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**Chapter 1**

**Summary**

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## INTRODUCTION

The Forest Service is one of the major Federal land managing agencies. It has been part of the Department of Agriculture since 1905, and now manages some 191 million acres of land in 43 States. The Forest Service Organic Act of 1897 and the Multiple-Use Sustained-Yield Act of 1960 (MUSYA) guide the management of these lands, providing for a variety of uses and outputs—commodities (*e.g.*, timber, livestock forage, and fuels and minerals) and unmarketed values (*e.g.*, recreation, wildlife habitat, and water flows)—and requiring management for sustained productivity.

The laws provide little guidance on how to balance the various resource values and assure sustainability. Initially, conflicts were managed by separating uses over space or time. However, demands on the resources have continued to climb, and unmarketed resources are now more widely valued by our society. Congress enacted the legal requirement for national forest planning in the Forest and Rangeland Renewable Resources Planning Act of 1974 (RPA). The principal purpose of RPA was to establish a national strategic planning process for meeting these conflicting demands while assuring the sustainability of America's renewable resources. RPA also directed the Forest Service to prepare integrated land and resource management plans for units of the National Forest System. As part of the RPA Program, the Forest Service was to develop the plans in accordance with MUSYA and the National Environmental Policy Act of 1969 (NEPA).

Congress amended RPA with the National Forest Management Act of 1976 (NFMA). (See box 1-A.) NFMA was largely a response to lawsuits that would have substantially reduced Forest Service timber sales. The new law provided guidance for forest planning by further emphasizing environmental considerations and quality standards. Congress also intended NFMA to aid in implementing MUSYA. Under NFMA the Forest Service retained much of its discretion in managing the national forests, but was

required to involve the public in the planning process.

Significant administrative and legal challenges have plagued national forest management and forest plans over the past 10 years. Congress has expressed concern about potential impacts of appeals and litigation on timber sales, employment, and budgets. Some of these challenges call for improving Forest Service compliance with environmental requirements. Others call for improving public involvement in the planning process. Still others blame FORPLAN—the planning technology the Forest Service has

### ***Box 1-A—NFMA Planning***

The National Forest Management Act of 1976 (NFMA) was largely an amendment to the Forest and Rangeland Renewable Resources Planning Act of 1974 (RPA). RPA, as enacted, required the Forest Service to prepare land and resource management plans for units of the National Forest System. The agency was to use an interdisciplinary approach to integrate physical, biological, economic, and other sciences. NFMA added guidance for public participation and for Forest Service considerations and standards 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.

chosen as its analytical tool—for a planning process that is complex and insensitive to nonuse values, such as preserving endangered species.

This OTA report presents a comprehensive assessment of national forest planning by the Forest Service. It evaluates technological, biological, social, economic, and institutional dimensions of forest planning. The report discusses the appeals process and the merits and weaknesses of the agency's planning technologies. It then presents options for Congress that could improve forest planning under NFMA.

## FOREST PLANNING AS STRATEGIC PLANNING

Strategic planning is a process for establishing management direction. The 1897 Organic Act, MUSYA, NEPA, RPA, and NFMA implicitly require a strategic planning process for the national forests. The Organic Act and MUSYA establish the basis for the Forest Service to accommodate uses and provide outputs while sustaining forest ecosystems. MUSYA acknowledges that people's needs determine the proper mix of uses and outputs, and that the mix can change over time. NEPA provides a framework for reporting intended actions and possible results of those actions to the public. RPA requires the Secretary of Agriculture to evaluate the Nation's renewable resources and to consider their future use and sustainability. NFMA establishes management considerations and environmental standards and guidelines, and requires public involvement in developing and revising management plans.

Strategic planning goals must be specific enough to provide clear direction for management activities and concrete enough to measure success. A forest plan should identify what kind of uses, outputs, and conditions are feasible and desirable. It should focus on issues of public concern, explaining how management will affect key sites, produce important outputs, and protect vital resources and ecosystems. By focusing on issues and explaining management changes, a strategic forest plan can guide the agency and inform the public.

### MULTIPLE USE AND SUSTAINED YIELD

Multiple use, according to MUSYA, is the management of renewable resources on the national forests to best meet the needs of the American people without impairing the productivity of the land. The Act calls for forest management based on relative resource values, not just on maximizing returns or outputs.

Multiple-use management has come to mean either joint production (using the same land for several uses simultaneously) or dominant use (using different parts of the land for different uses). Management based on joint production is difficult because of the lack of biological and social information on ecological interactions. Dominant-use man-

agement is complicated by the difficulty of determining which lands to manage for which uses.

Multiple use, to some, implies use of commodity resources (e.g., timber, livestock forage, and minerals). Areas where laws restrict commodity uses, however, such as recreation sites and wilderness areas, can still produce multiple values (e.g., recreation, wildlife habitat, and water flows). As a concept, multiple use assures consideration of varied resource uses and outputs, and seeks an appropriate balance among these. However, the concept provides little guidance for managers on how to balance conflicting uses and outputs.

MUSYA represents the first attempt by Congress to apply the goal of sustained yield broadly, to all renewable resources. Sustained-yield management requires maintaining the productivity of the land while producing high levels of annual outputs. Sustained-yield management of the national forests has been compromised by a lack of knowledge about ecological and social relationships and by a technical bias favoring production of individual resources over ecosystem management and protection. (See box 1-B.)

## PUBLIC INVOLVEMENT IN FOREST PLANNING

The Forest Service has a long history of soliciting public input in its decisionmaking processes. Before NFMA, this was generally informal and sporadic. With the enactment of NFMA, Congress reinforced the public's right to participate in agency planning and decisionmaking. NFMA embraces the notion that conflicts can be addressed best by integrating the public into the decisionmaking process early and often.

Consensus today is that the Forest Service has not used public input efficiently or effectively in its planning process. Much current criticism is similar to that heard at least 20 years ago: the agency asks for public input, but the input does not affect final decisions. Despite numerous opportunities for individuals and interest groups to participate throughout the planning process, many final forest plans appear not to accommodate public concerns.

The ineffective involvement of the public in the planning process may result from several factors: use of incorrect models of public involvement, lack of information on how to involve the public,

### **Box 1-B—Trust Fund**

*The* National Forest System is, in many respects, comparable to a trust fund established to provide continuous and permanent natural resource benefits. The 1897 Forest Service Organic Act established forest protection, stable water flows, and continuous timber supplies as 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 shows Congress' desire to maintain the resources of the national forests, much as the assets of a trust fund are conserved. In the forests and the trust fund, managers are responsible for protecting the assets. Annual benefits are important, but preserving the productive assets is paramount.

Two aspects of the National Forest System complicate the trust fund analogy. First, the annuities of the National Forest System include not only uses and outputs, but also nonuse values (e.g., various aspects of relatively undisturbed ecosystems). Second, the Forest Service, as required by law, provides 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.

professional resistance to the public's ideas, and inflexible conditions for managers. Most national forest managers still fail to recognize the purpose of public involvement, believing public participation is primarily an exercise in gathering information.

In fact, there are several reasons to involve the public in the planning process. First, the public must agree to, or at least accept, the management activities for the national forests and the overall direction management takes. The public is more likely to accept decisions if it has been involved in the process, understands the limits of the resources, and sees that consensus sometimes cannot be reached. Public participation also can serve as an early warning system. Public comments can alert agency planners to issues and concerns that are likely to cause significant controversy in the future. By working with the public, agency planners can develop plans that address current and emerging concerns and, thereby, avoid making decisions that prompt appeals and delay implementation.

No one best way exists to facilitate public participation in forest planning. The most effective means vary with decisions to be made, geographical setting, and preferences of the local publics. For example, a town meeting might work well in New England where town meetings have a rich history, but might fail in other parts of the country. Furthermore, some people like public hearings while others prefer personal interaction. Whatever procedures are chosen should encourage and stimulate debate, and managers should clearly respond to public desires and concerns. Otherwise, citizens and interest groups will seek other forums, such as Congress or the courts, to influence forest policy and decision-making.

The administrative appeals process offered by the Forest Service is best characterized as an extension of public participation provided for under NEPA and NFMA. The process allows any individual to request an agency review of forest plans or agency decisions. The administrative appeals process has helped the Forest Service to: 1) clarify planning decisions; 2) set standards for environmental analyses required by NEPA; and 3) resolve various issues, such as use of management indicator species, protection of biological diversity, and adequacy of resource monitoring plans. The appeals process has been costly and time-consuming, because it has forced the agency to resolve complex questions under NEPA and NFMA. However, what has been learned from the first round of plan development may make later revisions easier. The number of administrative appeals is surprisingly small, given the level of concern, but may be locally significant, and the Forest Service has often not met the deadlines specified in the regulations. Data on the number, location, rationale, significance, and effects of administrative appeals are not available, however, so it is impossible to evaluate the effectiveness of the current system.

Litigation is the final recourse for individuals or groups dissatisfied with Forest Service decisions. Judicial review assures that decisions are consistent with legal direction. Despite the substantial controversy surrounding spotted owls and old-growth forests in the Pacific Northwest, few Forest Service plans or activities are litigated. Congressional efforts to change the judicial review process seem to be attempts to resolve substantive issues without appearing to take sides. However, such changes are unlikely to improve forest planning or plan imple-

mentation, or to reduce conflict over national forest management.

## **BIOLOGICAL DIMENSIONS OF FOREST PLANNING**

Strategic planning depends on an analysis of resource conditions and trends. Inventories provide baseline data on forest resources. Monitoring then permits an evaluation of trends in the quality and quantity of these resources. Forest inventory and monitoring activities have long been criticized for failing to support integrated, multiresource programs. This failure is due largely to a historical emphasis on timber resource inventories, inattention to ecosystem processes, and insensitivity to the need for statistically valid data analysis. These problems are exacerbated by inadequate funding for these expensive but necessary activities.

The Forest Service is specifically criticized for not following NFMA inventory and monitoring requirements and for generating sparse, poor quality, and out-of-date information. It is also criticized for failing to follow through with monitoring activities described in the forest plans. Newly proposed 1991 regulations may strengthen the role of monitoring and provide renewed emphasis on integrated, multi-resource programs. Lack of money for detailed monitoring, however, will require the Forest Service to revise its monitoring plans to reflect more accurately what is possible and what is most important to accomplish under staff and budget constraints and according to public interest.

Inadequate inventory data has made it particularly difficult to address biological diversity comprehensively. Forest planning regulations require the Forest Service to maintain diversity of plant and animal communities and to select and monitor a set of management indicator species. These species are to serve as surrogate measures of the health of biotic communities in relation to management activities. However, the Forest Service lacks guidelines, training, and expertise to select and monitor indicator species and some of the selected species have not been monitored. Use of indicators should focus on an improved selection process, and should provide information on the consequences of management activities as well as on current habitat conditions and ecological processes.

## **FOREST PLANNING TECHNOLOGIES**

Technologies useful to forest management clarify resource location, analyze resource availability over time, and assess effects of decisions on ecosystems and on human values. Computer models, as one technology to help with these evaluations, provide estimates of what might happen under various management options.

The most useful technologies for examining spatial resource interactions are geographic information systems (GIS). These systems can superimpose locational data for two or more resources or activities (e.g., timber stands over soil types). In so doing, GIS can contribute to resource management decisions and to public understanding of resource interactions. These systems, however, are very expensive to acquire and develop, and must be based on reliable data. To date, the Forest Service has not used GIS extensively in forest planning, largely because of program and funding restrictions imposed by Congress.

Linear programming is also a useful technology for analyzing resource use. Linear programming models for land management try to maximize resource uses and outputs over time within ecological limits. The models can provide the Forest Service with information on how to meet the requirements of sustainable timber production and coordination of timber harvesting with other uses. Linear programming, however, requires massive amounts of data to define interrelationships among resources; excludes analysis of risk and uncertainty; and necessarily assumes direct, continuous, and reversible relationships among resources.

Resource simulation models are the principal technologies used by the Forest Service for estimating ecological and environmental responses to activities. These models try to quantify relationships among resources and results of management actions. Simulations such as timber growth-and-yield models and sediment yield models often examine consequences of management activities for a single resource. The regional diversity of forest resources has led to many unique, local models rather than universal models. Simulation models commonly are used as input to other models, such as linear programming models.

Economic and financial consequences of management must also be considered in planning. This can be done, in part, by examining the benefits and costs of the proposed activities, the approach taken in FORPLAN. In addition, models are used to estimate the local economic effects of management decisions. Input-output analysis is the traditional model used, and the Forest Service has developed variations of such a model--IMPLAN--for forest planning.

The Forest Service designated FORPLAN as the principal analytical tool for forest planning. FORPLAN is a linear programming model that maximizes the present net value of resource uses and outputs (i.e., maximizes management efficiency) within specified constraints. The Forest Service uses FORPLAN because it performs certain tasks well and because it helps organize planning around selected issues. The strengths of FORPLAN include its enormous analytical capacity; its focus on important issues (i.e., how much timber can be cut and from which areas); and its common language for analysts.

FORPLAN is limited by its requirements for massive amounts of data on ecological interactions and for market prices for all resource uses and outputs. FORPLAN includes nonuse values--such as protecting watersheds, preserving endangered species, and improving aesthetics--only as constraints rather than as goals. This implies that sustaining ecosystems is a constraint on production, and not a goal for managing the national forests. Further, FORPLAN, and linear programming generally, has little capability to analyze spatial concerns.

Some resource managers and public interests mistrust FORPLAN because of its large size and complexity, problems with documentation and verification, and poor understanding of how to use the results in decisionmaking. Nonetheless, FORPLAN can be a useful analytical tool if the Forest Service uses it with other technologies and to support public understanding.

## ECONOMICS IN NATIONAL FOREST PLANNING

Economic considerations in strategic planning for national forest management involve determining the balance among resource values and identifying impacts of national forest management on communities. MUSYA calls for consideration of the relative

values of resources, while RPA and NFMA set up requirements for economic analyses. Through these requirements, Congress intended the Forest Service to determine the proper balance among resource uses, outputs, and protection through interaction with the public. Although Congress rejected economic efficiency as the principal consideration for managing the national forests, it has been emphasized in national forest planning.

The Forest Service uses FORPLAN as an economic efficiency model in national forest planning. In terms of achieving economic efficiency, FORPLAN is limited by uncertainties over the comparability of market prices and other values, difficulty in balancing uses and outputs with nonuse values, and inaccurate cost and value data. FORPLAN's capability to assess efficiency of forest management alternatives also is limited by the lack of knowledge of quantity and quality changes in all resource values that might result from the management activities.

Community stability is a common local concern in forest planning. The Forest Service is limited in its ability to assess and achieve community stability because of imprecise definitions, the lack of measures of stability, the difficulty in measuring the acceptable pace and amount of change, and the agency's inability to influence resource or product demand.

The Forest Service uses IMPLAN, an input-output model adapted to each national forest, to assess employment and related impacts on communities. However, the county-level data used can mask differences among communities within a county. Furthermore, input-output models only provide comparable analysis for certain resource-based sectors. For example, the models define lumber and wood products as a single manufacturing industry, whereas recreation is scattered among several industries in the retail trade and service sectors.

Restructuring payments to counties based on timber sales may provide one way for the Forest Service to avoid causing community instability. At present, the Forest Service returns 25 percent of its gross receipts to the States for use on roads and schools in counties that contain national forests. Forest Service payments account for a large portion, up to 80 percent, of operating budgets in some Pacific Northwest counties. Timber typically accounts for most of the payments, usually 95 percent

of the total nationally, but the payments vary widely from forest to forest and from year to year. Thus, the counties have little certainty about annual payments, but are more likely to support Forest Service timber sales than other activities in the planning process. Fair and consistent compensation for the tax exempt status of national forest lands and activities could stabilize county payments, regardless of how the lands are managed,

### THE BUDGETING PROCESS

The annual Forest Service budget is the direct link between Congress and national forest management. Budgets in some forest plans have been constrained, providing a picture of financially feasible opportunities; in other forest plans, budgets have been unconstrained, providing an examination of a wide array of alternatives. Unconstrained budgets probably will not mesh with spending realities, and do not provide information on priorities, but constrained budgets exclude possible opportunities. Because of the different budget assumptions, the forest plan budgets cannot be aggregated to a simple National Forest System budget proposal.

The national Forest Service budget and appropriations are broken down by resource, in line item appropriations. These appropriations must be translated into integrated resource projects by resource managers. The imprecision of this translation and the difficulty of setting priorities among the line items has led to accounting data that may not reflect actual expenditures for managing the resources. Accountability is further complicated because target accomplishments for commodity resources, especially timber, are readily measurable whereas target accomplishments for noncommodity resources are not.

End-results budgeting, as proposed by the Forest Service, would collapse line items for national forest management into one operation and maintenance account. The agency would record separate line items for investments, such as roads, trails, and reforestation. The effectiveness of this budgeting system depends on accurate measures for changes in conditions of all resources in response to management activities. Although the General Accounting Office (GAO) reacted favorably to a test of end-results budgeting, the necessary measures of condition to demonstrate the end results of management are not sufficient at this time. Congress also may

perceive a loss in control over the budget for each resource program. An alternative approach might be congressional appropriations by activity+. g., planning, operations, maintenance and protection, investments, and monitoring.

Fourteen permanently appropriated special accounts or trust funds account for nearly a third of the Forest Service budget. Six of the largest are principally related to the timber program. The Forest Service has substantial discretion to determine the amount of money deposited in four of these funds—the Knutson-Vandenberg (K-V) Fund, the Salvage Fund, brush disposal, and other cooperative deposits—which are to be used on the national forest where the money was collected. Despite the substantial discretion to determine local budgets through timber management activities, Congress has exercised little oversight or control over the special accounts and trust funds.

### ORGANIZATIONAL FACTORS IN FOREST PLANNING

For at least half a century, the Forest Service was viewed as a premier Federal agency. It was seen as a strong and independent manager of public resources for the public good. Professionalism within the Forest Service provided the basis for its long history of success; however, as it is dominated by professionals and technicians trained in forestry, the agency has given emphasis to the management and use of trees. Although this emphasis has had merit in past national forest planning, public perceptions of the relative values of forest resources have been changing. Social values today are less utilitarian and less accepting of traditional forestry practices that may harm nonuse values of the forests. The profession and the agency have been changing, but many believe the change is too little too late.

The Forest Service, in accordance with NFMA and NEPA, has developed an interdisciplinary approach to forest planning. The agency uses teams of specialists in wildlife, forestry, recreation, engineering, hydrology, soils, economics, range, and many other fields. A diverse workforce brings a broader array of ideas, leading to increased creativity and flexibility for the organization. Efforts to diversify have been overshadowed, however, by the agency's traditional organizational structure by resource function, especially at regional and national offices. The emphasis on individual resources makes



integrated project planning and implementation difficult.

Most Forest Service employees believe that timber production is rewarded by the agency above other resource uses and values. More generally, agency employees believe that productivity (meeting targets, working hard, and being competent) and team spirit (loyalty, teamwork, promoting the Forest Service image, and getting along with peers) are the most rewarded organizational values. These organizational values differ from personal values held by many Forest Service employees, who, regardless of their professional training or level in the agency, tend to value recreation over other uses, followed by wildlife and water. Many employees also believe that concern for healthy ecosystems should be rewarded to the same degree as professional competence, hard work, and teamwork.

The mismatch between apparent agency and employee values may reflect several difficulties. These include changing established modes of operation, external pressures, and a reward system that typically measures the tangible outputs of commodity resources and ignores the intangible unmarketed and nonuse values.

To be implemented, the forest plans must be technically and politically feasible, i.e., consistent with scientific information, with public goals, and with national decisions. Technical feasibility can be assessed annually by comparing outputs, changes in conditions, and unit costs with those in the forest plan. Political feasibility can be measured, in part, by the number of administrative appeals and lawsuits filed against a plan. However, additional measures of the effectiveness of public involvement and manager responsiveness need to be developed to assure that managers are properly rewarded.

#### NFMA FOREST PLANNING IN RELATION TO NATIONAL RPA PLANNING

RPA establishes a strategic planning process at the national level structured around four documents: the RPA Assessment, the RPA Program, the Presidential Statement of Policy, and the Annual Report. NFMA establishes a strategic planning process at the local level, using an interdisciplinary approach and public involvement. The Forest Service regulations describe RPA-NFMA planning as iterative, in

that information from the forest level flows up to the national level and information in the RPA Program flows back to the forests. The Forest Service historically approached planning as a hierarchical process, allocating resource targets from the RPA Program to the regions, and from the regions to the forests. The 1990 process, however, was influenced by a more integrated approach using information from the plans in the RPA Assessment and in the Program strategies.

The national forest plans provide information on resource conditions and predicted results of proposed management actions. The RPA Assessment provides information on resource outputs, conditions, and trends on national forests, private, and other public lands. The RPA Assessment can serve as a source book for forest-level planners. Forest planners can design inventory and monitoring activities so data will be compatible with previous inventories and studies in progress. Data can then be more easily aggregated and used in a comprehensive analysis in the RPA Assessment.

The forest plans also contribute to the RPA Program, by identifying the public's preferred management alternatives. Issues and concerns that are widespread at the local level should receive special attention in the Program. As a strategic plan, the Program needs to set direction for national forest planning as well as for Research and for State and Private Forestry. The program, however, should not override local decisionmaking. Instead, it can augment local planning by addressing regional, national, and global issues not identified locally and provide direction for forest plan revisions.

The forest plans can provide information to the Annual Report on expenditures and results of management on each national forest. This information can be used to assure spending is balanced and efficient. Reporting on expenditures, outputs, and conditions should be consistent among forests and with the RPA Assessment so data can be aggregated and compared and trends assessed.

Target allocations from annual appropriations and the RPA program are difficult to *mesh with* local planning, primarily because targets are set only for certain outputs. Forest managers lack measures for annual nontimber outputs and nonuse values and, thus, are generally ill-equipped to demonstrate balance in achieving stated goals. Strategic planning does not require eliminating national targets. In fact,

targets are critical for reaching stated goals for various resources at different times. Hard targets for selected outputs, however, do not encourage an interactive flow of information from the local level to the national level and, thus, run counter to functional strategic planning and the iterative process.

Resource capability information developed at the local level is a base for RPA planning, whereas national objectives are essential to strategic planning and the setting of long-term goals. The process must be centralized to take a comprehensive look at overall direction and to integrate budgeting and performance appraisal. However, the process also must be decentralized to treat individual forests appropriately and to assure that local plans are technically and politically feasible.

### ROLE OF CONGRESS

OTA has identified four major findings on forest planning:

1. Plan development emphasizes timber and other physical outputs.
2. Monitoring of forest management activities is inadequate.
3. Budget decisions overwhelm planning decisions.
4. National targets can nullify local decisions.

In view of these findings, OTA has identified 14 options available to Congress to improve forest planning under NFMA. These options are discussed below under the corresponding finding. (See table 1-1.)

***Finding 1: Plan development emphasizes timber and other physical outputs.***

**The** Forest Service emphasizes allocating lands and producing physical outputs, especially timber, in forest planning and gives little attention to sustaining ecosystems. MUSYA, NFMA, and the planning technology FORPLAN encourage the emphasis on timber and other physical outputs. Forest plan implementation, budgeting, and national direction also emphasize land allocation and the quantitative, physical outputs of the national forests.

Option 1: Clarify legislative direction.

Congress could amend the laws guiding national forest planning and management to recog-

**Table 1-1—Major Findings on NFMA Forest Planning and Possible Options for Congress**

Findings	Options
Plan development emphasizes timber and other physical outputs	Clarify legislative direction Broaden the information base Establish targets for all resources Improve public involvement Expand use of information technologies
Monitoring of forest management activities is inadequate	Separate the monitoring function Require linkage between actions and results Require public involvement in monitoring
Budget decisions overwhelm planning decisions	Eliminate appropriations by resource Require realistic budgets in forest plans Control special accounts and trust funds Compensate counties fairly and consistently
National targets can nullify local decisions	Specify forest plans as the baseline for RPA planning Require RPA direction for all resources and all branches

SOURCE: Office of Technology Assessment, 1991.

nize the nonuse values of the national forests and to assure the protection of the ecosystems that generate the use and nonuse values.

MUSYA could be amended to expand the purpose of the National Forest System. The expanded purpose could include providing for all the use and nonuse values of forests and rangelands. Multiple-use management could be expanded to include multiple values of the lands, and focus on sustaining national forest ecosystems. Amendments to NFMA could require a determination of land suitability for all management activities and could require forest plans that aim to sustain all values, including nonuse values.

Option 2: Broaden the information base.

Congress could require the Forest Service to expand its forest planning inventory and analytical base to include necessary information and models on all resources, on ecological interactions, and on social and economic impacts.

NFMA planning has initiated few resource inventories beyond those already used in forest planning and management before NFMA. Inventory data and models for the timber resource are more extensive than those for other resources or for ecosystem conditions. Data and models for examining economic results of management activities are more complete for timber outputs than for other outputs and conditions. Congress could direct the Forest Service to balance its forest planning information base and increase inventory funding, to assure that analysis responds to public concerns over national forest goals and management practices.

Option 3: Establish targets for all resources.

Congress could require forest plans to specify targets for all resource uses and outputs, for nonuse values, and for ecosystem conditions identified as important by the public in its participation in the planning process.

Congress intended forest plans to set the direction for managing national forests. Current Forest Service databases and analytical tools, however, primarily measure physical outputs. Congress could require the Forest Service to develop measures that more fully describe management direction for the national forests. The Forest Service could then identify targets for all uses and outputs, for nonuse values, and for ecosystem conditions in the forest plans and in RPA planning.

Option 4: Improve public involvement.

Congress could clarify the purposes for involving the public in forest planning, and could direct the Forest Service to improve its public participation processes.

Vague guidance in the forest planning laws has led the Forest Service and the public to conflicting expectations about how public comments are to be used in determining the future direction of national forest management. The Forest Service model of public participation impedes effective participation because the public is viewed as an information source for identifying *output goals*, rather than as individuals and groups interested in all aspects of management. Congress could amend NFMA to direct the Forest Service to use public involvement to build plans and decisions that are more acceptable to society. The Forest Service also could improve its public participation process by emphasizing the

importance of building trust and acceptable solutions or compromises.

Option 5: Expand use of information technologies.

Congress could direct the Forest Service to broaden the variety of technologies used for information collection, analysis, coordination, and presentation to assure that spatial and temporal aspects of forest management are adequately addressed.

Current Forest Service planning technologies are impeded by lack of information on resource interactions, have limited capacity for analyzing spatial concerns, are difficult to understand, and emphasize impacts on the timber industry over other industries. Congress could direct the Forest Service to improve its use of planning technologies by integrating their principal tool for forest planning--FORPLAN—with a GIS. The Forest Service also could be directed to emphasize research on more complete models of economic impacts. Finally, the agency could improve the coordination of data collection and storage, build a historical record for forest planning, and contribute to an integrated RPA Assessment.

***Finding 2: Monitoring of forest management activities is inadequate.***

An enormous amount of Forest Service and public time and effort has gone into developing national forest plans. Monitoring, however, has been inadequate to determine whether the plans are being implemented. The inadequate monitoring results from an inadequate database, insufficient funding, and lack of incentives to monitor. It is difficult to monitor changes in ecosystem conditions without baseline information on preexisting conditions. The Forest Service system, which includes few nontimber measures for evaluating managers, does not encourage monitoring.

Option 6: Separate the monitoring function.

Congress **could** establish monitoring of forest plans as a separate Forest Service activity, with specified purposes and reporting.

Monitoring is important to determine whether proposed and ongoing management activities are consistent with planning goals. Currently no sanctions exist for incomplete or inadequate monitoring.

Congress could establish monitoring as a distinct Forest Service responsibility. Congress could then require an annual monitoring report, prepared by an interdisciplinary team, with specific requirements and with public participation or review. This would recognize the importance of monitoring, and might reduce the tendency to curtail or eliminate monitoring due to insufficient time or money.

**Option 7:** Require linkage between actions and results.

Congress could require the Forest Service to identify, in an annual report for each national forest, the results of activities in terms of outputs and conditions and in public participation in the planning process.

An annual report from each forest could be an added requirement under the NFMA planning process. This report could be used internally, for evaluating the performance of forest supervisors and staff, and externally, for informing the public about the results of management practices. The report could show how management activities meet output and condition targets specified in the plans and could also include an evaluation of public participation.

**Option 8:** Require public involvement in monitoring.

Congress could direct the Forest Service to include public participation in the monitoring of national forest plan activities.

Monitoring is expensive but essential in forest planning. It assures that activities conform with plan direction and achieve the plan goals. Public involvement provides feedback to the agency on how the public interprets the plan's direction. Public involvement also can help the agency focus on key concerns so that the most important outputs and conditions are measured carefully. Finally, public involvement in monitoring can provide checks and balances to assure that measurement is accurate.

***Finding 3: Budget decisions overwhelm planning decisions.***

**The** annual Forest Service budget request and appropriations from Congress are inconsistent with the budget levels and mixes assumed in national forest planning. This occurs, in part, because the forest plans set up an integrated approach to land and

resource management whereas the budget request and appropriations are arranged by resource activity. Forest plan budgets and annual appropriations also differ because budget assumptions vary in the amount of restrictions. When congressional appropriations conflict with forest plan direction, the former usually directs the course of action because Forest Service employees are responsible for assuring that money is spent as directed. Special accounts and trust funds, which result largely from timber activities, encourage the emphasis on timber outputs by providing counties and the agency with benefits from increased timber sales. Many special accounts and trust funds are permanently appropriated, and receive little attention from Congress.

**Option 9:** Eliminate appropriations by resource.

Congress could replace appropriations by resource line item with appropriations by management activity. Congress could then direct the Forest Service to develop its budget based on the activities needed to implement the forest plans.

Forest Service budget requests and congressional appropriations are now arranged in about 60 line items, specifying expenditures for resource activities. Proposed funding for each activity is adjusted at each budget step-by the Washington Office of the Forest Service, the Secretary of Agriculture, the Office of Management and Budget, and the House and Senate Committees on Appropriations. Resource-oriented appropriations encourage the administration and Congress to specify output targets, especially for timber, because such targets are easily specified and are controllable by Forest Service managers. The Forest Service gives monitoring a low priority because monitoring does not provide tangible outputs for which the managers can be rewarded and because the agency lacks penalties for inadequate monitoring. Congress could replace resource appropriations with appropriations for the activities necessary for managing the national forests—planning, implementation, and monitoring.

**Option 10:** Require realistic budgets in forest plans.

Congress could direct the Forest Service to include a range of budget possibilities, from the current forest budget to an unlimited increase, in the final plan for each national forest. The Washington Office of the Forest Service provided no direction on

the budget assumptions to be used in national forest planning. Some regions restricted budgets that forests could assume in planning, whereas other regions provided no restrictions. Budget restrictions are more likely to result in forest plans that are implementable but discourage identifying opportunities for improvement. Unrestricted budgets may specify opportunities for investments but may produce plans that are not realistic and cannot be implemented. Congress could require the Forest Service to include both types of information in forest plans. The agency could then link the forest plans with opportunity analysis in the RPA process and provide information on likely outputs and conditions in the annual budget request.

**Option 11: Control special accounts and trust funds.**

Congress could require more complete reporting on **the sources and uses** of money in the various special accounts and trust funds, and could clarify the purposes for which the funds could be used.

The Forest Service presents little information on the sources and uses of money in the various special accounts and trust funds that provide about one third of its budget annually. Thus, Congress is unable to exercise much control over their use. Congress could require the Forest Service to present more complete information on the sources and uses of money in the major special accounts and trust funds in the budget request, the RPA Program, the forest plans, and the annual reports. Congress could examine the use of special accounts and trusts funds and clarify the purposes for which the funds could be used.

**Option 12: Compensate counties fairly and consistently.**

Congress could replace the current program of returning 25 percent of gross Forest Service receipts with a system to compensate counties fairly for the tax exempt status of Federal lands and activities.

Since 1908, the Forest Service has returned 25 percent of its receipts to the States for use on roads and schools in counties where national forests are located. The Payments in Lieu of Taxes (PILT) program, administered by the Bureau of Land Management, also compensates counties for the tax exempt status of Federal lands. It is unclear whether

the combination of Forest Service receipt-sharing and PILT payments is fair compensation. In some areas, the counties may receive payments that exceed potential collections from a private owner of undeveloped land. In other areas, the counties may be undercompensated.

Many counties rely on Forest Service timber harvests for large portions of their budgets, but timber receipts may vary by as much as 50 percent or more from year to year. Furthermore, PILT payments require annual appropriations that could face reductions with Federal budget cuts. Congress could replace the current system of receipt-sharing and PILT payments with a system that fairly and consistently compensates the counties for the tax exempt status of national forest lands. Congress could require a study to devise the appropriate compensation methods and levels, and then replace the current system with the new tax-equivalency compensation system.

***Finding 4: National targets can nullify local decisions.***

RPA established a national strategic planning process for renewable resources. RPA also established a local planning process for preparing land and resource management plans for national forests. NFMA amended RPA to include considerations and requirements for local planning. The Forest Service describes the connection between RPA and NFMA as iterative, with information on capabilities and opportunities flowing from the local level to the national level, and national targets being allocated from the national level to the forests. The allocation of national RPA targets to the forests can negate local agreement about the proper management direction for a national forest. Nationally determined targets also can substantially alter national forest management directions that have been determined with considerable local analysis and public involvement.

**Option 13: Specify forest plans as the baseline for RPA planning.**

Congress could require the Forest Service to use the management direction established in the forest plans as the baseline for National Forest System outputs and values in the RPA planning process.

National analyses of management options may not account for site-specific interactions and constraints and, thus, can overestimate production possibilities on the national forests. To correct this, Congress could direct the Forest Service to use national forest plans as the baseline for outputs and values and specify that RPA Program direction be consistent with the forest plans.

Option 14: Require RPA direction **for all resources and all branches.**

**Congress could require the Forest Service to provide targets and national direction for all outputs and values and for all branches of the agency.**

The RPA Program has traditionally established physical output targets for the National Forest System, with only general direction for other values and other branches of the agency. Congress could improve the balance among resources and among Federal and non-Federal lands by directing the Forest Service to establish direction for agency programs to address all outputs and values on all forests and rangelands. Congress could require RPA Program direction for all four branches of the Forest Service, to be defined in long-term goals for productivity and ecosystem health and in short-term targets for outputs and conditions of concern.