 1989. In addition, although relevant data are determined by local concerns and issues, collection methods and measurements for information that is needed commonly or nationally should be standardized, to allow for aggregation of data from numerous forests.

Examining options and opportunities is a major part of the NFMA planning process. The process is often highly technical, as when land and resource capabilities are determined, tradeoffs are analyzed, and management prescriptions are developed. However, the public is affected by and interested in the results of the analyses, and the users, not technical standards, determine the compatibility or incompatibility among various uses and outputs of a given site or adjoining areas. Similarly, while the efficiency of management prescriptions can be technically evaluated, the prescriptions must be acceptable to the

public. Thus, examining options and opportunities is both a technical and a social process.

Implementation

The strategic plan guides an organization's actions. Although a strategic plan must be implemented, it is neither a long-term budget plan nor an ironclad commitment (241). This is particularly true for government agencies, since managers do not control all the variables that determine implementation (particularly budgets). Instead, the strategic plan identifies goals for the action plans used to build annual budgets and to determine activities. Forest plans should define condition and output targets for the national forests, which can then be the basis for budget proposals and for subsequent actions. They cannot be guaranteed commitments, because Congress enacts Forest Service appropriations annually. This contrasts with the view of forest plans as social *contracts*. Nonetheless, forest plans are agreements between the agency and the public about the goals of national forest management, and should therefore guide budgets and subsequent actions.

It is unclear whether forest plans are guiding budget proposals and management activities. Implementation difficulties arise from the complexity of environmental laws (206), but the agency believes that the plans are guiding national forest management (276). Others disagree, suggesting that the agency has backed away from implementing some forest plan decisions (205) or that the actions don't match the promises of the plans (76). Perhaps more importantly, the monitoring and evaluation of activities and results has been inadequate to determine whether forest plans are being implemented (i.e., whether budgets and actions are consistent with the plan) and whether the results match the expectations. (See ch. 6.)

A further problem in strategic planning is that line managers often do not realize that planning is a managerial function, that ' 'planning and doing are separate parts of the same job; they are not separate jobs' (101, 241). Managers who have not been involved in strategic planning commonly perceive plans as a burden imposed on them, rather than as a better way of doing business. The Forest Service has found that forest plans are likely to work best—be acceptable to the public and implemented by the agency—if the forest supervisors were directly involved in their development (276). However, the

forest planning process is complex and many pressures compete for a manager's time. Thus, managers are often only marginally involved in the planning process. Nonetheless, forest planning and management must become integrated, and the Forest Service is now providing training for forest supervisors and other employees on forest plan implementation.

Feedback and Control

Strategic planning is a continuous process, rather than a discrete act. Because it directs an organization's future, the strategic plan must be flexible enough to respond to economic and political changes. The Forest Service must also respond to natural disasters—fires, floods, hurricanes, volcanic eruptions, etc. Thus, one should not expect NFMA planning to be "done" it is an ongoing process of setting direction, of responding to feedback and to changing conditions, and of guiding actions and budget proposals. This is consistent with the NFMA requirements to amend plans as needed and to revise plans periodically.

Strategic planning requires that results—sales and profits in business; outputs, uses, and conditions for the national forests—be monitored to determine if the actions meet the organization's mission (241). If the results are unexpected and undesirable—if all the goals are not being achieved—actions can be modified to achieve the defined goals, or the plan amended to revise the goals, if necessary. Without periodic evaluation, the organization could continue in an unacceptable direction until litigation or some other unanticipated event forces a change. Thus, monitoring and feedback are essential to fulfilling the strategic planning process. However, as discussed in chapter 6, the Forest Service has done very little monitoring of forest plan activities.

Finally, strategic planning must be both centralized and decentralized in nature (101). It is centralized because the organization takes a comprehensive look at its situation and overall direction. Furthermore, the control systems—such as budgeting and performance appraisal—must be integrated and coordinated, to assure that the various units can be treated equitably. However, strategic plans must also be decentralized, so that individual units are appropriately distinguished and so that the managers have the flexibility to respond to local situations and are rewarded appropriately. The national strategic planning process under RPA sets the overall direc-

tion for the agency, and provides the centralized guidance for the agency. However, national production targets allocated to the national forests constrain flexibility to respond to local physical, biological, economic, and social conditions. Thus, forest planning must be consistent with the centralized guidance from RPA planning, but condition and output targets and plan implementation and evaluation must be decentralized, with each forest responding to its local situation.

Poor coordination among units is a common problem of strategic planning by corporations (101). The Forest Service is basically organized functionally—by resource. This structure has served the agency well for decades, but it inhibits integrated resource management. For example, the first round of forest plans was often reviewed in Forest Service regional offices and the Washington headquarters by resource staff specialists, who typically forced the plans “back in line with the traditional single-resource’ approach (276.). Reorganizing the staff and budget structures for integrated resource management was one of the future challenges identified in the agency’s recent critique of its forest planning process (276).

Another common strategic planning problem is inadequate links to control systems, such as budgets and incentives (101). Control systems guide performance. If the controls are inconsistent with the strategic direction, they can slow or even prevent successful implementation. In business, bonuses and promotions are often based on specific accomplishments, outputs, or programs. If these targets do not conform to the strategic goals, managers are more likely to ignore the strategic goals than their individual performance targets (241). Similarly, budgets that are not consistent with the strategic direction can shift management emphasis away from that direction.

The Forest Service has addressed part of the budget problem by calling for an integrated resource budget process (276), but creating a link between forest plans and annual budgets will require more than a new budget structure (215, 217). (See ch. 8.) Some critics of the agency have suggested that the current budget system encourages timber harvesting at the expense of other resources (187). Incentives and rewards related to the forest plan are equally important. Timber outputs have allegedly become so important that many past and current employees

have expressed concern that the timber targets override other resource considerations (66, 90, 136). As discussed in chapter 9, strategic forest planning requires that the Forest Service reward systems be explicitly tied to preparing effective forest plans and to implementing those plans.

SUMMARY AND CONCLUSIONS

Controversy has always surrounded the national forests. The 1897 Forest Service Organic Act was enacted principally to limit presidential authority to establish reserves, and the authority to sell timber was a subject of debate. In 1911, the U.S. Supreme Court ruled that the Forest Service did have the authority to regulate and charge for grazing in the national forests. The Multiple-Use Sustained-Yield Act of 1960 (MUSYA) was enacted at Forest Service request, because of various efforts to reduce discretion over managing the national forests. The National Forest Management Act of 1976 (NFMA) was enacted because litigation threatened to halt clearcutting in the national forests, and thereby reduce Forest Service timber sales by half. Today, the controversies include debates about red-cockaded woodpeckers, about spotted owls and old-growth Douglas-fir forests, about below-cost timber sales, and about the level of administrative appeals and litigation. Controversies will probably always exist, because people care about the lands and resources of the National Forest System.

The national forests have always been managed to provide multiple uses and sustained yields. MUSYA further articulated the purposes for national forest management, but did not establish unambiguous goals for the national forests. The act presents a mix of uses, outputs, resources, and land classes as “purposes, ’ without giving much guidance on how to manage for the many uses and outputs. Multiple use is to “meet the needs of the American people, ’ while sustained yield suggests limiting use to sustainable levels. Taken together, the 1897 Organic Act and MUSYA direct management of the national forests to accommodate resource uses and produce resource outputs in the mix that people want, while protecting the lands and resources, and sustaining the ecosystems. NFMA added considerations for management and regulations for developing, amending, and revising the plans and for management standards and guidelines, while requiring public participation in defining the mix of resource values for each national forest.

RPA established a strategic planning process for the Nation's natural resources. RPA, as amended by the NFMA, also required the agency to prepare and revise land and resource management plans for the national forests. These plans can also be seen as strategic plans, consistent with the guidance in RPA and NFMA, with the purposes outlined in the Organic Act and MUSYA, and with the public disclosure required by the National Environmental Policy Act of 1969 (NEPA).

Strategic planning establishes the direction for an organization. Goals are measured in concrete terms so that everyone (managers, employees, and the public) understands the direction. As directed by MUSYA, NFMA, and other laws, the national forests are to accommodate uses and produce outputs, while protecting lands and sustaining ecosystems. (See ch. 4.) Forest plans must, therefore, identify the quantity, quality, and timing of these goals. A document that presents such a comprehensive picture of all uses, outputs, conditions, and sites could be overwhelming to produce and to understand. Rather, the agency could present the management direction by describing how management under the plan will change for key sites, important outputs, and critical resources and ecosystems. In essence, quantity and quality goals must be set for the outputs and conditions people are concerned about.

Strategic planning for the national forests must be based on sound information and analysis, but is not a precise, rational, scientific process. A Forest Service review of criticisms concluded that national forest planning is essentially political in nature (10), and in its recent internal critique, the agency noted that "technical answers to social and political issues alienate many people" (276). Technical answers from computer programs were unlikely to be more acceptable for directing national forest management than was the professional expertise which had been rejected in the early 1970s in the Bitterroot controversy, the Monongahela lawsuit, and the enactment of NFMA. Strategic planning for government activities is rooted in public agreement-or working consensus, informed consent, or whatever term you choose to indicate that the management must be acceptable to the public. (See ch. 5.) Public involvement can be most effective, if: 1) the decisions to be made in the plan (and those to be postponed to another time or forum) are specified when planning is begun, and 2) the discussions and decisions focus

on the needs and concerns of the interested and affected individuals and groups.

A strategic forest plan begins with an assessment of the current situation-what people want and are concerned about, and the land and resource conditions and trends that are relevant to those desires and interests. More and better data will not "solve" forest planning problems, because strategic planning is not a rational, scientific process, but charting a course to the desired destination (the goals) depends on knowing the starting point. Inadequate data hamper strategic planning by restricting understanding of current conditions and direction. Furthermore, unless the data limitations are well known, technical analyses based on poor data provide apparently precise estimates of the consequences of various options and opportunities. (See ch. 7.) The incomplete and outdated information used in the forest plans, particularly on conditions- and impacts of concern to the public, has impeded strategic forest planning. (See chs. 6 and 8.)

If strategic planning is to have any value, the forest plans must be implemented. The plans are neither budget proposals nor ironclad commitments to actions or results, particularly since government agencies must request funds from a legislature. (See ch. 8.) Strategic plans must allow for the flexibility to respond to changing conditions, whether due to budget restrictions, political changes, or natural disasters. Nonetheless, the plans should guide budget requests and management activities. It is unclear, however, whether the forest plans are being implemented, because monitoring and evaluation of activities and results has generally been inadequate. (See ch. 6.) Plans are most likely to be implemented if managers recognize that planning is part of the job of managing a national forest, and are therefore closely involved in the planning process. (See ch. 9.)

Finally, strategic planning is a continuous process, with feedback to assess plan implementation. If the results differ unacceptably from those anticipated, the actions can be adjusted to achieve the desired goals, or the plan can be amended to modify the goals, if necessary. Without adequate monitoring, management could continue in an undesirable direction until forced to change by unexpected problems or litigation. (See chs. 5 and 6.)

A strategic planning process for the national forests is both centralized and decentralized—centralized for control and coordination, but decen-

tralized for flexibility to adapt to local physical, biological, social, and economic conditions. Direction for national forest planning from the RPA Program can provide the centralized coordination, but should not impose rigid requirements that hamper local flexibility. (See ch. 10.) Furthermore, the agency's traditional fictional organization structure has inhibited the integrated, interdisciplinary approach required in planning and appropriate in managing the lands and ecosystems, in assessing plans and activities, and in dealing with the public. (See ch. 9.) In addition, budgets and incentives must be linked to the goals set forth in the plan; the current budget system and performance appraisals emphasize commodity outputs over other use and condition goals, but managers must be held accountable for

achieving all condition and output goals. (See chs. 8 and 9.)

Ultimately, managing the national forests is akin to managing a trust fund. A trust fund is to provide annuities for the beneficiaries, but the assets of the trust are to be protected and enhanced. Similarly, national forests are to be managed to provide the values that people want—the uses, outputs, and protection of special sites and resources. The assets of the national forests—the lands, resources, and ecosystems—are to be conserved and improved, to assure that the values they provide can be sustained. Strategic planning is an approach, consistent with the laws governing the management of the national forests, that can achieve these goals.