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Report to Congressional Requesters

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FOREST SERVICE PLANNING

Better Integration of Broad-Scale Assessments Into Forest Plans Is Needed

GAO

Accountability * Integrity * Reliability

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Resources, Community, and
Economic Development Division

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The Honorable Frank Murkowski
Chairman, Committee on Energy and
Natural Resources
United States Senate

The Honorable Don Young
Chairman, Committee on Resources
House of Representatives

The U.S. Department of Agriculture's Forest Service manages about 192 million acres of land, including about 20 percent of the nation's forestlands. Since 1976, the agency has been required by law to develop a land and resource management plan—commonly called a forest plan—for each national forest or for groups of forests and to revise each plan at least once every 15 years. A forest plan spells out how the agency intends to (1) meet its responsibilities to protect the lands and resources that it manages and (2) provide products and services to the public. The first round of forest planning began in 1979, when the Forest Service approved the first of 125 plans that cover the 155 forests in the National Forest System. This round concluded with the Forest Service's approval of the last plan in 1995. In the second round of planning, over half of the plans must be revised during fiscal years 2000 through 2002.

In a 1997 report on the Forest Service's planning process, we found that the first round of forest planning was costly and time-consuming and the Forest Service often failed to achieve its planned objectives.[1] These difficulties occurred, in part, because the Forest Service lacked the data and technology to adequately address broad-scale ecological and socioeconomic issues that extend beyond the forests' administrative boundaries and the agency's jurisdiction. Without sound information to address these issues, the Forest Service has faced environmental and other challenges to the legality of its plans and projects, and courts have required the agency to delay, amend, or withdraw them. Moreover, as we reported in

[1] *Forest Service Decision-Making: A Framework for Improving Performance* (GAO/RCED-97-71, Apr. 29, 1997) and *Tongass National Forest: Lack of Accountability for Time and Costs Has Delayed Forest Plan Revision* (GAO/T-RCED-97-153, Apr. 29, 1997).

1998, inefficiency and waste within the planning process have cost taxpayers hundreds of millions of dollars.[2] To avoid such challenges and reduce inefficiency and waste during the second round of forest planning, most, if not all, of the national forests must improve how they address broad-scale conditions and issues.

Since the early 1990s, a consensus has grown among scientists and federal land managers that ecosystem-based assessments[3] could be useful in addressing broad-scale ecological and socioeconomic issues. The Forest Service has begun to use such assessments in revising its original forest plans during the second round of forest planning. For instance, in January 1995, the agency started the Great Lakes Ecological Assessment to gather and analyze information on ecological, social, and economic conditions–such as vegetation, fire patterns, climatic conditions, land ownership, and seasonal home ownership–to support resource planning and management for the seven national forests in the Lake States region of Michigan, Minnesota, and Wisconsin.[4] Moreover, on October 5, 1999, the Forest Service proposed new planning regulations that would encourage all of the national forests to use broad-scale assessments in revising their forest plans.[5]

Concerned about the potential costs, timeliness, and effectiveness of the Forest Service's planning process in general and of broad-scale ecosystem-based assessments in particular, you asked us to examine several planning efforts, including the Great Lakes Ecological Assessment. In this report, we discuss (1) the views of the Forest Service, other federal agencies, and GAO on the key elements that broad-scale ecosystem based assessments should contain to maximize their value to the forest planning process; (2) the extent to which the Forest Service has incorporated these elements into the Great Lakes Ecological Assessment and whether it has integrated

[2]See *Forest Service: Lack of Financial and Performance Accountability Has Resulted in Inefficiency and Waste* (GAO/T-RCED/AIMD-98-135, Mar. 26, 1998).

[3]An ecosystem is an interconnected community of plants and animals, including humans, and the physical environment within which they interact.

[4]The seven Lake States national forests are the Chippewa and Superior in Minnesota; the Ottawa, Hiawatha, and Huron-Manistee in Michigan; and the Chequamegon and Nicolet in Wisconsin. The Chequamegon and Nicolet forests are managed as one administrative unit. The seven forests are located in the Forest Service's Eastern Region (Region 9).

[5]64 *Fed. Reg.* 54074 (Oct. 5, 1999).

the assessment into the forest planning process; and (3) the extent to which the Forest Service's proposed planning regulations ensure that future broad-scale assessments contain these elements and are integrated into the forest planning process.

Results in Brief

In recent years, the Forest Service, others, and we have concluded that assessments should have certain key elements or characteristics to maximize their value in addressing issues that extend beyond the boundaries of national forests. For example, assessments must occur early in the process of revising forest plans and must be open and accessible to all interested federal and nonfederal parties. Forest Service officials in charge of assessments should make clear to the Congress, the public, and their staff what the objectives of the assessment are and what its products will be, as well as who will be responsible for delivering the products, at what time, and at what cost. If the agency does not conduct assessments at all or does not ensure that they contain these and other elements, it increases the risk that the planning process will continue to be costly, time-consuming, and less than fully effective.

In conducting the Great Lakes Ecological Assessment, the Forest Service has adopted some of these key elements and characteristics. However, regional and forest officials have not viewed the assessment as a priority and have thus not provided the leadership, guidance, and funding necessary to successfully complete it in a timely manner. In our opinion, the Forest Service has not effectively integrated the assessment into its process for revising forest plans in the Lake States. As a result, we believe that the agency risks repeating the inefficiency and waste of resources that occurred during the first round of forest planning, when it did not adequately address broad-scale issues and/or individual national forests independently attempted to gather and analyze data. Moreover, without the benefit of the assessment's analysis and conclusions on the range of ecologically viable and legally sufficient alternatives, the agency is more likely to find that the public will (1) challenge the revised forest plans, causing the agency to delay, amend, or withdraw them, and (2) become frustrated with the planning process if the management alternatives it helped develop do not prove to be ecologically viable and/or legally sufficient. Accordingly, we are recommending that the Secretary of Agriculture direct the Chief of the Forest Service to develop a strategy for funding and completing the assessment in time to support the revision of the Lake States forest plans.

The Forest Service's proposed planning regulations also incorporate some of the key elements that are important to broad-scale ecosystem-based assessments, but they could be strengthened to ensure that future assessments have these elements and are better integrated into the forest planning process. For instance, the regulations state that (1) forest plans must be based on the best available scientific information and analyses, including information from a variety of geographic areas, some of which may best be obtained from broad-scale assessments and (2) assessments should be conducted for geographic areas that extend beyond the boundaries of national forests and should reach conclusions. However, the proposed regulations are deficient in important areas. For example, they (1) generally leave the decision on whether to conduct an assessment to the discretion of the Forest Service's national forest supervisors, although it may be more appropriate for higher-level officials to make that decision; (2) do not state when in the planning process an assessment should occur; (3) are silent on the need for clear objectives and identifiable products; and (4) do not require the forests to identify their strategies for involving the public. In light of these deficiencies, we are recommending that the Secretary of Agriculture direct the Chief of the Forest Service to make further revisions to the proposed planning regulations that would maximize the value of broad-scale assessments and better integrate them into the forest planning process.

Background

The Forest Service, created in 1905, is required by law to manage its lands to provide high levels of six renewable surface uses–outdoor recreation, rangeland, timber, watersheds and waterflows, wilderness, and wildlife and fish–to current users while sustaining undiminished the lands' ability to produce these uses for future generations. In addition, the agency is required by its guidance and regulations to consider the production of nonrenewable subsurface resources, such as oil, gas, and hardrock minerals,[6] in its planning.

The field structure of the Forest Service's National Forest System consists of 9 regional offices, 115 forest offices, and 588 district offices that manage lands in 44 states, Puerto Rico, and the Virgin Islands. The Eastern Regional Office (Region 9) oversees the national forests in 13 states in the Northeast and Midwest, including the Great Lakes states of Michigan, Wisconsin, and

[6]Hardrock minerals include gold, silver, lead, iron, and copper.

Minnesota.[7] The agency is a hierarchical organization whose management is highly decentralized and whose regional foresters and forest supervisors have considerable autonomy and discretion in interpreting and applying the agency's policies and directions.

Legislation Established the Forest Service's Current Planning Process

In carrying out its mission, the Forest Service follows a planning process that is largely based on laws enacted during the 1970s. This process includes (1) developing a forest plan for managing each forest that blends national and regional priorities with the local forest's capabilities and needs and (2) reaching project-level decisions for implementing the plan.[8] The plan articulates what the Forest Service expects to do to meet its obligations to manage the national forest for multiple uses in a sustainable manner. The National Forest Management Act of 1976 and its implementing regulations require that the agency, in revising a forest plan, go through a series of steps, including issuing a notice of its intent to the public, presenting a range of management alternatives along with an analysis of their likely effects, soliciting and considering public comments on those alternatives, developing a final alternative, and making a final decision.

In analyzing the potential effects of management alternatives, the Forest Service must comply with the requirements of the National Environmental Policy Act of 1969. This act and its implementing regulations specify procedures for considering the environmental consequences of proposed federal actions and incorporating these considerations and public input into an agency's planning process. The act requires that a federal agency prepare a detailed environmental impact statement for every major federal action that may significantly affect the quality of the human environment. As part of this process, a federal agency must assess the effects of the proposed action in combination with the direct, indirect, and cumulative

[7]See our report *Land Management: The Forest Service's and BLM's Organizational Structures and Responsibilities* (GAO/RCED-99-227, July 29, 1999) for more information on the organizational structure of the Forest Service.

[8]Projects are on-the-ground activities, such as harvesting timber, restoring species' habitats, and constructing campsites.

impact[9] of activities occurring on other federal and nonfederal lands. The environmental impact statement is designed to ensure that important effects on the environment will not be overlooked or understated before the government makes a commitment to a proposed action. The Forest Service must also comply with the requirements of other environmental statutes, including the Endangered Species Act, the Clean Water Act, the Clean Air Act, the Wilderness Act, and the Migratory Bird Treaty Act, as well as of other laws, such as the National Historic Preservation Act.

The Forest Service approved the first forest plans for the national forests in Wisconsin, Minnesota, and Michigan in 1986 and must complete their revisions by no later than October 2001. The Forest Service has not yet formally begun revising the plans for the Michigan national forests because of provisions in the agency's appropriations acts for fiscal years 1998 and 1999. These provisions prohibited the Forest Service from expending funds on forest plan revisions until it issued new planning regulations. However, forests were exempted from the moratorium if the Forest Service had notified the public before October 1, 1997, of its intent to revise their plans. In 1996, the Forest Service issued a notice of intent to revise the plans for Wisconsin's national forests, and in 1997 it did the same for Minnesota's national forests. Thus, these forests were exempted from the moratorium. As of January 2000, the agency was in the process of developing management alternatives for these forests, which it plans to present to the public for comment in late 2000 or early 2001.

The Forest Service Has Taken Several Steps to Improve Its Planning Process

During the past decade, the Forest Service has taken several steps to improve its planning process. For example, to better accommodate the requirements of the Endangered Species Act, the National Environmental Policy Act, and other environmental laws, the Forest Service has turned to a science-based, ecological approach for managing its lands and resources. This approach, called ecosystem management, integrates ecological capabilities with social values and economic relationships to produce,

[9]Regulations issued in 1978 by the Council on Environmental Quality to implement the provisions of the National Environmental Policy Act require federal agencies to assess the effects of a proposed action on such resources as water, wildlife, and soils in combination with those of other past, present, and reasonably foreseeable future actions occurring on both federal and nonfederal lands.

restore, or sustain ecosystems' integrity[10] and desired conditions, uses, products, values, and services over the long term. Ecosystem management takes an integrated, holistic approach to natural resource issues and is therefore suitable for examining ecological and socioeconomic conditions beyond the boundaries of national forests.[11]

The agency has positioned itself to better implement ecosystem management by using satellite imagery, geographic information systems,[12] and desktop computer technology. These technologies provide for gathering, interpreting, and manipulating detailed data on a wide variety of ecological and socioeconomic variables covering millions of acres. To further its ecosystem management approach, the Forest Service has used these technological tools to support broad-scale ecosystem-based assessments.

One of the earliest broad-scale ecosystem-based assessments was performed in the Pacific Northwest as part of an effort to develop a regional plan for managing federal lands within the range of the threatened northern spotted owl.[13] When this regional plan, known as the Northwest Forest Plan, was approved in 1994, the courts lifted the injunctions that had barred the Forest Service from selling timber in northern spotted owl habitat. Such assessments have also been done for the interior Columbia River basin, including portions of Oregon, Washington, Idaho, Montana, Wyoming, Nevada, and Utah; the Sierra Nevada Mountains in California; the southern portion of the Appalachian Mountains stretching from northern Virginia and eastern West Virginia to northwestern South

[10]The Forest Service defines ecosystem integrity as the completeness of an ecosystem that, at multiple geographic and temporal scales, maintains its characteristic diversity of biological and physical components, spatial patterns, structure, and functional processes within its approximate historical range of variability.

[11]For a more complete description of ecosystem management, see *Ecosystem Management: Additional Actions Needed to Adequately Test a Promising Approach* (GAO/RCED-94-111, Aug. 16, 1994).

[12]Geographic information systems technology is the computer hardware and software that allow for the assembly, storage, manipulation, and display of geographic reference data (i.e., data that are associated with specific places on earth, such as the location of a watershed or an old-growth forest).

[13]See *Ecosystem Planning: Northwest Forest and Interior Columbia River Basin Plans Demonstrate Improvements in Land-Use Planning* (GAO/RCED-99-64, May 26, 1999).

Carolina, northern Georgia, and northern Alabama,[14] and the Ozark-Ouachita Highlands in Arkansas and Missouri.

Broad-scale ecosystem-based assessments can involve other federal land management agencies, such as the Department of the Interior's Bureau of Land Management, the National Park Service, and the Fish and Wildlife Service, as well as other federal agencies, including the Department of Commerce's National Marine Fisheries Service and the Environmental Protection Agency. For instance, the assessment team for the Northwest Forest Plan included scientists from all of these federal land management and regulatory agencies, while the assessment team for the Interior Columbia Basin Ecosystem Management Project included scientists from these agencies, other federal agencies, and universities.

Key Elements Maximize the Value of Broad-Scale Ecosystem-Based Assessments to Forest Planning

In recent years, the Forest Service and other federal agencies have learned lessons about conducting broad-scale ecosystem-based assessments to improve land management decisions on federal lands, including national forests.[15] Broad-scale ecosystem-based assessments have proved useful in (1) identifying and addressing ecological, social, and economic issues that extend beyond the boundaries of national forests and (2) defining ranges of ecologically viable and legally sufficient management alternatives and their consequences. Our work over the past 5 years has shown that in revising their forest plans, most, if not all, of the national forests must address these types of issues.[16] Doing so is necessary to enable them to comply with laws such as the Endangered Species Act and the National Environmental Policy Act. Experience has also shown that certain key elements maximize the value of broad-scale assessments to forest planners. For example, an

[14]The Southern Appalachian Assessment: Summary Report, prepared by federal and state agencies and coordinated through the Southern Appalachian Man and the Biosphere Cooperative (July 1996).

[15]See Lessons Learned Workshop: Policy, Process, and Purpose for Conducting Ecoregion Assessments, USDA Forest Service, Albuquerque, New Mexico (July 30 to Aug. 1, 1996), and The Ecosystem Approach: Healthy Ecosystems and Sustainable Economies, Report of the Interagency Ecosystem Management Task Force (June 1995).

[16]*Ecosystem Management: Additional Actions Needed to Adequately Test a Promising Approach* (GAO/RCED-94-111, Aug. 16, 1994), *Forest Service Decision-Making: A Framework for Improving Performance* (GAO/RCED-97-71, Apr. 29, 1997), and *Ecosystem Planning: Northwest Forest and Interior Columbia River Basin Plans Demonstrate Improvements in Land-Use Planning* (GAO/RCED-99-64, May 26, 1999).

assessment is more effective if it occurs early in the process of revising a forest plan and is open and accessible to all interested federal and nonfederal parties. Similarly, an assessment is improved when Forest Service officials make clear to the Congress, the public, and agency personnel what its objectives are and what its products will be, as well as who will be responsible for delivering the products, at what time, and at what cost.

Assessments Should Occur Early in the Forest Plan Revision Process

To be useful to decisionmakers in developing ecologically viable and legally sufficient management alternatives, an assessment should occur early in the process of revising a forest plan. For instance, during the development of the Northwest Forest Plan, the assessment and the decision-making were conducted sequentially. The assessment, which took about 3 months, was completed first, and the plan was approved about 9 months later. Conversely, during the development of the interior Columbia River basin plan, when the assessment and the decision-making were conducted concurrently, false starts and delays plagued the planning process. Officials responsible for developing the assessment and planning revisions concluded that running parallel assessment and decision-making processes does not work well. According to them, an assessment should be completed before planners identify and propose a range of management alternatives.

The Assessment Process Should Be Open to All Interested Parties

Land managers with relevant experience from the Forest Service and the Department of the Interior agree that the value of broad-scale ecosystem-based assessments is increased if the assessment process is open, and the results of the assessment are available, to all interested federal and nonfederal parties. These parties include not only federal, state, local, and tribal government agencies but also individual citizens and private landowners, as well as representatives of academia, industry, and interest groups.

Other federal and nonfederal parties can (1) help define the issues that need to be addressed at a broad geographic scale, (2) help identify all pertinent information relating to the issues and often provide information on nonfederal lands and resources more quickly and at less cost than if the Forest Service attempted to develop the data itself, and (3) provide valuable analytical capabilities. In return, assessments can allow the public to participate more meaningfully in the Forest Service's decision-making. Assessments–especially those that make use of geographic information

systems technology and are accessible on the Internet–can (1) provide the public with information on the current condition of federal lands and resources, as well as on the legal requirements and ecological conditions that help define the range of viable management alternatives and their consequences, and (2) allow interested parties to better analyze how various management alternatives might affect the ecological, social, and economic conditions of the region. For example, the data gathered for the Interior Columbia Basin Ecosystem Management Project are stored in geographic information systems and can be retrieved not only by the Forest Service but also by the public. Data gathered for the Southern Appalachian Assessment are also available on the Internet. As a result, pertinent information—which is not restricted to the administrative boundaries of the national forests—can be used for decision-making by many levels of government.

Although Forest Service land managers agree on the value of public participation in broad-scale ecosystem-based assessments, they also caution that a one-size-fits-all, standardized approach to involvement by interested federal and nonfederal parties is not desirable. Circumstances such as the contentiousness of the issues and the level of public interest and concern, and therefore the most appropriate public participation process, can vary greatly by forest and region.

Assessments Should Have Clear Objectives and Identifiable Products

While most, if not all, national forests will need to include broad-scale ecosystem-based assessments in the process for revising their forest plans, the objectives of the assessments will vary. Some assessments will address ecological, social, and/or economic issues already identified by forest planners. Other assessments will be tasked with identifying issues to be addressed during the revision process. Still other assessments will be asked to do both. Assessments may also provide basic social, economic, and ecological data for a region when it is practical and efficient for them to do so. Therefore, the Forest Service will need to make clear the objectives of a given assessment and the products that will be prepared to support those objectives.

For example, in the Pacific Northwest, the issue at hand was the loss of old-growth forests and the associated social and economic effects of trying to restore and preserve the forests. Thus, the assessment focused on developing and analyzing management options to provide the greatest economic and social returns that could be sustained over time without violating laws protecting the northern spotted owl and other old-growth-

dependent species. In the southern Appalachian Mountains, the assessment was tasked with gathering data on conditions in the region in order to identify potentially serious problems before they threatened the well-being of the region's natural resources. In the interior Columbia River basin, the assessment was designed to provide data on conditions in the basin that were directly relevant to a known problem (the conservation of fish habitat), as well as to identify emerging issues related to ecosystem management. In addition, all of these assessments provided basic data on ecological and socioeconomic conditions and made estimates about the probable outcomes of the federal agency's current management practices and trends.

Once the agency has settled on the objectives of an assessment, the likelihood of its achieving them will increase, we believe, if it prepares a thorough scope of work. Such a scope of work would identify what types of products and what level of detail are expected from the assessment team, as well as who is responsible for producing the products and when they are to be delivered. A scope of work is useful for holding agency personnel accountable and for communicating the design of the assessment to the Congress, the public, and other interested parties.

Assessments Should Be Conducted for Appropriate Geographic Areas and Should Include Both Federal and Nonfederal Lands

There is a general consensus that for an assessment to be effective, it should be conducted within a geographic area that coincides with the nature of the issues to be addressed or has common ecological or socioeconomic conditions. For example, to address the habitat needs of the northern spotted owl, the assessment conducted for the Northwest Forest Plan gathered and analyzed information on the availability and condition of habitat for the species within its natural range. Other issues, such as providing high-quality water and restoring aquatic systems, are being addressed at smaller, more appropriate geographic scales. Moreover, the plan can be tailored to the ecological conditions of particular geographic areas (e.g., old-growth rain forests in western Washington and drier forests in northern California).

The boundaries of other assessments have been determined by a combination of ecological and socioeconomic conditions rather than a single, or several, core issues. For example, the boundary of the Sierra Nevada Ecosystem Management Project study area was a "consensus" boundary based on a wide variety of ecological and social issues, most of which did not correspond to one another geographically.

There is also a general consensus that for assessments to be effective, they should include both federal and nonfederal lands. This is especially true in areas such as the southern Appalachian Mountains, where the majority of the land is in nonfederal ownership and the Forest Service must work with other landowners to adequately address broad-scale ecological and socioeconomic issues. The Southern Appalachian Assessment covered some 37.4 million acres of land, of which almost 84 percent is in private ownership.

Assessments Should Include Data Gathering, Analyses, and Conclusions but Not Make Decisions

Although their objectives will vary, all assessments should include three basic steps—gathering data; analyzing data; and drawing conclusions about past, current, and likely future ecological, social, and/or economic trends and conditions. Assessments do not, however, result in decisions.

By using past conditions (historic range of variability) as a baseline and comparing them to current and projected future conditions, an assessment team should draw conclusions about which ecosystems are functioning well and which are degraded or on the way toward degradation and thus are in need of restoration or protection. Assessment teams tasked with identifying issues will do so on the basis of these conclusions. For assessments designed to address known issues, these conclusions help identify the location for implementing possible solutions and the range of ecologically viable alternatives.

For example, the science assessment team involved in developing a management plan for federal lands in the interior Columbia River basin gathered and analyzed ecological, social, and economic data and then made predictions about potential future ecological and economic conditions under three different management scenarios–the status quo (which would combine commodity production and conservation), aggressive restoration, and a system of reserves in which human activity would be limited. These predictions helped the project's planning team explore a range of management alternatives that could sustain the ecosystem while meeting the public's needs for products and services. Similarly, the Southern Appalachian Assessment supported the revision of individual forest plans by gathering and analyzing large quantities of data to understand, among other things, how lands, resources, economies, and people are related within the larger context of the surrounding lands and how national forest management affects their relationships.

While broad-scale ecosystem-based assessments should reach conclusions, they should not result in decisions. As noted in the Interior Columbia Basin Ecosystem Management Project, the mix of products and services provided on federal lands "is as much a social decision as it is a scientific one" and trade-offs among legally sufficient and ecologically viable management alternatives are ultimately made by society. Similarly, the Southern Appalachian Assessment stated that the assessment does not attempt to provide solutions for the problems identified. The assessment avoided prescriptions because "prescribing is a political process in which all Americans must have a part." Instead, the assessment team tried to provide the information that people need for a productive discussion of the issues.

In the past, the Forest Service has used broad-scale assessments to support its decision-making process in two different ways. One approach has been to use an assessment as the basis for agency decisions that apply simultaneously to multiple forests (the President's Northwest Forest Plan). The second approach has been to use an assessment as the basis for decisions made separately by individual forest supervisors (the Southern Appalachian Assessment). The agency has not chosen a preferred approach, and both may be valid, depending on regional circumstances.

Regardless of which approach the Forest Service chooses, it is important for the agency to maintain the data, maps, and other products of assessments for future use and update the data over time. Under law, forest plans must be revised periodically and can be amended when circumstances warrant. Therefore, information on broad-scale issues will continue to be relevant to the agency's decision-making. Several approaches could be used to keep broad-scale data useful, depending on the type of data. For example, some landscape conditions covered by assessments—such as soil types or the location of water bodies–will not change appreciably over time. Data on these conditions do not need to be updated but must be maintained in a usable form. Other conditions–such as the human population or forest cover–will change appreciably over time across the assessment area as a result of the actions of many landowners, not just the Forest Service. Such data could periodically be updated for the assessment area; the frequency of the updates might depend on the rate of change relative to the cost of the update. A third category of conditions includes the results of the Forest Service's own actions, such as timber harvesting, road construction, or stream restoration on its own land. Currently, the Forest Service monitors the site-specific effects of these types of activities, but such monitoring does not fully capture changes in broad-scale conditions. In 1997, we reported that the Forest Service had

not made monitoring a high priority and that a lack of thorough monitoring data had hampered its decision-making ability.[17]

Assessments' Costs Should Be Identified and Funding Should Be Secured

Although broad-scale ecosystem-based assessments cost money to perform, they can save both time and money if they eliminate duplicative data gathering and analysis by individual national forests. Performing assessments also increases the likelihood that the Forest Service will avoid or prevail against challenges to its compliance with environmental and other laws. However, federal funding and resources may not be sufficient to cover all of the issues that could be addressed or to gather all of the potentially limitless ecological, economic, and social data that could be collected. Therefore, realistic objectives and estimates of resource needs–and of what can be expected from an assessment given different funding levels–need to be identified before an assessment is begun. Additionally, the Forest Service needs to allocate funds to accomplish the objectives in a timely manner.

The costs and time to do assessments can vary widely. For example, the assessment for the Northwest Forest Plan was completed in about 3 months and cost less than $3.5 million. The assessment for the Interior Columbia Basin Ecosystem Management Project took several years and cost about $22.7 million.

The Northwest Forest Plan assessment focused primarily on the northern spotted owl and other old-growth-dependent species and left other issues, such as providing high-quality water, to be addressed at smaller, more appropriate, geographic scales. The assessment for the Interior Columbia Basin Ecosystem Management Project addressed not just old-growth-dependent species but also other endangered and threatened species–such as anadromous fish (including salmon) and the grizzly bear–with different and/or more extensive habitat requirements. The assessment also addressed issues such as costly outbreaks of wildfires, insects, and diseases; invasions of exotic weeds; declines in soil fertility and water and air quality; wilderness preservation; mounting legal challenges; and unpredictable flows of commodities such as timber and livestock forage. The assessment team for the Interior Columbia Basin Ecosystem Management Project assembled over 170 data layers or maps of particular

[17] *Forest Service Decision-Making: A Framework for Improving Performance* (GAO/RCED-97-71, Apr. 29, 1997).

variables, such as vegetation types, grizzly bear range, employment, and income.

The Great Lakes Ecological Assessment Includes Some Key Elements but Has Not Been Well Integrated Into Forest Planning

Regional and forest officials conducting the Great Lakes Ecological Assessment have implemented some of the lessons learned about the key elements of assessments but have not viewed it as a priority and thus have not provided the leadership, guidance, and funding necessary to successfully complete it in a timely manner. As a result, the assessment has not been well integrated into the process being used to revise forest plans in the Lake States region. If these problems are not corrected, the agency risks (1) repeating the inefficiency and waste that occurred during the first round of forest planning, (2) spending even more money to defend against subsequent challenges to the forest plans' ecological viability and legality, and (3) frustrating members of the public who were encouraged to offer alternatives but were not given the information needed to develop them.

The Forest Service Has Implemented Some of the Lessons Learned about Key Elements

The Forest Service has implemented some of the lessons learned about the key elements of broad-scale ecosystem-based assessments to support the Lake States national forests in revising their plans. For instance, the agency is conducting the assessment at a geographic scale that will allow it to address ecological and socioeconomic issues that extend beyond the forests' administrative boundaries. In addition, it is gathering data extensively and making the data available to the national forests, as well as to other interested federal and nonfederal parties.

The Assessment Is Being Conducted at Appropriate Geographic Scales and Includes Both Federal and Nonfederal Lands

The Great Lakes Ecological Assessment is being conducted at a geographic scale that will allow the Forest Service to address ecological and socioeconomic issues that extend beyond the forests' administrative boundaries. The geographic area covered by the assessment is based on (1) the Forest Service's National Hierarchical Framework of Ecological Units, which identifies areas with common ecological features, conditions, and issues,[18] and (2) the location of major cities linked to the forests'

[18]In Nov. 1993, the Forest Service adopted the National Hierarchical Framework of Ecological Units as a classification and mapping system for use in forest planning. This hierarchy divides the earth into ecological units that have similar biological and physical potential. In other words, combinations of similar factors, such as climate, soil type, vegetation and water availability, are often indicative of certain types of ecosystems that can be classified and mapped.

management. The area of ecological interest within the assessment area encompasses approximately 62.7 million acres (98,000 square miles) in northern Michigan, Wisconsin, and Minnesota, including about 6.5 million acres of national forestland (see fig. I). The area is characterized by conifer (e.g., spruce; fir; and white, red, and jack pine) and deciduous (e.g., maple, oak, aspen, birch, beech) tree species across relatively flat terrain shaped in the past by glaciers and now dotted with thousands of freshwater lakes. The climate is temperate and is affected by the presence of the Great Lakes. The socioeconomic area covered by the assessment extends farther south to encompass such cities as Detroit, Chicago, Milwaukee, and Minneapolis-St. Paul.

Figure 1: The Boundaries of the Lake States National Forests and the Great Lakes Ecological Assessment

Source: Forest Service.

Using the National Hierarchical Framework of Ecological Units, the assessment team has divided the geographic area bounded by the assessment into ecological units at four nested geographic scales ranging from hundreds of acres to millions of square miles. While the largest unit is defined solely by geomorphology[19] and climate, the smaller units are refined to include specific soil and plant characteristics. This classification system provides land managers with information for making informed decisions for different ecological areas. For example, an outbreak of a forest pest may be influenced by management decisions across a large ecological unit, while the viability of a particular plant species may be linked to management decisions that affect a very small ecological unit.

An Extensive Amount of Data Has Been Gathered and Made Available to Interested Parties

Since it was organized in 1995, the Great Lakes Ecological Assessment team has gathered an extensive amount of ecological and socioeconomic data. These data have been made available to the Lake States national forests, as well as to other interested federal and nonfederal parties.

Originally, the assessment was to have two phases. During the first phase, the assessment team would gather data on ecological and socioeconomic issues. During the second phase, the team would analyze the data and draw conclusions, which it would report to the national forests and others. The assessment team has assembled over 150 sets of environmental, ecological, biological, social, and economic data and has produced maps of many of these data sets across the assessment area.[20] All of the maps produced by the assessment team are integrated into geographic information systems that allow them to be overlaid to provide more information about possible relationships among ecological, social, and economic conditions.

The assessment team has facilitated the consistent classification and mapping of similar ecological units across the Lake States—an outcome of particular importance to land managers.[21] This information is useful in developing forest plans because it identifies areas at different geographic

[19]"Geomorphology" refers to features of the earth's surface, such as mountains and valleys.

[20]The data are both tabular and spatial. The two kinds of data sets can be illustrated as follows: Tabular data can show, for example, the percentages of the Lake States national forests that are covered with jack pine, aspen/birch, and oak ecosystems. Spatial data can show where these different ecosystems are located on a map.

[21]This work builds on efforts initiated in the early 1990s by the Michigan, Minnesota, and Wisconsin departments of natural resources and federal agencies, including the Forest Service, to map similar ecological units consistently across the three states.

scales that have relatively uniform ecological conditions, such as similar forest types or comparable susceptibility to wildfire. In combination with information on factors such as climate and soil type, this information can be used to identify an area's ecological potential. The information can also be used in reaching project-level decisions—such as restoring an endangered species' habitat, harvesting timber, or building roads—because areas with relatively uniform ecological conditions tend to respond similarly to specific management activities.

Most of the data assembled by the assessment team had already been gathered but were being maintained by a variety of federal, state, and academic organizations, including the Lake State forests, and thus were not always compatible from place to place. The assessment team has made the data more compatible by using consistent definitions, computer systems, and scales of mapping. For example, the team stitched together three independently developed state-specific maps of historical forest types into one map that allows comparisons of forest types across the states and between past and current conditions. To facilitate data gathering during the first few years, the assessment team worked closely with many parties, including natural resource scientists and specialists in federal, state, and local governments; academia; and nongovernmental organizations.

To share the data gathered, the assessment team has made its data sets and maps available not only to the national forests but also to the public and other government agencies, either directly or on the Internet. In the opinion of some of the state officials with whom we spoke, the assessment has been a model in terms of sharing information and expertise between federal and state agencies. The officials attributed savings in both time and resources to the data and expertise provided by or gleaned from the assessment. (For more detail, see app. I.) On the other hand, the representatives of some nongovernmental organizations told us either they were largely unaware of the assessment's work until mid-1998 or they thought public participation was very limited.

Other Lessons About Key Elements of Assessments Have Not Been Applied

Other lessons learned about how to conduct broad-scale ecosystem-based assessments have not been applied in the Lake States. The Forest Service has not given the Great Lakes Ecological Assessment clear objectives that would support forest planning and has not integrated the assessment's products and timing into the agency's schedules for revising the national forest plans. In fact, the assessment team recently concluded that "formal

linkages between the [assessment] and national forest planning do not exist."

The Assessment Does Not Have Clear Objectives Linked to the Forest Planning Process

In the 5 years since the Great Lakes Ecological Assessment began, the Forest Service has never clearly identified its objectives with respect to forest planning. (See app. II for a time line of the assessment.) In addition, the assessment has relied on funding from a variety of sources at various times for a variety of purposes. (See app. III for a description of the assessment's funding for fiscal years 1995 through 2001.) As a result, the assessment's objectives have, at one time or another, been expanded to include activities that do not directly support the Lake States national forests in revising their plans and contracted to exclude other activities that would assist them in reaching more informed decisions.

As originally proposed by Forest Service ecologists in September 1994, the assessment was not intended to directly support the Lake States forests in revising their plans. Rather, it was intended to (1) study fire-dependent ecosystems[22] in the Lake States to improve the agency's management of them and (2) further refine and demonstrate the usefulness of geographic information system technology and the Forest Service's National Hierarchical Framework of Ecological Units. The assessment team has continued to receive funding from the Forest Service as well as from other sources to address these objectives. However, the assessment team leader and the Forest Service expected that the assessment, though not directly supporting the plans' revisions, would indirectly support the forests in their planning and management activities because of the general nature of the data being collected.

[22]Forests, grasslands, and other ecosystems historically composed of plant species that evolved with and are maintained by periodic fire.

In November 1994, planners with the Lake States national forests requested that the proposal be expanded to include a comprehensive ecological assessment of the Lake States. Their hope was that the assessment would identify the unique benefits that the forests could provide in the region and would assist the planners in assessing the large-scale effects of proposed actions. In January 1995, the supervisors for the Lake States national forests agreed to provide seed money for the assessment. They also agreed that the assessment should include social and economic issues. At the same time, the supervisors, together with the Eastern Regional Office, initiated a project to identify (1) issues affecting the Lake States region that transcend the boundaries of individual national forests and (2) the data and analysis that would be needed to address these issues in revising the forest plans. That project was completed in November 1995 and identified 15 broad-scale issues—such as loss of species' diversity, recreational demands, and timber supply—and recommended that data be gathered and analyzed to address the issues.[23] The assessment team has gathered some readily available data on these and other issues.

Although the Great Lakes Ecological Assessment has received funding from the Lake States forests, it has also relied on funding from sources other than the Forest Service to operate. In fiscal years 1996 through 1998, the assessment received 45 percent of its funding from the National Partnership for Reinventing Government.[24] According to the assessment team leader and others, this infusion of money allowed the team to significantly increase its data gathering and, without it, the team would likely have been able to gather data only on fire-dependent systems, as originally proposed. However, restrictions on the use of funds from other sources have limited the team's ability to respond to the immediate needs of the forest planning teams. For example, under the funding agreement, the assessment team devoted resources to data visualization and decision support systems (ecosystem modeling) that the forests did not ask for and have not used. In addition, according to some forest officials, the assessment team was unable to respond to requests for data from the forests because it was engaged in meeting obligations under its funding

[23]North Woods Broad-Scale Issue Identification Project: A Working Document for the Lake States National Forests, Lake States Issue Assessment Team, Forest Service (Nov. 1995).

[24]The National Partnership for Reinventing Government (formerly known as the National Performance Review) was initiated by the administration in 1993 to improve the efficiency and quality of individual agencies' operations, as well as of governmentwide systems, such as those for procurement and budgeting.

agreement. Similarly, in July 1999, the assessment team received funding from the Joint Fire Science Program.[25] While this money allowed the assessment team to gather data on and analyze natural disturbance patterns, the funds cannot be used to address social and economic issues.

The Assessment's Products and Timing Have Not Been Integrated Into the Forest Service's Schedules for Revising National Forest Plans

To provide for constructive public participation in the process of revising the plans for the Lake States national forests and to allow the forests to make timely, informed decisions, the assessment team should have completed its analysis of the broad-scale issues identified in November 1995 and reached conclusions early in the process. The team and the national forests have analyzed some of the data gathered to date, but other data have not been gathered, and conclusions have not been reached on many of the issues identified in November 1995. In addition, in November 1999–4 years after the first broad-scale issues were identified and about a year before the Minnesota and Wisconsin national forests are scheduled to issue draft alternatives–the Lake States national forests requested substantial additional information and analysis to support revisions to their forest plans. Only then did the forest supervisors and the assessment team meet to discuss products, schedules, and costs.

The assessment team has done, or is currently doing, some analysis of the data it has gathered, including (1) comparing past and current vegetation and disturbance patterns and (2) assessing the best locations for white pine ecosystem restoration projects. In addition, the individual Lake States national forests are using the assessment's data and maps to help them address broad-scale issues and develop management alternatives. For example, officials at the Chequamegon and Nicolet national forests in Wisconsin have used the assessment's data sets, maps, and geographic information systems to help assess (1) resource conditions and trends on the national forests and other lands, (2) the existing management direction of the national forests, and (3) the forests' unique role in northern Wisconsin. The forests concluded that they have greater potential than other lands in the region to provide large, continuous areas of northern hardwoods (maple, oak, and beech)—important habitat for many species such as migratory birds. Officials on the Chippewa and Superior national

[25]The Joint Fire Science Program is funded and administered by the Forest Service and the Department of the Interior's Bureau of Indian Affairs, Bureau of Land Management, National Park Service, Fish and Wildlife Service, and Geological Survey. The program is intended to provide federal land managers with information and tools for managing wildland fuels (trees, shrubs, grasses) so as to prevent the catastrophic wildfires that degrade the health of ecosystems and place people and infrastructure at risk.

forests in Minnesota told us they were using the assessment's data to provide (1) the public with quantitative descriptions of the forests' ecological units for use in developing management alternatives and (2) input for a model that analyzes the social and economic consequences of management alternatives. According to a resource specialist working for the Huron and Manistee national forests in Michigan, she used the assessment's maps of ecological units to update the regional list of sensitive species by identifying habitats in the Lake States similar to those on the forests and looking for occurrences of the species in those areas.

However, in November 1999, the Lake States national forests requested substantial additional data and analysis to support revisions of their forest plans, including assistance in identifying the "historic range of variability" to help define a range of ecologically viable and legally sufficient management alternatives.[26] The forests also needed more data on and analysis of (1) rare conditions such as old-growth forest, (2) habitat fragmentation, and (3) timber supply, especially regarding the role of the national forests in sustaining timber production. In addition, the forests requested that the assessment team provide more narrative discussion to help them understand the data and analyses. Some of the data that the forest supervisors requested in November 1999–including information on the historic range of variability and habitat fragmentation–were identified as needed for forest planning in November 1995 by the North Woods Broad-Scale Issue Identification Project.

Meanwhile, the Wisconsin and Minnesota national forests should be well along in the process of revising their forest plans. The Chequamegon and Nicolet national forests notified the public of their intent to revise their plan in 1996, and the Chippewa and Superior national forests notified the public of their intent to revise their plans in 1997. These forests are scheduled to issue their draft proposals late in 2000 or early in 2001.

To be useful to the national forests in developing ecologically viable and legally sufficient management alternatives, the assessment should have already completed its data gathering and analysis and reached conclusions. However, the forest supervisors' request for data in November 1999

[26]The historic range of variability is defined as the limits of change in the composition, structure, and processes of the biological and physical components of an ecosystem resulting from natural variations in the frequency, magnitude, and patterns of natural disturbances and ecological processes characteristic of an area before European settlement.

indicates that much is yet to be done. The assessment team leader told us that the team would not be able to provide all of the data and analysis by the time they are needed under current funding and staffing levels. As we observed in the first round of forest planning, such gaps in data and analysis could further delay the forests' plan revision schedules. Alternatively, the plans could be revised before broad-scale ecological and socioeconomic issues are adequately addressed. Moreover, without the benefit of the assessment's analyses and conclusions, the Forest Service cannot adequately identify the range of ecologically viable and legally sufficient alternatives and their ecological and socioeconomic consequences. As a result, the revised forest plans are more likely to be challenged, and the agency is more likely to delay, amend, or withdraw the plans. Under either scenario, residents of the Lake States who are economically dependent on the forests, communities and elected officials, and regional businesses and organizations live in uncertainty of the forests' future. In addition, individual forests risk increasing public frustration with the planning process if the management alternatives developed with public participation prove not to be ecologically viable and/or legally sufficient. For example, the Chippewa and Superior national forests solicited and received proposals for management alternatives from several public interest groups. Those groups invested time and resources working on proposals without the benefit of thorough information on the historic range of variability, even though the forests stated the requirement that alternatives lead to conditions that fall within that range.

Integration Into Forest Planning Has Not Occurred Because the Assessment Has Not Been a High Priority

Despite the recognized benefits of broad-scale ecosystem-based assessments in revising forest plans, the Forest Service's regional and forest officials have not viewed the assessment as a priority. Thus, they have been unwilling to provide the leadership, guidance, and funding necessary to complete the assessment in a timely manner. As we reported in 1999, issues that the Forest Service treats as priorities (1) benefit from a sense of urgency and strong leadership by top-level management, (2) are addressed through a strategy that provides the agency's managers with adequate direction and sets standards for holding them accountable, and (3) receive the resources necessary to implement the strategy.[27] The Great Lakes Ecological Assessment meets none of these criteria.

[27]Western National Forests: Status of Forest Service's Efforts to Reduce Catastrophic Wildfire Threats (GAO/T-RCED-99-241, June 29, 1999).

Although the issues being addressed by the assessment extend beyond the administrative boundaries of the individual Lake States national forests, neither the Forest Service's Eastern Regional Office nor the forest supervisors have provided the needed leadership. Rather, the assessment team has assumed leadership by default. Moreover, neither the region nor the forests felt an urgent need to complete the assessment in a timely manner. According to the assessment team leader, he first learned of the schedules for revising the Wisconsin and Minnesota national forest plans when the Forest Service notified the public of its intent to revise the plans in 1996 and 1997, respectively. Additionally, the forest supervisors and the team leader did not meet until November 1999 to discuss objectives, time frames, or costs for obtaining specific types of data and analyses the forests would need to finish revising their plans–4 years after the forests identified the broad-scale issues they would need to analyze in revising their plans.

In addition, Forest Service headquarters did not provide the region with any written guidance or directives on when to conduct the assessment or how to use its products, nor did it set standards for holding the region accountable. The region, in turn, took a "hands-off approach" and gave the forest supervisors the discretion to use or not use the assessment as they saw fit. An Eastern Region official told us the region did not believe that guidance was needed because the forest supervisors had originally supported the assessment and thus did not need to be told to use it. Our discussions with current and former staff on the forests and the assessment team revealed, however, that some forest supervisors and some regional officials were reluctant to support the assessment.

The final, and probably the most telling, indication that the assessment is not a high priority is the lack of attention given to its funding needs. The region and forests never asked the assessment team to identify what could be expected from the assessment given different funding levels, nor did they rank the issues identified in 1995 and 1999 so that available funds would be allocated to the agency's highest priorities. According to one of the forest supervisors who agreed to fund the assessment in 1995, the supervisors provided only modest seed money to begin the assessment because they did not expect the assessment to succeed in supporting revisions to forest plans. Another forest supervisor, who agreed to fund the assessment in 1995, told us that the supervisors as a group wanted to limit the scope of the assessment and tried to do so by limiting its funding.

Furthermore, unlike the Northwest Forest Plan and the Interior Columbia Basin Ecosystem Management Project, the Great Lakes Ecological Assessment has not been identified as a special project for funding in the Forest Service's fiscal year budget justifications, and the region has not withheld money from the forests' annual budgets to fund the assessment. Without adequate funding from the Forest Service, the assessment team has had to seek funding from other sources and has had to complete some activities that have not directly served the most immediate needs of forest planners.

Proposed Planning Regulations Need to Better Integrate Assessments Into the Planning Process

For broad-scale ecosystem-based assessments to be of value, the Forest Service will need to integrate them into its planning process. Toward this end, on October 5, 1999, the agency proposed regulations that would revise its process for developing forest plans. The draft regulations address some of the lessons learned to date about the key elements of broad-scale ecosystem based assessments and their role in forest planning. However, the regulations could be strengthened to ensure that they contain those key elements and are better integrated into the forest planning process.

Proposed Regulations Address Some Lessons Learned About Key Elements

The Forest Service's proposed planning regulations address some of the lessons learned about the key elements of broad-scale ecosystem-based assessments. For instance, they state that (1) forest plans must be based on the best available scientific information and analyses, including information from a variety of geographic areas, some of which can only be obtained, or can best be obtained, from broad-scale assessments, and (2) assessments should be conducted at appropriate geographic scales and reach conclusions.

The draft regulations establish ecological, social, and economic sustainability as the overall goal for managing the national forests and state that ecological sustainability–on which social and economic sustainability depends—is the agency's first priority.[28] To maintain and restore ecological sustainability, the proposed regulations would require the collection and analysis of information on ecosystems' composition, structure, and

[28]Ecological sustainability is defined as the maintenance or restoration of an ecological system's composition, structure, and function, which are characteristic of a plan area over time and space, including but not limited to ecological processes, biological diversity, and the productive capacity of ecological systems.

processes. Such information includes the types and distribution of animal and plant species and the frequency and intensity of fires, pest infestations, and other natural disturbances–at multiple geographic and time scales, including historic and current conditions. Likewise, the draft regulations would require the collection and analysis of social and economic data—such as industry employment and demographics–to help in understanding how social and economic sustainability is linked to ecological sustainability over space and time. Broad-scale assessments are often the only or the best source for some of this information, and the proposed regulations describe such assessments as a key element of the planning process.

The draft rules also discuss the appropriate geographic scales for assessments and identify how the assessments may be used in decision-making. According to the proposed regulations, assessments of ecological issues should be conducted within broad ecological boundaries on the basis of biological or geographic characteristics, such as the habitat range of a species. The draft rules also require that broad-scale assessments be more than just compilations of data. Instead, according to the rules, they should include findings and conclusions. These may be used in revising forest plans or in other planning activities, such as developing conservation strategies to protect sensitive species with wide-ranging habitats.

Proposed Regulations Could Be Strengthened to Better Integrate Assessments Into Forest Planning

The Forest Service's proposed planning regulations do not adequately reflect other lessons learned about conducting broad-scale ecosystem-based assessments. Hence, they could be strengthened to better integrate assessments into forest planning. For example, they (1) generally leave decisions about whether to conduct assessments to the discretion of the Forest Service's national forest supervisors, who have considerable autonomy for interpreting and applying the agency's policies; (2) do not state when in the process assessments should occur; (3) are silent on the need for clear objectives and identifiable products; and (4) do not require the regional offices and forests to identify their strategies for involving the public.

When revising their forest plans, most, if not all, of the national forests must address ecological, social, and economic issues that extend beyond their administrative boundaries (and often extend into other national forests). Most of the forests also lack the data and analyses to address these issues effectively. The draft regulations generally leave the decision about whether to conduct a broad-scale assessment to the discretion of the

forest supervisor. As evidenced in the Lake States region, the integration of broad-scale ecosystem-based assessments into forest planning, if left to the discretion of the forest supervisors, will be uneven and mixed throughout the agency, and some forests may lack the information they need to make informed decisions. In addition, because forest supervisors are typically responsible for individual forests, they may not be in the best position to decide when a broad-scale assessment should be done. While the proposed regulations would allow forest supervisors to combine their planning activities or would authorize one or more regional foresters or the Chief to take the lead in planning activities, the proposed regulations do not assign responsibility or institute a process for ensuring that such coordination will occur when warranted.

In addition, the proposed regulations state that planning must be done expeditiously and that forests should aim to complete the planning process within 3 years. However, the draft rules do not state that assessments should occur early in the revision of forest plans to provide for constructive public participation in the revision and to allow the forests to make timely, informed decisions.

Moreover, although the objectives of assessments and the methods of conveying their results will vary, the proposed regulations say nothing about the need for clear objectives and identifiable products. For example, the proposed regulations do not specify the need for a well-defined scope of work or a charter that would identify who is responsible for completing specific products in accordance with a time line and at a particular cost. Furthermore, although the proposed regulations call for future forest plans to summarize the cost of projected work, including assessments, they do not appear to recognize the need to authorize, fund, and conduct an assessment before revising a forest plan.

According to the proposed regulations, public participation and collaboration occur throughout all phases of the forest planning process, including assessments. Additionally, according to the proposed regulations, the public should be given an opportunity to participate in assessments and must be provided with the information necessary to fully engage in the planning process. However, the proposed regulations do not require regional offices and forests to identify how the public and other governmental entities will participate in assessments and in revising forest plans. By contrast, the planning regulations that the Forest Service proposed in April 1995—but never finalized—would have required the national forests to develop “communications strategies” describing how

the public and other government entities would participate in all stages of revising a forest plan, including the "prerevision process."[29] This process was described as a data collection and analysis exercise that would have served roughly the same function as a broad-scale assessment under the regulations currently being proposed. The regulations proposed in April 1995 would have required agency officials to invite the public and others to express their ideas and suggestions on a communications strategy and meet with interested representatives of other federal agencies and state, local, and tribal governments to establish and document procedures for ongoing coordination and communication throughout the plan revision process. The Forest Service would then have documented these procedures and made them available to the public.

Conclusions

The Forest Service has an opportunity to improve the value of broad-scale ecosystem-based assessments in forest planning, both in the Lake States and across the country. The Forest Service is revising the plans for the Lake States national forests and is fast approaching the legal deadline for doing so. However, the agency lacks information and analysis that would support its planning process and could be provided by the Great Lakes Ecological Assessment. Without a committed effort by the Forest Service to strengthen the execution of the assessment, the agency will be hampered in its ability to propose and choose among ecologically viable and legally sufficient management alternatives. Nationally, broad-scale assessments will be affected by the Forest Service's proposed new planning regulations. The Forest Service has the opportunity to learn from its experience in the Lake States and elsewhere and to institutionalize these lessons in its regulations and guidance. However, the proposed planning regulations do not take all of the steps necessary to maximize the value of assessments in the forest planning process.

Recommendations to the Secretary of Agriculture

To better integrate the Great Lakes Ecological Assessment into the process used by the Lake States national forests to revise their plans, we recommend that the Secretary of Agriculture direct the Chief of the Forest Service to develop a strategy that would allow the assessment team to gather and analyze data and reach conclusions on broad-scale planning-related issues identified by the forests before the forests identify a range of

[29] 60 *Fed. Reg.* 18886 (Apr. 13, 1995).

ecologically viable and legally sufficient management alternatives. If time and/or funding is not available to allow the assessment team to gather and analyze data and reach conclusions on these planning-related issues, then the region and forests will need to (1) rank the issues so that the available time and funds can be applied to the highest priorities and (2) identify the likely consequences of not addressing other issues–such as the increased likelihood of subsequent legal challenges to the plans' implementation—to assist the Forest Service and the Congress in making additional funding decisions.

To institutionalize the lessons learned about the key elements of broad-scale assessments, we recommend that the Secretary of Agriculture direct the Chief of the Forest Service to make further revisions to the agency's planning regulations. These revisions should make clear that broad-scale ecosystem-based assessments must be used in revising forest plans unless the region(s) and forests can justify their omission. The revisions should also provide that when a decision is made to conduct an assessment, the region(s) and forests must prepare a strategy that identifies, among other things, (1) how the assessment will be linked to the forest plan's revision, (2) how the public and other governmental entities will participate in the revision process, (3) what objectives the assessment will meet and what products it will generate, including those of the highest priority, and (4) how much the assessment will cost, how funding will be secured for it, and what is likely to happen if full funding is not available.

Agency Comments and Our Evaluation

We provided copies of a draft of this report to the Forest Service for review and comment. The agency focused its comments on our discussion of the Great Lakes Ecological Assessment and the proposed planning regulations. According to the Forest Service, the report accurately reflects the facts surrounding the agency's planning and the Great Lakes Ecological Assessment. However, the agency disagreed with our recommendation that it develop a strategy to guide the integration of the assessment with the Lake State forests' planning process because it does not believe that the forests need to rely on the Great Lakes Ecological Assessment to complete their forest plan revisions. We believe that the Great Lakes Ecological Assessment is the most appropriate mechanism for addressing broad-scale issues and needs to be fully integrated with the planning process to ensure that these issues are properly addressed. In addition, the Forest Service concurred with the desired outcome of our recommendation on further revisions to the agency's proposed planning regulations—namely, that broad-scale assessments be better integrated into forests' planning

processes—but it disagreed that the proposed regulations needed to be modified to accomplish this. We believe that modifying the proposed regulations will help hold agency officials accountable for integrating assessments into the planning process.

The Forest Service agreed that the Lake State forests need additional information and analysis to identify a range of ecologically viable and legally sufficient management alternatives, but it did not agree with our recommendation that it develop a strategy for integrating the assessment into the forests' planning process. The Forest Service commented that there are sources other than the Great Lakes Ecological Assessment for this information and analysis—such as the individual forests. We do not maintain that the Great Lakes Ecological Assessment must be the only source of information for the plan revision teams. However, we believe that using a centralized broad-scale assessment, rather than relying on decentralized efforts at each national forest, would (1) help to ensure that all of the individual forests have information on issues that extend beyond their boundaries; (2) reduce the costs of gathering and analyzing the data; and (3) increase the likelihood that the data would be consistently formatted and analyzed. We modified our recommendation to emphasize that the Great Lakes Ecological Assessment should be the primary vehicle for gathering data and conducting analysis to address broad-scale issues.

The Forest Service did not agree with the portion of our recommendation stating that the proposed planning regulations should require broad-scale assessments to be done unless the region(s) and forests can justify not doing so. The agency believes this would be unnecessary because the intent of the proposed regulations is to base decisions on scientific data, including broad-scale data when appropriate. On the basis of our work over the past 5 years, however, we believe that the need for an assessment will be the rule rather than the exception. Because the agency has not based its decisions on the appropriate broad-scale data in the past, we believe it would be prudent, and not burdensome, to require the agency to justify its decision not to conduct broad-scale assessments when revising forest plans. When an exception is warranted—as in the instances cited in the Forest Service's comments—we do not believe the agency will have difficulty explaining and justifying its decision. In addition, the agency disagreed with our recommendation that the proposed planning regulations be revised to require a strategy identifying the key elements of each assessment, including its objectives, time frames, and costs. Instead, the Forest Service believes that such guidance should be left to the agency's manuals and directives. However, given the difficulties the agency

has experienced because it has not always based its land management decisions on adequate science, especially regarding issues that extend beyond the boundaries of national forests, we believe that this requirement should be included in the planning regulations. We agree that the Forest Service should provide more specific details about how to prepare this strategy in its manuals and directives.

The Forest Service's written comments and and our detailed response to them are found in appendix IV of this report.

We conducted our work from June 1999 through January 2000 in accordance with generally accepted government auditing standards. Appendix V provides information on our scope and methodology.

As arranged with your offices, unless you publicly announce its contents earlier, we plan no further distribution of this report until 30 days after the date of this letter. At that time, we will send copies of this report to Senator Bingaman, Ranking Minority Member, Senate Committee on Energy and Natural Resources, and Representative George Miller, Ranking Minority Member, House Committee on Resources. We are also sending copies of this report to the Honorable Dan Glickman, Secretary of Agriculture; the Honorable Mike Dombeck, Chief of the Forest Service; and other interested parties. We will make copies available to others on request.

If you or your staff have any questions about this report, please call me at (202) 512-3841. Key contributors to this report are listed in appendix VI.

Jim Wells

Director, Energy, Resources,
and Science Issues

Other Uses of Data From the Great Lakes Ecological Assessment

The data assembled by the Great Lakes Ecological Assessment have been used for purposes other than supporting the Lake States national forests in revising their plans. State agencies, environmental groups, and timber industry organizations have reported using the assessment's data. Some of these users consider the data to be the best available and believe that the assessment team has presented the data in a neutral, easy-to-understand format. According to the Forest Service, the assessment has produced cost savings and prevented duplication of effort by providing reliable, accessible data in a regional context.

For example, the three Lake States–Michigan, Minnesota, and Wisconsin–own and manage millions of acres of state forestlands. Like the Forest Service, these states must develop management plans for the forestlands they manage and, in some cases, for all forestlands in their state. State departments of natural resources reported to us that their participation in the assessment supported existing collaborations with the Forest Service and helped them meet their own responsibilities. These agencies became familiar with the assessment, supported it, and were among the first to use, and benefit from, its products.

The departments of natural resources in Minnesota and Wisconsin have both relied on regionwide data from the assessment that they otherwise would not have had. For instance, both state agencies reported using the assessment's maps of regional historic and current vegetation patterns in their planning processes. In evaluating and planning for its state forests, the Wisconsin Department of Natural Resources has requested and used maps provided by the assessment team, including maps of climate and river and stream density. The Minnesota Department of Natural Resources used information from the assessment on the location of historic white pine forests and patterns of pest infestations to select locations for white pine restoration projects. Both departments also reported turning to the assessment team for its expertise in creating compatible spatial databases and in interpreting complex data sets.

Similarly, some of the environmental groups and industry organizations we spoke with reported using data from the assessment. For example, the timber producers' association in Wisconsin and Michigan has used the assessment's data on saw mill locations to help schedule the temporary closing of timber-related roads during the spring thaw. According to the director of an environmental group, he and other members of the group have used the assessment's maps to better understand and compare current and past forest conditions and to help shape their views on land

management decisions. However, representatives from the Minnesota chapters of two national environmental organizations commented to us that they were unaware of the assessment's work until mid-1998.

Time Line for the Great Lakes Ecological Assessment

1993	November	A group of 18 federal and state agencies publish a Resolution for Interagency Cooperation on Ecosystems Management and agree to share ecological information and to develop strategies and tools, such as consistent mapping systems, for the comprehensive management of the region's natural resources. The assessment subsequently builds on this collaborative effort.
1994	September	Forest Service ecologists propose to assess fire-dependent ecosystems in the Lake States to improve the agency's management of them and to demonstrate the usefulness of spatial data, the National Hierarchical Framework of Ecological Units, and multiscale analyses.
1994	November	National forest planners learn about this proposal and ask the ecologists to expand its scope to include a comprehensive ecological assessment for the Lake States region. The planners wish to identify any unique benefits that the national forests could provide, such as large areas of habitat, and view one broad-scale assessment as more efficient than several individual assessments at smaller scales. The assessment should also help planners look outside the boundaries of national forests to evaluate the large-scale effects of proposed actions.
1995	January-March	The planners and ecologists jointly propose the assessment to the Lake States forest supervisors. The supervisors agree to the assessment and provide seed money and staff time. An assessment team comprising agency personnel and researchers begins phase I of the assessment—gathering readily available social, economic, and ecological data from various sources, including the national forests and state and other federal agencies. At the same time, the Lake States forest supervisors approve a project to identify broad-scale issues that affect multiple forests.
1995	November	The broad-scale issue identification project, which included members of the assessment team, is completed. The resulting report identifies 15 broad-scale issues–including the loss of species, recreational demands, and timber supply–and the data and analysis needed to better understand them.[a]
1996	June	After depleting its seed money from the forests, the assessment team receives $265,000 of an eventual $338,500 from the National Partnership for Reinventing Government. With this funding, the assessment team continues phase 1 and, through cost-sharing arrangements with university researchers, adds landscape modeling and techniques to illustrate current and potential conditions under different management scenarios. Because of the funding agreement and constraints on resources, the assessment team conducts only projects related to its commitments to the National Partnership unless time and resources from other sources allow additional work.
1997	September	The assessment team begins to provide some data to the Lake States forests. Also in 1997, with funding from the National Partnership for Reinventing Government, the assessment team surveys more than 150 managers, planners, and social scientists in the northern Great Lakes region and across the United States to identify and rank the types and scales of data of greatest importance to the public and private sectors for addressing questions on the relationships between people and natural resources. This survey was designed to focus the assessment team's efforts on collecting the types of socioeconomic data that would be most useful in forest planning.
1998	February-March	The assessment team provides data tables to the Lake States forests that include historic and current vegetation patterns, road miles, land ownership, stream miles, and lake density in the forests' management areas.
1998	August-September	By August 1998, the assessment team begins presenting maps of the data it has assembled on the Internet. By the end of fiscal year 1998, funds from the National Partnership for Reinventing Government are essentially depleted. At that time, with the exception of some modeling work, the team meets most of its commitments under its agreement with the National Partnership to (1) collect existing social, economic, and ecological information; (2) map these data sets; and (3) make the data sets and maps available over the Internet or via other electronic means, such as compact disk.

1999	July	Funds arrive from the Joint Fire Science Program to support ongoing work characterizing historic, current, and potential future disturbance patterns across the Lake States region. This allows the assessment team to continue its work on phase 1 of the assessment—assembling data that are more costly and difficult to obtain–and phase 2—analyzing and reporting the data. The Joint Fire Science Program's funding cannot be used to gather and analyze social and economic data, so this type of work is eventually stopped.
1999	November	The Lake States national forests request substantial additional information from the assessment team to support revisions of their forest plans. The forest supervisors and the assessment team leader meet to discuss the assessment's objectives, time frames, and costs. They expect the assessment to be funded through fiscal year 2001.

[a]*North Woods Broad-Scale Issue Identification Project: A Working Document for the Lake States National Forests*, Lake States Issue Assessment Team, Forest Service (Nov. 1995).

Source: Great Lakes Ecological Assessment team leader.

Funding for the Great Lakes Ecological Assessment

Funding for the Great Lakes Ecological Assessment is expected to total more than $1.5 million from fiscal year 1995 through fiscal year 2001. Several sources both inside and outside the Forest Service have funded the assessment. (See table 1.) From fiscal year 1995 through fiscal year 2001, the Forest Service is expected to provide $897,000, or 58 percent of the assessment's total funding. The remaining $639,000, or 42 percent, will come from other sources.

Table 1: Funding for the Great Lakes Ecological Assessment for Fiscal Years 1995-2000 and Estimated Funding for Fiscal Year 2001

Dollars in thousands

Source	1995	1996	1997	1998	1999	2000	2001	Total	Percent of total
Lake States National Forests	65	66	66	50	49	59	49	404	26
Washington Office		30	80	30	30	30	30	230	15
Region 9	59	18	43	18				138	9
North Central Research Station	15				10	50	50	125	8
Total from the Forest Service								**897**	**58**
National Partnership for Reinventing Government		70	119	145	5			339	22
Joint Fire Science Program					54	167	79	300	20
Total from other sources								**639**	**42**
Total	**139**	**184**	**308**	**243**	**148**	**306**	**208**	**1,536**	**100**

Note: Percentages do not sum exactly because of rounding.

Source: Great Lakes Ecological Assessment team leader.

Within the Forest Service, the seven Lake States national forests provided seed money to start the assessment in fiscal year 1995 and have contributed each year to the salaries of the assessment team members. The Forest Service's Washington Office has also funded the salaries of the assessment team members since fiscal year 1996, and it paid for a pilot test of an ecosystem model in fiscal year 1997. In fiscal years 1995 through 1998, Region 9 funded studies of fire-dependent ecosystems. The Forest Service's North Central Research Station, located in Rhinelander, Wisconsin, has

helped fund the salaries of the assessment team members, the use of geographic information systems technology, and several research projects.

The assessment has also sought and received funds from sources outside the Forest Service. First, a working group of the National Partnership for Reinventing Government approved $338,500 in funding for the Great Lakes Ecological Assessment. The working group's mission was to provide seed money to innovative information technology projects that could (1) provide more efficient and effective services to the public, such as increased or improved information dissemination, and (2) benefit multiple federal, state, and local agencies through, for example, lower operating costs. The assessment team sought to meet this mission through the use of innovative technologies—namely, geographic information systems and the Internet–to effectively disseminate information on natural resource conditions to government agencies and the public.

The assessment has also received $299,750 from the Joint Fire Science Program, beginning in fiscal year 1999. The program supports projects that inventory wildland fuels or evaluate the impact of treatments, such as prescribed burns, on fuel conditions. The funds were provided specifically to support the assessment's efforts to bring multiple agencies together and to better understand fire-dependent ecosystems in the Lake States region.

The assessment team has leveraged the funds from the Forest Service and other sources through collaborative projects with other federal and state agencies and partnering arrangements with universities. For example, the Environmental Protection Agency and the Department of Agriculture's Natural Resources Conservation Service have contributed data and expertise. The Department of the Interior's Geological Survey has provided data, such as digital elevations, and has made its data server available to present the assessment's data on the Internet. State natural resource agencies provided such data as land type classifications and inventories of rare plants and animals, as well as expertise in interpreting these data. Universities in the region continued to pay part of the salaries of university researchers working on the assessment. Because the participants have derived mutual benefits from the assessment, they have not quantified their contributions to it.

Comments From the Forest Service

Note: GAO comments supplementing those in the report text appear at the end of this appendix

United States Department of Agriculture | Forest Service | Washington Office | 14th & Independence SW
P.O. Box 96090
Washington, DC 20090-6090

File Code: 1420

Date: FEB 7 2000

Barry T. Hill, Associate Director
Resource, Community, and Economic Development Division
General Accounting Office
441 G Street N.W.
Washington, D. C. 20548

The Forest Service has reviewed the General Accounting Office's draft report entitled "Forest Service Planning: Better Integration of Broad-Scale Ecological Assessments Into Forest Plans Is Needed" (GAO/RCED-00-56, code 141294).

Overall we found the draft report to be concise and well written. The report accurately reflected the facts surrounding Forest Service planning and the Great Lakes Ecological Assessment. The enclosed comments contain a few factual clarifications and some suggestions for editorial comments.

Thank you for the opportunity to review and comment on this draft report. If you have additional questions, please contact our External Audit Liaison, Linda Washington at (202) 205-3761.

Sincerely,

HILDA DIAZ-SOLTERO
Associate Chief for Natural Resources

Enclosure

Caring for the Land and Serving People

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The title of the GAO Draft Report, Forest Service Planning: Better Integration of Broad-Scale Ecological Assessments Into Forest Plans Is Needed, states a belief that is widely held. The following is the FS response to the Draft GAO report.

It is important to understand the context of FS planning processes.
Planning processes are designed to help move the nation towards sustainability. In the context of our legal framework, the journey towards sustainability (social, economic, and ecological) is a broadly accepted national goal. In the last decade the FS realized that a key challenge to sustainability, is to overcome a highly fractured environment resulting from fragmented distribution of resources; multiple state jurisdictions; multiple land ownership patterns; and highly decentralized, organizational diversity. This fragmentation is problematic for neighboring resource managers that share responsibility for managing common values that cross the national landscape. Fragmentation can lead to a 'cacophony' of individual management sounds, rather than a 'symphony' played by well-coordinated and integrated individual parts. This led to the breakdown of orderly development experienced in the PNW and what precipitated the developments such as broad-scale assessments associated with the President's NW Forest Plan; new approaches to land management; and ongoing revisions to the FS planning process.

The FS has practiced adaptive management to help mitigate the consequences of a highly fragmented environment. Broad-scale assessments, noted by the GAO, are an example of FS leadership to develop tools that provide a common base for collaborative planning and decision-making processes. Similarly, adopting the ecosystem management approach has enhanced FS ability to protect land and water resources concurrent to meeting human needs. An equally important initiative designed to help move the nation towards the goal of sustainability, is the revision of the FS planning rule. This rule revision process, while complex and time consuming, promises to strengthen the foundation for FS planning well into the next century of National Forests and Grasslands management. Specifically, the provisions of the rule will build stewardship capacity for sustainability.

- The proposed rule is designed to help reconnect a fragmented landscape by promoting planning strategies that are anchored in communities, regional in scope, and interagency in design.
- Land use plans are anchored in communities to foster opportunities to move away from a federally focused governmental decision-making structure towards a collaborative design that shares responsibility for outcomes with others.
- The responsible official is to foster relationships and create partnerships with interested and affected people, and other federal, state, local, and tribal governments who wish to have a role in defining the future of the national forests and grasslands.
- The FS official becomes a convener, facilitator, leader or participant, in collaboration that provides opportunities for continuous, early, open, and frequent involvement to develop a shared vision and achieve an understanding of proposed actions and their expected outcomes.

Together, these initiatives are facilitating FS efforts towards the goal of sustainability in an orderly and holistic way.

Comments on GAO recommendations:

1. **That the Secretary of Agriculture direct the Chief of the Forest Service to develop a strategy that would allow the assessment team to gather and analyze data and reach conclusions on the planning-related issues identified by the forests before the forests identify a range of ecological viable and legally sufficient management alternatives.**

See comment 1.

Response: We agree to gather and analyze data and reach conclusions on planning-related issues identified by the forests before the forests identify a range of ecological viable and legally sufficient management alternatives. We do not agree that the source of this needed information be limited to the GLA.

We believe the desired outcome of the GAO recommendation is that (1) required data and information is available in time to help inform the decision process. (2) if an assessment is needed as part of a forest plan revision, it should occur early in the FP revision process; (3) it be open to all interested parties; have clear objectives and identifiable products, be at the appropriate scale, include all lands; and be data and information rich but not make decisions. We are working towards this end and believe implementation of the new rule and related directives will establish these efficiencies.

Relative to the GAO perspective and findings reflected in the text, we believe some of the assumptions used are flawed. We believe the GAO report reflects a highly decentralized organization that has a mixed understanding (by people interviewed) of the purpose of the GLA and emerging collaborative processes. Based on the report, the GAO may not have been made aware of other relevant information bearing on this report.

The GLA draft contends "The FS has not given the Great Lakes Ecological Assessment clear objectives that would support forest planning and has not integrated the assessment's products and timing with the schedules for revising the national forest plans." (Page19 Par 1.) We offer the following perspective and comments.

See comment 2.

The GLA was not precipitated by the Forest Plan revision process and should not be viewed in that context. The GLA was initiated in 1995 to initially address management problems and opportunities associated with fire-dependent ecosystems. At the onset, the GLA had clear management goals and objectives as identified in the 1993 interagency resolution. The goals of the Great Lakes Ecological Assessment differed from those of previous assessments by design, and products from the assessment have been considered only one of many sources of contextual information available to the National Forests engaged in plan revision. In the first draft report of the Great Lakes Ecological Assessment delivered to the Forest Supervisors October 1996, the team GLA articulated the project's goals, which evolved since the project's inception in the spring of 1995. As stated in this report, "The Great Lakes Assessment is envisioned as one part of an overall program of integrated research and management activities that implement the principles of ecosystem management. In this overall cooperative program, we hope to provide a scientific basis for a long-term, iterative process that includes adaptive planning, management, monitoring, and research." With respect to planning, the project strove to "compile and interpret information that assists National Forests of the Lake States in evaluating their capability and role relative to the surrounding area."

Thus the GLA was not initiated solely as a consequence of the respective 1996 and 1997 Wisconsin and Minnesota Forest Plan revisions, and the GLA was not targeted to be completed for these early plan revisions, but was intended to be an ongoing effort with broad goals that included compiling and updating available broad-scale information common to issues on the national forests in the Lake States. The Forests cover any current information gaps with the best information available, and the plan revision topics go well beyond those covered within GLA, so assessment needs were never intended to be fulfilled by the GLA as a "stand-alone" assessment. The GLA will continue to be a work in progress as new data and analysis are added over time. The GLA will continue to support forest plan revision efforts; will be even more thorough for the forests about to come into plan revision; and will continue to improve the information available for implementing, monitoring and evaluating, and amending plans on a continuous basis.

See comment 3.

The GLA team was responsive to management and addressed many things useful for FP revisions. After the revision process started, and in response to management request, in 1995 the assessments team expanded the scope of the GLA to accommodate 15 broad scale issues associated with planning. Table two shows that the National Forests provided consistent funding from 1995 to present. As stated in the report, the assessment team gathered readily available data on these and other issues. It is factual that the Great Lakes Ecological Assessment is a work in progress, while the Chippewa, Superior, and Chequamegon-Nicolet National Forests continue to move ahead with plan revisions. These Forests are using contextual information and data from the GLA, or are obtaining it from other available sources to fill their information needs to be legally sufficient. For example, the Chequamegon-Nicolet National Forest has produced more than 12 focused assessments to meet planning needs (ie, Roads and Access; Range of Natural Variability; Recreation; Lands and Land Ownership, etc). The Minnesota National Forests have also produced reference papers that assess key resources at issue in the revision process including allowable sale quantity and timber supply, wildlife, recreation, old growth, habitat fragmentation, and rare resources. The Minnesota Forest Resource Council, an interagency effort including federal and state government, as well as forest industry and environmental organizations, has produced a document entitled "Minnesota Northeast Regional Landscape: Current Conditions and Trends." This assessment has addressed key issues including the range of historical variability, roads, extent and ownership of forestlands, land use, ownership fragmentation, building trends on lakeshore property, and social and economic conditions and trends. A GLA principal investigator, Mike Vasievich, assisted in the social and economic aspects of this assessment, relying in part on GLA generated data. Conclusions and recommendations from this assessment have been used to develop a working paper entitled "Desired Future Conditions, Goals and Strategies for the Northeast Landscape." Results of these assessments, as well as the GLA, will be used in formulating management alternatives and evaluating effects of proposed alternatives in Wisconsin and Michigan. Together, these assessments set a global, national, regional and local context for the resource issues being considered in the Plan Revision.

See comment 4.

Funding provided by partners involved in the collaborative GLA did not restrict work on FS priorities. Based on interviews, the GAO report leaves the impression that collaborative assessment efforts restrict or are not value added. As part of the collaborative assessment effort, some partners contributed funds conditional to the accomplishment of work germane to the planning area but specific to their area of interest. These funds provided by partners did not restrict work on FS priorities as stated. On the contrary, these funds augmented the collaborative effort from the regional perspective. In all, the assessment team assembled over 150 sets of

environmental, ecological, and economical data across the assessment area. All this information is useful for providing diverse contextual information for respective partners (FS timberlands in MI, MN, WI represents only 11.7 % of all timberland). Given the original intention of the GLA, the work has exceeded expectations and as noted in the report, has been well received and broadly used by both FS and other parties.

See comment 5.

The GLA is linked to decision-making structures including those involved in FP revisions. Based on some interview comments, the GAO reports suggest that GLA products have not been integrated in the FP revision process. These contentions are not factual. While we believe implementation of a new planning rule will strengthen the timing of information provided with decision making, the information contained in the GLA is germane to and has been integrated in decision-making processes including those in on going FP revisions. Linkages exist in several ways. Team members who worked on the GLA also worked on the planning staff of respective forests. For example, a member of the GLA workforce (Dr. Eunice Padley) was half-time on the Chequamegon-Nicolet's planning team for a lengthy period, and helped ensure that current GLA generated information, or information sources were available to the Forest. While the Forests have moved ahead of the GLA, they continue to avail themselves of the information being generated by the Assessment, and have developed additional assessment data on their own to support their own planning efforts. The Chequamegon-Nicolet National Forest, as an example, is working with Eric Gustafson (researcher contributing to the GLA) on modeling patchiness of ecosystems, and continues to work closely with Dr. Padley on population viability and range of natural variability. Dr. Dave Cleland, who supervises the GLA effort, is also directly contributing information to the Forest dealing with long-term trends of early successional habitat. These types of linkages provide a channel for information exchange and integration. Equally important is the use of the GLA by others. As noted in the report (app 1), GLA data has been well received and is used by our many partners. In turn, our partners coordinate the development of their respective land use plans with us. Thus cross-jurisdictional linkages exist based on common data themes housed in the GLA database. Another linkage is that the GLA will serve as a reference point for monitoring and inventory strategies designed to detect change resulting from the aggregated impact of regional management activities. Thus well-established linkages exist and these will be strengthened with implementation of the new planning rule.

More information is needed for informed decision making to complete the ongoing revisions. As noted in the GAO draft report, we agree that additional information is needed to complete the FP revision process. The information need was identified one year in advance of the planned decision date. As noted in this response, while more important information is being generated by ongoing work for the GLA, the Forests are concurrently using whatever information is available and applicable, and generating other information as needed to successfully support revision efforts. We plan to continue to develop and improve the GLA in the areas of focus chosen for it. The Forests will continue on revision schedules and ensure broad scale information needs are included within their revision processes, whether obtained through the GLA or from other available sources. We agree that funds need to be made available to provide the requested additional data and analysis. We are committed to this. We will optimize the use of existing information and initiate new work where necessary.

Summary on recommendation one: We believe the GLA was a focused effort with a well-defined purpose: to implement the principles of ecosystem management while providing a scientific basis for adaptive planning, management, monitoring, and research. The GLA was not

intended to be a stand-alone FP broad-scale assessment and should not be viewed in that context. The GLA data and analysis has been integrated in planning decisions and is broadly available to and used by our many partners. More information and analysis is needed to complete the FP revision process. The FS is committed to gather needed data and analysis to complete the FP revisions.

2. **That the Chief of the Forest Service make further revisions to the agency's planning regulations.**

See comment 6.

See comment 7.

Response: We disagree with the recommendation to make further revisions to the proposed planning rule "…making clear that broad-scale ecosystem-based assessments must be used in revising forest plans unless the region(s) and forests can justify their omission. The revision should also provide that when a decision is made to conduct an assessment, the region(s) and forests must prepare a strategy that identifies, among other things, (1) how the assessment will be linked to the forests' plan revision processes, (2) how the public and other government entities will participate in the process, (3) the objectives the assessment will meet and the products it will generate, including those of highest priority, and (4) how much the assessment will cost, how funding will be secured for it, and what is likely to happen if full funding is not available."

We believe the desired outcome of the GAO recommendation is that planning decisions be based on science data information; that data & information be timely, focused, and cost effective; that planning processes are open and collaboratively done. We are working towards this end and believe implementation of the new rule and related directives will establish these efficiencies.

See comment 6.

The need for science-based information to make informed decisions should justify initiation of broad-scale assessments. The GAO review of the rule was limited to those sections that concern broad-scale assessments as part of the planning process (pg39). A thorough reading of the rule however, will affirm that the new rule will help establish the desired stronger linkages between planning processes. The following provisions of the proposed planning rule: establishing sustainability as the ultimate goal; using the desired future condition as the reference point for planning; broad-scale assessments crossing ownership and jurisdictional boundaries; collaborative assessment, planning, and decision making processes; and better integration of science into planning processes, are inter-linked and designed to address and help ameliorate problems associated with land, resource, and organizational fragmentation. The rule encourages managers to harmonize respective resource management plans through landscape planning independent of jurisdictional lines thus facilitating collaborative stewardship. The rule also requires the FP be consistent with goal and objectives of national strategic plans. These provisions will improve FS performance and accountability systems, focus monitoring on key performance measures, and help provide form to a highly decentralized organization. While many of the provisions of the proposed rule merely reflect what the FS is currently doing (broad scale assessments, collaborative processes), we expect to have the rule in place this year. This will further solidify these relationships.

Under the new rule, national forest and grassland planning will be responsive to emerging needs and easy to change. In the future, revision will not be cumbersome, 'start over' documents on a 15-year cycle. Rather, plans will be 'living documents' kept current through frequent amendments or revisions on an as needed basis. Doing broad-scale assessments

should be justified on the basis of need, and not required as policy. Not all revision will require broad-scale assessments. Additionally, the FS may not always be the initiator of a broad-scale assessment, but rather a partner in assessment initiated by others. This renders mutual benefit: we contribute expertise while drawing from results, as appropriate, to update our plans.

With the adoption of the proposed planning rule, existing plans are the reference point and will be reviewed to conform to the provision of the rule. Specific revision decisions will focus on aspects of the current plan. Proposed actions will be developed under normal NEPA procedures based on scope and scale of issues identified. During this review process, information needs will be identified. The need for broad-scale assessments will be justified on a case-by-case basis.

With the adoption of the proposed planning rule, existing plans are the reference point and will be reviewed to conform to the provision of the rule. Specific revision decisions will focus on aspects of the current plan. Proposed actions will be developed under normal NEPA procedures based on scope and scale of issues identified. During this review process, information needs will be identified. The need for broad-scale assessments will be justified on a case-by-case basis.

See comment 7.

FS Directives will provide additional guidance reflecting lessons learned. We agree with the desired outcome of the recommendation but we do not think such guidance should occur in the rule itself. While the language of the rule provides a general planning framework, more detailed guidance on conducting planning processes will be provided in related FS Directives. FS regulations and handbooks will detail many specifics for how to implement the spirit and intent of the rule. The requirements for how assessments will be linked to the forests' plan revision processes; how the public and other government entities will participate in the process; how the objectives the assessment will be established, etc, will be included in FS Directives.

The Forest Service continues to improve in its ecological approach to management, with major strides being made during the past decade. There is no doubt that broad-scale assessments will be invaluable in addressing ecological and socio-economic issues pertinent to forest plan revisions. We agree not only that broad-scale assessments need to occur early in the forest plan revision process, but also that ongoing monitoring and evaluation efforts, and assessments are critical to quality plan implementation and timely plan amendments. We are working towards this end and believe implementation of the new rule and related directives will establish these efficiencies.

The following are GAO's comments on the attachment to the Forest Service's letter dated February 7, 2000.

GAO Comments

1. GAO and the Forest Service are largely in agreement on this point. We both agree that the primary objective of our recommendation is to ensure that the Forest Service has gathered the data and conducted the analysis needed to identify the range of ecologically viable and legally sufficient management alternatives. Although the data may be derived from sources other than the Great Lakes Ecological Assessment, we believe that efforts to collect and analyze data for broad-scale issues can be carried out most efficiently and effectively under the auspices of a single project, which can ensure appropriate coordination and prioritization. We revised the language of our recommendation to make this point clearer.

2. We agree that the Great Lakes Ecological Assessment was not precipitated by the forest plan revision process. However, we believe that it is now appropriate to view the assessment as a broad scale effort supporting revisions to forest plans in the Great Lakes region. Our work over the past 5 years has shown that in revising their plans, most, if not all, of the national forests must address ecological, social, and economic issues that extend beyond their boundaries. Doing so is necessary to enable them to comply with laws such as the Endangered Species Act and the National Environmental Policy Act. Because broad-scale assessments have proved useful in identifying and addressing these types of issues, we believe it is appropriate to view the Great Lakes Ecological Assessment in this role. We also believe that in 1995—as the assessment got under way—the Forest Service knew enough about the value of assessments and the elements that are key to their success to have linked it more formally to the forests' planning processes.

3. We agree with the Forest Service that the Great Lakes Ecological Assessment team has been responsive to forest managers and has provided useful information to support the revision process. However, we believe that if the Forest Service had (1) assigned a higher priority to the assessment, (2) established clear objectives for the assessment to support the revision process, and (3) better integrated the assessment into the revision process, the results would have been more responsive to the needs of forest planners and would have provided more information to support the revision process.

4. Our data show that a significant percentage of the Great Lakes Ecological Assessment team's funding came from sources other than the Forest Service and that these sources imposed restrictions on the types of data gathering and analysis their funds could be used for. Nevertheless, we continue to believe that collaboration with other research organizations is an important and necessary part of the assessment process. However, heavy reliance on sources other than the Forest Service to fund assessments can mean that funds are not available to gather data and complete analyses needed to revise forest plans..

5. We agree with the Forest Service that forest planners have used and are using products of the Great Lakes Ecological Assessment in the revision process. However, we believe that the assessment could be better integrated with or linked to the revision process. For example, it was not until November 1999 that the forest supervisors and the assessment team leader met to discuss the objectives, time frames, and costs of obtaining specific types of data and analysis that the forests would need to finish revising their plans.

6. On the basis of our work over the past 5 years, we believe that the need for an assessment will be the rule rather than the exception. Because of the agency's historical failure to base decisions on the appropriate broad-scale data, we believe it would be prudent, and not burdensome, to require the agency to justify its decision not to conduct broad-scale assessments when revising forest plans. When an exception is warranted—as in the instances cited in the Forest Service's comments—we do not believe the agency will have difficulty explaining and justifying its decision.

7. In general, the Forest Service agrees with the desired outcome of the portion of our recommendation that concerns a strategy for conducting assessments, but it believes that the guidance should appear in agency directives rather than in the planning regulations themselves. We believe that even if our recommendation is adopted and the provisions are added to the proposed planning regulations, most of the details needed by agency officials to implement the provisions would still need to be included in Forest Service directives. Including general requirements in the Forest Service's planning regulations would help to assure the Congress and the American people that assessments will be conducted when needed and will be done well. However, because the operational details will still be found in Forest Service directives, the Forest Service will have the flexibility to fine-tune the provisions or adapt them to changing circumstances.

Scope and Methodology

To determine the key elements of broad-scale ecosystem-based assessments, including lessons learned about why and how they should be done, we examined documents prepared by the Forest Service, the Department of the Interior, and other agencies. We also relied on previous GAO reports that identified deficiencies in the Forest Service's planning process and reviewed broad-scale assessments done by the Forest Service and the Bureau of Land Management in the Pacific Northwest.

To determine the extent to which Great Lakes Ecological Assessment contained the key elements of an assessment and was integrated into the national forest planning process, we conducted a thorough review of the assessment. We did our work both in the Great Lakes region and in Washington, D.C. To learn about the assessment's objectives, time lines, outputs, and costs, we met and talked extensively with the project's team leader. We also spoke with his supervisors in the Forest Service's Ecosystem Management Coordination Office and Eastern Regional Office. To learn more about the preparation of the assessment, we spoke with Forest Service employees assigned to the assessment and representatives of collaborating agencies and organizations. The collaborators included other federal agencies (the U.S. Geological Survey, the Natural Resource Conservation Service, and the Environmental Protection Agency), state departments of natural resources, and university researchers. We also reviewed the outputs that the assessment team posted on its Internet Web site. To learn more about the original objectives of the assessment and its uses in relation to the process for revising forest plans, we also spoke with forest supervisors or their staff from six of the seven Great Lakes forests: the Chippewa, Superior, Nicolet, Chequamegon, Huron-Manistee, and Ottawa national forests. Several of the Forest Service staff were retired when we spoke with them but had been involved with the assessment before retiring. To characterize the benefits of the assessment outside the Forest Service, we also spoke with representatives of state and county agencies, Native American tribes, forest industry associations, and environmental groups.

To determine the extent to which the Forest Service would integrate broad-scale assessments into the forest planning process, we reviewed its October 5, 1999, proposed planning regulations. Our review was limited to the sections that address the role of broad-scale assessments in the planning process. We conducted a qualitative evaluation of the proposed regulations in light of our findings in the Lake States region, as well as in the context of the lessons we and others have learned about assessments and their role in planning.

GAO Contacts and Staff Acknowledgments

GAO Contact

Charles S. Cotton (202) 512-3841

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