

ECOSYSTEM MANAGEMENT

**JOINT OVERSIGHT HEARING
BEFORE THE
SUBCOMMITTEE ON
OVERSIGHT AND INVESTIGATIONS
COMMITTEE ON NATURAL RESOURCES
AND THE
SUBCOMMITTEE ON
SPECIALTY CROPS AND NATURAL RESOURCES
COMMITTEE ON AGRICULTURE
AND THE
SUBCOMMITTEE ON
ENVIRONMENT AND NATURAL RESOURCES
COMMITTEE ON
MERCHANT MARINE AND FISHERIES
HOUSE OF REPRESENTATIVES
ONE HUNDRED THIRD CONGRESS
SECOND SESSION**

ON

ECOSYSTEM MANAGEMENT AND A REPORT BY THE GENERAL ACCOUNTING OFFICE, "ECOSYSTEM MANAGEMENT—ADDITIONAL ACTIONS NEEDED TO ADEQUATELY TEST A PROMISING APPROACH"

HEARING HELD IN WASHINGTON, DC, SEPTEMBER 20, 1994

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ECOSYSTEM MANAGEMENT AND A REPORT BY THE GENERAL ACCOUNTING OFFICE, “ECOSYSTEM MANAGEMENT—ADDITIONAL ACTIONS NEEDED TO ADEQUATELY TEST A PROMISING APPROACH”

TUESDAY, SEPTEMBER 20, 1994

HOUSE OF REPRESENTATIVES, SUBCOMMITTEE ON OVERSIGHT AND INVESTIGATIONS, COMMITTEE ON NATURAL RESOURCES; SUBCOMMITTEE ON SPECIALTY CROPS AND NATURAL RESOURCES, COMMITTEE ON AGRICULTURE, AND SUBCOMMITTEE ON ENVIRONMENT AND NATURAL RESOURCES, COMMITTEE ON MERCHANT MARINE AND FISHERIES,

Washington, DC.

The subcommittees met, pursuant to call, at 9:50 a.m. in room 1324, Longworth House Office Building, Hon. George Miller (chairman of the Subcommittee on Oversight and Investigations) presiding.

Present: Representatives Miller, Dooley, Lehman, Pallone, Unsoeld, Rose, Baesler, Bishop, Inslee, Pomeroy, Volkmer, Emerson, Kingston, Goodlatte, Dickey, Pombo, Everett, Lewis of Kentucky, Hansen, Pombo, Dickey, Gilchrest, and Taylor of North Carolina.

Also present: Representatives Penny and Johnson of South Dakota.

Staff present: Subcommittee on Oversight and Investigations: Charlene Dougherty, legislative staff, Linda Gordon Stevens, clerk, and Ted Case, minority consultant, Committee on Agriculture; Alexandra Buell, staff assistant; Keith Pitts, subcommittee staff director; and Glenda L. Temple, hearing clerk, Subcommittee on Environment and Natural Resources; Dan Ashe, staff director, Lesli Gray; Marvadell Zeeb, clerk, Sharon McKinney, counsel, and, Tom Melius, professional staff.

STATEMENT OF HON. GEORGE MILLER

Mr. MILLER. The hearing will come to order for the purposes of conducting an oversight hearing on the GAO report on ecosystem management and additional actions needed to adequately test the promising approach. My apologies for running late here, and because I am, let me just put my opening statement in the record. I want to thank all of the witnesses and I want to thank the chairs and the members of the other committees, Merchant Marine and Agriculture, for their participation. This report is in response to a

request from Chairman Studds, Chairman Rose, and me, the request that we made to try to help us better understand and to manage the ecosystem approach that the administration has undertaken and to give us a better understanding of what changes may be necessary to fully implement it.

With that, I will submit my statement in the record and recognize Mr. Pombo.

[Prepared statement of Mr. Miller follows:]

OPENING STATEMENT

Hon. George Miller
Oversight Hearing on the GAO Report:
"Ecosystem Management: Additional Actions Needed to
Adequately Test a Promising Approach

September 20, 1994

Last year, Chairman Studds, Chairman Rose and I, along with Congressman Norm Dicks, asked the General Accounting Office to prepare a report for us on the status of the federal government's initiatives to implement ecosystem management, additional actions needed, and barriers, both institutional and legal, to ecosystem management.

The purpose of this hearing is to review the GAO report and to hear from key Administration officials about both the report and their ongoing ecosystem management actions.

During the past year, the Natural Resources Committee explored the possibilities and the problems associated with ecosystem management. We conducted a workshop on how to better integrate science into resource management. We visited the greater Yellowstone ecosystem and saw the results of different management directives and philosophies on the landscape. We held a hearing in the Florida keys to examine the ecological and economic consequences of the declining health of the Everglades and Florida Bay. We took at first-hand look at resource issues in Colorado and held a workshop on the legal and institutional impediments to ecosystem management. A summary of our findings

and recommendations is contained in a majority staff report issued last April.

Ecosystem management has great potential for managing resources: if done right, we should be able to head off the "trainwrecks" we have seen in the Northwest; we should be able to restore degraded areas and to put our natural resources on a long-term sustainable basis; we should see more flexible management; we should see greater collaboration among the affected parties; we should see stronger scientific underpinnings for decisions about resources; and we should see a federal system which has been significantly streamlined. If done wrong, we could see added layers of bureaucracy.

Getting there from here won't be easy. The Administration is beginning to explore the steps that have to be taken and the barriers which need to be broken down. I look forward to hearing about the four pilot projects underway (the Pacific Northwest, the Everglades, the Anacostia River, and Prince William Sound. The Administration also has an ambitious project underway -- a series of seven ecosystem case studies and an analysis of legal, institutional, and budget issues affecting ecosystem management. We are all looking forward to the Administration's report when it is ready later this fall.

We know that there are a great many ecosystem management activities taking place across the country. It is our intention

to hold additional joint hearings during the next Congress to hear from witnesses who are involved -- in a "hands on" way -- with ecosystem management.

STATEMENT OF HON. RICHARD W. POMBO

Mr. POMBO. I would like to put my statement in the record.
[Prepared statement of Mr. Pombo follows:]

**Statement By
The Honorable Richard W. Pombo
before the
Joint Subcommittee Hearing
of the House Committee's on
Natural Resources; Agriculture; and
Merchant Marine and Fisheries
on
September 20, 1994**

Let me start by thanking the Chairmen of all three of these Subcommittees for holding today's hearing to discuss the issue of "Ecosystem Management." I would also like to thank the GAO for preparing this comprehensive report and our panelists, as well, for what I hope will be a spirited debate on this very important issue.

I am pleased that we are holding this first of what should be a series of hearings on this topic. I believe it is important that we give ourselves -- and the public -- the opportunity to fully debate the merits of "Ecosystem Management" as this concept represents a fundamental shift in the government's approach to the management of federal land and the regulation of private property in this nation.

In a historical sense, the concept of "Ecosystem Management" is a relative newcomer in the natural resource management arena. I must add also that this emerging concept -- with the exception of a few

pilot projects -- is largely untested. Keeping this in mind, it is important that we approach this idea with every bit as much scrutiny as we do optimism.

Many people view ecosystem management as the solution to the many complex environmental and natural resource issues that are currently before Congress. These issues include: how to ensure the sustainable long-term use of our renewable and environmental resources; how to coordinate the efforts of the four primary federal and management agencies -- all of which, by the way, have announced their intent to adopt an ecosystem management approach to their land practices; and finally, how to best provide for the needs of humans and to protect their rights as landowners.

There are some -- including myself -- who aren't convinced that this approach will achieve the delicate balance that is necessary between environmental priorities and the needs of the people. There are other questions as well, such as how much will all of this cost the American taxpayer -- not only in terms of dollars, but also with respect to the potential threat to their rights as property owners and possibly their livelihoods? Where does one ecosystem begin and another one end and what criteria do you establish to determine the range of an ecosystem? Who should be given oversight responsibility to assure the successful implementation of this program? Finally, how much time will it take to determine whether this concept is actually achieving its intended goals, or as it seems to be the case in the Pacific Northwest, is doomed to failure?

In determining the answers to these and many other important question, we must strive towards an open, honest debate that will lead to a consensus on this emerging idea of "ecosystem management." Once again, I thank the Chairmen for putting this hearing together. I look forward to the discussion and -- most importantly -- to the views of the distinguished guests on this panel.

Mr. MILLER. Are there any other opening statements that people would like to make? Don't feel inhibited because I was late, you guys weren't, so if you want to say something, please. You would just as soon get started?

Anybody who has a statement, I will put it in the record, if there is no objection. Hearing none, so ordered.

[Additional opening statements follow:]

Statement of the Honorable Gerry E. Studds, Chairman
Subcommittee on Environment and Natural Resources
At Joint Hearing on Ecosystem Management
Tuesday, September 20, 1994

Today our three subcommittees meet to discuss ecosystem management, two words which promise to revolutionize the way our nation's natural resources and federal lands are managed. This hearing will focus on a report by the U.S. General Accounting Office entitled, "Ecosystem Management -- Additional Actions Needed to Adequately Test a Promising Approach," that Representatives Miller, Rose, Dicks, and I requested.

It has become increasingly apparent that we must improve the ways in which federal agencies manage our natural resources. As the situation in the Pacific Northwest illustrated, when the directives of federal agencies conflict, situations arise which negatively affect both our wildlife and the communities involved. Thankfully, this Administration is taking the initiative to refocus our federal land management agencies. Shifting the concentration from a single species or resource to an entire ecosystem is a daunting task, but an extremely important one if we are to preserve our nation's ever dwindling natural resources.

I would like to commend both the Administration and GAO for their work on this issue. But there is a lot more to be done. As the GAO report indicates, there are many serious questions to be dealt with prior to fully implementing any type of ecosystem management. This report will help Congress and the Administration find the right answers.

STATEMENT BY THE HONORABLE JACK FIELDS
(R-TEXAS), RANKING REPUBLICAN MEMBER, AT
THE SUBCOMMITTEE ON ENVIRONMENT AND
NATURAL RESOURCES JOINT HEARING ON
ECOSYSTEM MANAGEMENT: SEPTEMBER 20, 1994.

Mr. Chairman, I appreciate your scheduling this hearing to review the results of a report by the General Accounting Office (GAO) that evaluates the progress of Federal agencies in adopting and using ecosystem management for managing land and natural resources.

The Federal Government owns about 30 percent of the Nation's total land base and relies primarily on the National Park Service, Bureau of Land Management, U.S. Forest Service, and U.S. Fish and Wildlife Service to carry

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out management policy. These agencies administer public lands under a system of laws that has evolved over the last century.

Mr. Chairman, differing agency missions and legal requirements hamper coordination and implementation of ecosystem management. In addition, extensive coordination is required between Federal agencies as well as state agencies, tribal interests, and private landowners -- all of whom make up the land ownership base of an ecosystem.

While ecosystem management has become increasingly popular, I do have some concerns about the general concept. One of my main concerns is how to balance the needs of a healthy ecosystem with human activities.

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I understand that the GAO report examined: (1) the status of Federal initiatives to implement ecosystem management; (2) additional actions required to implement this approach; and (3) barriers to government-wide implementation.

Mr. Chairman, I look forward to the testimony we will receive and join you in welcoming our witnesses.

#

JF:tmm

OPENING STATEMENT
of
THE HONORABLE JAY DICKEY
Fourth District - Arkansas
Before the
**Joint Oversight Hearing of the Natural Resources Oversight
Subcommittee, Agriculture Specialty Crops and Natural
Resources Subcommittee, and Merchant Marines
Environment and Natural Resources Subcommittee**
Regarding
Ecosystem Management

September 20, 1994

Mr. Chairman, thanks for scheduling this joint hearing today on Ecosystem Management with our colleagues from the Agriculture and Merchant Marines Committees.

In my view, this could well be the beginning of a legislative process that may result with the 104th Congress developing potentially landmark legislation to define and guide the Administration in implementing its Ecosystem Management policy. The result will likely be congressional action to change public land use and land management laws across the spectrum of our land management departments and agencies.

In some respects, this process is good. We certainly need to finally define the parameters of this Ecosystem Management policy. To that end, the hearings will need to be expanded to include broad-based public input and testimony regarding Ecosystem Management. The initial first step must be to define the term itself -- what does Ecosystem Management mean? To the best of my knowledge, there is not yet set in law, a clear and precise definition or clear scope of Ecosystem Management. It seems to me that has to be accomplished before the Congress even begins to change current multiple-use land management laws and policies. Frankly, to further restrict the existing law and the federal multiple-use land management framework causes me concern about the future management and public use of federal lands as well as intermingled and adjacent private lands.

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The GAO Report itself points out that Ecosystem Management entails the formation of "...distinct ecological units called ecosystems that span federal and non-federal lands." The GAO Report goes on to underscore that "...scientific understanding of ecosystems is far from complete..." and that "disparate missions and planning requirements set forth in federal land management statutes and regulations hamper such efforts" to coordinate federal agency land management goals.

The GAO says that "Congress will be constrained by...limitations embedded in the larger national land and resource use framework, many beyond the ability of the federal land management agencies individually or collectively to control or effect.

In terms of first even defining what we mean when we talk about Ecosystem Management, the GAO Report says changes will be needed to "...better define and achieve the minimum required level of ecosystem integrity and functioning." Implementing such a policy, the GAO says, will also require "...delineating...the boundaries of the geographic areas to be managed as ecosystems...(and) making management choices about desired future ecological conditions, about the types, levels, and mixes of activities that can be sustained, and about the distribution of activities among the various land units within the ecosystem...."

The public should know that all this most likely means more federal land use restrictions and modification of existing multiple-use land management laws that have existed at least since 1960. It could mean a further rationing of public activities, including commodity production, on federal public lands and potentially on intermingled or adjacent state and private lands as well.

The potential further rationing of public use of public lands is a major, vital and controversial issue. Because of that, the public needs to be active participants in what should be a national debate as these committees move forward with Ecosystem Management legislation.

Thank you.

**Statement of Sanford D. Bishop, Jr.
September 20, 1994**

Mr. Chairman, the public lands responsibilities of this subcommittee and Committees are important functions that afford the protection of, and access to public lands, and the report we will hear about today will play a key role in the further development of initiatives to implement ecosystem management policies.

Public policy decisions involving "ecosystem management" will contain likely trade-offs among ecological and socio-economic factors requiring reliable and detailed data collection. Management choices for public lands continually changes, as does the ecosystem itself, and for this reason there will be a continuing need for research, monitoring, and evaluating the ecological conditions of public lands.

I want to thank the Chairmen of the respective committees and my chairman for their foresight and judgement in requesting this study to help guide the policy decisions that are sure to be before us today and in the future.

CHARLES H. TAYLOR
11TH DISTRICT, NORTH CAROLINA

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**STATEMENT OF THE HONORABLE CHARLES H. TAYLOR
BEFORE THE JOINT SUBCOMMITTEE ON ENVIRONMENT AND NATURAL
RESOURCES, SUBCOMMITTEE ON OVERSIGHT AND INVESTIGATIONS, AND
SUBCOMMITTEE ON SPECIALTY CROPS AND NATURAL RESOURCES HEARING
20 SEPTEMBER 1994**

Listening to the Administration's representatives here today, Assistant Secretary Lyons, Assistant Secretary Frampton, et.al., I see we still have a philosophical difference in the approach to managing our natural resources. This Administration is not setting the stage to avoid train wrecks; it is in the process of taking up the tracks. Its management concept is founded upon a misguided idea based more on early 19th century romanticism than 20th century scientific knowledge -- scientific knowledge that has been gained by nearly a century of management example and experimentation. The Administration assumes the flawlessness of the last 20 years of legislation and policy.

And why should this Administration not assume that flawlessness? That policy is being managed by the same mentality, if not the same people, that has pushed it over the last 20 years.

Thus, we are here today to congratulate ourselves for the creation of this great "new" innovation, "ecosystem management." No one who is serious about resource management has a clue what

it means, but for most citizens it is spelled t-r-o-u-b-l-e. There is indication that government will show its onerous power when the boundaries of an ecosystem lap over those of private property. As always, the government agencies have little regard for private property rights when they are imposing their will.

There is confirmation by the GAO that no proof has been given to show that the ecosystems found on a 100-acre managed golf course, a 100-acre managed timber tract, or a 100-acre non-managed, non-harvested tract are better or worse than another. There is substantial difference in economic value, but no shown environmental difference in the three ecosystems.

When I was a child, I had an invisible childhood friend who would help me win all of my make-believe battles. I wondered after I grew up what had happened to him. I am glad to report today that I have found him in the minds of the Administration's representatives gathered here today.

I have never heard the term "ecosystem" used to do so many things. Assistant Secretary Lyons has described "ecosystem management" as being able to do everything imaginable: it will do my laundry or cook dinner -- whatever you are thinking, it will do it.

Mr. Frampton feels that if we waive the term "ecosystem management" and put it into a plan, that action will be

considered compliance of the Endangered Species Act, no matter what courts or plaintiffs may choose to do.

Ecosystem management will bring more water to California. Ecosystem management will bring more economic benefits to communities. Hell, it may even improve my turkey call.

Unfortunately, the overselling of this "new" term ignores the essential problem. This Administration is pushing the failed policies of the past. Many of its members and philosophical soul mates made many of those failed policies. Those failed policies are needlessly costing this nation tens of thousands of jobs. These failed policies are trammeling basic constitutional rights and placing an enormous cost on society -- from the thousands of dollars added to the cost of home construction to the one trillion dollars that is expected to be wasted on the ozone argument.

These policies are being pursued with complete disregard, in many cases, for the best science, and complete disregard of common sense; and, in many cases, the policy actually works against best environmental goals.

We must revisit and correct the flaws of legislation and policy enacted over the last 20 years. I doubt if the 103rd Congress will revisit it, and this Administration certainly won't.

We must have a natural resource management policy that does not "overuse" our resources, but allows decision making to be based on the best scientific sources in the profession. Our resource policy makers should consider the real costs associated their decisions and encourage renewable resources.

Mr. MILLER. We will begin with the witnesses from GAO: Mr. Duffus and others, if you will come forward. Welcome to the committee, and we look forward to hearing from you.

STATEMENT OF JAMES DUFFUS III, DIRECTOR, NATURAL RESOURCES MANAGEMENT ISSUES, RESOURCES, COMMUNITY, AND ECONOMIC DEVELOPMENT DIVISION, U.S. GENERAL ACCOUNTING OFFICE, WASHINGTON, DC, ACCOMPANIED BY CHARLES S. COTTON, ASSISTANT DIRECTOR; RALPH DOMENICK, SENIOR EVALUATOR; AND CHESTER JOY, SENIOR EVALUATOR

Mr. DUFFUS. Thank you, Mr. Chairman.

With me today are Mr. Cotton, Mr. Domenick, and Mr. Joy, who were the Washington team that worked on this report, and in the audience today is Mr. Brian Eddington from our Denver office who also participated in the effort.

We are pleased to be here today to discuss our report on a new, broader approach to managing the Nation's lands and natural resources called ecosystem management. The ecosystem management approach recognizes that plant and animal communities are interdependent and interact with their physical environment to form distinct ecological units called ecosystems that span Federal and non-Federal lands.

In response to your and Representative Dicks' request, we identified the status of Federal initiatives to implement ecosystem management, additional actions required to implement this approach, and barriers to governmentwide implementation. In summary, our work, which we generally limited to the four primary Federal land management agencies, showed that these agencies have initiated efforts to implement ecosystem management. In addition, the administration's fiscal year 1995 budget request includes \$700 million for ecosystem management initiatives.

However, if this approach is to be effectively implemented, the policy goal for ecosystem management needs to be clarified and certain practical steps need to be taken that clearly identify what must be done and which agencies and parties must be involved.

Finally, our work has shown that implementing ecosystem management governmentwide faces several significant barriers, including noncomparable and insufficient data, disparities in Federal agencies' missions and planning requirements that hamper interagency coordination, and incentives, authorities, interests, and limitations that constrain Federal and non-Federal parties' efforts to work together effectively.

Before discussing these matters in more detail, I will briefly provide some background information.

The four primary Federal land management agencies and numerous land units they manage and the many laws governing their management form the current Federal land management framework. This framework is part of a larger national land and natural resource use framework. This larger framework includes many Federal and State agencies that have regulatory or tax authority or financial or technical assistance programs that can greatly influence the use of natural resources and other activities on private lands.

Ecosystem management recognizes that humans are a component of most ecosystems; thus, human activities and uses are integral to ecosystem management. Proponents of ecosystem management believe that coordinating human activities across large geographic areas would do more to maintain or restore the health of ecosystems than the current practice of managing legislatively or administratively established land units and individual natural resources. They also believe that this approach would better ensure the sustainable long-term use of commodities such as timber and forage and other uses such as recreational activities. Hence, proponents believe that this approach would help to avoid or mitigate future ecological and economic conflicts by providing greater flexibility to coordinate activities over larger land areas.

Since the late 1980's, many Federal agency officials, scientists, and natural resource policy analysts have advocated adoption of ecosystem management to better address declining ecological conditions. At the local level, some Federal agency field offices have entered into collaborative arrangements with both Federal and non-Federal agencies, as well as with private landowners and representatives of other interests, to address problems or issues of mutual concern.

In addition, in some instances the agencies have entered into cooperative agreements with other Federal agencies to address specific ecological concerns. And, over the past 2 years, all four of the primary Federal land management agencies have independently announced that they are implementing or will implement an ecosystem approach to managing their lands and natural resources.

The movement toward ecosystem management is reflected in the administration's fiscal year 1995 budget request, which includes \$610 million for the initial stage of a governmentwide effort to implement ecosystem management, including accelerated funding for three ecosystem management pilot projects and \$90 million for a fourth pilot project. The budget request also states that to implement ecosystem management, the administration is considering the principles of managing along ecological rather than political or administrative boundaries, ensuring coordination among Federal agencies and increased collaboration with State, local, and tribal governments, the public, and the Congress, using monitoring, assessment, and the best science available and considering all natural and human components and their interactions.

In addition, both the Forest Service and the Bureau of Land Management have proposed reducing the number of separate budget expenditure categories for different resource activities, such as timber and wildlife in order to provide the increased flexibility they believe they need to implement ecosystem management.

The initial stage of a governmentwide effort to implement ecosystem management will require clarifying the policy goal for ecosystem management and taking certain practical steps to apply the principles being considered by the administration.

Currently, ecosystem management has no clear policy goal and the term has come to represent different things to different people. While there is no governmentwide legal requirement to maintain and restore the health of ecosystems as such, other laws do require Federal agencies to give priority to sustaining multiple uses on

Federal lands and providing minimum levels of protection to individual resources. If meeting these mandates depends on the health of ecosystems, then priority will have to be given to maintaining or restoring a minimum level of ecosystem integrity and functioning over production and other uses of resources at nonsustainable levels. The administration has not, however, clearly identified the priority to be given to the health of ecosystems relative to existing levels of human activities when the two conflict.

Since there is no governmentwide requirement to maintain or restore the health of ecosystems as such, the practical starting point for ecosystem management will have to be to maintain or restore the minimum level of ecosystem health necessary to meet existing legal requirements.

As the understanding of ecosystems increases through the experience gained from ecosystem management initiatives, including the four pilot projects, needed changes to existing legislative requirements can be sought to better define and achieve the minimum required level of ecosystem integrity and functioning.

The administration has not specified the steps required to apply the principles of ecosystem management included in its fiscal year 1995 budget request. We identified certain practical steps that we believe need to be taken to implement the principles. In taking these steps, the Federal Government will have to make difficult public policy decisions about how it can best fulfill its stewardship responsibilities.

The first step would be to delineate on the basis of reasonable ecological and management criteria, the boundaries of the geographic areas to be managed as ecosystems. In general, fulfilling ecosystem management's potential to protect natural resources and sustain long-term natural resource commodity production and other uses requires that the geographic areas to be managed as ecosystems be large enough to capture the complexities and linkages among the components and processes of the ecosystems and allow for consideration of the effects on the ecosystems of activities originating across ownership boundaries. Hence, the areas to be managed as ecosystems generally will have to be larger than any one Federal land unit or ownership, will include private and other non-Federal land holdings, and may cross State boundaries.

Once a geographical area to be managed as an ecosystem has been delineated, its ecology needs to be understood on the basis of the best available data in order to determine how the ecosystem's integrity and functioning can be maintained or restored. Among the actions required to implement this step would be determining the minimum level of integrity and functioning needed to maintain or restore a healthy ecosystem.

After an understanding of an ecosystem's ecology has been gained, management choices must be made concerning the desired future ecological conditions, the types, levels, and mixes of activities that can be sustained while still achieving these conditions, and the distribution of these activities over time among the various land units within the ecosystem.

The extent to which ecosystems receive protection above the minimum levels necessary to maintain or restore their integrity and functioning will depend on public policy decisions involving trade-

offs among ecological and socioeconomic conditions and will likely vary by ecosystem.

The extent to which desired ecological conditions can be maintained or restored and long-term commodity production and use can be sustained will depend in large measure on the extent to which disparate private landowners and Government agencies can reach agreement on the desired conditions and the actions needed to achieve them. Not only will this agreement require unparalleled coordination among Federal agencies but it will also require extensive collaboration and consensus-building among Federal and non-Federal parties that emphasize technical assistance, market-based incentives, and voluntary cooperation, and recognize private property rights, and State and local jurisdictional authorities.

Finally, ecosystem management requires the flexibility to adapt on the basis of new information. This process requires continually researching, monitoring, and evaluating the ecological conditions of ecosystems, and, where necessary, modifying management on the basis of new information to better accommodate socioeconomic considerations while ensuring that minimum or desired ecological conditions are being achieved.

Our work has shown that the administration's initiatives to implement ecosystem management governmentwide face several significant barriers. These include noncomparable and insufficient data that hinder understanding of ecosystems, disparities in missions and planning requirements that hamper interagency coordination, incentives, authorities, interests, and limitations in the national land and natural resource use framework that constrain collaboration and consensus building between Federal and non-Federal parties.

It is likely that the governmentwide implementation of ecosystem management may ultimately require changes not only to the existing framework of laws governing Federal land management but also to other Federal authorities and programs that influence the use of natural resources and other related activities on non-Federal lands.

While ecosystem management should provide a basis for making more scientifically informed policy decisions and more accurately predicting their consequences, it cannot provide definitive answers to what will essentially always be public policy questions such as the importance of maintaining or restoring the health of ecosystems relative to shorter-term values and concerns and the types, level, mixes, and distribution of human activities over time among various Federal and non-Federal land units within an ecosystem.

Mr. Chairman, in our report we recommended the development of a strategy to implement ecosystem management that clarifies the policy goal for ecosystem management, translates the general principles in the administration's 1995 budget request into practical steps that clearly identify what must be done and which agencies and parties must be involved, and identifies barriers for implementing ecosystem management and options for overcoming them. The White House Office on Environmental Policy, the Department of the Interior, and the Department of Agriculture's Forest Service in their comments on our report, agreed with this recommendation.

We also recommended that progress in implementing this strategy in the pilot projects and other ecosystem management initiatives be collectively assessed and reported as part of the yearly budget and appropriations process.

In conclusion, Mr. Chairman, we recognize that compared with the existing Federal approach to land management, ecosystem management may require greater flexibility in planning, budgeting, authorizing, and appropriating funds, and in adapting management on the basis of new information. However, we believe that if ecosystem management implementation is to move forward, it must advance beyond unclear priorities and broad principles. Clear goals and practical steps for implementing ecosystem management need to be established and progress in implementing this approach needs to be regularly assessed and reported.

Mr. Chairman, as you and the other chairmen requested, we will continue to monitor the development and implementation of the administration's ecosystem management strategy and the efforts by the administration to carry out the steps needed to implement ecosystem management and identify barriers to ecosystem management and options for overcoming them. Also, as requested, we will evaluate the administration's related fiscal year 1996 plans and budgets. At your request, we will also examine issues related to ecosystem management on non-Federal lands that may constrain effective collaboration and consensus building with non-Federal parties.

That concludes our statement. We will be glad to respond to questions, that you or other members of the subcommittee may have.

[Prepared statement of Mr. Duffus follows:]

United States General Accounting Office

GAO

Testimony

Before the Subc. on Oversight and Investigations, Committee on Natural Resources; the Subc. on Environment and Natural Resources, Committee on Merchant Marine and Fisheries; and the Subc. on Specialty Crops and Natural Resources, Committee on Agriculture, House of Representatives

For Release on Delivery
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9:30 a.m., EDT
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ECOSYSTEM MANAGEMENT

Additional Actions Needed to Adequately Test a Promising Approach

Statement of James Duffus III, Director,
Natural Resources Management Issues,
Resources, Community, and Economic Development Division



GAO/T-RCED-94-308

85-042 O-95-2

Messrs. Chairmen and Members of the Subcommittees:

We are pleased to be here to discuss our report on a new, broader approach to managing the nation's lands and natural resources called "ecosystem management."¹ The ecosystem management approach recognizes that plant and animal communities are interdependent and interact with their physical environment (soil, water, and air) to form distinct ecological units called ecosystems that span federal and nonfederal lands. In response to your and Representative Dicks's requests, we identified (1) the status of federal initiatives to implement ecosystem management, (2) additional actions required to implement this approach, and (3) barriers to governmentwide implementation.

In summary, our work, which we generally limited to the four primary federal land management agencies,² showed that these agencies have initiated efforts to implement ecosystem management. In addition, the administration's fiscal year 1995 budget request includes \$700 million for ecosystem management initiatives. However, if this approach is to be effectively implemented, the policy goal for ecosystem management needs to be clarified and certain practical steps need to be taken that clearly identify what must be done and which agencies and parties must be involved. Finally, our work has shown that implementing ecosystem management governmentwide faces several significant barriers, including (1) noncomparable and insufficient data, (2) disparities in federal agencies' missions and planning requirements that hamper interagency coordination, and (3) incentives, authorities,

¹Ecosystem Management: Additional Actions Needed to Adequately Test a Promising Approach (GAO/RCED-94-111, Aug. 16, 1994).

²The four primary federal land management agencies are the National Park Service, the Bureau of Land Management, and the Fish and Wildlife Service within the Department of the Interior and the Forest Service within the Department of Agriculture. Together, these agencies manage about 30 percent of the nation's total surface area and about 97 percent of all federal lands.

interests, and limitations that constrain federal and nonfederal parties' efforts to work together effectively.

Before discussing these matters in more detail, I will provide some background information.

BACKGROUND

The four primary federal land management agencies, the numerous land units they manage, and the many laws governing their management form the current federal land management framework. This framework is part of a larger national land and natural resource use framework. This larger framework includes many federal and state agencies that have regulatory or tax authority or financial or technical assistance programs that can greatly influence the use of natural resources and other activities on private lands.

Ecosystem management recognizes that humans are a component of most ecosystems; thus, human activities and uses are integral to ecosystem management. Proponents of ecosystem management believe that coordinating human activities across large geographic areas would do more to maintain or restore the health of ecosystems than the current practice of managing legislatively or administratively established land units and individual natural resources. They also believe that this approach would better ensure the sustainable long-term use of natural resources, including the production of natural resource commodities such as timber and forage and other uses such as recreational activities. Hence, proponents believe that this approach would help to avoid or mitigate future ecological and economic conflicts by providing greater flexibility to coordinate activities over larger land areas.

STATUS OF FEDERAL INITIATIVES

Since the late 1980s, many federal agency officials, scientists, and natural resource policy analysts have advocated the adoption of ecosystem management to better address declining ecological conditions. At the local level, some federal agency field offices have entered into collaborative arrangements with both federal and nonfederal agencies, as well as with private landowners and representatives of other interests, to address problems or issues of mutual concern. In addition, in some instances, the agencies have entered into cooperative agreements with other federal agencies to address specific ecological concerns. And, over the past 2 years, all four of the primary federal land management agencies have independently announced that they are implementing or will implement an ecosystem approach to managing their lands and natural resources.

The movement toward ecosystem management is reflected in the administration's fiscal year 1995 budget request, which includes (1) \$610 million for the initial stage of a governmentwide effort to implement ecosystem management, including accelerated funding for three ecosystem management pilot projects, and (2) \$90 million for a fourth pilot project.³ The budget request also states that to implement ecosystem management, the administration is considering the following principles: (1) managing along ecological rather than political or administrative boundaries, (2) ensuring coordination among federal agencies and increased collaboration with state, local, and tribal governments; the public; and the Congress, (3) using monitoring, assessment, and the

³The four pilot projects are to restore (1) the old-growth forests of the Pacific Northwest, (2) the ecological health of south Florida, including the Everglades and Florida Bay, (3) the ecological health of the Anacostia River in Maryland and the District of Columbia, and (4) natural resources damaged by the March 1989 oil spill from the supertanker Exxon Valdez in Alaska's Prince William Sound.

best science available, and (4) considering all natural and human components and their interactions. In addition, both the Forest Service and the Bureau of Land Management have proposed reducing the number of separate budget expenditure categories for different resource activities, such as timber and wildlife, in order to provide the increased flexibility that they believe they need to fund multiple purpose activities of ecosystem management.

IMPLEMENTATION OF ECOSYSTEM MANAGEMENT

The initial stage of a governmentwide effort to implement ecosystem management will require clarifying the policy goal for ecosystem management and taking certain practical steps to apply the principles being considered by the administration.

Clarifying the Policy Goal

Currently, ecosystem management has no clear policy goal, and the term has come to represent different things to different people. While there is no governmentwide legal requirement to maintain or restore the health of ecosystems as such, other laws do require federal agencies to give priority to (1) sustaining multiple uses on federal lands and (2) providing minimum levels of protection to individual resources. If meeting these mandates depends on the health of ecosystems, then priority will have to be given to maintaining or restoring a minimum level of ecosystem integrity and functioning over production and other uses of resources at nonsustainable levels. The administration has not, however, clearly identified the priority to be given to the health of ecosystems relative to existing levels of human activities when the two conflict.

Since there is no governmentwide requirement to maintain or restore the health of ecosystems as such, the practical starting point for ecosystem management will have to be to maintain or

restore the minimum level of ecosystem health necessary to meet existing legal requirements. As the understanding of ecosystems increases through the experience gained from ecosystem management initiatives, including the four pilot projects, needed changes to existing legislative requirements can be sought to better define and achieve the minimum required level of ecosystem integrity and functioning.

Establishing Practical Steps

The administration has not specified the steps required to apply the principles of ecosystem management included in its fiscal year 1995 budget request. We identified certain practical steps that we believe need to be taken to implement the principles being considered by the administration. In taking these steps, the federal government will have to make difficult public policy decisions about how it can best fulfill its stewardship responsibilities.

The first step would be to delineate, on the basis of reasonable ecological and management criteria, the boundaries of the geographic areas to be managed as ecosystems. In general, fulfilling ecosystem management's potential to protect natural resources and sustain long-term natural resource commodity production and other uses requires that the geographic areas to be managed as ecosystems be large enough to (1) capture the complexities and linkages among the components and processes of the ecosystems and (2) allow for consideration of the effects on the ecosystems of activities originating across ownership boundaries. Hence, the areas to be managed as ecosystems generally will have to be larger than any one federal land unit or ownership, will include private and other nonfederal landholdings, and may cross state boundaries.

Once a geographical area to be managed as an ecosystem has been delineated, its ecology needs to be understood on the basis of the best available data in order to determine how the ecosystem's integrity and functioning can be maintained or restored. Among the actions required to implement this step would be determining the minimum level of integrity and functioning needed to maintain or restore a healthy ecosystem.

After an understanding of an ecosystem's ecology has been gained, management choices must be made concerning (1) the desired future ecological conditions, (2) the types, levels, and mixes of activities that can be sustained while still achieving these conditions, and (3) the distribution of these activities over time among the various land units within the ecosystem. The extent to which ecosystems receive protection above the minimum levels necessary to maintain or restore their integrity and functioning will depend on public policy decisions involving trade-offs among ecological and socioeconomic considerations and will likely vary by ecosystem.

The extent to which desired ecological conditions can be maintained or restored and long-term commodity production and use can be sustained will depend in large measure on the extent to which disparate private landowners and government agencies can reach agreement on the desired conditions and the actions needed to achieve them. Not only will this agreement require unparalleled coordination among federal agencies, but it will also require extensive collaboration and consensus-building among federal and nonfederal parties that emphasize technical assistance, market-based incentives, and voluntary cooperation and recognize private property rights and state and local jurisdictional authorities.

Finally, ecosystem management requires the flexibility to adapt on the basis of new information. This process requires continually researching, monitoring, and evaluating the ecological

conditions of ecosystems and, where necessary, modifying management on the basis of new information to better accommodate socioeconomic considerations while ensuring that minimum or desired ecological conditions are being achieved.

BARRIERS TO IMPLEMENTATION

Our work has shown that the administration's initiatives to implement ecosystem management governmentwide face several significant barriers. These include (1) noncomparable and insufficient data that hinder understanding of ecosystems, (2) disparities in missions and planning requirements that hamper interagency coordination, and (3) incentives, authorities, interests, and limitations in the national land and natural resource use framework that constrain collaboration and consensus-building between federal and nonfederal parties. It is likely that the governmentwide implementation of ecosystem management may ultimately require changes not only to the existing framework of laws governing federal land management but also to other federal authorities and programs that influence the use of natural resources and other related activities on nonfederal lands. While ecosystem management should provide a basis for making more scientifically informed policy decisions and more accurately predicting their consequences, it cannot provide definitive answers to what will essentially always be public policy questions such as (1) the importance of maintaining or restoring the health of ecosystems relative to shorter-term values and concerns and (2) the types, levels, mixes, and distribution of human activities over time among various federal and nonfederal land units within an ecosystem.

Messrs. Chairmen, in our report we recommended the development of a strategy to implement ecosystem management that (1) clarifies the policy goal for ecosystem management, (2) translates the general principles in the administration's fiscal year 1995 budget

into practical steps that clearly identify what must be done and which agencies and parties must be involved, and (3) identifies barriers to implementing ecosystem management and options for overcoming them. The White House Office on Environmental Policy,⁴ the Department of the Interior, and the Department of Agriculture's Forest Service, in their comments on our report, agreed with this recommendation. We also recommend that progress in implementing this strategy in the pilot projects and other ecosystem management initiatives be collectively assessed and reported as part of the yearly budget and appropriations process.

In conclusion, Messrs. Chairmen, we recognize that, compared with the existing federal approach to land management, ecosystem management may require greater flexibility in planning; in budgeting, authorizing, and appropriating funds; and in adapting management on the basis of new information. However, we believe that if ecosystem management implementation is to move forward, it must advance beyond unclear priorities and broad principles. Clear goals and practical steps for implementing ecosystem management need to be established and progress in implementing this approach needs to be regularly assessed and reported.

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Messrs. Chairmen, as you requested, we will continue to monitor the development and implementation of the administration's ecosystem management strategy and the efforts by the administration to (1) carry out the steps needed to implement ecosystem management and (2) identify barriers to ecosystem management and options for overcoming them. Also, as requested, we will evaluate the administration's related fiscal year 1996 plans and budgets. At

⁴The White House Office on Environmental Policy established and chairs an Interagency Ecosystem Management Task Force to implement an ecosystem approach to environmental management.

your request, we will also examine issues related to ecosystem management on nonfederal lands that may constrain effective collaboration and consensus-building with nonfederal parties.

This concludes our statement. We will be glad to answer any questions that you or other Members of the Subcommittees may have.

(140524)

Mr. MILLER. Thank you.

We have been joined by Chairman Rose and Chairman Hansen.

If either of you have opening statements, I would be glad to yield to you, or if you want to put them in the record, whichever you would like to do.

STATEMENT OF HON. JAMES V. HANSEN

Mr. HANSEN. Mr. Chairman, I would ask unanimous consent that mine be included in the record.

Mr. MILLER. Without objection, so ordered.

[Prepared statement of Mr. Hansen follows:]

**OPENING STATEMENT
OF
THE HONORABLE JAMES V. HANSEN
ECOSYSTEM MANAGEMENT
SEPTEMBER 20, 1994**

Mr. Chairman, I fully concur with your decision to hold a congressional hearing on "ecosystem management"; a term that is now in common usage in the environmentalist vernacular and particularly since the Administration is proposing to spend \$610 million for the undefined purpose of "ecosystem management" in fiscal year 1995. Unfortunately, just like the gag rules passed on an ever more frequent basis by the Democratic House leadership, the limitation on witnesses at our hearing today precludes any meaningful analysis and discussion of the topic.

We will hear today about a GAO report prepared at an unknown cost to the taxpayers which purports to explore this issue. I expect that this report, like other GAO reports on grazing, mining, and other resource topics did not have the benefit of preparation by any experts in land management, biological sciences or other disciplines necessary to objectively analyze this topic. We may also hear about a so-called "Majority Staff Report" on this same subject. That report was prepared at a cost of thousands of dollars of limited Committee funds, is based largely on the opinions of a handful of persons on this topic from the farthest left perspective.

Both of these reports reach the same conclusions; (1) that existing laws do not adequately protect natural resources, (2) that the condition of natural resources is steadily declining and (3) that because of the decline in resource conditions, fundamental changes in land management laws and policies are required. These conclusions simply do not square with the facts.

What are the facts? In the last 30 years Congress has permanently set aside nearly 100 million acres of Federal land as wilderness. We have established 65 million acres of new wildlife refuges and 55 million acres of new national parks. Nearly 3,000 miles of river have been protected as wild and scenic. We have placed a moratorium on offshore

drilling along 75% of the coastline of this country. There are now more elk, antelope, turkey, bighorn sheep and many other game animals than existed at any time in the last 100 years. In fact, there are as many white-tailed deer today as when the Pilgrims landed on Plymouth Rock. The Federal range is now in better condition than any time in the last 100 years. There are more forested acres East of the Mississippi River than at any time in the last 150 years. Streams which once burned are now parks and clean enough to swim and fish in. Air pollution has been cleaned up around the country. We have spent billions cleaning up toxic waste sites and banned some very harmful chemicals, such as DDT.

Is every square inch of this country protected or pristine? Not hardly. Is there more we can do? Absolutely. But I cannot sit by and allow this Committee to launch forward with the concept that a massive expansion in Federal land use control is the salvation of the natural resources of this country.

There is one area of the GAO report that I do agree with, which is that the Federal government has not done a very good job of resource stewardship in many places. We have parks where deer and elk are far in excess of the carrying capacity and are ruining the range, we have catastrophic fuel loadings on our western forests waiting to ignite, as they did this summer. With a record like this, the

last thing we need is to expand the control of the Federal government.

The Interior IG recently reported that the condition of lands in the national wildlife refuge system was so bad that the best strategy for protecting lands entrusted to the Federal government was a moratorium of further land acquisition by the Fish and Wildlife Service.

Part of the obstacle to effective Federal land stewardship lies in the political interference which precludes the Federal land management agencies from carrying out their responsibilities in a professional manner and part of it lies with the mandates from Congress to

continually expand the Federal domain. I agree with the Interior IG that putting the brakes on endless expansion of the Federal domain is a good first step, but more is needed. We need to move toward less Federal intervention and regulation of non-Federal lands, as well as less Federal land ownership over time.

Ecosystem management, the latest environmentalist code word for expanded Federal land use control, is the wrong solution for the conservation of this country's natural resources.

Mr. MILLER. Thank you very much, Mr. Duffus, for your report.

I want at the outset to commend you and your team for this report. I think no matter what individual Members of Congress' views might be on this approach, I think you have clearly delineated both the problems, the barriers and some of the policy considerations that should be undertaken if we are going to have a successful ecosystem approach to the management of these lands. Specifically, I think this report makes it very clear that while there is a very strong embrace of the ecosystem management approach by the administration, as with any major policy decisions, you are kind of in the position of coming in in the middle of the movie. You lay ecosystem management over the top of 15, 20, or 30 years of laws that were designed for very specific purposes and safeguards and directions and constituencies and political realities and unrealities, whatever it may be, and now you decide you want a broader approach. It is a little bit like welfare reform or education reform. You find out that the underlying body of law is almost inconsistent from the get-go with that approach. I think you outline that in a number of cases rather well in this report with the fact that at a minimum, these four agencies grew up with different missions, different purposes, different constituencies, and different political alliances over the past 50 years, and now we are deciding they are all going to play to one tune, and it just doesn't quite work out that way.

I'm thinking of the events of the last couple of days. People just marveled at the fact that Army helicopters were on a naval aircraft carrier—the first time in history that the Army had taken off from a Navy ship. Of course, the Marines didn't marvel at the idea that the Army was on that aircraft carrier, but the change can be brought about.

The other one that I think is very important—and this committee had a chance to witness this firsthand when we visited Rocky Mountain National Park, a park adjacent to a highly urbanized area and surrounded by private property to a great extent. The management of these Federal assets and of these ecosystems is going to be highly dependent upon cooperative arrangements with private property owners. You simply cannot achieve the objectives of the protection, whether it is the park or the riparian system or what-have-you, without that cooperation.

In another time and place, we would have tried to purchase that cooperation. We would have tried to simply buy that land mass, put it into the Federal reservation and therefore get it under one management regime. But we are not going to have the ability to do that. It is becoming more and more limited all of the time because of budget constraints and concerns. Again, there is a whole body of law that your report suggests has an impact on our ability to arrive at these cooperative arrangements to provide incentives to private landowners, which is not under the jurisdiction of any of the four committees here in terms of tax law and considerations in regard to those owners. So I think the report has done an outstanding job of delineating the problem.

On the bottom of page 56 of the report you talk about: "Furthermore, most agency officials agree that implementing ecosystem

management will likely require extensive conforming amendments or comprehensive revisions to long-range plans."

The time frames here get rather interesting in the sense that we are looking for more and more cooperation and yet plans are in place or about to be in place that come from a different school of thought and management which was sort of static five-year, ten-year, and longer-term plans. How do we navigate those waters in terms of arriving at the interagency cooperation?

Mr. DUFFUS. The planning requirements of the land managing agencies and other federal agencies do have an impact on how well you can implement and will be able to implement ecosystem management government wide. In many cases it takes several years to complete those plans, and, as you indicated, those plans reflect different missions, of the agencies. So I am not quite sure how we navigate it. I know we believe it is a problem. There is no question it is going to have an impact on how successful the government is going to be in implementing the approach.

Mr. MILLER. You talk about the need to first go out and delineate what you think those ecosystems might be. Some of those have been highlighted because we have already undertaken activities—the Everglades, Yellowstone, the Northwest, and other areas where there seems to be some agreement that this lends itself to an ecosystem approach to solving some of the immediate problems. But obviously just the decision in and of itself to classify an area that would be included in an ecosystem management is controversial. Then after you do that, you have got to bring together this kind of cooperative management arrangement among all the different levels of government and the private landholders. As you look at this system currently, is that a realistic expectation?

Mr. DUFFUS. I'll ask Mr. Cotton to respond to that.

Mr. COTTON. That is something we are looking to see played out in the pilot tests. We are interested to see where those pilot tests are in making these hard decisions about the minimum level of integrity and functioning for these ecosystems that everybody agrees to, and then looking to what human activities you can accommodate while still maintaining those conditions, and then distributing those activities amongst all the federal and nonfederal parties that are within the boundaries of either the watershed or whatever area that defines the issue.

Right now, it is unproven. Where we, I think, as well as the administration, are going out to find out where they stand in implementing ecosystem management is in the pilot projects, and then to find out if you can work within the existing framework of plans, within the existing framework of budgets, or if indeed you need a new plan and a new budget for an ecosystem.

Mr. DUFFUS. I just might add that, as the report mentions, in these four pilot projects, at least in the majority of them, the issues in the areas are pretty intractable. The sides are pretty well polarized, and that just adds another dimension and I think, another problem. But you need to collect information on it and see how doable it is.

Mr. MILLER. Let me at this moment yield to Chairman Rose, who has another commitment, for a question.

Mr. ROSE. Let me ask you if you all agree with this. Ecosystem management is based on the premise that decisions should be based on the best scientific data available. To date the Government's monitoring for ecosystem health has been lacking. Our view has been more specific or incident specific, like the spotted owl, salmon, oil spills, point source pollution, and has not attempted to look at the big picture, and monitoring is time consuming.

Second, another premise of ecosystem management is flexibility and the ability to quickly change course on management decisions if and when science bears out the need for change. Currently, many of our environmental laws and regulations—NEPA, Federal Advisory Committee Act, wetlands regs, et cetera—have the effect of slowing down processes in order to carefully evaluate environmental impacts.

Now I'm moving back. You know, I think Chairman Miller has hit on a very important part: How you are going to coordinate things when you have got all these long-range plans about ready to be laid on. But just for me, for one second, back up and comment on the current quality of the science that is necessary to monitor these changes, and then, do we have the ability to quickly change course on management decisions if and when the science bears out the need for change?

My assumption is, we probably don't have enough science and we probably don't have enough flexibility, and, you know, instead of just talking about how you are going to relook at these long-range plans and see if they can all work together, it is going to have to be a very massive change to put this in place.

Mr. DUFFUS. Yes, we would agree with that.

As we indicate in our report, there is a lack of data. The National Biological Survey has been established in this administration and I think it will be looked to as an agency to get a better understanding of the science and of the information.

Mr. COTTON. Chairman Rose, could I add to that? It is not just that everybody is focusing on the scientific data, but at some point in time there are going to have to have some judgment calls, some policy decisions made, and to make those decisions you are not going to only have to have good scientific data but you are going to have to have good socioeconomic data as well, and both of those data bodies are missing or incomplete.

Mr. MILLER. One final question, and then I will yield to my colleagues.

One of my concerns as I read your report—and I hope we can have a second round of questioning here—and, again, maybe I'm wrong, and please correct me if that is the case, but some of this is in the eye of the beholder. It seems to me when you talk about ecosystem management—and this goes to what Mr. Cotton just said—you are contemplating some trade-offs in the management of the resource in its totality that individual—let's just stick with Federal—individual Federal laws may not allow you to make.

In the area I come from, California, we may be able to arrive at water releases that hold the San Francisco Bay Delta habitat in its totality in good shape—pretty good shape—but we may not be able to have water releases that protect each and every species in that habitat for a whole host of reasons and meet the other competing

demands—the human element—for the rest of our State and even our region. Ecosystem management would suggest that somehow we can manage consistently with competing needs and requirements. To what degree, as you look at this, are those goals going to be thwarted because you have very specific laws within these four agencies and/or separate laws?

Mr. COTTON. Ecosystem management plays to, I guess, the 80 percent of the population that says you want to do both—you want to maintain the resource and yet you want to maintain some level of commodity production, some level of uses of the land. It is not tailored to those who are saying rest the west or tailored to those who are saying, you know, let's go to short-term uses. So in trying to strike that balance, what it hopes to do is, by taking this broader approach, allow trade-offs that would not otherwise be allowed under things such as the Endangered Species Act. It may be that you can say for this individual project or for this given stream flow or whatever we have a trade-off whereby we can accomplish both. You may not satisfy everybody but you will essentially accomplish the dual objectives of sustaining the resource while allowing some level of activity on it that would not otherwise be permitted.

Mr. MILLER. Under current regimes, on that theory, if a governor wanted to change their welfare system, that governor would come to the Federal Government and ask for waivers so they can cut across some of the categorical program requirements, specifications, what-have-you, to see whether they can redesign a better welfare program. This is absent welfare reform. But under the current system that is what you would do. You would come to the Government, you would come to the Secretary at HHS, you would say here's our plan to deal with this case load, here's what we would like to be able to do, we would like to move money here, job training, and now we need your stamp of approval. You can't do that in resource management, can you?

Mr. COTTON. No. The whole system, the whole budgeting system, the whole planning system, the whole appropriations system runs counter to ecosystem management, and what they would have to do is decide an area that they want to manage as an ecosystem, and then each of the agencies in that area would go in, do their separate appropriations process, ask for monies. They may or may not get it. If one agency does get it and the other agency doesn't and the whole agreement was based upon both receiving funding, it could very well fall apart.

Mr. MILLER. I guess if I didn't like this approach I'd do nothing. But that really worries me in terms of the kinds of time lines and our ability to respond to the crisis—but crises exist in some regions, and on our ability to anticipate and to change some courses to avert what the Secretary has called train wrecks and crises, what-have-you, that ecosystem management could start to look a lot like Gulliver. I mean it is strapped to the beach here by a lot of very specific detailed laws with the best of intentions but may in fact be absolutely incompatible with resolving the kind of broader management approaches that are envisioned here. I mean I think that is what your report says.

Mr. DUFFUS. That is true.

Mr. MILLER. That is our determination, and the administration will testify after you, but I think that is an accurate road map that you have put forth here for the Congress.

Now whether or not we end up having to have legislative waivers or redeterminations of these laws or whether we ever get to endangered species and we make room for ecosystem management, those are serious, serious policy considerations, but I'm not sure you can have success in ecosystem management until some of those policy considerations are consciously made by the Congress.

Mr. COTTON. Mr. Chairman, one other point that hopefully came across in the report is that this has been from the very beginning and continues to be, a bottom-up approach that actually started in the prior administration and has gained momentum in the current administration. I don't think you can establish national policy until you have built consensus through these pilot projects and other initiatives as to what needs to be done and what needs to be changed and let the administration come to you, not you go to the administration.

Mr. MILLER. Thank you.

Mrs. UNSOELD.

Mrs. UNSOELD. I'm not sure I understood that last statement. Why do you think it is going to have to all come from the administration?

Mr. COTTON. Because I think right now with the limited amount of information that is out there as far as how to take these principles, translate them into actions, and actually bring about the goals that ecosystem management hopes to accomplish, the information isn't there to say what needs to be changed. So you don't really want to put the cart before the horse, you want to let them see what can work within the existing framework of laws.

Mrs. UNSOELD. True, but don't you have a built-in disincentive on the part of any administration who is charged with implementing the laws that are in place, and you have different agencies with that responsibility. It is going to be very difficult for them to initiate a total change that requires perhaps giving up some individual agency's authority in order to have a more cooperative and single management plan and objective.

Mr. COTTON. And that could be something that comes out of these pilot tests and these initiatives. As we point out, that is a potential roadblock, the disparate missions of these different agencies, and everything may ultimately end up with them concluding that they can only go so far.

Mrs. UNSOELD. It has seemed to me as an observer in the Pacific Northwest that the Endangered Species Act, however powerful a tool it was, represents a failure of the other laws, processes, of functioning properly because you shouldn't ever reach that crisis stage, and that since we have on both the forests and the fish, as we put together—and I want to commend the administration for what they have done in putting together the forest plan and the ecosystem approach attempt there, and now we are integrating the fish recovery—it would seem to me that that is almost a microcosm of the difficulties and that out of that experimentation will come the road map for what changes need to be made in the underlying laws that did not prevent us from getting into the crisis.

But let me ask you, isn't FACA another impediment?

Mr. COTTON. It seems to be showing up everywhere, yes.

Mrs. UNSOELD. Would you mind elaborating on that, because there is a great deal of difficulty to get it discussed out in the open, because I think it is considered a political quagmire, but I think we should examine it and roll it around.

Mr. COTTON. I think actually that would be a question better asked of Mr. Lyons.

Mrs. UNSOELD. I intend to do that too, but let's hear your views.

Mr. COTTON. Our information on that law is not as firsthand as his, and that is one of the things that we are following up on for the three committee chairmen. We know it has been identified as a problem in the Pacific Northwest and elsewhere. The question is do you overreact to it or do you work with it, or can you work within it, and right now we don't know. We would like to go out and take a look at it.

Mr. JOY. Representative Unsoeld, if I could just add one thing to that because I think that situation speaks the same as the Endangered Species Act question. That it is less an issue of the administration versus Congress, per se, than it is the kinds of information that will come through. The administration's process must be done before even the administration suggests legislation. The real concern, I think, is creating fixes without having bottom-up information that clearly identifies precisely what the problem is. And that is the case in either that or the planning side.

Mrs. UNSOELD. I think it is our responsibility, however, to create an atmosphere where the administration will be willing to bring those problems to the public.

Mr. JOY. And that is what I think we have identified in our report; that is the key task that the administration must do—to very specifically identify and support with evidence what exactly is the problem in existing law, and that is really a major part of the agenda.

Mrs. UNSOELD. I appreciate that. Thank you.

Mr. MILLER. Thank you.

Mr. Gilchrest.

Mr. GILCREST. Thank you, Mr. Chairman.

Just a quick comment. It seems to me that through billions of years of evolution, life on Earth has grown to be interconnected in very specific ways through various ecosystems that are themselves interconnected. So it would seem to me that we must not only understand why it is essential to perpetuate evolution in order to ensure the quality of life as we know it, which is to sustain all life.

So it seems to me regardless of all of the complexities of trying to get these agencies to work together, it is, I think, looking a hundred years in the future, which is not that far off in my opinion. We are or ought to be about understanding how we can begin the process to put in place an ecosystem management approach that will work, and you mention a number of things that provide flexibility. The National Biological Survey can at least be a part of this to give us the information that is necessary to understand the biology that is present, and the chairman was talking about sometimes when you release—and I'm not sure I understand all of the facts about releasing water in your particular district, but maybe a spe-

cies is going to become extinct as a result of the socioeconomic factors that reside there, but maybe that particular species is not all that important to begin with, if we understand the whole ecosystem approach.

So I think this is something that is important enough for us at this stage of the game to begin working on.

But I have just a couple of quick questions, and I know these probably can't be answered because we are in the very early, preliminary stages of trying to understand how this whole thing can be implemented.

If we do have an ecosystem management approach, and especially if we are considering coordinating human activities across not only county lines and State lines and Federal land and private property—which is essential, I think, to have a program that is going to actually be a real program—how do you envision then in an ecosystem approach, working with the Federal Government, the different agencies in the Federal Government, the State Government, local government, as far as what is going to then be necessary? You are going to have to manage or plan land use: Where is the open space going to be? Where is the commercial area, the industrial area, the residential area? All of these things, it seems to me, are going to take an extraordinary effort to not only create the system that has the mechanics to work but then make sure a local planning commission in Oshkosh, Wisconsin or Chestertown, Maryland, where I'm from, has the resources and the knowledge and the information to make informed decisions on the local level so we just don't turn the whole thing over to the Federal Government.

I apologize for that broad statement.

Mr. DUFFUS. I would agree with what you said. I don't see anything in what you said that would cause us any problems.

It is going to be difficult. There is no question about it. We think it starts, though, with a commitment or an understanding on the part of that local council or that local community to know that the actions they are going to take are going to result in something to their benefit and to others. So the consensus building we talked about, the voluntary cooperation and incentives or technical assistance, whatever it takes, I think is the beginning to get buy-in to this whole process. If they don't buy in at the outset it is going to be exceedingly difficult, if not impossible, to convince them later on when the government makes the decision that this is in their best interest. I think it is a big task to assure that they have the information that they are going to need to make the right decisions.

Mr. GILCREST. Like in a lot of other things, I think that is really essential and key to a successful broad program with this magnitude.

There are four pilot projects in this.

Mr. DUFFUS. That is correct.

Mr. GILCREST. I would like to talk to somebody in the near future about, since we are looking at an ecosystem approach and trying to coordinate, I guess, these four pilot projects, all of the various entities that are involved—private landowners, local governments, and so on. Have you given any thought to the Chesapeake Bay program which to a degree coordinates Federal involvement,

State involvement, local involvement, various agencies, private landowners, and so on? Have you given any thought to the Chesapeake Bay program and the Chesapeake Bay watershed?

Mr. DUFFUS. Well, these aren't our pilot projects, they are the administration's projects, and that question would probably be better asked of the administration witnesses. They have identified three in addition to the four that we mention in our report that they are currently going to do some more work in—the Southern Appalachia, the coast of Louisiana, and the Great Lakes—but the Chesapeake Bay wasn't one of them. I don't have an answer as to why it wasn't selected.

Mr. GILCHREST. One last quick question. In the report and in your statement you make a comment about coordinating human activities across large geographic areas. Could you elaborate on that statement?

Mr. DUFFUS. Well, what we are saying is that ecosystems don't know boundaries. In other words, they are not bound by the legislative or administrative boundaries, and so it is a recognition, I believe, that activities on private and federal lands influence the health and integrity of ecosystems. In order to maintain or restore the health of an ecosystem you have to consider activities that occur elsewhere and the human activities that occur, of course, on those lands that may have some impact on the health of the ecosystem.

Mr. GILCHREST. And I understand that concept. I think early on something has to be said to allay some fears that the Federal Government is going to take over all planning commissions and all local communities as far as land use is concerned.

Mr. DOMENICK. If I might add to that, we are not envisioning that there is going to be this room and all the players are going to be in the room and we are going to decide on all the activities that are going to take place in this ecosystem. I think what we are starting from in ecosystem management, is getting managers of land to raise their perspective beyond the land unit boundaries that confine their area of responsibility and to look to this larger ecological system and to try and understand it and how it is affected by the various things that are happening within the ecosystem. Once you understand that and you understand how the functioning and the health and the integrity of the ecosystem is being impacted by various activities, then you are in a position to try and understand what kind of actions might be necessary to mitigate that adverse impact and move you in the direction that you want to go. At that point in time, once you understand this, then it is working with the other players in the ecosystem to try and get everybody moving in the direction that it needs to go to help bring or prevent the adverse impact that is being caused.

So it is more of an understanding of what is happening and then trying to work out the actions in a mutually beneficial way to try and accomplish the desired result.

Mr. GILCHREST. Thank you.

Thank you, Mr. Chairman.

Mr. MILLER. Mr. Dooley.

Mr. DOOLEY. Thank you, Mr. Chairman.

I thank all of you for your testimony.

In my review of it, I had some questions on the recommendations, and they relate to the comments of Mr. Miller in that you make the statement, to clarify a policy goal for ecosystem management that specifies that priority be given to maintain and restore then levels of ecosystem integrity and functioning. I guess the concern I have is that we do have multiple laws and regulations that are currently in place that are being utilized in part to achieve a minimum level, be they ESA, be they Clean Water Act, be they going through the NEPA process.

My concern is, why was there not a recommendation that if you are going to go to an ecosystem management approach, that the agencies that are vested with the responsibility of administering these laws would be developing a plan to work together and integrate their operations and their applications under those specific regulations in order to achieve the broader purpose that other Members have talked of, of maintaining the ecosystem health?

Mr. COTTON. In fact, in our report, Mr. Dooley, we say that's the starting point. When you are determining the minimum level of ecosystem health, the minimum level of integrity and functioning on which sustaining the productivity and production and preserving the resource depend, then you start with the existing substantive laws like the Endangered Species Act and existing procedural laws like NEPA. That would give you your floor. As you move along, you may see, though, that you want to make changes to one or more of those laws to afford the opportunity to better address—

Mr. DOOLEY. I guess that doesn't quite get to the concern I have, and we will use the San Francisco Bay delta as an example, that you have existing environmental laws that are working counter to one another, and that if you are prescribing that they maintain the floor, it is not getting at the real problem of a coordinated approach to providing for the environment of the San Francisco Bay delta.

I mean even within the ESA we might be taking measures to protect the winter run chinook salmon and also perhaps the delta smelt or striped bass population. Striped bass feed on winter run chinook salmon. If you improve their habitat you would be working counter to preservation of winter run chinook salmon, yet we have mandates that can be enforced through legal actions and recourse that make that difficult to achieve, and it has to go beyond administering those as the floor, it has to basically have the administration, if they are going to develop an ecosystem policy that we are at times going to see that it is imperative that we supersede some of these laws, and that the Federal Government acknowledges that as a policy it is going to be important in order to really get the consensus that is needed to move forward an ecosystem approach.

Mr. DUFFUS. I don't think our report is inconsistent with that. Prescribing the floor as you said, means that at a minimum there needs to be a clear goal as to whether or not to meet the existing legislative requirements of protecting the resource or to sustaining the use of the resource. To the extent that doing so depends on a healthy ecosystem, then that is your starting point. You may end up with changes, but the starting point, as we see it, is the existing framework of laws.

Mr. DOOLEY. I guess my only concern is that I would have been more comfortable in the recommendations, and it is not because they weren't implied maybe, but that there would have been an acknowledgment that there are some present inconsistencies in our regulations that could preclude the administration in the adoption of an ecosystem approach from being successful, and that before we can move forward with this policy we are going to have to publicly acknowledge that.

You know, one of the other recommendations that was fairly specific was dealing with the delineation of areas that encompass an ecosystem. Well, obviously, as Mr. Gilchrest talks, sometimes this might encompass local government lands, State lands, or even private property.

I can tell you, I'm having a hard time convincing a lot of my constituents that they ought to adopt and embrace an ecosystem management approach that is basically saying that we are going to maintain as the floor for this ecosystem all the present environmental regulations which are being used independently to cause a great deal of uncertainty in the utilization of resources, that if you are going to move forward with the delineation of ecosystems without any acknowledgment in a policy perspective that there is going to be this coordination, and that is the real concern that a lot of folks are going to have in terms of embracing this as a policy.

Mr. COTTON. We point out in the report that the existing framework of laws and agencies and land units will probably present a major barrier. We also point out that policy can't supersede law, so you have to work within the existing framework that essentially the Congress has given you and see what can work in that framework or what needs to be changed. We would look to the administration in the delta or elsewhere to come forward and say right now we have two laws that conflict with each other or right now we have a law that provides a disincentive for a certain party to move toward ecosystem management and we think we need to have a change.

Mr. DOOLEY. So am I to understand by that response that you didn't feel that it was in your charge in the development of this report to identify and to acknowledge those conflicts?

Mr. COTTON. I think we did identify it as a potential major barrier.

Mr. DUFFUS. Not the specific conflicts.

Mr. COTTON. But not specific.

Mr. JOY. Mr. Dooley, if I might add, maybe the distinction here was you used the word "floor," and we really didn't mean that everything has to stay in place as it is, but rather as the starting point. What we recommended specifically was that the administration, as a part of its process, identify exactly every one of those and propose specific changes in legislation and in regulations and in institutional practices to overcome them. The distinction there being, whether it is a waiver approach or whatever, is that it has to be identified specifically by them. But we do recommend that that is exactly what they do.

Mr. DOOLEY. Well, I appreciate that response because that was precisely my concern, and I didn't see in the recommendations, in

the summary of those, really see that clarified to the extent that you have just done, Mr. Joy. So thank you.

Thank you, Mr. Chairman.

Mr. MILLER. Thank you.

I think existing law almost requires that each and every acre of land be as intensively managed as can possibly be, and that is inconsistent with the notion of ecosystem management. I think that that is kind of the basic rub here.

Mr. Taylor.

Mr. TAYLOR of North Carolina. Thank you, Mr. Chairman.

I'll move in a little different direction rather than the current direction.

Mr. MILLER. Mr. Taylor.

Mr. TAYLOR of North Carolina. Yes, sir.

Mr. MILLER. I made a mistake here. I am going to take Members in the order in which they came, and Mr. Hansen was here before you.

Mr. TAYLOR of North Carolina. I would yield to the gentleman from Utah.

Mr. HANSEN. Thank you. I didn't mean to intrude, but I have to run for another meeting.

Thank you, Mr. Chairman.

I have been sitting here listening to this predicated on ecosystems, and it reminds me of asking the question all the way back in 1981 to Jim Watt of what an ecosystem is, to Dale Robertson, Max Peterson, Manuel Lujan, and I'm still waiting for the definition. The only definition we even come close to is one by Secretary Babbitt when he was talking about the National Biological Survey. He said in his response, "It's in the eye of the beholder." So now this whole discussion, sitting here and talking about how we are going to manage an ecosystem, and yet we don't even have it defined yet.

Mr. Duffus, you scared me to death when you said it knows no boundary. That really sounds like Federal land use planning, if I may say so, which is a term none of us like to say around here because it is a sacred term, but it is scary to bring it up. Is there somewhere in this report you have got that someone defines it? And now apparently we have got four or five definitions. BLM has a definition, Forest Service has a definition—if they have one—and no one has defined it.

So it reminds me of the time when Mr. Seiberling was chairman of the public lands subcommittee and he put a bill in called buffer zones, and it had two things in it that no one could find the definition of. One was "adjacent to a park," that there was no definition of "adjacent to," so when I was debating him on public policy in Salt Lake City, he said if you are standing in Bryce Canyon and you can see as far as Las Vegas, that is "adjacent to." Wow, that is a long way.

The second one was "significant damage," and no one defined "significant damage." If we are really serious about this, just like any contract has a definition of terms so we can all turn to the back of it and find out what that is, it would sure be nice if someone would define it before we go off half cocked and start passing laws on things we don't even know what we are discussing.

Does someone want to give me a definition? I'm willing, Mr. Chairman—anybody in the room, anybody in the United States.

Mr. MILLER. Well, you would probably get maybe a hundred different definitions.

Mr. HANSEN. Okay. Sorry. We will just ask the panel, Mr. Chairman.

Do you define it anywhere, Mr. Duffus?

Mr. DUFFUS. Mr. Cotton would like to respond.

Mr. COTTON. Yes. Mr. Hansen, I think you are actually asking for two definitions. I think you are asking for a definition of what is an ecosystem, and then another definition of what is ecosystem management. And you are absolutely right, one response to what is an ecosystem, since they are hierarchical and are at different scales, is that anything can be an ecosystem or a part of an ecosystem or multiple ecosystems, and one of the things we tried to address in this report is at what level or what scale do you impose management, and then it becomes ecosystem management that allows you to do things differently than what you are doing now, and it kind of gets into a breadth issue, a broader area than what is now defined by federal land units or by state boundaries or by administrative boundaries or whatever.

Mr. HANSEN. I think you have clearly talked about the management angle, and I appreciate that. You have done a good job on that. I'm still trying to figure out what we are going to manage. That is the thing that bothers me. We have put something in place, and we don't really know how to run the war, so to speak.

As I have looked through your report—did you bring in any experts like land managers, wildlife people, forestry people—did they all have a hand in writing this, or is this just strictly GAO?

Mr. DUFFUS. No experts had a hand in writing the report, it was GAO.

Mr. HANSEN. No experts had a hand in it but just GAO. In other words, the inference we draw from that is, GAO are not experts. Is that right?

Mr. COTTON. We walked into that one.

Mr. DUFFUS. Could I clarify that response? [Laughter.]

Mr. HANSEN. By all means. We are hoping you will.

Mr. DUFFUS. You asked whether or not the experts helped us write the report, and the answer is no, the experts did not help us write the report. In the course of this work we talked to experts. You know, this was an educational process for us as well when we undertook this assignment. We learned a lot as we went along and collected the information and talked to the folks that we talked to.

Mr. COTTON. Everything in this report we drew from existing policies, from existing plans, from the conversations that we have had with all the different scientists that are involved in all the different projects; we covered the waterfront; and then, as we do in many GAO reports, to get concurrence from the agencies, or to get clarification, we sent it out for comment to Interior, the Forest Service, and the Council on Environmental Quality to get their input.

Mr. HANSEN. Mr. Cotton, in your expert opinion—in your opinion as experts in your field, do you feel that there should be a definition of ecosystem that is agreed upon by all agencies of the Federal

Government? Wouldn't that expedite and make this a better way to do business, or are we going to have every different chief of the Forest Service, Secretary of Interior, Fish and Wildlife, everybody come in here and give us their own interpretation?

Mr. COTTON. Well, in my role as serving you as a Member of Congress, they have defined what is an ecosystem, and what we asked them to do in this report is to come out and say what exactly they mean by ecosystem management.

Mr. HANSEN. Do you think it would be too hard to ask that you people—and I know this isn't my place to do that, and I stand to be corrected by Chairman Miller, but don't you think it would be nice if we agreed on one, that we put one on the table and we agree on it? I mean those of us from the West who keep hearing the idea that it starts with the Colorado River all the way down to California or the Yellowstone or whatever it may be, we are just getting a little weary of trying to figure out what we are dealing with.

I think it would be a great idea, Mr. Chairman, if someone comes along with the idea and we define this particular term.

Mr. MILLER. Would the gentleman yield?

Mr. HANSEN. I would be happy to yield.

Mr. MILLER. First of all, we say it starts in California and works its way all up through Colorado.

Mr. HANSEN. Everything starts in California.

Mr. MILLER. But let me ask just as part of your question: When you looked at the four agencies, the big four here, in dealing with this question, do you get a sense that the agencies are adapting to this definition and to this concept or they are taking the concept and trying to adapt it to how the agencies are being run? Not that all four are doing the same thing, one may be doing another, but along the lines that Congressman Hansen talked about, do you get the sense that at least in terms of the concept and some definitional consistency, that the agencies are moving in the same direction, or are we fudging with it to try to hold on to jurisdiction and status and power and personnel and everything else that goes along with it?

Mr. COTTON. As we point out in this report, we think that both the Bureau of Land Management and the Fish and Wildlife Service have done a very good job of saying in their policy documents or draft policy documents exactly what it is they mean by the term "ecosystem management."

Mr. MILLER. And you consider that consistent with what the administration—

Mr. COTTON. With the overall goal of ecosystem management being to sustain or maintain or restore the health of the ecosystem, recognizing that everything else is contingent upon it, yes.

Mr. MILLER. And what is going on in the other two agencies?

Mr. COTTON. Well, the Forest Service was the first one to move toward ecosystem management, but they haven't come out with, I think, as clear a definition of the policy goal as the other two agencies have, and the Park Service, to my knowledge, hasn't attempted to define it yet.

Mr. MILLER. OK. I don't want to take up other people's time.

Mr. HANSEN. Thank you.

Let me conclude, if I may.

Do you think Congress ought to take a stab at that, or do you think that would be totally impossible for Congress to do it?

Mr. COTTON. Well, in this report we said what we thought the policy goals of ecosystem management should be.

Mr. HANSEN. I always worry about the definitions in a way. One, we like to live by them, because that gives us some criteria. On the other side of the coin, they are violated so around here; the Endangered Species Act, for example, and how they go on listing. A lot of us strongly feel that it is not being done right. Down in my own State, the desert tortoise are like flies in that area and yet they are on the Endangered Species List.

You get into things like what is wilderness, and you read it in the 1964 bill, untrammelled by man, if man was never there, and we see bills introduced all over the place. They go right over the top of cities, roads, and the whole bit, and people come up here and righteously say, "Oh, gee, that's a great thing." Doesn't anyone ever read the definition of what it is? And if it is so, Congress has the ability and should change it.

Thank you, Mr. Chairman. I appreciate the opportunity to respond.

Mr. MILLER. Thank you.

Mr. Volkmer.

Mr. VOLKMER. I have a few questions.

When you look at an area to be managed by an ecological system, how large an area are we looking at? In other words, what impacts on the ecosystem of that area, and how far does that impact spread out?

Mr. DUFFUS. Well, I think it would vary. I don't know that you could prescribe what it would be. As we say in the testimony, it should be large enough to allow for capture the linkages and complexities of the species and communities within the ecosystem and also be large enough to allow for consideration of the effects of activities occurring across Federal and non-federal or private lands. So it would vary.

Mr. VOLKMER. As you looked at these areas—you looked at areas, correct? Areas of the United States?

Mr. DUFFUS. We did not look at areas in this report.

Mr. VOLKMER. You did not.

Mr. DUFFUS. No.

Mr. VOLKMER. Therefore, your report would impact on all areas of the United States?

Mr. COTTON. No. Our report, I guess, would be superimposed on geographical areas that somebody has identified as an ecological unit that they want to manage as an ecosystem. Now the administration has identified, as we said previously, seven areas where they have essentially drawn the boundaries, usually by watershed of the area that they would like to jointly manage as an ecosystem.

Mr. VOLKMER. Just out of curiosity, just for purposes of discussion, doesn't Washington, D.C., have an ecosystem?

Mr. COTTON. Yes.

Mr. VOLKMER. Doesn't every part of the United States have an ecosystem?

Mr. COTTON. Yes.

Mr. VOLKMER. In fact, doesn't this whole Earth have an ecosystem?

Mr. COTTON. It is an ecosystem.

Mr. VOLKMER. And doesn't what occurs even in one part of this world, of this Earth, impact on other parts?

Mr. COTTON. To a degree, yes.

Mr. VOLKMER. I mean if you have a volcanic eruption in Hawaii of sufficient magnitude, or Mexico or any place else, doesn't that impact?

Mr. COTTON. Yes.

Mr. VOLKMER. And even though we as a Federal Government may decide that there are certain what I call minute areas of this Earth—and that is what we are talking about—that are managed for ecosystems, a small part of this total Earth, that even though all these Federal agencies may do their best to manage for ecosystem purposes to preserve whatever ecosystem they want to preserve, that is part of it too, isn't it? They have to decide what ecosystem they want to maintain, correct?

Mr. COTTON. Correct.

Mr. VOLKMER. I mean that is subjective, not objective, that is subjective, and other things can occur in other parts of this world where no one has any control that can also impact on that.

Mr. COTTON. Yes. I would not say that it is subjective versus objective, I would say you would look in the areas where you could actually have an impact and attempt to manage them better.

Mr. VOLKMER. No, no. What I am saying is, the ecosystem that you wish to have in the future rather than the ecosystem that you presently have—because that is what we are talking about—that or maintaining the present ecosystem, that is going to be a subjective decision by someone.

Mr. DOMENICK. If I might comment on that, sir, the scientists maintain that there are distinct ecological units out there that are very interdependent and that support various forms of life and various activities.

Mr. VOLKMER. I won't deny that.

Mr. DOMENICK. Okay. I think ecosystem management as a concept is saying we need to understand them and how various activities impact on them and to try and mitigate those impacts that are going to adversely affect the ability of those ecosystems to support and sustain natural resources and those communities and economies that are dependent on them. So there is the concept that these things exist, and in terms of various areas of the country, various groups have tried to define specific areas like the Yellowstone area or the South Florida Everglades.

Mr. VOLKMER. I agree. But what is the attempt to preserve that ecosystem, the one that exists there now, the one that existed 50 years ago, 100 years ago, or to channel it so that we have a different ecosystem than what we have now in the future?

Mr. DOMENICK. I think from our perspective and the way we have described it in the report is, we are not saying that an ecosystem has to be brought back to what it was at a specific point in time and maintained there. We are talking about the ability of the ecosystem to support the natural resources that are there and to support the economies and the communities that depend upon

them. Also that there is some level—that if it degrades below a certain level it will no longer be able to support those resources, the communities and the economies. The challenge facing ecosystem management is being able to identify these areas and being able to identify how it is being impacted by the various activities so as to mitigate those situations to the point where it can continue to support indefinitely into the future the development of the natural resources within the ecosystem and to support those communities and economies that have become dependent on those resources.

Mr. VOLKMER. Basically what you are saying then is that to preserve the existing ecosystem that would be there, but the way I have always envisioned it in the years that I have worked on it is that there are those—and I don't disagree with it—that wish to change things as they impact on that ecosystem to return it to where it was maybe 30 years ago or 40 years ago or 20 years ago, some other time, so you get back to the clean streams, you get back to more of the vegetation that was there before different vegetations that impacted on plant life and animal life that existed. Is that what you understand?

Mr. DUFFUS. That may result from efforts to maintain or restore, but I don't think the starting point is to say let's go back the way this ecosystem was at a certain point in time and do everything we need to do to bring it to that condition. I don't think that is the starting point. That is not what we are saying is the starting point.

Mr. VOLKMER. What you are then telling me is that what you have envisioned ecosystem management as is basically to reduce the probability of degradation of what exists in that system today as far as air, water, land, vegetation, animal life, et cetera. Correct or incorrect?

Mr. COTTON. Mr. Volkmer, they use three words, I think, in deciding what they want to do in a particular ecosystem—maintain, restore, or simulate. So there are certain ecosystems, for example, they identified South Florida—the Everglades and Florida Bay—as an ecosystem. They don't want to maintain it in its current state. The word they use is restore and simulate. So in that ecosystem they are talking about going back to some preexisting condition.

There are other areas where their goal would be to maintain what is there now. So it varies—it really varies by geographic area as to what they intend to do or hope to do—restore to some prior condition, maintain in an existing condition, or if you can't do either, somehow simulate what was there at a certain point in time.

Mr. VOLKMER. All right. Then as the management—I think you brought it out in your statement and your report—of the area for an ecosystem, it necessarily would entail—impact on at least—impact on, non-Federal land and areas as well as Federal.

Mr. DUFFUS. That is correct.

Mr. VOLKMER. In order to be able to—

Mr. MILLER. The gentleman's time has expired. Is the gentleman going to wrap up his questioning here?

Mr. VOLKMER. Yes, this is the end of it—in order to either maintain the ecological system there, management for maintenance, or restored or anything, you have to necessarily do that. Is that correct?

Mr. COTTON. You have to involve non-Federal parties in most ecosystems to accomplish your objectives, yes.

Mr. VOLKMER. What do you mean by involvement? What do you mean by that word?

Mr. COTTON. There is usually the idea that both the federal and non-federal parties recognize the fact that there is an issue or concern that affects everybody such as the condition of the Chesapeake Bay, and the idea is to go in with ecosystem management and build consensus, and build cooperation among those parties. We are not talking command and control, we are talking incentives, cooperation, technical assistance, those types of things. Or, excuse me, that is our understanding of the administration's approach to ecosystem management.

Mr. VOLKMER. Right, at this time. But if you wanted to do it where you had complete control over the area, it would take Federal action in order to do that, correct?

Mr. COTTON. Cooperation among the federal agencies in that area, yes.

Mr. VOLKMER. No, no. If you had private State lands that were involved that were necessary to be managed in order to manage the total ecological system that is hoped to be managed, you would have to have control over that State or non-federal land.

Mr. COTTON. No. You would have to have the cooperation, not control.

Mr. VOLKMER. What if they didn't cooperate?

Mr. COTTON. Then you probably would not be able to accomplish all that you hoped to accomplish in that ecosystem.

Mr. VOLKMER. That is what I mean. If you want to accomplish everything in that ecosystem that you are proposing to do, then you must have control over—well, if you don't have cooperation.

Mr. COTTON. We have tried to control for years, and it only goes so far.

Mr. VOLKMER. I know that. That is what I am trying to point out, that if you don't have the cooperation—and I have private lands or State lands, and they are being utilized within this ecological system to the detriment of the proposed management scheme, then the only way to stop me would be to take some type of action that would require that I no longer do that.

Mr. COTTON. You could conceivably buy them out or something, yes.

Mr. MILLER. The gentleman's time has expired.

Mr. Taylor.

Mr. TAYLOR of North Carolina. I like the way the gentleman is proceeding. Maybe I can proceed along the same way.

The thing that troubles me about the nebulosity of this whole term ecosystem management is that it is very subjective. I can recall where we have had people come in and testify. I remember one person who hadn't bathed in a long time or changed clothes much, and he himself was an ecosystem—if you define an ecosystem by the fact that it has forms of life growing on it and critters being encouraged. If you say that about any area, that is the general definition of any ecosystem.

Did you detect any effort to pick an ecosystem that is the best out of, say, three systems? If I have 100 acres here and 100 acres

there, and this 100 acres is a golf course, this 100 acres is a managed silvicultural site, maybe planted, maybe thinned or managed under timber stand improvement, and this one over here is totally unmanaged and it has grown up into brush or whatever, now, did you detect any effort to say that any one of those three is better than the other as an ecosystem?

Mr. COTTON. They could have all been included in the same ecosystem.

Mr. TAYLOR of North Carolina. Suppose they were ten miles apart and weren't included in the same ecosystem. Is there anything to say that one of those three sites is better than the other? They are all ecosystems, are they not?

Mr. COTTON. They are all parts of ecosystems.

Mr. TAYLOR of North Carolina. Well, they are as you look at the 100 acres. If you put that artificial boundary, just as you put the artificial boundary of a watershed, it would be an ecosystem, would it not?

Mr. COTTON. Something could draw the boundaries around a golf course and, I guess, call it an ecosystem.

Mr. TAYLOR of North Carolina. I mean if you don't draw a boundary, then you take the whole world because the whole world is an ecosystem.

Mr. COTTON. That is why we tried to address in this report that what is different—one of the things that is different about ecosystem management from the current way that you manage lands is that it takes a broader approach and it has to be an area large enough to provide you certain flexibility so that you can say let's keep the golf course because we are going to do something else over here that will allow us to still accomplish our objectives while still letting people like me tee off.

Mr. TAYLOR of North Carolina. Did you see any effort—if you have the three together, is there any indication that any one of those ecosystems is better than the other?

Mr. COTTON. They have not drawn the boundaries that way.

Mr. TAYLOR of North Carolina. Well, presuming they had, and assuming that a centimeter can be an ecosystem, have you seen any evidence that any one of those ecosystems would be any better than the other?

Mr. COTTON. No. They are all allowed. Altered areas and unaltered areas are all allowed.

Mr. TAYLOR of North Carolina. So what we determine is positive in an ecosystem, as Mr. Volkmer was saying a moment ago, is pretty much subject to what we come up with. It may be based on science, it may be based on fantasy or a bumper sticker, but it is pretty much going to be a subject you have determined, which would bring me to Mr. Domenick who was saying a moment ago—and I think I got this right—that the ecosystems are planned to support economies that depend upon them. That is one of the criteria that would be used.

Then in the Pacific Northwest, which as we know is a great timber producing area, is there any indication that the Forest Service is going to change its approach there from what the Administration has just said and go back and look at that whole area and make its determination of how much it will allow to be harvested based

on soil site indexes and species compositions and growth rates and things of that nature?

Mr. DOMENICK. In terms of the Pacific Northwest it seems to me that the premise of ecosystems management is that it allows for sustainable development, sustainable use.

There are some suggestions that the kind of levels of uses that have been occurring in the Pacific Northwest may not have been sustainable, and because they weren't they brought some ecological degradation which limits the ability to continue to produce it at those levels and also it impacts on things like the salmon because of degradations that have occurred as a result of some of the timber harvests.

Mr. TAYLOR of North Carolina. What do you mean by sustainable? If you are talking about the economy of an area of the country that provides a large portion of the fiber for the country, sustainable yield has to do with the silvicultural science used to sustain a yield perpetually, would it not?

Mr. DOMENICK. I think we would make a distinction between sustainable yield from a timber harvesting standpoint versus sustainable ecosystems in the sense that the natural area is able to produce a certain level of resources at a continuing level indefinitely. Now one could use up those resources at a faster rate, in which case the ecosystem may not be capable of continuing to produce the resources to allow you to continue to proceed at that rate. That is the theory.

Mr. TAYLOR of North Carolina. But you make that decision on harvest rate on a silvicultural basis, a scientific silvicultural basis, to keep a sustainable yield. That is how you determine whether you are harvesting too fast or too slow or what the situation may be. You look at the soil site indexes and the species compositions and the silvicultural science around what you are talking about, and that determines how fast you are going to harvest, whether you need to plant a different species, various things you change. Those are scientific questions, have nothing to do with bumper stickers or anything else, and my question to you is, is there any evidence that the forest plan that has been developed for the Pacific Northwest was based on any sort of scientific basis for managing that part of the ecosystem?

Mr. COTTON. It was based on science but not the science of agriculture, it was based on the science of biology and science of ecosystems, ecology.

Mr. TAYLOR of North Carolina. I see why you are reading that word, because it is like a slick eel, you can never get anywhere with it, I mean you just keep going round and round, and that is the problem that we have had, and that was mentioned a moment ago by the gentleman from Utah. We get wetlands. We didn't even have a definition for wetlands, it was just whatever somebody happened to think was a wetland, and then people started being put in jail for filling dry lands, and that is what creates the consternation and the problem. We don't, or the people that I represent, don't want any more of the bull that we have had. They would like to get down to a tighter definition, one where they would be able to count on for economic reasons, one using scientific evaluations and some management in an orderly fashion rather than in the

vague way that depends on who happens to have the political strength at the moment.

Mr. JOY. Representative Taylor, if I might, because I think you have hit upon a very important thing which we recognize as well, and it is the need for various kinds of definitions. But what we are saying is yes, it will be subjective. These are very difficult public policy decisions.

The relationship between sustained timber yield on a silvicultural basis in the Pacific Northwest, for instance, is measured not only in scientific terms but is measured also in terms of the weight accorded to other resources under other natural resource laws passed by the Congress. The point is that ecosystem management presumably will allow a way of defining—admittedly at this point we point out it is not very clear where they are, how they will be defined. But what the scientists are essentially saying is that there is a way to understand those relationships better than have been defined in existing law. Hopefully it will lead to that clarity. That is going to be a process over time of more and more carefully defining it. We try to point out they are not defined now, and that one of the first tasks that needs to be done is that sense of delineation.

Mr. TAYLOR of North Carolina. But we have a policy that has just been established that has not used that basis in formulating the policy.

Mr. MILLER. Would the gentleman yield?

Mr. TAYLOR of North Carolina. I would be glad to.

Mr. MILLER. I think part of that also is that the policy looked at past practices and what in theory were the promises of past practices, which were sustained yield on a rotational basis, and when you went on the ground and took inventory you found out the trees simply weren't there, and therefore the rotations and the yields could not be sustained or even met in some cases where, on the books, you had a 20-year-old forest, which sort of gives you one vision of a forest until you get there and you find out that after 20 years the forest doesn't reach your needs because of all of these other attendant problems that weren't admitted to. That was also cranked in along with the biology and others, the fact that the trees simply—no question—simply weren't there, they weren't there, and so the inventory was off.

Mr. TAYLOR of North Carolina. Would the gentleman yield?

Mr. MILLER. Yes.

Mr. TAYLOR of North Carolina. If your statement is true, did we have substantial private and Federal data to substantiate your statement from professional people?

Mr. MILLER. We have for the first time, as a result of the task force in the Northwest, that kind of data. When we started matching up the maps, the inventories and how these were carried on the books, there was a dramatic mismatch between what the agencies were cranking into their plans and the existing inventory and the quality of that inventory. That is part of the reason, along with the other biological science, for the rearrangement of the yields and the cuts and what have you. At the same time, taking that into consideration, they were still able to somewhat lighten the load on private lands in that area.

Mr. TAYLOR of North Carolina. It is difficult, and I wouldn't want to get into debating the task force findings and what methods it used and so forth. Suffice it to say that in discussions with private landowners and foresters, who, usually their skill, I have found, is far above what the Government has done as far as managing timber for yield purposes, because for the Government, that isn't its principal goal for the Forest Service—they have not found that the forests were not producing. Their estimates are, the forests are performing as they estimated they would be performing. Now perhaps we should examine the Federal forest management alongside private management.

The problem with the vagueness of ecosystem management also—and I think Congressman Volkmer alluded to it—is that you run into problems. You start conflicting an ecosystem, since it is such a subjective thing, and you get away from the principal reasons for the various agencies. I maintain the Forest Service was created to produce fiber for the Nation, the Park Service was created to produce recreational areas where there would not be harvests. Secondly, you run into ecosystems: If it is my subjective desire to do it, I can extend it over into private lands or wherever I want to, as far as I want to. In other words, if it goes from one centimeter to the size of the Earth, then I can restrict it wherever I decide to restrict it with an artificial boundary. That spells not ecosystem, it spells trouble with the Federal agencies, because the depth of dumb cannot be fathomed, and it spells trouble with the bureaucracy, and our folks know it. I think Congress probably knows it. Allowing this to sort of run loose at this stage, at a time when no one has any concept of where we are heading, given the vague definition, troubles people so much, and they have got a lot of past experience as examples. That is why I appreciate what you are saying here.

I wish and I hope we can draw a definition of ecosystem management before we start setting policy based on it. Perhaps we jettison the term "ecosystem." We should manage to the best natural resource use possible, which is kind of what you were saying, with the best science possible. Maybe we should forget about saying "ecosystem" as a code word for doing something that may be completely contrary to that, because if we pick the third one over here, the 100 acres of brush pile, and that is our management practice, that can be an ecosystem, it can fall within the definitions of someone's subjective idea of what is best, but it clearly is not best for society or in the way to manage our resources.

Thank you, Mr. Chairman.

Mr. MILLER. Mr. Bishop.

Mr. BISHOP. No questions, Mr. Chairman.

Mr. MILLER. Mr. Pombo.

Mr. POMBO. No questions.

Mr. MILLER. Well, as I think you can see from the interaction with the members of the committee, your report has hit a very responsive chord here. The success of this program, again, from whatever view Members have of it, is going to be based in large fact on whether or not what you identify as the barriers and concerns can be addressed or can't be on a timely basis, because I think you have the potential here to drag out actual implementa-

tion in the Northwest, and maybe that becomes the model. But I don't think most politicians would like that to become the model—a situation where it gets to such a crisis you all end up in court. You like to think that you could avert and develop the management plan that is short of that kind of action and that kind of disruption.

But I think, as you noticed in your report, and as some of the scientists and policy people have said, current practices are not developing the sustainability of the values that people want from those resources, and those are multiple values and multiple claims on that resource. In many areas of this country, current practices are not going to allow that to happen, and they are heading toward a much larger conflict between those claims on the uses of that resource. At some point we are going to have to make some legislative determinations, along with the administration, on how we are going to carry this out if, in fact, this is a promising approach to managing those assets within those competing claims.

So thank you. Thank you for torching this one here, and now that we have got it lit, we will see where we go.

Mr. DUFFUS. You are welcome, Mr. Chairman.

Mr. MILLER. Thank you very much for all of your hard work and all of your time. You continue to be very, very helpful to this committee and to the other committees.

PANEL CONSISTING OF JAMES PIPKIN, COUNSEL TO THE SECRETARY, DEPARTMENT OF THE INTERIOR, AND CO-CHAIR, INTERAGENCY ECOSYSTEM MANAGEMENT WORKING GROUP, WASHINGTON, DC, ACCOMPANIED BY DIANE GELBURD, ASSOCIATE DEPUTY CHIEF FOR PROGRAMS, SOIL CONSERVATION SERVICE, DEPARTMENT OF AGRICULTURE, AND CO-CHAIR, INTERAGENCY ECOSYSTEM MANAGEMENT WORKING GROUP, WASHINGTON, DC; GEORGE T. FRAMPTON, JR., ASSISTANT SECRETARY FOR NATURAL RESOURCES AND ENVIRONMENT, DEPARTMENT OF THE INTERIOR; AND, JAMES LYONS, ASSISTANT SECRETARY, NATURAL RESOURCES AND ENVIRONMENT, DEPARTMENT OF AGRICULTURE, WASHINGTON, DC

STATEMENT OF JAMES PIPKIN

Mr. MILLER. With that, we will call the second panel: Mr. Pipkin, who is counsel to the Secretary of the Department of the Interior and cochair of the Interagency Ecosystem Management Working Group in Washington; Mr. George T. Frampton, assistant secretary of Fish, Wildlife, and Parks; and Mr. James Lyons, assistant secretary for the Natural Resources; and Diane Gelburd, Associate Deputy Chief for Programs, Soil Conservation Service, will be joining Mr. Pipkin.

Welcome to the committee.

As I think you can see from the discussion with the previous panel, the administration has embarked upon an approach that I happen to think does hold great promise by providing more modern management techniques and scientific understanding but at the same time has created controversy and in some cases misunderstanding and a great deal of apprehension about exactly where we

are going. We certainly want to thank you for agreeing to come forward and appear before the three committees.

Mr. Pipkin, we are going to start with you.

Mr. PIPKIN. Thank you, Mr. Chairman. Good morning.

My name is Jim Pipkin. I am counselor to the Secretary of the Interior. With me is Dr. Diane Gelburd of the Soil Conservation Service in the Department of Agriculture. We are the cochairs of the administration's Interagency Ecosystem Management Working Group. I am presenting a statement for the record which I will now summarize, and then Dr. Gelburd and I will both be available for questions.

The genesis of our work is the Vice President's work on the National Performance Review which strongly supported the concept of cross-agency ecosystem planning and management. It suggested that the President issue a policy directive on ecosystem management and also suggested the establishment of goals, guidelines, and a process for implementation. It called on the director of the White House Office on Environmental Policy to establish and head an interagency ecosystem management task force made up of relevant assistant secretaries. The Interagency Ecosystem Management Working Group was formed to assist the task force in its work to conduct case studies and develop a report on implementing an ecosystem approach.

I want to explain what we mean by the term "ecosystem management," and I recognize that this will not satisfy the request for total specificity on the definition, but the working group agreed to define an ecosystem as an interconnected community of living things, including humans and the physical environment with which they interact. Ecosystem management we are defining as an approach to restoring and/or sustaining healthy ecosystems and their functions and values based on a shared vision that integrates ecological, economic, and social factors. Our working goal is to restore and/or maintain the health, sustainability, and native biological diversity of ecosystems while supporting human communities and their economic base.

Let me point out two things about those definitions in our working goal. First, one common misunderstanding about the concept of ecosystem management is that it focuses solely on environmental protection and not on human needs. As the GAO report recognizes, that is not the case. Ecosystem management, as we see it, involves a recognition of the interrelationship of a healthy economy and a healthy environment. It focuses on policies that foster both a sustainable economy and a sustainable ecosystem.

Second, an ecosystem approach is not, as some assert, a Federal takeover of private lands. It is not an attempt to usurp State and local land use planning or management. We know that such a top-down approach is neither feasible nor desirable. An ecosystem approach is instead a way to promote cooperation among all interested stakeholders. It enables Federal agencies to implement their responsibilities with an emphasis on partnerships rather than adversarial relationships. Further, it facilitates more efficient management that benefits both the public and private sectors and reduces the confusion and delay that often occurs when the public has to identify and meet agency requirements. Other benefits are

mentioned in the testimony of all of us at the table today and in the GAO report.

The interagency working group is working hard to establish a clear understanding of the essential elements of an ecosystem approach. I would like to explain briefly the process that we are following.

The working group established six issue teams with multiagency representation oriented to the issues of public involvement, budget processes, policy, legal authorities, science and information, and institutional issues. These issue groups are identifying opportunities for and barriers to effective use of an ecosystem approach.

We also selected seven ongoing ecosystems as case studies and surveyed them during July and August. These case studies will help us to learn from the experiences of implementing an ecosystem approach and to determine what the task force or the Congress can do to facilitate more effective agency performance. They are South Florida, Southern Appalachian Highlands, the Anacostia River watershed, the Great Lakes, southern Louisiana wetlands, Prince William Sound, and Pacific Northwest forests. The case studies, together with the work of the issue groups, will be incorporated into a report to the task force. We expect the report to be completed by the end of November. The report's findings and recommendations will be used by the interagency task to identify the next steps.

At this point we are in the middle of our analytical process and do not have any specific recommendations to share with you today.

We agree with much that is in the GAO report, especially its recitation of the benefits of ecosystem management and its characterization of ecosystem management as a promising next step for Federal land management. Many of the additional implementation actions that GAO says are needed are reflected in the need of the task force that we are now doing.

As an initial step in communicating the requirements of an ecosystem approach to field personnel, the interagency task force has identified some guiding principles, and I will briefly mention seven of these.

As I indicated earlier, ecosystem management is aimed at restoring or maintaining the health, sustainability, and native biological diversity of ecosystems. It supports sustainable economies and communities. It requires developing a vision of what constitutes sustainable health and biodiversity for an ecosystem in collaboration with all interested parties.

Similarly, ecosystem management requires developing implementation strategies collaboratively with other interested parties on a voluntary basis. It relies on the best available scientific understanding of ecosystem composition, structure, and function, and related human economic and social dynamics. It uses specific measurable objectives to monitor and evaluate outcomes, and it employs adaptive management, learning from successes and failures and allowing management flexibility to respond to new information.

"Ecosystem management" is a misunderstood term, and it has become divisive. However, the concepts that underlie it are not new, and there are many examples of ecosystem-based management being practiced at a variety of geographic scales and by a

broad range of interested parties inside and outside the Federal Government. These mostly bottom-up efforts are demonstrating both positive environmental results and successes in creating diverse partnerships to identify and resolve ecological problems.

Mr. Chairman, that concludes my prepared remarks. Dr. Gelburd and I would be pleased to answer questions.

[Prepared statement of Mr. Pipkin follows:]

**TESTIMONY OF JAMES PIPKIN,
CO-CHAIR, INTERAGENCY ECOSYSTEM MANAGEMENT WORKING GROUP
BEFORE THE JOINT HEARINGS OF THE
COMMITTEE ON NATURAL RESOURCES - SUBCOMMITTEE ON OVERSIGHT AND
INVESTIGATIONS, COMMITTEE ON AGRICULTURE - SUBCOMMITTEE ON
SPECIALTY CROPS, AND THE COMMITTEE ON MERCHANT MARINE AND
FISHERIES - SUBCOMMITTEE ON ENVIRONMENT AND NATURAL RESOURCES
September 20, 1994**

Good morning. My name is James Pipkin. I serve as Counselor to the Secretary of the Interior. Today I address the ecosystem approach primarily from the perspective of the Administration's Interagency Ecosystem Management Working Group, of which I am co-chair. With me is Dr. Diane Gelburd of the Soil Conservation Service, USDA, who is the other co-chair of the working group. I will deliver the statement but Dr. Gelburd and I will both be available for any questions that you may have.

The genesis of our work is the Vice President's report of the National Performance Review, which strongly supported the concept of "cross-agency ecosystem planning and management." It suggested that the President issue a directive that "establishes a national policy to encourage sustainable economic development and ensure sustainable ecosystems through ecosystem management." It further suggested the establishment of goals, guidelines, and a process for achieving cross-agency ecosystem planning and management, and it called on the Director of the White House Office on Environmental Policy (OEP) to establish and head an Interagency Ecosystem Management Task Force (Task Force) made up of relevant Assistant Secretaries.

Late last year the Task Force was constituted and began its work. The Task Force, which is chaired by the White House Office on Environmental Policy, is made

up of Assistant Secretaries from twelve departments and agencies, as well as representatives from the Office of Management and Budget and the White House Office of Science and Technology Policy. The Task Force formed the Interagency Ecosystem Management Working Group to assist in its work, to conduct case studies, and to develop a report on implementing an ecosystem approach.

Before going any further, I should explain what we mean by the term ecosystem management. The Task Force agreed to define an ecosystem as an interconnected community of living things, including humans, and the physical environment with which they interact. Ecosystem management is an approach to restoring and/or sustaining healthy ecosystems and their functions and values. It is based on a collaboratively developed vision that integrates ecological, economic, and social factors.

Our working goal is to restore and/or maintain the health, sustainability, and native biological diversity of ecosystems while supporting human communities and their economic base.

I would point out two things about those definitions and our working goal.

First, one common misunderstanding about the concept of ecosystem management is that it focuses solely on environmental protection and not on human needs or the existing human uses of the land. As the GAO Report recognizes, that is emphatically not the case. Our definitions recognize human needs and the importance of developing a vision that integrates ecological, economic and social factors. Ecosystem management, as we use that term, involves a recognition of the interrelationship of a healthy economy and a healthy environment. It focuses on policies that foster both a sustainable economy and a sustainable ecosystem.

Second, I cannot emphasize too strongly that an ecosystem approach to resource management is not, as some seem to believe, a federal takeover of private lands. It is not an attempt to usurp state and local land use planning or growth management. It is not a process by which federal agencies decide what ecological problems exist and how to fix them. We know that such a "top-down" approach is neither feasible nor desirable. An ecosystem approach is instead a way to promote cooperation among all interested stakeholders. It enables federal agencies to implement their responsibilities with an emphasis on partnerships rather than adversarial relationships.

Further, the coordination promoted under ecosystem approaches facilitates more efficient management that benefits both the public and private sectors. The various federal and non-federal agencies involved in resource management will be encouraged to develop complementary and consistent policies, which will give land owners and land users a greater degree of certainty and predictability, and also clarify their responsibilities. This cooperation will reduce the confusion and delay that often occurs when the public has to identify and meet agency requirements.

An ecosystem approach will also empower field managers to a greater degree than currently exists, thus streamlining both management structures and processes. At the same time, it will encourage the more effective use of data and expertise to address problems that concern all stakeholders. Aside from these programmatic benefits, the improved use of resources is especially important given the need for budgetary restraint.

Mr. Frampton and Mr. Lyons address in their testimony a variety of benefits that we in the Administration believe can accrue from an ecosystem approach to land and resource management. I believe that those benefits are substantial.

At the same time, because an ecosystem approach often requires a different way of thinking and organizing management activities, we also are fully aware of barriers that can frustrate its effective use.

We in the Interagency Ecosystem Management Working Group are moving to establish a clear understanding, among managers in all agencies with environmental and natural resources responsibilities, of the essential elements of an ecosystem approach. We hope that these deliberations will help to minimize some of the misunderstandings that have occurred.

You are well aware of the need to move thoughtfully and deliberately, as evidenced by your request for recommendations for legislation or other assistance from Congress to remove institutional and legal barriers to the use of an ecosystem approach. As I have said, these are precisely the kinds of recommendations we are considering in concert with other agencies through the Interagency Ecosystem Management Task Force. We are also encouraged by this joint hearing, which demonstrates a recognition that ecosystem management may involve not only interagency coordination but also coordination among Congressional committees.

I would like to explain to you the process that we have been following in attempting to address these issues. First, the working group established six issue groups with multi-agency representation, oriented to the issues of public involvement, budget processes, existing policy, legal authorities, science and information, and institutional aspects. These issue groups are identifying opportunities for and barriers

to effective use of an ecosystem approach, and are proposing ways in which the barriers can be overcome and the opportunities maximized. Should any concerns require legislative action, we will discuss them with you or other appropriate committees of jurisdiction.

Second, recognizing that techniques for applying an ecosystem approach may vary according to the natural resource issues and ecological systems involved, the Task Force selected seven on-going ecosystem activities as case studies. These case studies will help us to learn from the experience of those who are implementing an ecosystem approach, and will help us to determine what the Task Force or the Congress can do to support efforts in the field and facilitate more effective performance by the federal agencies in the future. These ecosystems, which we refer to as "survey and assist" ecosystems, include South Florida, Southern Appalachian Highlands, the Anacostia River Watershed, the Great Lakes, Southern Louisiana wetlands, Prince William Sound, and the Pacific Northwest forests.

The working group surveyed these ecosystems during July and August. It is now working diligently to compile and organize the collective findings from the seven ecosystems. These findings, together with the work of the issue groups, will be incorporated into a report to the Interagency Ecosystem Management Task Force. We expect the report to be completed by the end of November.

The findings and recommendations will be used by the Interagency Task Force to identify the next steps to be taken in forging future directions for an ecosystem approach. The report will also contain much of the information that you requested from us as part of our testimony. While we have some initial indications of areas in which there are successes and problems, we are in the middle of our analytical

process and will not have any specific recommendations to you and your Committees until after our report is completed and reviewed by the Interagency Ecosystem Management Task Force. In the meantime, I can speak in general terms about our progress and efforts.

In your letter of invitation, you also ask that we present our thoughts on the GAO report on Ecosystem Management that was released this month. The GAO Report recommends actions that should be taken by the White House Office on Environmental Policy, in conjunction with the Secretaries of the Interior and Agriculture and other appropriate federal officials. Specifically, the report recommends development of a strategy that:

- clarifies a policy goal for ecosystem management that specifies the priority to be given to maintaining or restoring minimum levels of ecosystem integrity and functioning relative to nonsustainable short-term uses, including commodity production;
- translates the principles in the Administration's fiscal year 1995 budget into practical steps that clearly identify what must be done and the parties that must be involved;
- addresses barriers to governmentwide implementation of ecosystem management and identifies specific statutory, regulatory, institutional, and procedural options for resolving them; and
- proposes additional geographic areas for pilot projects, where problems or conflicts have not become intractable, and where there will be greater opportunities for accommodating activities across an ecosystem.

We believe that the Interagency Task Force has already made great progress in this direction. I mentioned earlier the definitions and working goal that have been agreed upon by the Task Force.

As the GAO Report notes, the actual application of these concepts on the ground is difficult, especially when there appears to be a conflict between ecological goals and economic goals. But we believe that an ecosystem approach, with its emphasis on partnerships among the various stakeholders, lends itself to resolution of such seemingly intractable problems. Moreover, broadening the framework of relevant considerations (in terms of geography, biology, earth sciences and economics) and taking a longer-term view of those considerations will enable us to make decisions that benefit both the environment and the economy.

In addition to the seven ecosystems I mentioned above, we have also selected the Great Plains, Monterey Bay and the Mojave Desert as "new initiative laboratories." As noted in the GAO Report, the laboratories will employ a collaborative process to document historical ecosystems, develop a vision of the range of desired future conditions, and consider how current stakeholder actions will address key concerns.

As an initial step in communicating the requirements of an ecosystem approach to field personnel, the Interagency Task Force has identified some guiding principles, which include the following. Ecosystem management:

- is aimed at restoring and/or maintaining the health, sustainability, and native biological diversity of ecosystems;
- involves management decisions based on considerations of ecological units and time frames -- generally broader geographic views, and longer-term time frames -- that allow consideration of cumulative effects;

- supports sustainable economies and communities;
- requires a vision of what constitutes sustainable health and biodiversity for an ecosystem, in collaboration with all interested parties;
- requires mechanisms for setting priorities among objectives, and for identifying and reconciling conflicts;
- develops coordinated, partnership approaches, in which federal agencies develop implementation strategies collaboratively with all interested parties on a voluntary basis, assist interested communities, design plans and budgets to meet the goals, prevent duplication of effort, and create efficiencies;
- relies on the best available scientific understanding of ecosystem composition, structure, and function, and related human economic and sociological dynamics;
- uses specific, measurable objectives to monitor and evaluate outcomes;
- employs adaptive management--learning from successes and failures, and allowing management flexibility to respond to new information; and
- provides that goals for an ecosystem's desired range of future conditions be developed through an understanding of past ecosystem conditions and achieved through adjustment and implementation of legally-mandated agency activities, together with state, local and private sector efforts.

These elements of an ecosystem approach are not new, but their endorsement by the federal government represents an advance in coordinated resource management. We also recognize that an ecosystem approach may require changes in attitude to enable resource managers to look beyond their limited jurisdictions, not to manage lands owned by others, but to encourage voluntary partnerships with other

government agencies and land owners for resource planning and management with the goal of maintaining healthy, diverse and productive ecosystems while supporting sustainable economies and communities.

I might also point out that the Congressional Research Service, as you may already be aware, held meetings on ecosystem management last spring. Many federal agencies submitted papers to the Congressional Research Service at that meeting describing current ecosystem activities, the nature of coordination and cooperation with other agencies on ecosystem activities, application of automated geographic analysis tools such as geographic information systems, any changes in budget structure to implement an ecosystem approach, and impediments to effective use of an ecosystem approach. The Congressional Research Service has compiled these agency summaries. They are an excellent source of summary information on how agencies throughout the federal government are using an ecosystem approach.

Finally, in addition to the formal interagency ecosystem activities that I have already discussed, we are pleased that professional ecosystem specialists at the headquarters level initiated an ad hoc Interagency Ecosystem Management Coordination Group, which has been instrumental in providing a forum for identifying and resolving many of the technical concerns and problems of the various federal agencies and working toward common approaches for all agencies to follow. The activity began not out of any requirement or with any formal charter, but out of a simple need for professionals to inform and be informed of developments in this rapidly developing field.

In addition, beyond the federal efforts I have mentioned, there are many examples of ecosystem-based management being practiced at a variety of geographic

scales and with a broad range of agencies and cooperators. Many of these mostly "bottom-up" efforts have been under way for several years and are demonstrating both positive environmental results and successes in creating diverse partnerships to identify and resolve ecological problems.

Much of our current understanding of an ecosystem approach arose from these professionals from all walks of life, in and out of government, grappling with the issue as it gained public attention.

Mr. Chairman, that concludes my prepared remarks. Dr. Gelburd and I would be pleased to answer any questions you may have.

Mr. MILLER. Do you have a statement, or are you here to respond?

Ms. GELBURD. No statement, Mr. Chairman.

Mr. MILLER. Okay. Thank you.
Secretary Frampton.

STATEMENT OF GEORGE T. FRAMPTON, JR.

Mr. FRAMPTON. Thank you, Mr. Chairman.

I think the discussion here this morning suggests that ecosystem management has become the Rohrsach test of the 1990's. Different people look into it and see very different things, perhaps depending on their highest hopes or maybe their greatest fears.

We don't think that ecosystem management is terribly mysterious, we think it is very practical. It is a set of strategies that is based on the concept that you can't really manage natural resources—land water, wildlife, vegetation, soil—in isolated fragments, that natural systems are connected and they have got to be managed in a collaborative way. That means ecosystem management is really about partnerships between Federal land managers and State and local governments and private landowners; it is about getting all the stakeholders together at the beginning; it is about taking a long view; it is about using good information, and, most important, it is our best opportunity, maybe our only opportunity, to really try to integrate environmental protection and economic sustainability; it is the only way to do it.

In my prepared testimony, Mr. Chairman, I have discussed a range of projects and initiatives in which the Administration is involved in trying to apply some of these principles, and I won't go into all of them. The first one obviously is the President's forest plan in the Pacific Northwest where we have tried to show that within existing laws it is possible to do ecosystem management, and I think it demonstrates very well the opportunity—as I said before, it may be the only opportunity—to integrate economic sustainability into natural resource management, because this administration was faced with a situation in which the failure to apply ecosystem principles had resulted in the timber program in the Northwest being put into receivership by the Federal courts. There wasn't any timber program, the timber program was in chapter 11—not a good institutional or business strategy. We are engaged in an effort to apply ecosystem principles to try to get it out of chapter 11 and to try to mount a sustainable timber program.

Now there are people in the industry who think that the sustainable level that is targeted by the President's plan is too low, there are people in the environmental community who think it is too high, but it is the only way to have a sustainable timber program.

I have talked in my written testimony about South Florida, the San Francisco Bay delta, and a number of other initiatives. The one I want to mention in my oral comments, because I think it is potentially a model for application of ecosystem principles to the Endangered Species Act, is the so-called NCCP process in Southern California.

When the Fish and Wildlife Service last summer listed the California gnatcatcher as a threatened species, it also promulgated a special rule under the Endangered Species Act which in effect

seeks to delegate to State, county, and municipal governments the opportunity to meet the requirements of the Endangered Species Act not only for the gnatcatcher but for other listed and potentially listable species in Southern California that are dependent on some very fragmented habitat types like the coastal sage scrub, which is where the gnatcatcher lives, and in effect said to these governments, if you and private developers can get together and implement a plan for the counties, preserve these habitats, then we will consider that—on a multi-species basis—sufficient for present and future—for some period of years—compliance with the Endangered Species Act and provide substantial certainty for local governments and private developers to go forward over a period of decades and still be in compliance with the Endangered Species Act. I think that illustrates what the Administration is trying to do in applying ecosystem principles to the Endangered Species Act itself, which is to push the decision making down so that that the people who are most affected are the most involved in developing plans and then implementing them.

I also talk briefly in my testimony about the efforts that have begun by the U.S. Fish and Wildlife Service to restructure some of its programs along ecosystem management lines, and with me this morning is Mollie Beattie, the director of the Fish and Wildlife Service, who can respond to questions about that.

Finally, toward the end of my prepared testimony I try to identify what I think are some important benefits for private landowners that can flow from ecosystem management. Some see ecosystem management as an attempt by the Federal Government to reach out and regulate private land. I think it is just the opposite. It is a recognition that the Federal Government cannot accomplish its objectives, and indeed we can't accomplish joint environmental objectives, by regulating or buying up private land. We have to do it through a collaborative, joint partnership process that depends on shared interests and a shared vision, and I have listed as examples four reasons why I think ecosystem management is beneficial for private landowners.

First, it provides a kind of one-stop, one-time shopping, and certainty for private development interests and landowners that in many cases we simply can't get without an ecosystem approach.

Second, ecosystem management, by drawing in as many stakeholders as possible at the beginning, hopefully will ensure that the interests of private landowners are considered right up front in any kind of regulatory or planning process.

Third, where we try to do what we have done in Southern California to push the decision-making about compliance with Federal statutes down to the local and municipal and county and State level, we have reduced the intrusive role of the Federal Government to the maximum extent possible, and, finally, I think what this Administration has tried to do, particularly with Endangered Species Act issues, is to say the following: We would like to rely first and primarily on Federal lands as the land base for protecting species that are imperiled; second, we want to establish incentives and habitat conservation plans and special rules so that the large landowners provide most of the additional protection that is necessary, if any, going beyond what is provided on Federal land.

What that means is, if you look at the whole ecosystem and you can satisfy most of your habitat and species protection needs first with public and Federal or State land, and then with cooperative arrangements between governments and large private landowners, you have a much greater opportunity to provide relief in the way of exemptions or decreased management responsibilities for the small private landowners, the people who tend to be impacted the most by any kind of Government regulation because they don't have the resources or the land base to work around the legal requirements creatively.

So I think these are four examples of some real benefits for private landowners, not negatives but positives, that come from this Administration's approach to ecosystem management, and I think we shouldn't be shy about trying to make that argument to those who are concerned that ecosystem management means more Federal regulation of private land.

Thank you, Mr. Chairman.

[Prepared statement of Mr. Frampton follows:]

TESTIMONY OF GEORGE T. FRAMPTON, JR.,
ASSISTANT SECRETARY FOR FISH AND WILDLIFE AND PARKS
BEFORE THE JOINT HEARINGS OF THE
HOUSE COMMITTEE ON NATURAL RESOURCES'S
SUBCOMMITTEE ON OVERSIGHT AND INVESTIGATIONS,
COMMITTEE ON AGRICULTURE'S SUBCOMMITTEE ON SPECIALTY CROPS
AND NATURAL RESOURCES; AND THE
COMMITTEE ON MERCHANT MARINE AND FISHERIES'
SUBCOMMITTEE ON ENVIRONMENT AND NATURAL RESOURCES
September 20, 1994

Mr. Chairman and members of the Committee, I appreciate the opportunity to appear before you today to discuss the subject of ecosystem management.

To an unprecedented degree, this Administration has sought to bring an ecosystem perspective to public land and natural resource management. Ecosystem management is one of Secretary of the Interior Bruce Babbitt's highest priorities. In furtherance of this effort, he has tasked his assistant secretaries and bureau directors to work together within the framework of common departmental objectives. As a result, new partnerships have been forged between Interior Department agencies with intertwined land management or resource management responsibilities but often poor neighborly relations in the past. Two examples are the National Park Service and Bureau of Land Management (BLM) in forging joint management planning for the California Desert; and the Bureau of Reclamation and U.S. Fish and Wildlife Service in the San Francisco Bay-Delta.

In addition to overseeing joint efforts between agencies at the Department of the Interior, I have personally found myself spending as much time working with officials of the Environmental Protection Agency (EPA), National Oceanic and Atmospheric Administration (NOAA), Army Corps of Engineers, the U.S. Forest Service (USFS), and state and local governments as I have spent with managers from the U.S. Fish and Wildlife Service (FWS) and National Park Service (NPS) for which I have direct policy responsibilities. Other assistant secretaries have had much the same experience.

This should say a little bit about the working world of ecosystem management.

I understand that the Committee is interested in a candid, analytical account of this Administration's practical experience to date in ecosystem management: what we conceive ecosystem management to be, what we have tried to do where, what has been successful and what has not, what obstacles must be overcome, what we have learned, and to what extent the Congress might provide guidance or assistance in the future.

My testimony seeks to be responsive to that mandate.

WHAT IS ECOSYSTEM MANAGEMENT?

One thing we can say for sure: ecosystem management is widely misunderstood.

On both ends of the spectrum of environmental politics, it is often maligned and feared -- albeit for opposite reasons.

Members of the so-called "wise use" and private property rights movements see ecosystem management as a vast conspiracy to "lock up" more and more land from development based on biological values -- a bigger and vastly more dangerous version of their perception of the Endangered Species Act. Linking ecosystem management with the need to protect biological diversity exacerbates these fears, because the linkage suggests that ecosystem management puts protection of plants and animals above all other values.

By contrast, some environmentalists are deeply suspicious that ecosystem management is nothing more than a sophisticated cover for land managers to make trade-offs and compromises rather than enforce existing laws, an elaborate explanation for giving in to political pressure when presented with tough resource protection decisions.

Then there are some (including scientists, land managers, and public officials) who go to the other end of the spectrum, placing almost religious faith in ecosystem management. To them it appears the solution to all our problems, as if ecosystem management were some new ideology or scientific system that if skillfully applied could magically resolve all complex natural resource challenges by optimizing away conflicts and thus making them vanish, leaving everyone happy.

In reality, ecosystem management is none of these things. Rather, it is a common sense strategy, or series of strategies, designed to maximize the chances of sustaining natural communities (and their biological values) over a long period of time while at the same time maximizing sustainable economic activity based in and around those natural communities.

As such, there is nothing mysterious, sophisticated, or unduly threatening about ecosystem management. It is resolutely practical and down-to-earth. It is based on a recognition that natural systems are interrelated, and our approach to protecting them must similarly be coordinated. It also involves looking at a large enough region and a long enough span of time to account for large-scale environmental impacts and provide for local scale uses. It links protection of natural values with economic sustainability. It requires applying the best scientific knowledge available, but recognizes that science ultimately cannot dictate all the key

decisions. It demands partnerships between different levels of government, and private decisionmakers; and it insists that diverse constituencies and interests participate in formulating management plans, and then implementing them.

Most authors who have written about ecosystem management in the past five years have defined it by the following key characteristics:

1. Choosing appropriate ecological boundaries for the ecosystem, which will seldom coincide with political lines (counties, states, national forests, etc.).

2. Seeking to manage natural resources not simply to protect or maximize one species but to protect the integrity of a full variety of species, populations, and natural communities.

3. Using the best available science as a basis for management.

4. Promoting cooperation between management agencies to integrate their individual mandates into a common, cooperative management regime for the entire ecosystem.

5. Choosing a long period of time for management planning (e.g., through natural life cycles and historic cycles of disturbance such as fires, floods, forest rotations, etc.).

6. Pursuing "adaptive management," that is, monitoring the effects of the initial management regime carefully and remaining flexible enough to tinker with it as more information becomes available and better science is developed.

What is sometimes missing from this list, but is absolutely critical to this Administration's approach to ecosystem management, is that among the communities whose integrity we must seek to preserve are human communities. People live in, use, are dependent upon, and impact nature. The ability of human communities to sustain themselves over time must be a central element in ecosystem management. Indeed, the highest priority of this Administration in natural resource management is to demonstrate that environmental protection and sustainable economic activity are interdependent.

Therefore, a seventh essential characteristic of ecosystem management is:

7. Identifying and promoting sustainable economies for communities in and around the ecosystem.

Also often overlooked is that ecosystem management can never be value-neutral, or value-free. We hardly ever optimize for a set of "outputs" from an ecosystem (whether natural, or economic, or both) without deciding what it is we want to maximize for. And ultimately, it is human values that play the dominant role in prioritizing ecosystem management goals.

My own definition of ecosystem management includes still another factor: the process by which important decisions are made. Seldom mentioned in any literature, it seems to me a centerpiece of what this Administration is trying to accomplish.

I believe ecosystem management should not only encourage collaborative activities between federal, state, and local levels of government, private landowners and stakeholders, but also stress decentralization of decisionmaking. Ecosystem management should push planning (and then the implementation of plans) down to a local level wherever possible, so that those most directly affected will have the greatest say in developing the management regimes, implementing them, and then adapting the based on actual results.

Where possible the federal government should seek to play a leadership and assistance role: to set overall directions, to promulgate (or validate) scientific standards, to provide technical assistance and oversight (including final approval authority to ensure the integrity of the planning), and sometimes to assist in

funding. But the actual formulation and operation of detailed ecosystem management plans can often be done best at the state and local level by those most involved, based on their knowledge of local conditions.

In several of the examples I discuss below, the involvement of local decisionmakers is crucial. For instance, the role of private developers, city and county governments in California's Natural Communities Conservation Planning (NCCP) program is essential to its chances of success. Cooperative agreements and "Habitat Conservation Plans" already signed or now being negotiated by the U.S. Fish and Wildlife Service with large private timberland owners in the Southeast, Northern Rockies, and Pacific Northwest provide opportunities for private property owners to free up large forest tracts for long-term logging while protecting habitat for already-listed and potentially-endangered species. The involvement of local fishermen, scientists and community leaders in drawing up a research plan for Prince William Sound, and of local community economic restoration and adaptive management councils in the Pacific Northwest, are integral to those initiatives. The partnership between the federal and state government in Florida has meant the difference between gridlock and progress in the Everglades restoration campaign.

In other cases, we have begun to make significant progress simply from getting federal agencies to work together effectively

for the first time; in these instances we are hopeful that as the issues mature, the fruits of increased local stakeholder involvement will increasingly be realized in the future.

In every case, however, the building of partnerships and of interagency (and intergovernmental) cooperation across jurisdictional lines; the use of science as a template; the recognition that economic sustainability must be integrated with protecting the integrity of natural communities; the openness with which we articulate values to be optimized; and the ability to remain flexible to change, based on new information -- these have been essential ingredients of our program.

PRESIDENT'S PACIFIC NORTHWEST FOREST PLAN

When President Clinton assumed office in January 1993, he was confronted by gridlock in the management of public forestland in the Pacific Northwest. Decades of overcutting lands managed by the U.S. Forest Service and Bureau of Land Management, combined with inability of federal agencies to work together had resulted in a suite of federal court injunctions bringing the timber program in the Westside of the Cascades region in Washington, Oregon, and Northern California to a virtual halt.

In April 1993, the President and Vice President, accompanied by four members of the Cabinet, held a day-long Forest Conference

in Portland, Oregon, at which local citizens, scientists, economists, representatives of the forest products industry, environmentalists, Indian tribal representatives, and others were invited to give their views on solutions to the conflict.

Following the Conference the Forest Ecosystem Management Assessment Team (FEMAT) was assembled to prepare an assessment of options for future management of federal forests in the region that would take an ecosystem approach. This team was unique in its expertise (including more than fifty of the most knowledgeable scientists and managers in the country familiar with old-growth forest issues), in its interagency and interdisciplinary make-up, and in its charge. Under the direction of Dr. Jack Ward Thomas, now Chief of the U.S. Forest Service, FEMAT was directed to set aside agency concerns and develop an integrated approach to forest management in the region. In essence, the President's instructions through Secretary Babbitt and Secretary of Agriculture Mike Espy were to come up with a plan that would comply with all applicable laws, protect the long-term health of the forest ecosystem, and provide a sustainable longterm timber harvest.

At the same time, another working group was tasked with developing an economic plan to assist timber-dependent communities in making a transition to what was likely to be a substantially reduced level of federal timber harvest in the region.

Working round the clock for three months, FEMAT went to extraordinary lengths to consider the impacts of various management alternatives on more than 1,000 species or groups of species, looking at common habitat needs, and integrating terrestrial and aquatic strategies. In these respects, as well as its mission to produce an integrated region-wide plan, FEMAT broke new ground in the field of ecosystem management.

FEMAT produced ten options, which were released for public comment together with a draft Environmental Impact Statement on July 30, 1993. The proposed plan, Option 9, included setting aside more than nine million acres total in old growth forest or "late successional reserves" (LSR's) and riparian reserves designed to protect water quality, fish habitat, and stream-side integrity. A little over 4 million acres of "matrix" area was to be targeted for the large bulk of the expected timber harvest. About 1.5 million acres would be structured into "Adaptive Management Areas" where, with the involvement of local constituencies, experimental management regimes could be developed to protect key forest values and also produce timber or other forest products. Probable longterm timber harvest levels for the area would approximate about 25% of the average timber harvest levels during the 1980's.

In addition to the reserve areas, Option Nine outlined a pattern of "key watersheds" that would be subjected to comprehen-

sive analysis before full timber operations could commence, and would be subject to special limiting rules.

Option Nine also contemplated an entirely new management structure to coordinate the activities of federal agencies throughout the region, and to make certain that they consulted with state and tribal forest managers and with private landowners as well. Implementation of the overall plan would be coordinated by a regional or ecosystem board of directors - - the Regional Executive Committee (REC) - - consisting of the regional directors of the relevant agencies: the Forest Service, BLM, U.S. Fish and Wildlife Service, National Marine Fisheries Service (NMFS) in NOAA, Bureau of Indian Affairs.

The REC would have its own staff of experts, called a "Regional Ecosystem Office" (REO), detailed from the agencies but reporting to an Executive Director responsible to the REC itself. In addition, interagency teams would be constituted to develop plans on a "province" basis (a subregion of the entire ecosystem, usually comprising portions of a number of national forests), and to do watershed analysis on key watersheds.

In order to oversee economic transition funding for the region, Community Economic Revitalization Teams (CERTs) were established at the State and ecological province level, composed of

local and state officials and business leaders as well as federal officials.

Finally, a White House office was opened in Portland, Oregon, to oversee the plan implementation efforts of the REC, coordinate the economic assistance effort, and provide outreach to constituency groups.

Ultimately, the REC would be responsible to an Interagency Steering Committee in Washington composed of Assistant Secretary - level and White House officials.

In the fall of 1993, more than 100,000 comments were received on the proposed plan. An interagency team worked throughout the winter to review these comments and revise the proposed plan; significant additional scientific analysis was factored into this review. As a result, a revised version of Option Nine (which included expanded riparian protection, a larger scientific monitoring program, and a total increase in reserve areas), was adopted by the Administration in April 1994.

The President's plan has now gone into effect. Although court challenges are pending and will be heard this fall, no parties to the challenges were willing to ask the courts to suspend plan implementation pending resolution of the legal issues. The Regional Executive Committee consisting of regional federal agency

directors has been formed, a regional ecosystem office established, and an executive director selected for the office (a career SES position established in the National Biological Survey, the executive director will report directly to the regional executives).

An Intergovernmental Advisory Committee to the Regional Executive Committee is also being established under the Federal Advisory Committee Act and will include state and tribal officials.

Fourteen key watersheds have been chosen as "pilot watersheds" to test the watershed assessment approach. Province-level executive teams have also been formed to coordinate sub-regional planning that is ecologically-based, rather than done simply on a forest-by-forest or BLM management district basis.

The U.S. Fish and Wildlife Service issued a scoping notice last winter for a special rule under section 4(d) of the Endangered Species Act that would clarify and, to the extent possible, reduce existing restrictions on private forestlands in the region. The intended rule reflects the goal of the President's plan that public lands should bear the brunt of protective measures for the northern spotted owl and other listed species. Publication of the proposed rule is targeted for this fall.

Implementation of the President's Forest Plan for the Northwest poses a tremendous challenge. Substantively and procedurally, the Plan represents an entirely new way of doing business: new rules for protecting watersheds and planning timber sales; new advisory and management groups; a new interagency and intergovernmental approach to planning and management; and new types of planning tools including comprehensive watershed analysis for all key watersheds. Patience will be required as we try to build up to a sustainable level of timber harvest under the plan as quickly as possible over the next several years, while at the same time demonstrating the integrity of the plan's provisions for environmental protection.

RESTORATION OF THE EVERGLADES/FLORIDA BAY ECOSYSTEM

South Florida's Everglades represent a national park, and a much larger wetlands/estuarine ecosystem, in grave peril. (Everglades National Park presently comprises only about 20% of the historic Everglades.) For a hundred years we ditched, diked, and drained this system for flood control, agricultural and urban development, and highway transportation. Only in the 1970's and early 80's did governments begin to realize that as a result of creating this vast managed water system, we had largely destroyed the natural water-based ecosystem that sustains the wildlife and water quality of South Florida, the source of drinking water for

burgeoning communities, and the resources on which the region's most valuable industry - - recreation and tourism - - depends.

Since 1983, with the inauguration of then Governor Bob Graham's "Save the Everglades" program, the State of Florida (under governors of both parties) and federal agencies (particularly the National Park Service) have been working on a series of individual projects to help restore natural functions and curb pollution in the Everglades. These included restoration of the meandering Kissimmee River (channelized in the 1960's from its 103 mile length through 35,000 acres of floodplain wetlands to a 56-mile concrete ditch called the "C-38 Canal"); cleaning up nutrient-loading of Lake Okeechobee from dairy farming; expanding Everglades and Great Cypress Park and Preserve, and improving water flow through Everglades National Park.

In the 1980's evidence mounted that sugar cane and vegetable growing in the 450,000 acre Everglades Agricultural Area (EAA) south of Lake Okeechobee was loading the Loxahatchee National Wildlife Refuge and Water Conservation Areas north of Everglades Park with phosphorus--converting natural sawgrass vegetation to cattails. In 1988, the federal government sued the State of Florida for failing to enforce its own water quality laws. When Governor Lawton Chiles came to office in 1991, he settled the litigation with a plan to construct a system of filtration marshes and require industry to utilize better management practices on

their farms. But agricultural parties continued from 1991 to 1993 to litigate in state court to prevent the State, the South Florida Water Management District (SFWMD), and the federal government from implementing the settlement - - a litigation that threatened to go for many years at great cost to all before any relief was in sight for the Everglades.

In 1992, Congress authorized the Army Corps of Engineers to begin a review study to determine how the Central and South Florida Project (C&SFP), the largest flood control project dominating South Florida north of and around the Everglades, could be reengineered in light of threats to the ecology and water supply of South Florida. No action had been taken to fund or commence this study when the new Administration came to office.

In March 1993, Secretary Babbitt convened a meeting of officials from the Department of the Interior and senior career officials from the Corps to explore ways to commence the study and make it useful, since it appeared that the study would play a key role in any overall long term restoration strategy for the region. Corps officials were enthusiastic about funding the study and beginning it immediately, and welcomed substantial participation of other federal agencies in setting overall objectives for the study. From the meeting, however, it became clear that without a mechanism for federal land managers such as the Park Service and Fish and Wildlife Service and other key federal resource agencies (particu-

larly EPA and NMFS) to work together in outlining overall federal objectives for the C&SF Restudy, it would ultimately be deficient.

As a result, in June 1993 the South Florida Ecosystem Restoration Task Force was convened by the Department of the Interior. The Task Force, formalized in September 1993 in a formal memorandum of understanding, is composed of representatives at the Assistant Secretary level from six departments and ten agencies (National Park Service, U.S. Fish and Wildlife Service, National Biological Survey, U.S. Geological Survey, Bureau of Indian Affairs, Army Corps of Engineers, Department of Justice, EPA, NOAA, USDA Soil Conservation Service). In addition to coordinating federal objectives for the C&SF Project restudy, the Task Force will design an ecosystem-based science program; support development of multi-species recovery plans for endangered species; and coordinate a variety of important individual restoration projects that are already underway. These projects include reengineering by the Corps and South Florida Water Management District of areas east of Everglades Park needed for more natural water flow in the Park (the so-called C-111 Project); improving water flows into the Park; and looking at ways to combat the serious degradation that appears to be occurring in Florida Bay as evidenced by sea-grass die-offs, algae blooms, reduction of natural populations including pink shrimp, and threats to the coral reef ecosystem of the Florida Keys National Marine Sanctuary.

Realizing that a Washington-level Task Force could, at best, set budget priorities and direct overall policy, the Task Force created a Florida-level Working Group, which is where the real interagency cooperation must occur. The Working Group in turn established 3 subgroups (science; infrastructure; and management and coordination). The Work Group was specifically tasked by the Task Force to develop by fall of 1994 a draft of an overall ecosystem restoration strategy; and a priority research agenda for the region.

In November 1993, the Science Sub-group produced a draft report used by the Corps in its C&SF Project Restudy to solicit public comments, and this month will publish for peer review and public comment a comprehensive proposed regional scientific research plan.

Ten days from now, the federal Task Force, its Florida Working Group, the board of the South Florida Water Management District, and a state Commission for a Sustainable South Florida appointed by Governor Chiles in March 1994 will all hold overlapping meetings over three days in Key Largo, Florida. (The commission is composed of 35 representatives from state and local government, business, public-interest groups, and four non-voting federal members.) At that time the Science Sub-Group will propose a short-term set of research priorities, with input from state and SFWMD scientists. A draft restoration plan for the entire ecosystem developed by the

Working Group will be briefed to the various entities. The Corps will unveil its draft set of alternatives for reengineering the C&SF Project, preliminary to a final Reconnaissance Study to be published in November 1994. And the final results of the C-111 study will be discussed, with potential for acquiring properties east of Everglades National Park that can provide more longterm fresh-water flow to the east end of Florida Bay.

Federal agencies' budget officials have also been working together at the Task Force level in Washington to create a "cross-cutting" budget for federal agencies which are part of the Task Force.

Simultaneously with these activities, the Departments of the Interior and Justice, with participation of the Corps of Engineers, entered into a mediation process with agricultural interests in South Florida, the State, the SFWMD, and environmental parties to settle the litigation over implementing the 1991 federal court settlement decree. Agreement was reached in July 1993 on a technical plan superior in many respects to the original plan and over respective federal, state, and agricultural financial contributions. But negotiations to finalize the agreement broke down in December when several major agricultural parties left the table. Finally, the substance of the July 1993 settlement with significant environmental improvements was incorporated in state legislation, The Everglades Forever Act, enacted in April 1994. The

clean-up plan, payment schedule, and management practices mandated by this legislation provide an important element and "foundation" for overall restoration, ending the delay in cleaning up agricultural return flows and diverting tens of millions of dollars that would otherwise have been spent on litigation costs into construction of a pollution filtration system.

A close partnership between the federal Task Force, the State (the Governor's office, and Department of Environmental Protection), and the South Florida Water Management District has been essential to our initial steps toward an overall restoration effort in South Florida. Bipartisan support from the Florida Congressional delegation has also been important. Creating formal bodies like the Task Force, Working Group, and Science Sub-Group to institutionalize federal interagency cooperation has also been a key development. While individual restoration projects in various parts of the ecosystem had been initiated prior to 1993, movement toward a comprehensive regional strategy and plan would be impossible without these more formal mechanisms, committing agencies at all levels to the priority of the South Florida program.

PRINCE WILLIAM SOUND

When President Clinton was elected, he found that very little progress had been made in the effort to implement an effective program for spending \$1.1 billion in fines Exxon Corporation was

scheduled to pay to the federal government and State of Alaska as a result of the Exxon Valdez Oil Spill. By the Exxon settlement decree and court order, the Exxon Valdez Oil Spill (EVOS) Fund is administered by a Trustee Council consisting of three state and three federal trustees who must agree unanimously on all plans, actions, and expenditures.

By April 1993, after nearly two years, there was no restoration plan (despite hundreds of thousands of dollars spent to write one), no permanent staff for the Council, and no discernible pattern to the expenditures of money that had occurred, most of which went to the six government agencies represented on the Council for a variety of individual projects.

While at first blush it might appear that the Clinton Administration and that of Governor Walter Hickel in Alaska would have many differences over natural resource policies, in fact remarkable progress has been made in the past sixteen months to develop and implement a consensus partnership.

A final restoration plan, based on extensive public input, was written and published with a draft Environmental Impact Statement, a final version will be adopted next month. An Executive Director was selected, by consensus, and he immediately put in place a top-rate professional staff. The Trustees have now agreed upon a balanced, overall strategy to implement the probable final Restoration Plan. It includes (1) direct restoration, (2) a spill-

area wide science and monitoring program, and (3) acquisition of important unprotected habitat i the spill area. The land acquisition program will be balanced geographically among various affected regions within the spill area. The science and monitoring plans are especially noteworthy because they are being developed cooperatively between Trustee staff and agency scientists from state and federal agencies, the University of Alaska, outside consultants, and Prince William Sound residents, fishermen, and local scientists.

A sophisticated, comprehensive parcel ranking system was used by an interagency Habitat Working Group to evaluate and "rank" all significant habitat areas where landowners indicated they might be willing sellers (primarily Native Corporations seeking cash in exchange for selected lands, most of whose members were hard hit by the spill). This ranking will help the Trustees prioritize habitat acquisition decisions. More than half a dozen potential major acquisitions are currently under appraisal and/or negotiation, with the goal of consummating by year-end at least several additional major acquisitions (two, at Katchemak Bay State Park and at Seal Bay on Afognak Island, were completed in 1993). Funding of a major Science Center facility at Seward as well as research based in Cordova, Kodiak and at the University of Alaska, is also contemplated for final decision this year.

NATURAL COMMUNITIES CONSERVATION PLANNING; SO. CALIFORNIA

The California gnatcatcher is a small songbird that subsists primarily in the fast-disappearing coastal sage scrub habitat of San Diego, Orange, and Riverside Counties in California. Unfortunately for the bird, this same habitat is also much favored by residential home developers.

When the gnatcatcher was listed by the U.S. Fish and Wildlife Service in 1993 as a threatened species, the Service promulgated a "special rule" under section 4(d) of the Endangered Species Act to delegate responsibility for protecting the gnatcatcher to an ongoing state/local planning process in California called the Natural Communities Conservation Planning (NCCP) process. Under this state law, counties and cities are encouraged to adopt multi-species and multi-habitat protection plans, including creation of reserve areas encompassing key combinations of imperiled types of habitat (such as coastal sage scrub) adequate to support sustainable populations of natural animals and plants.

The Service's special rule provided that if the relevant counties and cities adopted such plans, pursuant to scientific guidelines developed by state scientists (subject to approval by USFWS), the Service would review and approve the overall plans as a substitute for case-by-case, species-by-species, review of each and every individual landowner plan to develop vacant land that

might harbor a listed species. Then development could proceed in all areas so designated by the plan, even if "incidental taking" of species might occur.

The special rule provided that for those jurisdictions making satisfactory progress toward final plans, limited development could take place during the interim period, not to exceed 5% of the total habitat, subject to other scientific screening.

As a result of this action, private developers are working with state, county, and city governments, environmentalists, planners, and scientists in Orange and San Diego Counties to develop NCCP plans. Whether plans with scientific validity can weather the political process in these areas, and whether adequate and equitable means can be found to fund the acquisition or creation of needed preserve areas, remains to be seen. However, the potential benefit to species at risk, to local government bodies and to developers could be enormous.

HABITAT CONSERVATION PLANS AND COOPERATIVE AGREEMENTS

In 1983, Congress provided in section 10 of the Endangered Species Act for the possibility that private landowners might submit to the Fish and Wildlife Service "Habitat Conservation Plans" (HCP's) governing management of their lands to avoid adversely impacting populations of threatened or endangered

species. Once the Service approves an HCP, incidental taking of species is permitted as long as the plan is complied with.

Under Secretary Babbitt, the Interior Department has encouraged use of such plans. Recently, a new policy was announced by the Secretary that guaranteed substantial certainty or "shelf life" for applicants whose plans are approved. Except in the most extraordinary circumstances, private land owners can rely on the plans for the period initially stipulated by the Service (often 15-20 years or more) as adequate to safeguard habitat for those specific species the plan was designed to protect. Thus certainty for development and other activities can be afforded over a substantial span of time, as well as protection for at-risk species not yet listed.

An example of the tremendous mutual value of HCPs to the private owner and to imperiled species is illustrated by the large numbers of major private industrial forestland owners in the Pacific Northwest who have approached the Service to negotiate multi-species HCPS subsequent to finalization of the President's Pacific Northwest Forest Plan.

The Forest Plan relies almost exclusively on public lands for the large reserves necessary for spotted owl breeding, nesting, and foraging (particularly for young birds). The additional need for protection of private lands is primarily to supplement smaller

reserves and to provide "dispersal" habitat (corridors) through which owls can move from one federal reserve to another. Under the Endangered Species Act (ESA), the federal government can only require private landowners to protect isolated areas where owls are found, or likely to be found, now on private lands--but little old growth forest remains here. A landowner who develops an HCP to manage his timberlands for dispersal habitat may be able to cut more timber while providing more of what the owl needs in the overall scheme of the regional protection plan.

Moreover, an owner who develops a multi-species plan pledging to protect forested riparian areas important to owls and also to not yet listed salmon stocks) can win longterm approval for a management regime that need not be altered if the fish are listed as threatened or endangered in the future. In other words, the landowner buys certainty and predictability; the Service buys more valuable protection for owls, as well as anticipatory protection for fish not yet listed under the ESA, neither of which it could achieve by regulation alone. Earlier this year, the Fish and Wildlife Service established a "SWAT Team" in the Pacific Northwest to negotiate many HCPs simultaneously; the team is headed by Curt Smitch, a former wildlife official for the State of Washington, whose salary is shared by the State in order to demonstrate the importance of state-federal cooperation in this project.

Several multi-species HCPs are currently being negotiated in other parts of the country. For instance, HCPs creating reserves are in advanced stages of development in Washington County, Utah (St. George), and Clark County, Nevada (Las Vegas). An important HCP was recently approved in Bakersfield/Kern County, California.

The "cooperative agreement" and "no take agreement" are less formal versions of the HCP, in which a large private landowner meets its ESA obligations for a listed species by agreeing with the Fish and Wildlife Service to adopt certain management practices intended to avoid virtually any likely taking of that species. The Department--either through the FWS or National Biological Survey--has now entered into half a dozen such agreements with major timberland owners in the Southeast to manage their lands to protect species such as the red cockaded woodpecker (with FWS), or to survey landholdings for other listed species such as a rare salamander (NBS).

OTHER EXAMPLES OF INTERAGENCY COOPERATION

In a number of areas of the country, this Administration has taken an ecosystem approach by developing new cooperative initiatives among federal agencies which have seldom worked together--indeed, often worked at cross-purposes--in the past.

In the San Francisco Bay-Delta, the Administration established a working group dubbed "Club Fed" consisting of the four agencies with responsibility for providing water, promulgating water quality standards, and protecting endangered fish species: EPA, the U.S. Fish and Wildlife Service, the Bureau of Reclamation, and the National Marine Fisheries Service. It is the coordinated, united action of these agencies that has created a dynamic through which we hope the State of California, now working with the federal government, will assume its primary responsibility in a comprehensive reexamination of water deliveries in the region.

In expectation that Congress might enact some version of the California Desert Protection Act during 1994, the National Park Service and Bureau of Land Management earlier this year formed an interagency joint management contingency planning team. The team has developed a contingency plan for managing a new park or preserve, expanded national monuments. The contingency plan includes newly designated BLM wilderness. The plan includes cooperative management assistance and joint visitor services. The team has recently expanded to include the military services, important landowners in the area, as part of the Defense Department's own ecosystem management initiative. Partnering with the State and San Bernardino County will also be essential for regional cooperation and efficiencies in resource management of the Desert.

The Department of the Interior has recently formed a working group with the Federal Aviation Administration (FAA) to resolve issues relating to overflights of national parks, particularly by commercial tour operators. An Advanced Notice of Proposed Rule-making was released earlier this year, announcing an intention to promulgate joint regulations to restore natural quiet and permit restoring degraded resources at Grand Canyon and several Hawaii parks, and to head off similar problems at additional parks before they occur.

Another working group consisting of Interior and Defense Department (and Military Service) employees has been addressing tactical theater level overflight conflicts (particularly respecting National Wildlife Refuge lands) for more than a year. We are currently negotiating an umbrella agreement to formalize and expand this group, at the Secretarial level.

AGENCY REORGANIZATION TO FURTHER ECOSYSTEM VALUES

The U.S. Fish and Wildlife Service is an example of an agency that has begun to revise its programs and organizational structure to promote ecosystem principles in delivery of services to customers. Each of the Service's seven geographical regions identified and mapped seven or eight subregions, or "ecosystems", within its jurisdiction. Within the regional office, a team leader has been designated for each ecosystem (the national total is 52),

and representatives from various separate agency "programs" are assigned to that team. The ecosystem team is charged not only with coordinating separate agency programs that impact its ecosystem, but perhaps more important looking for new opportunities to build partnerships with private landowners, local governments, and state wildlife agencies within that particular ecosystem.

For 1995-6, priority ecosystems or clusters of ecosystems will be identified for special attention and possibly for targeted funding, with activities being coordinated by the team rather than directed by individual program officers.

WHAT ARE THE ADVANTAGES OF AN ECOSYSTEM APPROACH?

The obvious advantage of an ecosystem approach for the government agency and for the public at large is that it offers a better chance to comprehensively sustain the environment, and a greater likelihood that regulators and land managers will integrate economic sustainability into their decisionmaking. The ecosystem approach fosters interagency cooperation and promotes the use of partnerships. And it promises considerable efficiency of effort.

But there are also very important benefits of ecosystem management for private landowners and the directly regulated segment of the public, as well.

First, ecosystem management offers private landowners numerous opportunities for "one-stop, one-time shopping", for permits or permissions that might otherwise have to be obtained one species at a time, one small piece of land at a time, over a considerable period and at great expense. The multi-species HCP, offering private landowners and local governments certainty for 10-25 years in meeting obligations to protect not only listed species but species that might become listed in the future, is a prime example.

Second, because the ecosystem approach relies on involving as many stakeholders as possible in resolving and preventing natural resource conflicts, the chances are greater that private landowner interests will be considered up front and fully.

Third, where the federal government seeks to push decision-making down to state and local levels, ecosystem planning and management encourages a less direct, less intrusive role for the federal government in private land-use decisions.

Finally, in virtually all of the Administration's ecosystem initiatives we have looked to public land first to provide for species and habitat maintenance. In addition, ecosystem management offers incentives to large private landowners to supplement species and habitat maintenance provided by public lands. The ecosystem approach, by looking at the big picture, thus creates new opportunities to structure relief for small private landowners.

For all these reasons, the ecosystem approach should be viewed as providing helpful and creative opportunities for relief to private landowners from existing federal regulation, rather than a program to extend federal regulation to private land in places where it does not currently exist.

WHAT WORKS? WHAT HAVE WE LEARNED?

As Mr. Pipkin's testimony notes, some of the "lessons learned" will need to await the case studies being conducted by the Administration's Interagency Ecosystem Management Task Force.

A few preliminary lessons seem clear. Ecosystem plans are not easy to fashion, nor easy to implement. The ecosystem approach represents a challenge to conventional agency mandates. Thus structures must be created to provide direction, and incentives, to each key agency manager to put the coordinated program at least on a par with his or her own agency program. And leaders must be picked for interagency councils and task forces who are comfortable with a "new way of doing business."

The ecosystem approach seems to work best where it builds on cooperative work already being done in the field, rather than imposed from a centralized source.

Ecosystem management must be based on good science, but neither science nor scientists can dictate many of the important policy decisions. Science can analyze the problem, delineate alternatives, and predict consequences and (sometimes) levels of risk. But science seldom offers only one solution.

We are still very much pioneers in ecosystem management. Almost every initiative this Administration has undertaken has been a "case of first impression," with its own geographical and political idiosyncracies. So we are still on a steep learning curve. Many of our ecosystem initiatives are like architect-designed houses: they are fascinating and challenging, but they often leak.

I sometimes use two analogies to describe my experience over the past fifteen months as one of the pioneers on this trail.

Ecosystem management is not elegant or clean, it's messy. It is not like programming a computer or painting a canvas. It is like getting underneath your car and trying to figure out what is making that banging noise. There is no way to emerge without being covered in sweat, dirt, and oil.

Ecosystem management is often turbulent. Secretary Babbitt has laid out for us two priorities: base decisions on good science; and take an ecosystem approach. The trouble with this is that science

is objective and rational. Ecosystem management, by contrast, inherently involves partnerships, which require blending diverse interests, making trade-offs and compromises. Ecosystem management is integrative and political, rather than deductive. Where these two tributaries ("do good science; do ecosystem management") meet, they often cause a major portion of the main river channel to become very choppy.

BARRIERS TO INTERGOVERNMENTAL AND OTHER COORDINATION

A particularly significant "lesson learned" concerns coordination and cooperation among the many levels of government and other stakeholders involved in the management of an ecosystem. Even under the best of circumstances, addressing intergovernmental relationships and coordination with interested entities is a major challenge! In many instances, however, this inherent difficulty is compounded by the need to comply with the Federal Advisory Committee Act (FACA). FACA was enacted to ensure openness in efforts to advise Federal agencies about the purpose, scope or conduct of their programs. To achieve that openness, the Act requires that where committees or similar groups including one or more nonfederal members are established or utilized by Federal agencies to provide advice to decision makers, the group must be chartered and must function in accordance with FACA. But, the unintended consequence of FACA is to make State-Federal and other cooperation--and therefore representation of a broad array of

nonfederal interests--more difficult. Nonetheless, we endeavor to comply with the spirit and letter of FACA.

I appreciate this opportunity to speak for Secretary Babbitt and the Department of the Interior about its experience with ecosystem management, and to share some personal observations as well.

I would be happy to respond to any questions you may have.

Mr. MILLER. Thank you.
Mr. Lyons.

STATEMENT OF JAMES LYONS

Mr. LYONS. Thank you very much, Mr. Chairman. I'm pleased to come before you today to discuss the administration's interest and commitment to ecosystem management.

You have my written statement. What I would like to do this morning, though, is depart from my prepared remarks and offer some thoughts and insights into ecosystem management as it has evolved to become the guiding principle for natural resource management in the Department of Agriculture and other departments of the Federal Government as well.

You have heard from each of us a commitment on the part of this administration to the concept of ecosystem management, and I want to apologize in advance as the anchor for this team if my statements are somewhat redundant, but in light of the questions we heard earlier and the atmosphere here today, I don't know that that will hurt.

Ecosystem management is an approach to land stewardship which embodies a very simple principle. In fact, it is one of the laws of ecology, if you will, but everything is connected to everything else. That is, ecosystem management transforms management from a single resource or species focus to an approach that recognizes the interconnected nature of natural resources. It is an approach that seeks to ensure that management is cognizant of the complexities of ecosystems, of how changes in the status of one resource may affect another so that our management decisions can be better informed and better integrated.

The concept of ecosystem management is the product of a rather rapid evolution in our thinking with regard to how natural resources should be managed. Until relatively recently, management strategies continued to focus on the production of a single resource, such as timber, or the protection of a single species, like the northern spotted owl. The problem with such an approach was that it was highly inefficient and often resulted in unnecessary conflicts between resource production and protection goals. With a little forethought, with better scientific information, and employing the concepts and principles of ecosystem management, we can seek to reduce or even head off future management disputes.

Mr. Chairman, you, Chairman Studds, and Chairman de la Garza deserve some credit for promoting the concept of ecosystem management at a time when the simpler alternative of species-focused strategy might have been preferred. You recall your involvement in the Gang of Four study which represented the first real effort to take a multi-species, scientifically-based regional approach to resolving long standing conservation conflict. A product of the efforts of Doctors Gordon, Johnson, Franklin, and Thomas, the now infamous Gang of Four was a precursor to the efforts which led to the production of the President's forest plan and really the first effort to try and look at a multi-species solution to a complex regional problem.

USDA is strongly committed to the development and implementation of ecosystem management as a framework for our natural

resource conservation policies and programs. The USDA Forest Service has pioneered in the development of ecosystem management concepts and has conducted much of the ground-breaking research that provides the underpinning for current ecosystem management strategies.

Dr. Jack Ward Thomas, chief of the Forest Service, has led much of this research and has personally managed several of the pioneering efforts to develop broad-based resource management strategies including the forest ecosystem management assessment team effort which developed the basis for the President's forest plan. At the helm of the Forest Service, Jack has reemphasized the agency's commitment to ecosystem management as the framework for how it does business on the ground.

Similarly, the Soil Conservation Service, with a presence in nearly every county in the United States, has committed itself to the development of an ecosystem-based assistance program for farmers and ranchers across the Nation. Under the leadership of Paul Johnson who accompanies me here today, SCS is working with private landowners to help them understand their management options and opportunities in the larger context of the landscape, the ecosystem in which they operate.

Together, the Forest Service and the Soil Conservation Service directly affect the management of more of the American landscape than any other department or agency of Government. Given our role in the management of the Nation's National Forests and our responsibility for promoting the stewardship of private forests and agricultural lands, we can do much to promote ecosystem management concepts and principles in concert with our sister agencies that we can do a better job of serving our public landowners and our customers.

I have recently directed the Soil Conservation Service and the Forest Service to form a partnership to develop a unified approach to implementing ecosystem management in the Department of Agriculture. Key to this effort will be the development of joint definitions, data bases, and protocols for conducting resource inventories and assessments. We are currently evaluating the possibility of developing one unified GIS system for the two agencies to permit the collection and dissemination of resource information across administrative boundaries. Similarly, we are evaluating the potential for developing a unified set of eco-regions to facilitate the development of data on resource conditions and trends and to improve our ability to collaborate and coordinate management activities within the Department. One of our immediate goals is the production of a single natural resource inventory of the Nation's forests, agricultural, and range lands to improve our ability to manage and provide management assistance on an ecosystem basis.

USDA has also played a critical role in fostering improved collaboration and cooperation among the agencies and departments within the Federal Government who share an interest and need to work better together. Given the differing jurisdictions of each agency—something we have already discussed today—their varied mandates and resources, teamwork will be critically important to the successful implementation of ecosystem management—partnership, as George indicated.

As noted by other witnesses today, natural resources know no geopolitical boundaries. To do the job of managing resources, we must work together, land managers and the regulating agencies, to achieve our common goal of maintaining healthy and productive ecosystems and a sustainable flow of the goods and services they provide.

Mr. Frampton has highlighted the administration's efforts to develop an ecosystem-based strategy for the protection of northern spotted owl and related flora and fauna. Soon after completion of the FEMAT effort, USDA, working with our sister agencies in the Department of the Interior and Commerce and in EPA, initiated an ecosystem-wide assessment of the forest resources of eastern Washington and Oregon, Idaho, and western Montana. This east side assessment, as it has come to be known, shares many of the same attributes as FEMAT. It is an ecosystem-oriented, scientifically-based, region-wide assessment of the status and health of forest resources intended to serve as the foundation for improved management for the forests, fish, and wildlife of the region. It is headed by a multidisciplinary team and includes representation from the Forest Service, the Soil Conservation Service, BLM, Fish and Wildlife, Bureau of Indian Affairs, National Marine Fisheries Service, Department of Commerce, and EPA. In addition, State agencies and tribal nations are partners in this effort.

Some have asked, why undertake another massive effort of this nature? I think the answer is really a simple one. If we are to avoid future train wrecks like the one that brought resource management to a standstill on the west side of the Cascades, then we must have the foresight and the information to make informed management decisions before crises strike.

Our efforts on the east side serve two primary purposes. One is to develop a comprehensive database to update forest plans in the four-State area. The other is to paint a more accurate picture of the status of resources associated with the Columbia River. By adding the information from this east side assessment to that which was generated by the FEMAT, we can begin to better understand the factors affecting the health of the entire Columbia River system, a necessary piece of information if we are to have any hope of sustaining important resources like salmon runs in the Columbia.

Of course, Mr. Chairman, we are involved in other ecosystem management efforts. You are aware of the work we are doing in the Sierra Nevadas, and in addition Assistant Secretary Frampton and I are headed to Jackson, Wyoming, later this week to discuss renewal of the long-standing partnership between the National Forests and the Parks that constitute the greater Yellowstone ecosystem.

Mr. Chairman, I offer these examples of our ecosystem management efforts to illustrate some of the common principles and critical needs of each which have actually been highlighted already by Mr. Pipkin. I would emphasize one though, and that is partnership and teamwork which are critically important to the success of these and other ecosystem efforts.

People with a common perspective and a shared commitment to understanding the functions and status of an ecosystem are essential. So too is trust, a factor that has suffered during the past 12

years. For ecosystem management to be possible, all affected agencies must commit the resources necessary to get the job done, but without restoration of a measure of trust among the employees of different agencies for their commitment to protecting or restoring the ecosystem in question, ecosystem management cannot succeed.

Trust is also a significant concern, or so it seems, when it comes to consideration of the role of private lands in the context of ecosystem management. To be clear, ecosystem management requires some understanding of the contributions that each landownership, public and private, might make to the health of natural resources, but ecosystem management should not dictate how these resources are to be managed, particularly when it comes to private lands. Rather, ecosystem principles should help landowners and land managers understand their options and the consequences of different management activities for them and others in the particular area of concern.

Ecosystem management is not a regulatory strategy. To the contrary, it should serve as a means of preventing or eliminating regulation by providing landowners with choices before all their choices run out. Historically, both the Soil Conservation Service and the Forest Service assist States and private landowners at their request. As we implement ecosystem management in the USDA, this philosophy will not change.

I need also address the matter of people in ecosystem management, and this is to reiterate what Mr. Pipkin said. Some opponents of the concept of ecosystem management would like to argue that it is a biologically-based concept which ignores the needs and values of people. To the contrary, ecosystem management cannot be effective unless it acknowledges the critical role that people play as a part of the ecosystem in which they reside. It is people in the communities in which they reside that give natural resources their value, that create management conflicts, and that develop the means to resolve those conflicts.

People have the greatest effect on ecosystems, and they have the right to benefit from the goods and services natural resources provide. Our goal is to ensure that through improved understanding of the relationships between people and their natural resources we can sustain the production of the goods and services that come from an ecosystem by maintaining its health and productivity.

As a part of our reinvention efforts in the Department of Agriculture, both the Forest Service and the Soil Conservation Service are considering changes in their organization that would be built upon the ecosystem concept.

The Forest Service, for example, is considering one alternative that would provide for restructuring of its regional boundaries to coincide with ecological regions, such as Bailey's eco-regions. The Forest Service was designated as a reinvention laboratory in the President's National Performance Review and is considering other concepts associated with reinvention that would improve our ability to manage in a more ecologically sound and efficient way. Soil Conservation Service, soon we hope to be called the natural resources conservation service, is considering similar approaches and similar changes in structure and function.

To be successful, however, we must realize that ecosystem management will require new investments and changes in program efforts just on program emphasis on the ground. More emphasis must be placed on the restoration and protection of ecosystems in our monitoring and assessment of program performance. Successful performance under ecosystem management cannot be measured in terms of single outputs like board feet or miles of trails built or acres of farmlands treated. Instead, new measures of the health and sustainability of natural resources must be developed. We are hard at work to develop these new performance measures.

Our success in implementing ecosystem management will also be a function of the degree of congressional support we receive. Investments in monitoring and assessment in basic research into ecosystem functions are needed if we are to have the information and the technology that is necessary to succeed. However, in the past this money has been hard to come by. In addition, if any changes in regional organizations is deemed necessary to improve our ability to manage ecosystems, we will need congressional blessing to get that. On this front, support has been particularly lacking.

Finally, the Congress must be willing and able to view agency budgets for specific ecosystem initiatives in an integrated fashion. Funding packages like this is not the traditional way of doing business, but this is also essential if ecosystem management is to succeed.

We believe that ecosystem management is the right thing to do, and we hope the Congress will be supporting our efforts to implement this strategy. The promise of ecosystem management is significant. It is a common-sense way of managing natural resources. It promises to be more efficient and can lead to the elimination of redundant programs and unnecessary paperwork. It requires greater flexibility on the ground and, as such, can improve the ability of managers to adapt to local resource conditions and better respond to changes in the needs of individual landowners.

One of the cornerstones of ecosystem management is the concept of adaptive management, management that responds to new science and changes in resource status so that management techniques are state of the art, and it requires collaboration and coordination, a teamwork approach. Thus, it affords Federal agencies, States, the tribes, and private landowners with the opportunity to collaborate and innovate and learn from each other's experiences and performance.

To reiterate, ecosystem management is not a new program, it is not a new regulatory strategy, and it is not a new political initiative, it is a philosophy and a way of doing business that reflects current science, management concepts, and common sense.

Later this fall, USDA will host on behalf of the White House Office on Environmental Policy a workshop on the ecosystem management strategies and programs being developed by the various Federal agencies involved. Our goal for this workshop is to better understand the different approaches we are each taking to adopt ecosystem management principles and to begin to identify opportunities for further collaboration, perhaps to include measures like similar eco-regions and approaches that would further cooperation and teamwork on the ground. There are, however, pros and cons

to this concept. This effort will be a follow-up to the work led by Mr. Pipkin and Ms. Gelburd which was presented to you earlier.

Mr. Chairman, we are pleased with our progress in adopting ecosystem management in the Clinton administration and in particular in the Department of Agriculture. This new way of doing business holds great promise. The partnership that has developed between the Departments of Agriculture, Interior, Commerce, and the EPA is excellent and unprecedented, and we remain optimistic that this approach to natural resource management will benefit both the natural resources we are entrusted to manage and the public we serve.

Thank you very much.

[Prepared statement of Mr. Lyons follows:]

STATEMENT OF
JAMES R. LYONS, ASSISTANT SECRETARY
NATURAL RESOURCES AND ENVIRONMENT
UNITED STATES DEPARTMENT OF AGRICULTURE

Before the Joint Hearings of the
Subcommittee on Specialty Crops and Natural Resources
Committee on Agriculture

Subcommittee on Environment and Natural Resources
Committee on Merchant Marine and Fisheries

Subcommittee on Oversight and Investigations
Committee on Natural Resources

Concerning Ecosystem Strategies
in the
Department of Agriculture

September 20, 1994

MR. CHAIRMAN AND MEMBERS OF THE SUBCOMMITTEE:

Good Morning. I am James R. Lyons, Assistant Secretary for Natural Resources and the Environment for the Department of Agriculture. With me today are Paul W. Johnson, Chief, and Richard Duesterhaus, Deputy Chief for Technology, from the Soil Conservation Service and Gray Reynolds, Deputy Chief from the Forest Service's National Forest System.

General Accounting Office (GAO) Report on Ecosystem Management

USDA is committed an ecosystem approach on Federal lands and when assisting private landowners and other resource users.

The GAO report accurately portrayed the Forest Service's history and thinking on ecosystem management and its implementation efforts. We also concur with the report's

recommendations for implementing a Government-wide approach to ecosystems. If we are to be successful in fulfilling ecosystem management potential, the Forest Service and Soil Conservation Service must promote the long-term sustainability of ecosystems by ensuring they are healthy, diverse, and productive.

Overview

Never before have the natural resources of this country been under such intense pressure to provide both the necessities of life as well as enrich the quality of life for so many people. People who manage our natural resources, in both the private and public sectors, are facing increased demands to provide the marketplace with goods and services derived from our resource base. Increased population pressure, increased demands from domestic and foreign markets, new technologies, and the depletion of biological diversity are some of the long-term issues confronting natural resource managers.

These competing demands on our natural resource base make it imperative that resource use and management be approached with a more integrated view and address the land in a holistic and systematic fashion. The ecosystem approach offers such a framework for proactive and sound economic, environmental, and social decision-making.

Interdisciplinary and Interagency Cooperation

Because ecosystems extend beyond political and other administrative boundaries, interdisciplinary and interagency cooperation is essential. As you will hear today from me and other witnesses, the Administration is implementing an ecosystem approach to resource management and protection that emphasizes interagency cooperation. An example of this cooperation is the Interagency Ecosystem Management Working Group co-chaired by James Pipkin from the Department of the Interior (DOI) and Diane Gelburd from USDA's Soil Conservation Service. Both are here today and will address this working group in detail.

Ecosystem Approaches for USDA

Within USDA, an Ecosystem Collaboration Team has been established to share information among agencies and to develop an USDA policy for implementing ecosystem management on Federal lands and ecosystem-based assistance on private lands.

An ecosystem approach is the best way to ensure USDA's commitment to protect and conserve natural resources while using those resources to produce food and fiber. An ecosystem approach also conforms to the way the world is arranged; as interrelated ecological, social, cultural, and economic systems. It also provides a framework for integrating the knowledge and perspectives of the natural and social sciences into these systems.

I would like to highlight some of the reasons why USDA should adopt an ecosystem approach:

- . It ensures the maintenance of the capacity to meet human food, feed, fiber, and industrial needs of present and future generations.

- . It integrates the quality of life concerns in all programs by explicitly recognizing humans in the environment.

- . It ensures the use of both ecological and economic information in planning and decision-making.

- . It encourages the advancement of a more scientific approach to the application of natural and social sciences in resource decision-making.

- . It ensures consideration of the stakeholders needs and desires.

- . It responds to the Secretary's need for coordinated information to address complex resource use issues.

- . It provides for an information and education planning effort to inform decisionmakers of their alternatives.

. It encourages all of us to practice good resource stewardship because ecosystems have a finite capacity to provide goods and services to society on a sustainable basis.

An ecosystem approach will provide a number of benefits. For example:

1. It will provide a common framework for USDA programs which will improve the quality of public service.
2. USDA programs will be planned and evaluated on holistic scientific principles to minimize projects working at cross purposes.
3. It will assist the Department in working more effectively with local, State, and other Federal agencies and the public regarding long-term issues such as wetlands protection and restoration policies.
4. Ecosystem approaches will facilitate sustainable agriculture and sustainable development policies and programs.

Soil Conservation Service and Forest Service Collaboration

The Soil Conservation Service and Forest Service Ecosystem Collaboration Team has been formed to provide USDA leadership for planning and implementation of ecosystem concepts for use on Federal lands and on private lands where requested by the landowner. This collaboration team will reduce duplication and inconsistent policy and guidelines, and will also further the use of ecosystem concepts.

The Soil Conservation Service and Forest Service have developed an action plan for collaboration between the two agencies. The plan includes:

1. Research and Technology
2. Policy Development
3. Training
4. Database Coordination
5. Communication and Terminology

I would like to briefly discuss each of these elements.

1. Research and Technology

Forest Service Research has been actively involved in the major regional ecosystem assessments that have been completed or are now underway. Some examples are the interagency Forest Ecosystem Management Assessment Team (FEMAT) for the Pacific Northwest and northern California spotted owl forests and the East side Forest Ecosystem Forest Health Assessment for eastern Oregon and Washington.

The Soil Conservation Service and the Agricultural Research Service (ARS) are restructuring their partnership for research and technology. The result will be future research projects conducted by ARS which include ecosystem concepts that will help the Soil Conservation Service provide "ecosystem based assistance" to the public.

2. Policy Development

The Soil Conservation Service and Forest Service Ecosystem Collaboration Team has drafted a USDA policy on ecosystem approach. This vision and policy provide an umbrella for all agency activities that relate to natural resources.

In addition, both agencies also have policies that relate to their specific missions. The Soil Conservation Service provides assistance to private landowners and the Forest Service manages National Forest System lands and also assists private landowners through its State and Private Forestry program.

The Soil Conservation Service policy is to provide ecosystem-based assistance to all customers and to help the customer improve ecosystem health, restore damaged ecosystems, and sustain natural resources. Ecosystem-based assistance is the integration of ecological, economic, social, and human factors in order to maintain and enhance the quality of the environment to best meet society's current and future needs.

The Forest Service policy is to use ecosystem management as a holistic approach to natural resource management, moving beyond a compartmentalized approach focusing on the individual parts of an ecosystem. It is an approach that focuses on the forest landscape and its position in the larger environment in order to integrate the human, biological, and physical dimensions of natural resource management. It requires an accelerated scientific effort and the efficient incorporation of new scientific information into on-the-ground management.

3. Training

The Soil Conservation Service and the Forest Service have initiated a training program for applying the ecosystem approach for employees.

The Soil Conservation Service has just piloted a training program on ecological principles that emphasizes the fundamental principles of ecosystems. SCS is coordinating with the Forest Service and Bureau of Land Management to develop a universal training course for all agencies.

The Soil Conservation Service and Forest Service are developing an ecosystem approach training program to help planners and decision makers look at the economic and environmental needs of a watershed, community, or large defined area. This training program will be delivered by "distant learning methods" utilizing the electronic highway and thus have the capability to train multi-agency personnel, stakeholders, local leaders, and other concerned publics. The course will be delivered on April 10, 1995 to more than 2,000 interested individuals in all 50 states.

4. Database Coordination

A joint agency meeting was completed last week in Denver to develop a common "Geomorphic Description System."

The agencies have published an "Assessment of The Soil Conservation Service and Forest Service Coordination of Natural Resources Information" in July. The two agencies are in the process of implementing the recommendations in the report to eliminate overlapping data collection and analysis by the agencies.

5. Communication and Terminology

The Forest Service prepared a draft Glossary of ecosystem management key terms. The Soil Conservation Service and Forest Service Collaboration Team will work with other USDA agencies to complete a final glossary of key terms for USDA.

We have developed a Coordination Index which identifies approximately 50 program areas within the Soil Conservation Service and the Forest Service where ecosystem coordination is needed. Key contacts in each program area have been identified for each agency.

Cooperation with Private Landowners

I would also like to explain where USDA stands regarding private property.

Although ecosystems cross political and physical boundaries, the USDA respects private property rights. Historically, both Soil Conservation Service and Forest Service assistance to State or private landowners has always been at the request of the landowner. The agencies then may provide technical or financial assistance, if available, depending on what is needed and desired by the landowner. As we implement ecosystem management in USDA, this philosophy will not change.

Many of the examples in the attached supplemental statement, include private landowners who have voluntarily asked for the assistance of the Soil Conservation Service or the Forest Service's State and Private Forestry area. We strongly support this voluntary approach to encourage the participation of private landowners in an ecosystem approach. We have been very successful with this partnership approach which encourages innovative alternatives that result in better management for our natural resources.

Summary

The Department believes that the only way an ecosystem approach will be successfully implemented is through the collaborative efforts of private landowners, interest groups, and State and Federal agencies. Under Secretary Espy's leadership, both the Soil Conservation Service and the Forest Service are committed to moving forward in implementing ecosystem-based assistance to private landowners and ecosystem management on National Forest System lands.

The ecosystem approach is changing the philosophy of how the Soil Conservation Service and the Forest Service and their partners view their role in conservation. This change should not be viewed as abandoning or condemning past actions but, rather as an effort to build on what has been learned in the past.

As both agencies complete broadscale assessments and on-the-ground projects, these efforts will be monitored to evaluate management strategies, and where necessary, adapt management to incorporate new information from the scientific community and the public.

The ultimate success of the ecosystem approach--an approach that recognizes that people are an integral part of the ecosystem and their needs must be blended with environmental concerns--will depend on how we focus our scientific inquiry and apply science.

Mr. Chairmen, this completes my prepared statement. We will be pleased to respond to any questions you may have.

SUPPLEMENTAL STATEMENT

FOR THE TESTIMONY OF
JAMES R. LYONS, ASSISTANT SECRETARY
U.S. DEPARTMENT OF AGRICULTURE

FOR THE JOINT HEARING CONCERNING:

ECOSYSTEM MANAGEMENT STRATEGIES IN THE
DEPARTMENT OF AGRICULTURE

September 20, 1994

This supplemental statement details the efforts of USDA's Soil Conservation Service and the Forest Service in beginning to implement ecosystem-based assistance and ecosystem management. The statement also includes several ongoing field level projects that represent the range of projects that are being implemented by the two agencies.

Soil Conservation Service Ecosystem Management Implementation

Action Plan

Earlier this year, Chief Paul W. Johnson issued an action plan for the Soil Conservation Service to assist landowners and other resource decision makers to achieve a high level of productivity that is in harmony with a quality environment. The centerpiece for this plan calls for providing ecosystem based assistance for Soil Conservation Service customers. The action plan includes:

1. Implement an ecosystem-based assistance approach throughout the agency;
2. Develop an overall framework for policy, regulations, and law that promises ecosystem-based assistance;
3. Develop, use, and adapt science-based tools to support ecosystem-based assistance;
4. Use key indicators to monitor ecosystem health; and
5. Develop and implement a communication plan to support ecosystem-based assistance.

SCS delivered its policy statement to all field offices and implementation of Ecosystem-Based Assistance on a voluntary basis has begun. This assistance blends the latest ecosystem science principles with sound conservation fundamentals of previous years and uses the Coordinated Resource Management process; a formal problem-solving, consensus-building process involving all concerned participants. It also assures the integrated management needed to sustain our soil, water, air, plant, and animal resources, as well as the social, economic, and cultural considerations.

Field Implementation of Ecosystem Management

1. The Malpai-Borderlands Group, is a coalition of 36 ranchers in southeastern Arizona and southwestern New Mexico. With the technical assistance of the Soil Conservation Service, they are developing a plan to restore and protect over one million acres of rangeland. The resource concerns include threatened and endangered plant and animal species, the need for improved rangeland diversity, water quality, and soil erosion concerns.

The Soil Conservation Service is providing technical assistance to the ranchers for improved rangeland and soil conservation, livestock management, and water quality and wildlife habitat improvement. The Soil Conservation Service is also participating in several innovative field trials related to this project. Because many of the ranchers are Federal land permittees, the Forest Service and Bureau of Land Management are cooperators in the project. In addition, some of the innovative ideas that are being adopted for this project includes the use of "grass banks" which are grasslands set aside until needed as a replacement for other pastures being rehabilitated.

2. In the northwest, the Soil Conservation Service is working with private landowners, local conservation and irrigation districts, Tribal governments, State and other Federal agencies to recover endangered species of salmon and other threatened species. The primary effort is in the headwaters of the Columbia River Basin and in the coastal tributaries where salmon return to spawn. The ongoing projects include:

- a. Developing coordinated resource plans, for both private and Federal lands, that will protect riparian areas and reduce stream sediment load, and thereby improve water quality.
- b. Implementing a pilot project to develop grazing management plans that include both private land and National Forest lands.
- c. Installation of stream diversions to reduce the loss of salmon fry.
- d. Adjusting water withdrawals to improve fish passage.

Another important part of the salmon initiative is coordinating with the Department of Commerce to hire unemployed commercial and tribal fisherman to work with local conservation districts and the Soil Conservation Service staff to help restore salmon habitat areas.

This innovative effort shows how the rural economy can benefit from wise resource use and cooperative efforts.

3. The St. Albans Bay Rural Clean Water Project in northern Vermont is a ten year monitoring and evaluation program that was initiated when a high use recreation area was closed due to poor water quality. The recreation area provided a substantial part of the local community's revenue.

A voluntary program that includes 70 landowners was set up with the assistance of the landowners, local conservation districts, and local, state, and Federal agencies. A combination of water quality improvement projects were completed including containment facilities for dairy runoff, erosion control practices on cropland, and the local sewage treatment plant was upgraded.

These efforts have improved water quality and the recreation area has been reopened.

4. Sympson Lake is the primary water supply for the 25,000 people in the town of Bardstown, Kentucky. Water users have experienced an increase in poor taste and odor problems in the water, and a decrease in domestic water supply during periods of high use and low rainfall. Nearly two-thirds of the wells and springs in the county contain high levels of coliform bacteria and nutrients. Other impacts to the water supply were animal waste and herbicide treatment along power line right-of-ways.

To address these and other problems, technical assistance to the local community in developing an ecosystem-based assistance program was provided through the coordination of the Kentucky Water Interagency Coordinating Committee, the Soil Conservation Service, and the Forest Service. The planning team worked closely with the local community in identifying the extent of local concerns and problems, inventorying and assessing existing data, evaluating alternatives, and issuing a final report.

Many of the report's recommendations are now being implemented including county wide planning and zoning to control urbanization around the lake, improved management of recreation on the lake, and eliminating the use of herbicides along power lines adjacent to the lake.

5. In the Navesink River Watershed in New Jersey, a P.L. 566 cost-shared implementation program focused on non-point source pollution problems that were impacting the ecosystem of shellfish in Monmouth County, New Jersey. The primary goal of the program is to reduce bacterial contamination of shellfish harvesting waters so that unrestricted shellfish harvesting could take place. A second goal was to implement land and water treatment measures designed to improve agricultural productivity and mitigate nutrient and sediment loading to the largest domestic water supply in the county, Swimming River Reservoir.

These critical ecological problems were addressed by having all the major participants meet and understand each agency's role and responsibility relative to the common goals of the citizens in the watershed. Dealing with the array of nonpoint source problems encountered in the Navesink watershed brought the stakeholders and interested parties together and brought to their attention the total resource needs and opportunities.

The importance of healthy ecosystems and using a total approach to solving problems with flexible, innovative considerations on a site-specific basis were the results of the project. The success of the project was from the agricultural component that had voluntary long-term farmer cooperation and implementation of farmland management practices throughout the watershed. A specific action resulted in a manure composting facility being constructed with public as well as private funding. The facility accepts manure composting from horse farms in the Navesink Watershed. It is anticipated this will reduce the amount of animal waste now exposed to stormwater runoff, with a subsequent reduction of bacterial and nutrient contamination of the river. It is estimated the project will provide a \$1.2 million annual benefit to the citizens of New Jersey.

6. Even before ecosystem-based assessment concepts became popular, SCS had offered ecosystem-based assessment planning assistance to state and local governments. SCS's River Basin Program began to encourage the State natural resource agencies and those cooperating Federal agencies as well as concerned citizen groups to develop a "State Strategic Resource Management Plan." These plans focused on the water resources but were encouraged to examine the problems, needs, and opportunities of a river basin and set priorities for assisting local communities to develop total coordinated resource management plans. This effort began in 1952 and there are now 38 states enrolled in this effort. Many have developed special EBA type watershed plans, utilizing EPA and local and state or private investments.

An example of one of these river basin projects is the Big Springs Basin Plan in Iowa. The planning effort brought together farm co-operators, area agricultural suppliers, local, state, and Federal agencies, and others who were concerned about water quality, erosion, crop production, fish and wildlife populations, and wetlands. Through extensive public involvement, together with special resource inventories, surveys, and data, the group demonstrated more effective ways to use nitrogen, other crop nutrients, pesticides, animal manures, legumes, and various soil conservation practices.

The results have been an annual savings for farmers in the basin of \$200,000 and restored a major water supply spring for trout.

The project is being used as a prototype for other river basins in Iowa and other Great Plains States to heighten awareness how the proper timing and use of nitrogen fertilizer can reduce water quality impacts and reduce fertilizer costs to farmers without reducing crop yields.

Forest Service Ecosystem Management ImplementationAction Plan

In February, 1994, Chief Jack Ward Thomas issued a National Action Plan for Implementing Ecosystem Management. The goals of the action plan are:

1. Adopt an ecosystem management approach throughout the agency;
2. Integrate ecosystem management into all activities;
3. Strengthen collaboration and innovation; and,
4. Ensure our management actions are ecologically responsible, economically viable, and socially acceptable.

This action plan represents the commitment of the Forest Service to shift from the testing and demonstration phase to full implementation of ecosystem management on National Forest System lands and by assisting private landowners through our State and Private Forestry organization.

State and Private Forestry Programs

The Forest Service's State and Private Forestry programs furnish an entire range of options to assist State or private landowners and local communities. Some examples include:

Forest Stewardship programs that provide technical and financial assistance to nonindustrial forest landowners and encourage the practice of good stewardship and wise use of resources while promoting forest health. Since the enactment of the 1990 Farm Bill, Forest Stewardship and Stewardship Incentive Programs have provided more than \$21 million in assistance to individual private forest landowners. Over 25,000 plans are in place which meet landowner objectives and incorporate ecologically appropriate forest practices.

The Forest Health program supports efforts to improve and protect the forests on National Forest System Lands, and in cooperation with others, on other lands in the United States. The past year marked field implementation of the Broadscale Analysis of Forest Health Assessment in western Montana and much of northern Idaho. In the Pacific Northwest, over 4,500 clones of disease and blister-rust resistant white and sugar pines have been tested and are available to all forest landowners.

Fire management partnerships established in the fire community at the local, state, and Federal level are invaluable in cooperative land management planning efforts and are key to resolving joint landowner concerns about forest health, risk mitigation, and air quality.

For example, private landowners and state agencies around Missoula, Montana are actively working with the Forest Service to reduce the potential for catastrophic wildfire and improve ecosystem health. The community, Missoula County, Salise and Kootenai Tribes, University of Montana, Montana Department of Fish, Wildlife and Parks, Missoula County Fire Protection Association, Snowbowl Ski Area, Intermountain Research Lab and the Lolo National Forest have developed a plan that meets local needs and desires, reduces fire hazard by removing trees and improves forest health through prescribed burning activities.

Forest Products Conservation and Recycling Program encourages the conservation of forest resources through conservation and adaptation of waste materials and Rural Community Assistance helps strengthen the capacity of communities to develop sustainable development that is consistent with ecosystem management principles.

Urban and community forestry programs reach out to thousands of the nation's most diverse people and communities. These include urban forestry tree planting projects and conservation education programs such as the National Summer of Service, Commencement 2000 and Smokey Bear's 50th Celebration.

In January of 1994, the Forest Service, Soil Conservation Service, National Park Service, Bureau of Land Management and Fish and Wildlife Service signed a MOU on environmental education which provides the foundation for this landmark activity. As a result, The National Environmental Education and Training Foundation and a number of Federal agencies have solidified a landmark public/private partnership to work on education for "Sustaining Healthy Ecosystems".

Field Level Implementation of Ecosystem Management

1. The purpose of the Demonstration of Ecosystem Management Options (DEMO) project is to demonstrate and evaluate a range of alternatives for managing forest ecosystems in the Douglas-fir region of the Pacific Northwest. DEMO specifically tests biological and operational feasibilities and evaluates economic and social acceptabilities. Many of society's needs for forest resources are considered within this long-term integrated demonstration and test of ecosystem management strategies.

The project has focused research attention on six subject areas of ecosystem management: wildlife, vegetation, soils and fungi, hydrology, social perceptions, and economics. Proposed treatments include retaining 15, 40, 75, and 100 percent of the preexisting forest canopies on eight different study areas in western Oregon and Washington. The study areas were selected to be representative of major site and stand conditions occurring on managed forest lands throughout the Douglas-fir region.

DEMO will monitor the ecological, economic, and social effects of a wide range of management options in an integrated, replicated, and scientifically credible study.

DEMO also addresses the debate over competition for natural resources. Late successional forest features will receive particular emphasis in the study.

Scientific collaboration and integrated analysis of data is encouraged through a shared database. Research contributors to the integrated scope and support of the study include the University of Washington, Oregon State University, University of Oregon, Washington State Department of Natural Resources, Douglas Project Coalition (Oregon), Aerial Forest Management Foundation, BLM, and the Forest Service.

2. In September 1990, the Swedlund wildfire burned 14,000 acres in the Cicero/French Creek area of the Black Hills National Forest. The area was a near monoculture of overstocked stands of Ponderosa Pine. The historic open, grassy areas were limited due to the invasion of Ponderosa Pine and lower French Creek had been altered to a shallow, wide stream that required annual stocking of trout.

An interdisciplinary team approached the restoration by establishing historic and sustainable conditions for the area. The team reviewed information about the historic setting for the Black Hills.

The recovery effort included cooperating with 27 private landowners in the Cicero/French Creek area, Custer County Conservation District, the Soil Conservation Service, and the State game and fish department.

Two years of monitoring show a more diverse species of vegetation within the area, growth rates of grasses and shrubs is exceptional, and fish surveys show trout are now spawning naturally in the restored stream gravel.

3. The Ouachita Mountains Ecosystem Management Project on the Ouachita National Forest in Arkansas is a coordinated effort between research and management.

The first research projects were designed to experiment with timber harvest techniques and natural regeneration that can be used as alternatives to clearcutting and planting. After project completion, research is monitoring the large-scale ecosystem responses to these alternative management approaches. The project is being implemented through the cooperation of two national forests, two research stations, and ten universities.

The project is directed at sustainable ecosystem management--the ability to achieve and sustain desired ecosystem conditions and resource values. Elements under study include mixed-species stand dynamics, forest growth and yield, plant biodiversity (including emphasis on herbaceous plants), soil and litter nutrients, soil compaction and disturbance, stream morphology and woody debris deposition, small mammals, and neotropical migrant birds.

The project is an example of bringing Forest Service research and management together to assess current management strategies so the results can be immediately applied to Forest activities.

4. On the Prescott National Forest, the 110,000-acre Yavapai Project Area, includes a privately-owned ranch in an intermingled, checkerboard pattern. Before the project began, the rangeland conditions did not meet Forest Plan standards and guidelines. Pinyon and juniper trees were invading the grasslands and sheet erosion was washing away the topsoil. The ranch owners asked the Forest Service to start a process that would integrate resource use, including livestock grazing.

The Forest is working with county, State, and other Federal agencies, the University of Arizona, Arizona State University, and local interest groups. The vegetation and soils were mapped by the Forest Service and the Soil Conservation Service and a wildlife research project was initiated by the Prescott National Forest and Arizona State University.

Public involvement included numerous public meetings, a public opinion survey, and direct contact with industry and environmental groups.

After analyzing the data and public comments, the Forest Service developed a "coordinated resource management" approach in which livestock grazing is planned to meet objectives for wildlife habitat, water and soil protection, and vegetation management.

The completed plan is being funded by the Forest Service and the State of Arizona with matching funding provided by the rancher.

5. Another example of ecosystem management in cooperation with other Federal agencies is an interim and long-term strategy for salmon by the Forest Service and Bureau of Land Management that would slow down the degradation and begin the restoration of aquatic habitat and riparian areas on Federal land. The interim strategy is the Pacific Salmon and Steelhead Habitat Management Strategy (PACFISH) which was released for comment in March 1994. The Forest Service is currently consulting under the Endangered Species Act with the National Marine Fisheries Service to determine the effects of this strategy on listed salmon. The long-term strategy will be proposed in two geographically specific Environmental Impact Statements, one for eastern Oregon and Washington and one for Idaho and Montana. In part, PACFISH amends Forest Service and Bureau of Land Management land use plans in Oregon, Washington, Idaho, and northern California outside the Presidents Forest Plan area. This includes land use plans for 15 National Forests and seven Bureau of Land Management Districts.

Mr. MILLER. Thank you. I appreciate your detailed discussion of this, Jim, because I think it is important that we have on the record exactly what are the intentions and purposes from the administration's point of view as we continue this discussion.

I said earlier in this hearing that I felt that the enforcement of many of what I would consider specific laws in this area over the last 30 years is inconsistent with ecosystem management. Secretary Frampton, you suggest that that is not the case and, in fact, even suggest that, as you say at the bottom of page 3 of your statement, some environmentalists are deeply suspicious that the ecosystem management is nothing more than sophisticated cover for land managers to make trade-offs and compromise rather than enforce existing laws.

I don't harbor that suspicion, but I have the question of whether or not the goal of ecosystem management, which I think, as Secretary Lyons said, is not based upon single outputs but looking at a larger panorama of that asset and the competing uses and values of trying to develop a management scheme—I still have the question of whether or not that could be done. Let me qualify that by saying I recognize in terms of the habitat conservation plans what you are doing. I think it is an excellent approach to try to push some of those decisions down to the local levels in an area as heavily impacted as Southern California was. We may get through that one, but under the current scheme of existing laws the pressure builds on everything that is around that habitat scheme, as I understand it, and you still have the same thresholds under endangered species and/or wetlands or others, and we start to force more and more pressures on the remaining areas, which makes those decisions much more difficult.

Mr. FRAMPTON. I guess my own preliminary view of this is that we don't quite know enough yet, we haven't taken some of these initiatives far enough yet to know whether we really need some significant changes in current law to do ecosystem management right. I think clearly the President's forest plan, which, in 120 days the administration tried to design a wholly different way of managing those forests with agencies working together and with tribes and State and local communities that will be tested this fall in the courts as to whether you can do that kind of ecosystem management within existing laws. I think certainly with respect to the Endangered Species Act we are trying to find and are finding that there are opportunities and flexibility and room for creativity within the existing law that move us away from the species-by-species approach.

Mr. MILLER. You are testing that theory. You don't know that yet.

Mr. FRAMPTON. In many of these initiatives we are testing.

Mr. MILLER. That will be determined in court at some point. In some cases it may very well be determined in court, right?

Mr. FRAMPTON. Absolutely. And the same is true with habitat conservation plans in places like Utah, and perhaps our attempt to write a 4(d) rule for the Pacific Northwest, for private landowners in the Pacific Northwest. But we clearly have come up against places in existing law that pose serious problems, and FACA is one of them. While I have to say very emphatically that this Adminis-

tration has no position, is not seeking any changes in the Federal Advisory Committee Act, it is absolutely clear from our experience in Florida and the Northwest that has made it very difficult to have the most efficient kind of discussions and collaboration with State and local government officials and tribal officials. In order to comply with both the letter and the spirit of FACA, which we have done, it means that in effect we have said to our State and local government partners: we can't really sit at the same table as equals. We can only do it through chartering an expensive committee or through more informal types of joint meetings.

So we are already running into aspects of existing law that clearly pose problems for ecosystem management. Whether major changes in existing natural resources statutes, mandates, are going to be required, I don't think we are quite at the point where we can say that yet. That is my own personal view.

Mr. MILLER. Historically, again, there is my impression, that what has happened maybe in the private sector—and I look at the California community where home building, let's say, is a big effort and so is farming to some extent—that over time decisions were made about a species or use of lands or wetlands, or the pool of wetlands that would be available or not available or is threatened or not threatened. After each decision the pressure shifted to the next person in line, and you ended up with—it seems to me we are almost at the state now where on each species and each acre or less of wetlands we have this inverted pyramid and the whole Clean Water Act comes to play on that acre or on that species in that locale. You can chase the kit fox all the way around the Central Valley of California and we still haven't decided where people can make decisions about the use of their lands or not having the use of their lands.

It also seems to me—and again I am fully prepared to stand corrected—that ecosystem management allows you to embrace a series of decisions about a larger area, this ecosystem. That may lighten the Federal pressure, if you will, or State pressure where you have the Endangered Species Act at the local level, or wetlands protections on the overall landscape to allow for some of these competing uses without intensively fighting it out on each acre of land when somebody wants to change the use or the purpose or harvest of that land.

You are now in court with the Northwest plan. If I remember some of the evidence in the Northwest plan, there are some species there that aren't in as good shape as others under this plan, and the footnotes say, with some site-specific work we think we can get these species to survive for 50 years or maybe some of them over into 100 years, but they are not guaranteed existence under the plan that is filed with the court. You are running the ridge, it seems to me, on that plan, as you might be in any habitat conservation plan, because you get back to fairly absolute requirements of the Endangered Species Act. Is that a fair discussion?

Mr. FRAMPTON. I think you are absolutely right about the Endangered Species Act issues in the better part of California where we have to move away from the salami approach—you know, one species at a time—to look at a bigger multi-species ecosystem approach, so we have more room to account for all the species, and

the test of whether we can make the Endangered Species Act work is whether we can do that quickly enough. We are trying.

Now the President's forest plan in the Pacific Northwest poses a slightly different set of issues. There has been some misunderstanding about the ratings contained in the EIS about persistence levels. In the final plan, as incorporated in the record of decision, we looked at over 1,000 species and groups of species. The ones that tend to have lower persistence numbers are simply the ones that we don't know very much about, and you can't say with 90 percent assurance that you can preserve something over 100 years when you don't even really know where it is. So there the issue is not that we are allowing less room or we are taking more risk for those species, it is really a question of how much do you invest in research and monitoring to get more information.

Mr. MILLER. I think the Northwest may be a pretty good example where we have offered some trade-offs between private landholders and the Federal preserves in answering some of the problems raised by the owl and salmon in that plan and follow-ons.

But if you look at a large ecosystem, whether it is South Florida or whether it is Yellowstone or the Northwest, and you say that if you implement the plan and you use the best scientific evidence, you can achieve the following 15 things—maybe a sustainable but smaller timber industry, local communities, number of species, recreational values, all of these things—do you ever get to the point where you get to make as a matter of public policy a conscious, in-the-light-of-day determination that we are going to trade off some other values, whether they be species or forest stand or what-have-you? That is what you did in the Northwest, that is what is sort of going on here. Everybody had to give at the office.

But we don't yet know if the law is going to allow those trade-offs where you did very well by the owl and the murrelet, the salmon, and others, but as you got down some others weren't so well treated—but that is the trade-off politically. And I say that in the best interpretation of "political". The people in that region have come to more or less agree on what makes some sense in terms of the values, the competing economic interests and the environmental concerns. But we don't know yet whether you are going to be allowed to proceed. Is that not correct?

Mr. FRAMPTON. Well, I know Jim Lyons is eager to answer that question too.

Mr. MILLER. We will keep him off stage for a while.

Mr. FRAMPTON. I think the answer in general with ecosystem management is that neither law nor science give us a definitive answer and you do have to decide to some extent what you are going to maximize or optimize for, so there are trade-offs and there are decisions.

Mr. MILLER. Are you comfortable you can make that public policy determination whether we can only provide a 30 percent chance of the probability that a species will be there or won't be there? Are you allowed to make that decision?

Mr. FRAMPTON. Well, in general, ecosystem management tries to create a process where you have enough people at the table so that you make a societal decision about your value choices.

Again, I wouldn't agree that that is a set of issues that applies to the President's forest plan because the direction, there was to develop a plan that meets all existing laws and that preserves the forest and then essentially produces the highest sustainable timber harvest when you have done those things, met all the laws and developed a plan that preserves the forest. We are going to test whether we have met the Endangered Species Act or allowed too little for some species in the President's forest plan.

Mr. MILLER. So you are absolutely going to test it.

Mr. FRAMPTON. They contend that, but I personally am quite confident we have met those standards.

Mr. MILLER. It is in play at this point, so we don't know yet whether ecosystem management will bias a more balanced approach with respect to underlying laws such as wetlands protections and/or endangered species. Maybe that is not what you want to do, I am saying those laws still come into play and we don't know yet the outcome of that.

Mr. FRAMPTON. It may not bias a more balanced approach. We are not sure, but it should bias a much more efficient approach in terms of, you may still be left with trade-offs, but ecosystem management should bring us a lot more protection for a lot of species and habitat, some of which you couldn't reach out to regulate right now. I mean you are looking at the future to keep things away from the Endangered Species List and a much more efficient outcome for land use for development, for private landowners, at the same time. Ultimately you may still get to the point where you have to make choices and trade-offs, but it should at least maximize what you get on both sides of the ledger before you have to make those trade-offs.

Mr. MILLER. Mr. Lyons.

Mr. LYONS. Mr. Chairman, let's not lose sight of the fact that ecosystem management is a process. It is a process for identifying options and developing alternatives with regard to management decisions. The reason it is essential that we use that kind of process in this day and age is, because of the complexity of these issues the relationship between owls and old growth and salmon and riparian areas and murrelets and other species is exceedingly complex and we can only understand those complexities and the trade-offs by using these kinds of principles and approaches. Whether or not ecosystem management generates an adequate strategy to meet legal requirements to provide the species protections we are talking about is really a function of the decisions we make based on the use of this concept.

I think when we started the processes that you and I were involved in some years ago, we mistakenly thought if we got a bunch of scientists in the room that we would get the answer, that science would generate that answer. Of course science provides a framework that allows us to get more concrete understanding of what the options and alternatives are, but it too doesn't generate the answer. Ultimately the decision has to be made by policy makers, be they on Capitol Hill, be they in the administration, be they at the local management level. That will ultimately determine whether or not we meet our legal obligations and provide for the protection of the resources we are concerned about.

Mr. MILLER. I don't want to take more time, but I am deeply concerned that the credibility of the process is being maintained. You can't meet every expectation, but I think there is an expectation that ecosystem management allows more values to be considered within the process and may call into play some trade-offs among those values. I don't expect anybody to agree with all that, but that is some expectation.

If we find out after we go through the entire process that we are still tied down to very specific detailed plans that are inconsistent with one another on how we deal with the internal workings of that ecosystem, I'm not sure we have advanced very far, and I'm not sure that we can maintain our credibility about this approach. We are not there yet, but it bothers me down the road because we are talking about doing one thing and yet most Members of Congress are constantly besieged by actions that are taken outside of ecosystem management and it gets attributed to ecosystem management.

Mr. LYONS. I would agree, Mr. Chairman, that that is a problem, a problem of perception, but ecosystem management as a framework for decision making, for understanding the relationship between different resources in a given region, a given ecosystem, has got to be a much more efficient and effective way to do business because it is going to provide us sound scientific information and a basis for making more informed decisions, and I think we have demonstrated that in the work that has been done in the Pacific Northwest, the work that George spearheaded in the Everglades, and the efforts we are undertaking in other places. We are heading there.

We do have some conflicts that are generated, I think, by some existing legal requirements which may or may not be consistent with the overall ecosystem framework. This is the question you raised earlier, but that shouldn't be a surprise. I mean the laws that we are operating under were drafted 20, 30 years ago. The forest planning amendments to NFMA were passed in 1976, and they are based on an understanding of the science of management and technology that is vastly different than the 21st century technology that we are trying to implement that we call ecosystem management, and this is an issue that as an administration we will look at.

But we are doing our best in the Northwest plan, and the Northwest forest plan is the best example to date to try and operate within the framework of existing law and regulation. I think, given that, we have done a pretty good job of coming up with a strategy that seems to fit. Ultimately the courts will decide whether or not we have done an adequate job from a legal standpoint, but we are a lot better off using this concept, ecosystem management, than we were with the single species, single resource approach that we inherited when we first came on board.

Mr. MILLER. Mr. Pombo.

Mr. POMBO. Thank you.

We have talked a lot about the ecosystem management approach for a number of years and as a means of avoiding some of the problems as they currently exist and some of the so-called train wrecks that have happened, and in some ways it does seem to be—in read-

ing your testimony and listening to what you have said here, it does seem to be an avenue that bears further study and something that we really do need to look at. But at the same time I have a lot of apprehension and a lot of deep concerns about what falls under this umbrella and where we go from here.

I happen to represent an area of California that includes a large portion of the delta, the San Joaquin Delta, and if you start looking at the protection of the delta and what we need to do in order to protect that part of California, we extend all the way from Northern California to Southern California, everything from the watersheds to the water that goes into Southern California that people drink, and every action that is taken in effect to water affects the delta in California. The ability to cut down trees in Northern California affects the quality of the water in the delta. The Endangered Species Act plays a large part in all of that.

In my particular area, I have everything from the San Joaquin kit fox habitat of the foothills on one end of my district, the Swensen hawk which covers a large part of my district, and foraging in the agricultural fields throughout my district, the giant garter snake which lives in the drain ditches, the ferry shrimp which lives in the mud puddles throughout the district. Just about every square inch of my district is habitat for one endangered species or another.

The water that feeds the industries that do still exist in my district comes out of the delta which is affected by the salmon or the delta smelt. Everything that happens in my district is part of an ecosystem, and if you start following—and I guess following up on some of the comments that the chairman made, if you start following the current environmental law to the letter of the law, you basically say no more human activity in this area because it conflicts with the Endangered Species Act, and I guess my apprehension and my deep concern comes from, where do we go? I mean if we turn this over to you and say, "Okay, manage this ecosystem," what decisions do you come up with? What happens to the people that live many my district if I as a legislator tell you, "Okay, here's the ecosystem, manage it"? I mean, to me that is a very deep concern, and I'm not willing to, I guess, blindly say okay, guys, go for it.

I don't know how you can answer that because of a lot of the activities that have already occurred, but I do have some deep concerns about just blindly saying that everything within this ecosystem is going to be managed in this way at the same time that we are doing that, and, you know, as the chairman said, it seems like all the weight of every piece of environmental legislation that has been passed in the last 30 years come down to one property owner or one small wetland or one individual that happens to be pumping water out to irrigate his field, and the entire effect of all of that has just been devastating on my area.

Mr. FRAMPTON. I don't see any of us leaping to respond to that.

When you say reluctant to turn it over to us, certainly in terms of the bay delta water regime I don't think that the Federal Government, certainly in this administration, has been that eager to handle that football, but in effect the State forced the Federal Government to grab a hold thereby, abdicating its own responsibilities,

and at least what we have done in this administration is to make sure that the four key agencies which never worked all that well together before—Bureau of Reclamation, EPA, NIMPS, and the Fish and Wildlife Service—are in tandem and in lock-step in trying to meet our obligations and to do it in a way that continues to offer partnership to the State. I think right now we are on track to work with the State to provide an opportunity for the State to reassume its responsibilities and by doing so to bring in water resources and bring in a larger area than would be possible if the Federal Government was forced to do it by itself.

So if the State joins with us in trying to solve these problems, which are not only endangered species problems, they are water allocation problems, they are economic problems, they are water supply problems—if the State joins with us, then—and this is one of the benefits of an ecosystem approach—we will bring in a lot more water and therefore we will take some of the burden off irrigated agriculture in the Central Valley by working together; whereas if the Federal Government has to solve the problem alone because the State won't play, won't cooperate, then we have fewer handles to turn and everybody is going to be more severely affected.

I don't offer that as a defense, I'm only saying that I think there are tremendous benefits here to States and the Federal Government working together, and that is our contribution to ecosystem management. Making the Federal agencies work together and trying as hard as possible to work with the States, a net result will be that individuals will be affected less by bringing a bigger resource base to bear on problem solving.

Mr. POMBO. It may sound good to a representative that represents the southern part of the San Joaquin Valley to share the burden on pumping water. My district has been fairly unique in that the southern part of my district is canal water, the northern part of my district is the delta, and the western part is the delta that pumps directly out of there, and the eastern part is coming out of the Sierra as well as ground water.

You talk about everybody sharing in the pain here. That is my whole district, I mean we have just all shared, and no matter what decision is made in terms of water availability, it is going to hurt my district, and that is one of the reasons I am so concerned with those decisions that are made.

At the same time, I do feel if we are going to make the ecosystem management approach work that there has to be more flexibility in our Federal environmental laws, there has to be the flexibility in there to make the management approach work. I think that that is extremely important, and I guess from the comments that the chairman made earlier he feels that maybe it is time that we take that up.

Thank you.

Mr. PIPKIN. May I just add a comment? It relates to your question of what it is that you are turning over to us.

Much of the work that the interagency task force has focused on relates to the process of how do you better involve interested stakeholders and the public in shaping the vision as to what the desired condition should be? How do you bring about better interagency coordination? How do you bring about better coordination with the

States and the tribes? How do you assure that you use the best science—those kinds of issues—and I think those are objectives that virtually all of us would endorse and that agencies are already trying to do. So when we are talking about studying ecosystem management and trying to recommend ways to make it more effective, we are really talking about ways to identify and prove the existing processes.

I would also say we are making decisions now obviously, and what ecosystem management involves is assuring that in making those decisions we are taking a view that takes into account interrelationships and that recognizes the biological and economic consequences involve a longer time frame possibly than has been considered in some decision-making in the past, and also a recognition that both from an economic and a biologic perspective we don't have all the information that we ideally would like to have, but we have to deal with that. We have to somehow incorporate adaptive management and these other techniques to allow us to move on even though we know that that information is not total, and in a way I don't know what other options we have other than to go the course that we are doing.

We are being pushed in that direction by a lot of different forces including the Federal courts, and we just would mention the one decision related to the northwest forests where a Federal judge essentially told the Forest Service that it wasn't adequate that it just look at spotted owls but that it had to look at other creatures that are dependent on old growth forests and the Forest Service has to consider what the BLM was doing on its land and take that into account. Those kinds of interrelationships are the same kinds of things that we are talking about.

I think the chairman is exactly right in posing the question of trade-offs. I think implicit in some of the judgments being made is the notion of trade-offs, that maybe you have to accept a higher degree of biological risk than you would ideally like to do if that was your only objective because our objective is to promote economies as well and the people who rely on a resource.

We don't know the answers to that. We are going to know some of those for sure because there are lots of lawsuits on the northwest forest situation challenging whether BLM has the power to do ecosystem management under the O&C Act, whether Forest Service under NFMA has certain authorities, whether undue risk has been taken for a species, but we have to move on and we think this is the most promising way to go.

Mr. POMBO. I understand your point, and I guess I would further restate that if there were more flexibilities in our current environmental law in the Pacific Northwest you would have made, or the team that was together to put that together, would have made very different decisions than the ones that were made, and because the flexibility was not there they were not allowed to weigh the economic costs and the social costs on the Pacific Northwest as deeply as many of the people who were involved would have liked to have, but they knew that with the inflexibility of our current environmental laws they weren't allowed to do that, and they tried to go as close as they could and still meet the law, and I realize that that was the objective there, but because there is no flexibility in the

law and because there is no ability for them to weigh the social and economic costs on a large portion of our country they were not allowed to do that and it hurt the attempt at reaching some kind of consensus out of the Pacific Northwest, so that both sides felt that they were hurt because there is a large segment of the population in the Pacific Northwest that feels that they were not hurt and that their values and their priorities were not considered, and throughout the country we are having the same problems, whether it is my district, whether it is Mr. Dooley's district, or whether it is Mr. Taylor's district. We all have a large segment of people who feel that their values and their social well-being are not being taken into consideration by the Federal Government, and with our current laws I don't feel that is possible.

Ms. GELBURD. I would like to build on what Mr. Pipkin has said, and I think one of the reasons so many people are taking an ecosystem approach now is to avoid what happened in the Pacific Northwest, to not get to that point where there are such conflicts, and I think the strongest endorsement of an ecosystem approach comes from the private landowners and the way people are getting together and using, for example, in California the coordinated resource management planning process, people that may have never gotten together in the past but are now getting together, looking at what they have defined as their ecosystem and addressing what they see as a vision of what they want their natural resources and their economy and their society to be and moving in that direction, and there are just some tremendous examples throughout the country of how people are accomplishing and improving their economic viability, taking this approach, so they don't get into the kinds of problems that we are seeing in some parts of the country.

Mr. MILLER. Mr. Dooley.

Mr. DOOLEY. Thank you, and following up on some of the same concerns that the chairman had in a conversation that we engaged in with the first panel, I think it was Mr. Joy from the GAO who basically did clarify that one of the recommendations that they were making in acknowledging that there were some inherent conflicts with moving towards an ecosystem management approach with the existing environmental regulations that were in place and that they felt that there was going to have to be some accommodation or changes in order to effectively move into that ecosystem plan, Mr. Frampton, do you agree with that statement, or do I understand that you disagree?

Mr. FRAMPTON. Well, I tried to answer the question that I thought the chairman was posing before by saying I think it is a little bit early to tell whether really significant changes in environmental laws are going to be required.

Clearly the existing laws pose problems for ecosystem management. We are trying to do our best to accommodate those problems and work around them. Whether we can successfully do that or not, my own judgment is that is still an open question.

Mr. DOOLEY. You made some comments in response to the chairman's statements that even some of the work that is being done on habitat conservation plans and others that were taking this initial step toward an ecosystem management approach were going to be resolved in the courts. If you are publicly and consciously ac-

knowledging that these are going to be resolved in the courts, why does not the administration try to enact policies that will provide and accommodate this approach short of ending up and having it resolved in the courts?

Mr. FRAMPTON. Well, we are not the ones that are suing ourselves.

Mr. DOOLEY. But it is a policy, an existing regulation in law that is in place, which is giving grounds that is challenging the ability for some groups to work together cooperatively to move towards an ecosystem approach that is in fact giving the opportunity for litigation. So why don't we address that with some changes in policy?

Mr. FRAMPTON. Certainly in the development of the President's forest plan we did our best to find a plan that we thought would be consistent with the law and would find support from all sides. We are getting sued by both sides. We can't control that. I don't know that there is anything we could have done there to prevent that.

Mr. DOOLEY. Not under existing law.

Mr. FRAMPTON. Under existing law, and in other areas—for example, under the Endangered Species Act the administration did come out recently with a set of new policies designed to demonstrate that we can move our administration of that Act in a direction of ecosystem management and respond to some of the criticisms that have been made of the Act and the way it has been administered. Some of them have legitimate bases.

So I think we are trying to develop policies and in some cases new regulations, special regulations under the Endangered Species Act, that help us get there under the existing statutes. We are doing our best to avoid having these initiatives tested in court, but ultimately, absent Congress making changes in the laws, we can't control whether we get sued or not.

Mr. DOOLEY. I really appreciate the work that your agency and yourself have done in order to develop what we think is a coordinated approach in the San Francisco Bay delta with the Club Fed process because a lot of the people that have dealt with this issue for some time really do see that as an attempt to bring the various agencies together and take a coordinated approach. This deals in part with your comments that you want to work to get all the stakeholders together in trying to find a way to embrace some policy that will get to the ecosystem management.

But the problem and one of the inherent conflicts that I see developing in this is that if you again don't have some reform of the existing environmental regulations there is always going to be some party, a stakeholder, that will never be a part of that process that can still, under existing environmental statute, be they ESA or whatever, can file suit against what could be the agreement by the multiple agencies and the existing stakeholders that undermine the whole process.

How do we create the certainty with the stakeholders that there is going to be some level of sufficiency that will be a product of engaging in this process that gives them the real incentive to even participate unless we have the changes in policy, in law, which provide for that protection?

Mr. FRAMPTON. Under the Endangered Species Act we have an interdepartmental working group that is now looking at proposed regulatory changes that would help do that. Secretary Babbitt also announced within the last month a policy with respect to habitat conservation plans of recognizing that when a landowner or a municipality or a county or group comes up with a plan and the plan is approved, that the plan will have a guaranteed shelf life over a fairly extensive period of time, whatever it is that the Fish and Wildlife Service approves, so that you have a great deal of certainty built into that.

Now it is true that even in the case of a habitat conservation plan that is developed by developers, environmentalists, county and city governments, and is approved by the Fish and Wildlife Service for 20 years that covers 100 species, you may have people out there who are going to try to go into court and contest the plan. But to the extent that through policy or regulations we can, number one, increase the number of stakeholders, and, number two, provide something that is relatively immune from litigation, we are trying to do that. But at the end of the day, short of Congress cutting off judicial review under most of these statutes, which I don't think this administration favors, there isn't any way to stay out of court. It is just a condition of life.

Mr. DOOLEY. On your definition of shelf life then, I guess in light of your last statement, even under this reform, and administrative reform, there is still no real protection against any future litigation.

Mr. FRAMPTON. We are a litigative society.

Mr. DOOLEY. I guess from a policy perspective it is going to be very difficult, from my perspective, to see an effective ecosystem management plan being able to be implemented unless you can give some certainty to the stakeholders that if they commit to this process, if they commit to making some sacrifices, that there is going to be a level of protection and level of certainty, and I would hope that, you know, as we consider potential legislation, that there would be by the administration an acknowledgment of this. That is what will bring people to the table. If we can even in the delta, assure my constituents and George's constituents that this is what we are going to require in terms of environmental outcomes and environmental water, and they will provide some certainty in outflows, you know, we can get people to the table. But right now trying to get people to the table because, you know, this year it is the delta smelt, next year it will be another smelt, it will be some other fish, there is no certainty there, and how can we ever get people to buy into this ecosystem approach unless we do, as a policy, embrace this concept that we are going to have to make some changes in law?

Mr. FRAMPTON. To the extent that we can design our own process to provide that kind of certainty, that is a very high priority for, certainly for Secretary Babbitt and I think for the administration. Ultimately we can't provide certainty against anyone litigating.

Mr. DOOLEY. Unless we adopt it as a policy that if we were going to identify an ecosystem and delineate that ecosystem, that if the stakeholders and the Government agencies who came together that defined an environmental plan for that area, that there would then

be an exemption and a waiver that Mr. Miller talked about earlier from litigation as it pertained to future environmental statutes or existing environmental statutes within that ecosystem.

Mr. FRAMPTON. For people who participate in that process, we are moving in the direction of policies and regulations that provide that certainty. There is no way under existing law that you can provide certainty against people who don't participate.

Mr. DOOLEY. And what you are saying then is that you would not advocate consideration of a provision that would say that if we did move to an ecosystem approach where we did have the stakeholders that were involved in it, we did have the administration, we did develop an environmental plan that was approved and signed off by Fish and Wildlife, that there would be an exemption from the provision in the Endangered Species Act for litigation challenging the listing of a species or the failure to list a species in that ecosystem.

Mr. FRAMPTON. Well, that is too general a question. I think obviously we would have to look at what kinds of certainty or insulation from judicial review is provided. Right now some insulation from judicial review and some high standards against successful judicial review are already built into parts of the Endangered Species Act both in the law itself and developed court decisions. Whether the administration would support a higher level of high jump bar in certain circumstances I think is something that we are looking at as a matter of policy. We haven't really looked at it as a matter of legal changes.

Mr. PIPKIN. May I just add three quick points on this question of conflict with existing laws. First, although we have been talking about litigation that exists with respect to the Northwest forest plan, let me say that the Government has taken the position very strongly that we do have the legal authority to do what we have done and we have some confidence in that position.

Second, although we focused on the Endangered Species Act in this last few minutes, I want to point out that in the GAO report they say ecosystem management would not necessarily alter the Federal land management agencies' basic legislative mandates, sustaining multiple uses of Federal lands and protecting natural resources; rather, it would change these agencies' approach to fulfilling their stewardship responsibilities, and I think that generally is true.

Third, I would just say quickly that the kinds of questions that you are raising are exactly the issues that a legal issues group of the interagency task force is looking at and we do not have any conclusions on that now, as to whether legislation will be needed or will be recommended but we will have that.

Mr. DOOLEY. What is the time line on that?

Mr. PIPKIN. We are expecting the report to be finished in late November.

Mr. DOOLEY. Thank you.

Mr. MILLER. Mr. Gilchrest.

Mr. GILCREST. Thank you, Mr. Chairman.

I had a lot of questions that everybody else had almost similar questions on, and I feel if I ask them again they are going to be really redundant or duplicative, so I am just going to go through

them in about 30 seconds, and if you want to respond, respond; if not, I'll go on to one that hasn't been asked yet.

I was going to ask a very hypothetical question to the extent that if the ecosystem management approach were adopted in 1944, how would you have seen the situation in our environmental world changed in 1994? Would it have impacted? I think it would have. We would not have had, it seems to me, a problem with the spotted owl. I'm curious to see how it would have impacted zebra mussels. What would have been the policy about migration patterns for migratory species such as shad and building dams for electric power and things like that?

But it really seems to me that we are in the basic preliminary, very fundamental approach to an ecosystem management plan where many of the kinks will not be worked out unless we move forward. And I guess, Mr. Frampton, you said we are in a litigation society, and I think that is probably true, and I hope we never have a policy where there won't be some potential for litigation. Albeit sometimes litigation does cause a lot of problems, we should never be so dictatorial and have such open and shut positions that somebody couldn't or wouldn't want to challenge it.

But I do have two fundamental questions. One is really redundant, but I am going to ask it anyway. Could you tell me in your—anybody can answer this—if someone asked you when you went into a 7-11 to get a coffee and a hot dog right out on the street because they read it in the paper somewhere, what is the purpose of ecosystem management, what would you tell them?

Mr. LYONS. I'll bite on that one. The purpose is to make better decisions about how their natural resources ought to be managed to address the interests and concerns they have as well as the interests and concerns of their children.

I might also suggest, Mr. Gilchrest, that if we had had the capability to implement ecosystem management 50 years ago you would probably have a longer goose season and a bigger bag limit.

Mr. GILCREST. Maybe more oysters too.

Mr. LYONS. That would be fine.

Mr. PIPKIN. Beyond making better decisions, I think at the core of it is a recognition of the interrelationship between a healthy natural resource and a healthy economy, and many, many of the situations that we are dealing with in this country are situations where something has gone out of balance there and where State legislatures, local people, grassroots people, whether it be Chesapeake Bay or whether it be South Florida, have made a decision that what has happened to the natural resource requires work, not only to protect the natural resource for its sake but because economies depend on that, and it may be fishing in the Florida Bay or it may be crabbing in the Chesapeake Bay or whatever, or salmon in the Pacific Northwest, but there are economic consequences of the environmental degradation, and it is the linking of those two and a recognition of that relationship that lies at the core I believe.

Mr. GILCREST. Just one last sort of question-comment type of thing. Our population has grown from 1790, which was 3 million, to 1890, around 76 million, in 1990 about 250 million, and if we only double in the next hundred years there is going to be some management requirement for 500 million people.

In a couple of items that I have read from your statement and the report, they make a comment about cumulative impact or the cumulative effect. Now I am assuming that means the cumulative impact of man-made development on the land which then automatically becomes a part of the ecosystem so that has to be taken into consideration as far as its impact is concerned.

I guess it was about 1972, but I wasn't here when they passed the first Clean Water Act—in the early 1970's when they passed the Clean Water Act. I think that is probably one of the most successful pieces of legislation that has ever passed through this Congress because it pinpointed point sources of pollution and started the process of cleaning up rivers and lakes and groundwater and so on.

It seems to me we are at a stage of much more complexity, and the difficulty of managing our resources now is not specifically identifying the point source of those pollution problems but now we have to look at the whole scale of ecosystem management as far as the impact of all living species, even human beings. Now we are looking at something as complicated as nonpoint source pollution, but when we talk about cumulative impact, then that means we are touching on something that is very sensitive as far as can we manage 500 million people in the United States, and then what happens? What about 2050 or 2150? What goes beyond that?

So in some sense, are we with this ecosystem management, however frail and indecisive it may appear to be right now—can this answer the more difficult question of how to manage within the context of our ecosystem an ever increasing population and non-increasing resources?

Ms. GELBURD. I think the question is not so much can we manage the people but can they manage themselves and what they are doing and their effect on the environment, and I think a good example when you look at the cumulative impacts is how people have gotten into recycling. You know, when this was first brought up a lot of people would say there's no way anybody is really going to get into recycling, but now it is a very common activity, and I know when I go into parts of the country where there isn't a place to throw my can or my bottle, I feel like I'm performing a violation of some sort against a law. It is a very natural way of operating, and I think that is a lot of what we have to do. It is not so much managing people as educating them for their long-term sustainability, and to see just with my neighbors the changes that occurred when they started having children and how my neighbors who weren't voluntarily recycling before it was required suddenly started recycling when they had children and how we had the whole street helping each other out and carting the stuff to the recycling centers, that is an education, and I think that is what we need to do, and that is part of this entire package and one of the sections in their upcoming report.

Mr. GILCREST. Why did they recycle when they had children? Because they had more stuff or they thought it was a good idea? [Laughter.]

Ms. GELBURD. Definitely they had more stuff, but I think it was the recognition that they wanted to pass on our heritage to future

generations and not use it up and that the natural resources are part of our economic capital and that we have to invest in them.

Mr. GILCHREST. Okay. Thank you very much.

Thank you, Mr. Chairman.

Mr. MILLER. Thank you.

It has been a long morning, but let me ask a couple of other questions.

One of the points in the GAO report on page 56 is—let me read it to you: “Further, most agency officials agree that implementing ecosystem management will likely require extensive conforming amendments or comprehensive revisions of long-range plans,” and goes on to explain that that can take many years.” That process was raised here, and you have talked a lot about adaptive management.

I assume that the interagency task force, is looking at this issue in terms of time lines and in terms of internal barriers to achieve the kind of ability to adapt to new information, new science, and new politics. There is a political overlay on all of these ecosystems.

Mr. PIPKIN. That is correct.

Mr. MILLER. I’m telling you, right? What the heck. I’ve got to have a little fun with you up here, being chairman—just in case you hadn’t felt it.

Is the interagency task force going to address these issues? Some of it comes under legal barriers or plans. That one concerns me. We have an old body of law that was much more static than the kinds of issues you are now dealing with and the time frames in which we expect things to be solved now.

Mr. PIPKIN. We have an institutional group that is looking at those kinds of internal barriers as well. One of our main concerns is that we not be, by ecosystem management, adding on another layer of things that people have to do on top of what they are already doing but a recognition that we have to streamline, we have to do things in a different way. But those kinds of areas in terms of planning processes or in terms of other procedures that are required within agencies before they can make a turn in their decision-making path is something we are very much looking at.

Mr. MILLER. In some ways it may be one of the very hard parts of this equation. You know, it is sort of like General Motors for years was promising everybody a new car, but it took them 15 years to retool their assembly line so they could, in fact, produce a new car as opposed to something that they tried to pass off as a new car.

Mr. PIPKIN. And time lines are very different for different agencies. We also are finding that the extent to which agencies have to come back to Congress repeatedly for authority to change, that it is different for, say, the Corps of Engineers and their processes than it is for some of the other Federal agencies, and all that is part of our deliberations. But we have no conclusions at this point.

Mr. MILLER. Let me say—and Congressman Dooley said it—the critics of this process ought to really talk to the stakeholders that have been engaged in this process, because I think to a great extent most of them believe that this is a better process than what preceded it. For all of the fire and the heat of the Pacific Northwest prior to the President’s plan now it is amazing how acceptable the

President's plan now is in serious political terms—and I mean politics in terms of the forest industry, the environmentalists, the local politicians, the national politicians, and all of the disparate groups, the economies and local communities—how acceptable it really is. I appreciate you are being sued, and I appreciate there are all kinds of criticisms and articles being written about it, but the fact is, there is a conscious decision-making process going on there, and you are attempting to thread the needle. There is a great deal riding on whether or not you are able to do that, and a court will decide that. But that is the first shot, and there will have to be a reaction to what the court does or does not do in Congress or out of Congress.

But I just want to say, in California where you have Club Fed going on, and what is going on in Southern California with the gnatcatcher and even with all of the acrimony that we have in South Florida, this is a much preferable process in terms of working with Federal agencies than any of us have witnessed over the last couple of decades.

So this review is about pushing this along and trying to address a lot of indirect criticisms and some direct criticisms that are hurled at this process because, again, I think in an interview with the stakeholders, most of them would say what a refreshing arrangement this is. Now whether or not it can be done and achieve the outcomes is still to remain in the case of Bay Delta. We will wait and see whether we can satisfy all of those stakeholders, but I think everybody who is a party to it would give this a ringing endorsement.

Now whether they will get their piece of cake at the end of the process remains to be seen, but right now as we are doing an interim review and as we looked at the GAO questions—and they are serious questions and they must be addressed in terms of success—I have still got to believe that the interim report is that this has been a very good process. This is a much better process than anything we have seen in the past.

I really appreciate the time that you have spent with the three committees, trying to bring us along as you have encountered new thresholds and problems in this process. I still believe that there are going to be major policy considerations, whether you can call them compromises or what-have-you, that the Congress is going to have to grapple with.

I don't want to set off a waiver movement here, but I find it interesting that I can move poor children and make the individual determinations about their nutrition, their housing, their health care, and everything else based upon waiving some bureaucratic hurdles to doing that, not civil rights laws and basic statutes, but to get that done and help the governor achieve that. But I don't know that that can ever be done with respect to resource management, and yet I think to some extent that flexibility is what people are crying out for on all sides of this equation.

Let me thank you very much for your time. Your time is very valuable in this struggle to rationalize these policies. I appreciate the time that you have spent with the committees this morning.

I have some questions, and I know Mr. Taylor said when he left that he has some questions, that we are not going to ask today, but we would like to submit them to you and have your responses.

Thank you.

[Whereupon, at 1:00 p.m., the subcommittees were adjourned.]

APPENDIX

SEPTEMBER 20, 1994

ADDITIONAL MATERIAL SUBMITTED FOR THE HEARING RECORD

GAO

United States General Accounting Office

Report to Congressional Requesters

August 1994

ECOSYSTEM MANAGEMENT

Additional Actions Needed to Adequately Test a Promising Approach



GAO/RCED-94-111



United States
General Accounting Office
Washington, D.C. 20548

Resources, Community, and
Economic Development Division

B-256275

August 16, 1994

Congressional Requesters

As agreed with your offices, this report addresses (1) the status of federal initiatives to implement ecosystem management, (2) additional actions required to implement this approach, and (3) barriers to governmentwide implementation.

As arranged with your offices, unless you publicly announce its contents earlier, we will make no further distribution of this report until 30 days after the date of this letter. At that time, we will send copies to the appropriate congressional committees; the Director of the White House Office on Environmental Policy; the Secretary of the Interior and the Directors of the National Park Service, Bureau of Land Management, Fish and Wildlife Service, and National Biological Survey; the Secretary of Agriculture and the Chief of the Forest Service; and the Director of the Office of Management and Budget. We will make copies available to others upon request.

This report was prepared under the direction of James Duffus III, Director, Natural Resources Management Issues, who may be reached at (202) 512-7756 if you or your staff have any questions. Other major contributors to this report are listed in appendix IV.

A handwritten signature in cursive script, reading "Keith O. Fultz".

Keith O. Fultz
Assistant Comptroller General

B-256275

List of Requesters

The Honorable George Miller
Chairman, Committee on
Natural Resources
House of Representatives

The Honorable Gerry E. Studds
Chairman, Committee on Merchant Marine
and Fisheries
House of Representatives

The Honorable Charlie Rose
Chairman, Subcommittee on Specialty Crops
and Natural Resources
Committee on Agriculture
House of Representatives

The Honorable Norm Dicks
House of Representatives

Executive Summary

Purpose

Even though many laws have been enacted to protect individual natural resources—air, water, soils, plants, and animals, including forests, rangelands, threatened and endangered species, wetlands, and wilderness areas—ecological conditions on many federal lands have declined. As a result of these declines and the recognition that some historic levels of natural resource commodity production and other natural resource uses cannot be sustained indefinitely, federal land managers have had to substantially decrease production of some renewable commodities, such as timber, and other uses, such as recreational activities, on some land units. These reductions have, in some instances, disrupted local economies and communities, contributing to intractable conflicts between ecological and economic values and concerns.

Since the late 1980s, many federal agency officials, scientists, and natural resource policy analysts have advocated a new, broader approach to managing the nation's lands and natural resources called "ecosystem management." This approach recognizes that plant and animal communities are interdependent and interact with their physical environment (soil, water, and air) to form distinct ecological units called ecosystems that span federal and nonfederal lands. In response to congressional requests, GAO identified (1) the status of federal initiatives to implement ecosystem management, (2) additional actions required to implement this approach, and (3) barriers to governmentwide implementation.

Background

The federal government owns about 30 percent of the nation's total surface area. To manage its holdings, it relies primarily on four agencies—the National Park Service, the Bureau of Land Management (BLM), and the Fish and Wildlife Service (FWS) within the Department of the Interior and the Forest Service within the Department of Agriculture. These agencies, the numerous land units they manage, and the many laws governing their management form the current federal land management framework that has evolved over the last century. As agreed with the requesters, GAO limited the scope of its work primarily to the relevant activities of these four agencies.

The federal land management framework is part of a larger national land and natural resource use framework. In addition to other federal and state land management agencies, this larger framework includes many federal and state agencies that have regulatory or tax authority or financial or

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technical assistance programs that can greatly influence the use of natural resources and other activities on private lands and in marine waters.

Proponents of ecosystem management believe that coordinating human activities across large geographic areas to maintain or restore healthy ecosystems—rather than managing legislatively or administratively established land units and individual natural resources—would, among other things, better address declining ecological conditions and ensure the sustainable long-term use of natural resources, including the production of natural resource commodities. Hence, proponents believe that this approach would help to avoid or mitigate future ecological and economic conflicts by providing greater flexibility to coordinate activities over larger land areas. Therefore, ecosystem management would not necessarily alter the federal land management agencies' basic legislative mandates—sustaining multiple uses of federal lands and protecting natural resources. Rather, it would change these agencies' approach to fulfilling their stewardship responsibilities through a better scientific understanding of these mandates' relationship to one another. Compared with the federal agencies' current approaches to land management, this new approach will require greater reliance on ecological and socioeconomic data, unparalleled interagency coordination, and increased collaboration and consensus-building among federal and nonfederal parties within most ecosystems.

Results in Brief

Over the past 2 years, all four of the primary federal land management agencies have independently announced that they are implementing or will implement an ecosystem approach to managing their lands and natural resources, and each has been working to develop its own strategy primarily within its existing framework of laws and land units. In addition, the administration is proposing in its fiscal year 1995 budget, among other things, to fund the initial stage of a governmentwide approach to ecosystem management, including four ecosystem management pilot projects. It is also considering various principles for its governmentwide approach, including managing along ecological rather than political or administrative boundaries.

Implementing the initial stage of a governmentwide approach to ecosystem management will require clarifying the policy goal for ecosystem management and taking certain practical steps to apply the principles being considered by the administration. These steps include (1) delineating ecosystems, (2) understanding their ecologies, (3) making

Executive Summary

management choices, and (4) adapting management on the basis of new information. In taking these steps, the federal government will have to make difficult policy decisions about how it can best fulfill its stewardship responsibilities.

The administration's initiatives to implement ecosystem management governmentwide face several significant barriers. For example, although ecosystem management will require greater reliance on ecological and socioeconomic data, the available data, collected independently by various agencies for different purposes, are often noncomparable and insufficient, and scientific understanding of ecosystems is far from complete. While ecosystem management will require unparalleled coordination among federal agencies, disparate missions and planning requirements set forth in federal land management statutes and regulations hamper such efforts. And although ecosystem management will require collaboration and consensus-building among federal and nonfederal parties within most ecosystems, incentives, authorities, interests, and limitations embedded in the larger national land and natural resource use framework—many beyond the ability of the federal land management agencies individually or collectively to control or affect—constrain these parties' efforts to work together effectively.

GAO's Analysis

Federal Agencies Are
Beginning to Implement
Ecosystem Management

The administration's fiscal year 1995 budget proposal requests \$610 million in discretionary spending for ecosystem management initiatives. Most of this money is to accelerate three ongoing interagency restoration efforts that are being designated as pilot ecosystem management projects: (1) the old-growth forests of the Pacific Northwest, (2) south Florida, including the Everglades and Florida Bay, and (3) the urban watershed of the Anacostia River in Maryland and the District of Columbia. Another \$90 million in mandatory spending is to be used to fund a fourth pilot project—Alaska's Prince William Sound, damaged by the March 1989 oil spill from the supertanker Exxon Valdez.

The budget document also states that the administration is considering the following principles: (1) managing along ecological boundaries, (2) ensuring coordination among federal agencies and increased collaboration with state, local, and tribal governments; the public; and the

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Congress, (3) using monitoring, assessment, and the best science available, and (4) considering all natural and human components and their interactions.

In 1993, the White House Office on Environmental Policy, created in the same year by the President, established an Interagency Ecosystem Management Task Force to implement an ecosystem approach to environmental management. A draft "Ecosystem Management Initiative Overview," prepared and approved by the task force, summarizes the efforts of the agencies to clarify goals, translate principles, and derive lessons from ongoing ecosystem management efforts that can be applied to other ecosystems. The task force has also formed an interagency work group to examine major issues that influence the effectiveness of ecosystem management—such as the budget process, legal authorities, and information management—and to make recommendations to the task force for improvements.

Additional Actions Are
Needed for
Implementation

Implementing the initial stage of the governmentwide approach to ecosystem management will require clarifying the policy goal for ecosystem management and taking certain practical steps to apply the principles being considered by the administration.

Neither the administration's fiscal year 1995 budget document nor the task force's draft "Ecosystem Management Initiative Overview" clearly identifies the priority to be given to the health of ecosystems relative to human activities when the two conflict. Definitions developed by BLM, FWS, and others leave no doubt that greater priority will have to be given to maintaining or restoring a minimum level of ecosystem integrity and functioning over unsustainable commodity production and other uses. The practical starting point for ecosystem management will have to be to maintain or restore the minimum level of ecosystem health necessary to meet existing legal requirements. As the understanding of ecosystems increases through the experience gained from ecosystem management initiatives, including the four pilot projects, needed changes to existing legislative requirements can be sought to better define and achieve the minimum required level of ecosystem integrity and functioning.

Implementing ecosystem management will also require taking practical steps that clearly identify what must be done and which agencies and parties must be involved. These steps include (1) delineating, on the basis of reasonable ecological and management criteria, the boundaries of the

Executive Summary

geographic areas to be managed as ecosystems, (2) understanding their ecologies (including their current conditions and trends, the minimum level of integrity and functioning needed to maintain or restore their health, and the effects of human activities on them), (3) making management choices about desired future ecological conditions, about the types, levels, and mixes of activities that can be sustained, and about the distribution of activities over time among the various land units within the ecosystems, and (4) adapting management on the basis of continually researching, monitoring, and assessing ecological conditions.

Barriers Impede Implementation

The administration's initiatives to implement ecosystem management governmentwide face several significant barriers. For example, understanding the ecology of an ecosystem will require collecting and linking large volumes of scientific data. In addition, large volumes of socioeconomic data must be collected, organized, and analyzed to identify important relationships between human activities and ecological conditions and trends and to make necessary or desired trade-offs among ecological and socioeconomic values and concerns. However, available data are often not comparable, and large gaps in information exist. Furthermore, there is still much uncertainty about how ecosystems function—uncertainty that contributes to strong differences in the interpretation of scientific evidence.

Coordination among federal agencies within an ecosystem will be hampered by disparate missions and separate, lengthy planning requirements—both of which are rooted in the existing federal land management framework. For example, in the greater Yellowstone area, adjacent National Park Service and Forest Service lands in the same ecosystem have been managed with very different objectives, in part because the Forest Service receives funding incentives for timber harvesting. Coordinated revision of the agencies' plans under existing separate laws will take several years to accomplish.

Collaboration and consensus-building with state, local, and tribal governments; the public; and the Congress will be constrained by incentives, authorities, interests, and limitations embedded in the larger national land and resource use framework, many of which are beyond the ability of the federal land management agencies to control or affect. For example, participants at an October 1993 Yale University workshop on ecosystem management concluded that federal, state, and local regulatory

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agencies and tax authorities often operate in a way that does not support, and in many cases impedes, ecosystem management.

GAO believes that the four pilot projects proposed in the administration's fiscal year 1995 budget afford an opportunity to identify these and other barriers as well as statutory, regulatory, institutional, and procedural options for overcoming them. However, to adequately demonstrate ecosystem management's potential to avoid or mitigate future ecological and economic conflicts, GAO believes that it will be necessary to test the approach in geographic areas where problems or issues of mutual concern have not become as intractable as they have at the four pilot projects and where greater flexibility exists to coordinate activities across ecosystems while still maintaining or restoring their ecological health. The interagency task force is considering additional projects that should provide opportunities to demonstrate this potential.

Recommendations

GAO recommends that the Director of the White House Office on Environmental Policy, through the Interagency Ecosystem Management Task Force, (1) develop a strategy that clarifies the policy goal for ecosystem management, translates the general principles in the administration's fiscal year 1995 budget into practical steps that clearly identify what must be done and which agencies and parties must be involved, and identifies barriers to implementing ecosystem management and options for overcoming them and (2) report progress in implementing this strategy as part of the yearly budget and appropriations process.

**Agency Comments
and GAO'S Evaluation**

GAO requested and received written comments on a draft of this report from the Department of the Interior, the Forest Service, and the White House Office on Environmental Policy, all of which agreed with GAO's analysis. Interior's response included comments from BLM, the National Park Service, and FWS. Interior described the draft as thoughtful and said that it provided much useful guidance. BLM considered the draft well researched and well prepared and stated that it revealed a sound understanding of ecology and its relationship to ecosystem management. According to the National Park Service, the report brings together the current situation regarding ecosystem management, some implementation problems, and options for overcoming them. FWS said that the report provides a well-written and comprehensive analysis of the issues. The Forest Service found the report to be in line with the agency's history and thinking on ecosystem management and subsequent implementation.

Executive Summary

policy and posture. The White House Office on Environmental Policy termed the draft a well-framed and lucid presentation of the basic facets of ecosystem management.

The Forest Service and the White House Office on Environmental Policy concurred with both of GAO's recommendations, while Interior agreed with the first recommendation and the intent of the second recommendation. However, Interior said it would prefer to see the collective assessment and reporting of progress in implementing ecosystem management included in the interagency task force process rather than in the yearly budget and appropriations process.

While Interior's preference would meet the executive branch's need for a collective assessment of federal agencies' progress in implementing an ecosystem management strategy through pilot projects and other initiatives, it would not make these agencies as accountable to the Congress as GAO's recommendation. In GAO's view, the greater flexibility in at least some of the agencies' budget structures, which the agencies believe ecosystem management requires, needs to be balanced or offset by greater accountability to the Congress for the agencies' ecosystem management expenditures. GAO believes that this accountability can be better ensured by assessing and reporting progress toward achieving measurable performance objectives as part of the yearly budget and appropriations process.

The agencies' comments and our responses are presented fully in appendixes I through III.

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Abbreviations

BLM	Bureau of Land Management
CEQ	Council on Environmental Quality
CRS	Congressional Research Service
FACA	Federal Advisory Committee Act
FLPMA	Federal Land Policy Management Act
FWS	Fish and Wildlife Service
GAO	General Accounting Office
NBS	National Biological Survey
NEPA	National Environmental Policy Act
NFMA	National Forest Management Act
OTA	Office of Technology Assessment

Introduction

The federal government's share of the nation's total surface area, once as high as 80 percent, is now about 650 million acres, or about 30 percent. Today, four agencies—the National Park Service, the Bureau of Land Management (BLM), and the Fish and Wildlife Service (FWS) within the Department of the Interior and the Forest Service within the Department of Agriculture—manage about 628 million acres, or 97 percent of these federal lands.¹ These lands contain a significant portion of the nation's wealth of natural resources, including, as of about 1980, 38 percent of the nation's forests, 54 percent of the nation's grazing lands, and the sources of many of the nation's streams and rivers. These agencies, the numerous land units they manage, and the many laws governing their management form the current federal land management framework that has evolved over the last century.

The federal land management framework is part of a larger national land and natural resource use framework. In addition to other federal and state land management agencies, this larger framework includes many federal, state, and local agencies that have regulatory or tax authority or financial or technical assistance programs that can greatly influence the use of natural resources and other activities on private lands and in marine waters.

Even though many laws have been enacted to protect individual natural resources—air, water, soils, plants, and animals, including forests, rangelands, threatened and endangered species, wetlands, and wilderness areas—ecological conditions on many federal lands have declined. As a result of these declines and the recognition that some historic levels of natural resource commodity production and other natural resource uses cannot be sustained indefinitely, federal land managers have had to substantially decrease the production of some renewable natural resource commodities, such as timber, and other natural resource uses, such as recreational activities, on some land units. These reductions have, in some instances, disrupted local economies and communities, contributing to intractable conflicts, referred to by the Secretary of the Interior as ecological and economic “trainwrecks.”

Since the late 1980s, many federal agency officials, scientists, and natural resource policy analysts have advocated a new, broader approach to managing the nation's lands and natural resources called “ecosystem management.” This approach recognizes that plant and animal communities are interdependent and interact with their physical

¹Nearly all of the remaining federal lands are administered by the Department of Defense.

environment (soil, water, and air) to form distinct ecological units called ecosystems that span federal and nonfederal lands. They believe that this approach will, among other things, better address declining ecological conditions and ensure the sustainable long-term use of natural resources, including the production of commodities, thus helping to prevent future ecological and economic conflicts from becoming intractable.

The Federal Land Management Framework Has Evolved

The federal government's approach to managing federal lands and their natural resources has evolved in response to changing national social, economic, and ecological concerns and values. The current federal land management framework began to take shape at the end of the 19th century when, after a century of conveying or selling most new territorial lands, the Congress began establishing agencies to manage the remaining federal lands. Over the last 30 years, this framework has evolved to include new responsibilities for protecting individual natural resources.

Federal Lands Were Conveyed for Private Development

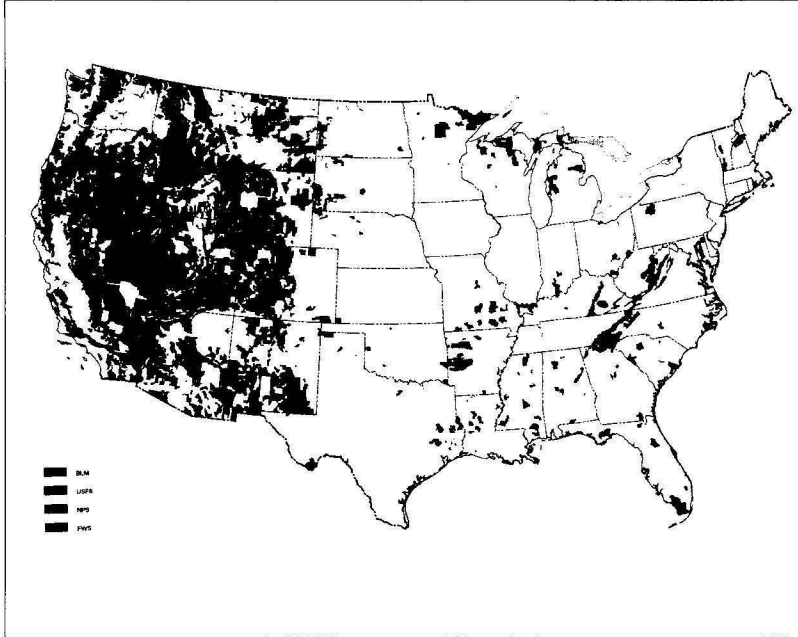
During the United States' first century as a nation, the federal government viewed its land management role as temporary. Beginning in 1785, the federal government established a system for surveying and selling its increasingly vast land acquisitions to new states, their settlers, and railroad companies, opening the American frontier.

Toward the end of the 19th century, the federal government had transferred virtually all of its generally productive lands in the eastern, southern, and midwestern United States as well as much of its most productive agricultural, range, and timber lands in the far West to private ownership. It also generally allowed private uses on the remaining federal lands in accordance with local laws and customs.

Federal Lands Were Managed to Sustain or Increase Their Long-Term Productivity

After several decades of rapid development and unrestricted use, many of the nation's lands and natural resources were significantly degraded. Responding to growing national concerns, the Congress began to redefine the federal government's role in land management from temporary to permanent retention and active stewardship. Over the years, this stewardship became focused on sustaining or increasing the long-term productivity of the federal lands so that they might supply desired natural resource commodities and uses into the future.

Figure 1.1: Lands Managed by Four Primary Federal Land Management Agencies in the 48 Contiguous States



Source: U.S. Geological Survey.

Chapter 1
Introduction

Throughout the 20th century, this new role—and a new federal land management framework for implementing it—grew as the Congress enacted legislation reserving numerous federal land units for different purposes. Through these laws, the federal government set aside many remaining lands in the West and acquired degraded private lands in eastern areas of the country. These laws generally specified that various existing or newly created federal agencies were to actively manage the land units for the production of specific natural resource commodities and for other uses. These agencies were eventually consolidated into the four principal land management agencies that exist today.

BLM, established in 1946, currently manages about 270 million acres, most of which are range and semiarid lands. Located mainly in the West and in Alaska, these lands have been used primarily for mineral development and livestock grazing under systems originating in 1872 and 1905, respectively. The Forest Service, created in 1905, manages about 191 million acres consisting primarily of national forests and grasslands; the forested lands are managed to a great extent for timber production. These lands are located in 45 states but are also largely concentrated in the West and in Alaska. The National Park Service, established in 1916, manages about 77 million acres, divided into over 360 units in 49 states. These units are managed to conserve their scenery, natural and historic resources, and wildlife for the enjoyment and recreation of current and future generations. FWS manages a loosely structured system, established in 1966, of about 500 wildlife refuges, the first of which was created in 1903. These refuges are concentrated in Alaska and along four major north-south waterfowl migration flyways. They encompass about 89 million acres, which have been managed primarily for the benefit of wildlife, including endangered species and waterfowl. When compatible with the primary purposes for which a refuge was established, other activities such as mining and mineral leasing, recreation (including hunting and fishing), and livestock grazing are generally permitted.

Figure 1.1 shows the location of these agencies' lands in the 48 contiguous states.

**Legislation Creates
Production-Oriented
Incentives**

Beginning early in the 20th century, the Congress enacted legislation creating incentives to provide for specific levels of certain natural resource commodities and other uses from Forest Service and BLM lands. Later legislation directed the agencies to manage lands for multiple purposes and to consider their long-term as well as short-term productivity. Examples of this later legislation include (1) the Multiple Use-Sustained Yield Act of 1960 and (2) the Classification and Multiple Use Act of 1964 as superseded by the Federal Land Policy Management Act of 1976 (FLPMA). These statutes gave authority to the Forest Service and BLM to manage lands for multiple uses to best meet the present and future needs of the American people (the multiple-use principle), and to sustain in perpetuity outputs of various renewable natural resource commodities and other uses (the sustained-yield principle). However, despite this later legislation, the two agencies, in many cases, continued to emphasize the production of commodities as established in prior statutes and in accordance with annual congressional appropriations.

For example, the Forest Service receives most of its operating funds from (1) the receipts of timber sales under the Knutson-Vandenberg Act of 1930, which authorizes national forests to retain a portion of their timber sale receipts to help fund reforestation and other activities as well as regional office and headquarters expenses, and (2) appropriated funds linked primarily to managing and harvesting timber. Therefore, in most national forests—even in some where timber harvesting is uneconomic and other activities and uses are more valuable—forest managers depend on timber sales for funds. For many years, in annual appropriations acts, the Congress also specified “target” levels of timber to be harvested.

Other legislation requires the two agencies to share receipts from the sale or use of natural resources on federal lands with the states or counties within which the activities occur. For example, the Forest Service is required to allot 25 percent of its gross receipts from commercial activities in national forests to states and counties. Similarly, BLM is required to allot varying percentages of its grazing fees, ranging from 12.5 percent to 50 percent, and both agencies allot about 50 percent of their adjusted onshore oil, gas, and other mineral receipts to states or counties. These payments, which are often required by federal law to support specific local activities, such as schools and roads, contribute substantially to some localities’ budgets. This is one reason, in addition to enhancing local employment, that some state and local governments have supported the continued production of high levels of natural resource commodities from federal lands.

Legislation Requires Protecting Individual Natural Resources

Over the last 30 years, increasing scientific and public concern about the declining condition of the nation's natural resources has led the Congress to enact a number of laws to protect individual natural resources on both federal and nonfederal lands. These laws regulate the quality of air and water and require the preservation of plant and animal species, including fish, whose survival is threatened or endangered. As a result, the current federal land management framework has evolved to become a complex collection of agencies, land units, and laws designed to sustain or increase long-term commodity production and uses on federal lands while protecting the natural resources for future generations.

Recognizing that federal lands and activities on them are important to protecting natural resources, the Congress has also enacted several largely procedural laws requiring federal agencies to identify and consider the effects of their activities on natural resources. Primary among these laws is the National Environmental Policy Act of 1969 (NEPA), which established the Council on Environmental Quality (CEQ) in the Executive Office of the President and requires federal agencies, in accordance with regulations promulgated by CEQ, to prepare detailed environmental impact statements for major federal actions that may significantly affect the quality of the human environment. In preparing these statements, the agencies must identify and consider the direct, indirect, and cumulative impacts on natural resources of activities on their lands, both alone and in conjunction with the activities of other agencies and landowners.

Also, FLPMA, the National Forest Management Act of 1976 (NFMA), and the National Parks and Recreation Act of 1978 require BLM, the Forest Service, and the National Park Service, respectively, to develop long-range land use or general management plans for their lands. These plans must not only project resource commodity production and other uses over a number of years but also, consistent with NEPA procedures, identify the likely impacts on natural resources of planned activities.

In addition, the Congress has set aside certain federal lands to protect their natural conditions. For example, to protect and preserve their natural conditions, vast areas have been designated as wilderness and certain rivers have been designated as "wild and scenic."

Federal Land Management Is Part of a Larger National Framework

The current federal land management framework of laws, land units, and agencies is, in turn, part of a larger national land and natural resource use framework that includes not only other federal and state land management agencies but also numerous federal, state, and local agencies with regulatory or tax authority or financial or technical assistance programs that can greatly influence the use of natural resources and other activities on private lands and in marine waters.

States and localities regulate land and natural resource uses by a variety of means including (1) local zoning laws and regulations, (2) state forest practices acts that limit the extent and methods of timber harvesting, and (3) wildlife management programs. Furthermore, state laws govern most decisions on water allocation and use, and states are primarily responsible for devising plans to meet federal air quality standards and for devising water quality standards. Additionally, numerous treaties have given Native Americans control over the use of tribal lands.

In addition,

- the Environmental Protection Agency has authorities and responsibilities under 12 major environmental statutes, including those to protect and enhance air quality (the Clean Air Act) and to restore and maintain the chemical, physical, and biological integrity of the nation's waters (the Clean Water Act);
- the U.S. Army Corps of Engineers has primary legislative authority to regulate activities in wetlands and other waters of the United States and to manage the nation's water resources with such projects as dams, reservoirs, levees, harbors, waterways, and locks;
- Agriculture's Soil Conservation Service provides financial and technical assistance to private landowners to prevent soil erosion;
- numerous commodity stabilization programs in Agriculture provide financial assistance to farmers who produce certain crops;
- Interior's Office of Surface Mining Reclamation and Enforcement is responsible for protecting the public and the environment from the adverse effects of coal mining while allowing access to the coal that is important to the nation's energy needs;
- Interior's Bureau of Reclamation is responsible for planning, constructing, and operating water resource projects in an environmentally and economically sound manner in the interest of the American public; and
- Interior's FWS, in addition to managing wildlife refuges, shares responsibilities with the Department of Commerce's National Marine Fisheries Service for ensuring the protection and restoration of threatened

or endangered plant and animal species under the Endangered Species Act of 1973.

Moreover, land uses can be greatly influenced by state and local property tax laws, which often provide for differential taxation of lands on the basis of use, as well as by federal and state inheritance tax laws, which influence the disposition of lands in estates. Finally, the Fifth and Fourteenth Amendments to the Constitution prohibit the federal and state governments from taking private lands for public uses without just compensation. Courts have ruled that certain government regulations of land use have constituted takings requiring just compensation.

Declining Ecological Conditions Have Led to Conflicts

Despite the enactment of numerous laws to protect individual natural resources, ecological conditions on many federal lands have declined. For example, according to a federal interagency team, many forests in the Pacific Northwest have become so damaged by timber harvesting that species are disappearing and many streams no longer provide adequate habitat for fish.² Similarly, BLM has reported that sedimentation in streams has increased; rangelands have become less productive; plant, animal, and fish habitats have been damaged; the health of forests has declined; and the range and numbers of many native flora and fauna have decreased.³ National Park Service managers have reported diminished scenic views, polluted streams, and destruction of wildlife and its habitat.⁴ Numerous other reports indicate that such problems are neither isolated nor diminishing.

Such declines, coupled with the recognition that some historic levels of resource commodity production and other uses cannot be sustained indefinitely, have required federal land managers to substantially reduce levels of timber harvests, livestock grazing, recreational activities, and other uses on some land units. These reductions, in turn, have had adverse economic and social effects on some nearby communities whose economies are highly dependent on uses associated with federal lands. Other communities have also been adversely affected because they

²Forest Ecosystem Management: An Ecological, Economic, and Social Assessment; Report of the Forest Ecosystem Management Assessment Team, Forest Service and BLM (Portland, Oregon: July 1993).

³Ecosystem Management in the BLM: From Concept to Commitment, Instruction Memorandum No. 94-14 (Dec. 14, 1993).

⁴National Park Service: Activities Outside Park Borders Have Caused Damage to Resources and Will Likely Cause More (GAO/RCED-94-59, Jan. 3, 1994).

depend on commodities—such as the Pacific salmon—whose stocks have been reduced by declining ecological conditions on federal lands.

These adverse effects on local economies and communities have created intense ecological and economic conflicts over federal land management. Concern over declining ecological conditions and reduced commodity production and other uses on federal lands has led to an increasing number of administrative and judicial challenges to federal land managers' decisions by environmental, industrial, and recreational organizations and groups. These challenges have frequently resulted in delayed, altered, withdrawn, or stalemated decisions, such as the court-imposed moratorium on timber harvesting on federal lands in the old-growth forests of the Pacific Northwest. Responding to these challenges has required agency staff to extensively reevaluate prior decisions.

Ecosystem Management May Be a Promising Next Step for Federal Land Management

Federal and other researchers have found that communities of plants and animals, which can include humans, are interdependent and interact with their physical environment (soil, water, and air) to form distinct ecological units called ecosystems that span federal and nonfederal lands. As a result, a growing number of agency officials, scientists, and natural resource policy analysts believe that a new, broader approach—referred to as ecosystem management—is needed to manage lands and natural resources. They believe that maintaining or restoring ecosystems—rather than managing legislatively or administratively established land units and individual natural resources—would, among other things, better address declining ecological conditions and ensure the sustainable long-term use of natural resources, including the production of natural resource commodities. They believe that this approach would thus help to avoid or mitigate future ecological and economic conflicts by providing greater flexibility to coordinate activities over larger land areas. Therefore, ecosystem management would not necessarily alter the federal land management agencies' basic legislative mandates—sustaining multiple uses of federal lands and protecting natural resources. Rather, it would change these agencies' approach to fulfilling their stewardship responsibilities through a better scientific understanding of these mandates' relationship to one another.

Ecosystems Are Complex, Dynamic Ecological Units

Ecosystems are distinct ecological units that are commonly classified according to their "structures." These structures are differentiated from one another by particular combinations of "biological components," such

as plant and animal communities, and "physical components," including landforms like mountains or plains and water systems like watersheds⁵ and river basins.⁶ Ecosystem structures and components are developed and sustained through the influence of interactive "processes" among components such as climate, nutrient cycles, and dispersion and succession patterns that are characteristic of given ecosystems.

For instance, the old-growth forest ecosystem of the Pacific Northwest has been defined by its characteristic structure of biological components—including over-200-year-old living conifers, standing and fallen dead trees, and associated plants and animals (including two species of threatened birds, the northern spotted owl and the marbled murrelet) that depend on both the living and the dead trees for their survival—and physical components such as mountains. Characteristic processes include heavy rainfall and the decay of woody material that, together, enable trees to grow old enough and large enough to develop cavities and materials for nesting and allow their root systems to contribute to nutrient cycles that sustain the food chain.

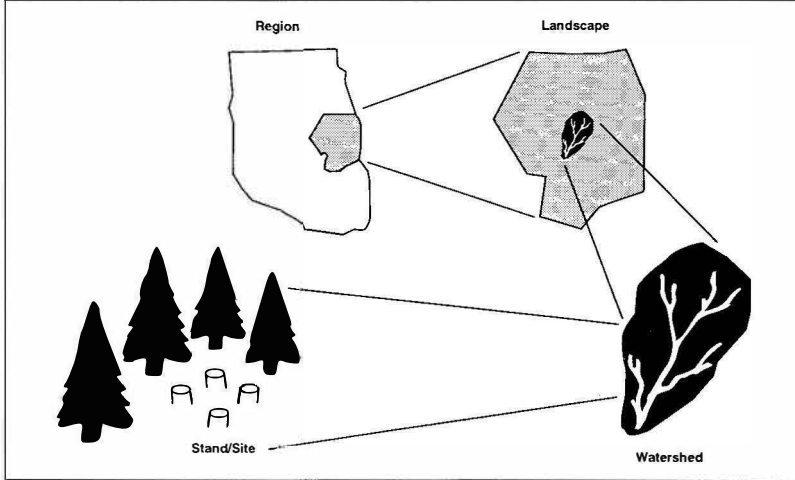
The structures, components, and processes—and even the boundaries—of ecosystems vary over time as a result of natural disturbances, such as fires, floods, and climatic variations. However, ecosystem functioning is generally resilient to the normal range of these disturbances—commonly referred to as the historic range of natural variability. In many cases, ecosystems depend upon such disturbances for their regeneration and continued functioning.

Ecosystems exist at several geographic scales, from large continents to very small sites of a few square feet or less. These different scales form a hierarchy in which several smaller ecosystems may exist within a single ecosystem at the next larger scale. Also, ecosystems are "linked" to one another at any given scale—as well as up and down among scales in the hierarchy—by ecological "functions" that they perform for one another, such as providing moisture or nutrients across their boundaries. This hierarchy of scales is illustrated in figure 1.2.

⁵A watershed is variously defined as the entire region drained by a waterway that flows into a lake, reservoir, or ocean; the total area above a given point on a stream that contributes water to the flow at that point; or the topographic dividing line from which surface streams flow in two directions.

⁶River basins are watersheds drained by a river and its tributaries.

Figure 1.2: Hierarchy of Ecosystem Scales



Source: Adapted from H. Salwasser, "Conserving Biological Diversity: A Perspective on Scope and Approaches," *Forest Ecology and Management*, Vol. 35 (1990).

Maintaining and restoring the "integrity" of the components and the functioning of the processes within ecosystems is important to protecting "biological diversity" (biodiversity)—or the variety of species, the genetic differences among them, and the communities and ecosystems in which they occur. A 1991 report by the Keystone Center, which was based on the deliberations of 60 federal officials and scientists, nonfederal scientists, and representatives from environmental and industry organizations, concluded that preserving biodiversity is critical for a number of reasons.⁷ The report concluded that, among other things, biodiversity (1) supports

⁷Final Consensus Report of the Keystone Policy Dialogue on Biological Diversity on Federal Lands, Keystone Center (Keystone, Colo.: Apr. 1991).

the integrity and resilience of ecological systems on which humans depend, (2) is the source of about half of all prescription drugs and the likely reservoir for many future ones, (3) makes possible improvements in the resistance of desired food and fiber species to pests, disease, and drought, and (4) provides the basis for future increases in productivity. However, a 1992 report by the Office of Technology Assessment (OTA) found, as have numerous other studies, that a large and growing number of species is recognized as being in danger of extinction and that many others suffer from a loss of populations or reductions in their distribution across their natural ranges of habitat.⁸ As the Keystone report noted, the loss of biodiversity has been associated with the diminished integrity of ecosystem structures and components and the functioning of their processes and linkages and can have significant adverse impacts on their ability to provide for material needs of human society.

Humans Are a Component of Ecosystems

Humans are a biological component of most ecosystems, and ecosystem management does not presume that ecosystems have a life and destiny independent of people and their communities. Since ecosystems include humans, human activities and uses are integral to ecosystem management. However, by virtue of new technologies, population growth, and increased use of lands and natural resources, humans have a unique capacity to alter ecosystems through activities that create sudden ecological stresses, profoundly affecting the integrity and functioning of ecosystems.

For instance, the Forest Service has used agricultural production techniques—such as suppressing fires; clearcutting native tree species; and applying herbicides and fertilizers to replacement stands of a single species selected for superior growth characteristics, planted at optimum densities, and periodically thinned—to produce higher levels of timber from federal forests than would have been produced by the natural succession of original stands. However, by altering the processes important to natural succession, these techniques have reduced native biological components and greatly changed forest ecosystem structures. These techniques have also adversely affected other ecosystems by disrupting important functional linkages. For example, increased sedimentation in streams resulting from these techniques has damaged the spawning grounds for Pacific salmon, which are components of both this and the marine ecosystems where they spend most of their adult lives.

⁸Combined Summaries: Technologies to Sustain Tropical Forest Reserves and Biological Diversity, OTA-F-515, (Washington, D.C.: May 1992).

Studies by agencies and nonfederal scientists have found that human activities have brought about much of the decline in ecological conditions on federal lands. In some instances, they have found that commodity production and other uses on federal lands have significantly changed ecosystems. These changes occurred because the activities were concentrated in areas (spatial scale) that were too small or were conducted over time frames (temporal scale) that were too short for ecosystems to absorb or in a manner that fragmented ecosystems, breaking important linkages. They also found that many declining conditions were associated with activities taking place on nearby nonfederal lands. This finding is consistent with several GAO studies over the last decade, including (1) the previously cited 1994 report on activities outside park borders that have caused damage to park resources and will likely cause more and (2) a 1991 report on the Flathead National Forest that found timber harvests on private lands in the northern Rocky Mountains had significant adverse impacts on water quality and wildlife habitat on adjacent national forest lands.⁹

Ecosystem Management Appears to Be a Sounder Approach for Meeting Federal Stewardship Mandates

For these reasons, agency officials and nonfederal scientists agree that federal land management must no longer be focused primarily on individual uses on individual land units or on protecting individual natural resources. Rather, a consensus has emerged that ecosystem management provides a sounder approach for meeting the federal stewardship mandates of protecting natural resources and sustaining long-term commodity production and other uses on federal lands.

Compared with federal agencies' traditional approaches to land management, ecosystem management entails coordinating human activities across larger areas and over longer time frames so as to maintain or restore an ecosystem's integrity and functioning. Healthy ecosystems, in turn, are critical to ensuring the sustainable long-term use of natural resources, including commodity production, and have a much greater potential to support diverse and sustainable local economies. Finally, ecosystem management may provide a scientifically credible forum in which regulatory and procedural requirements for protecting natural resources can be addressed early and jointly, thus reducing the number of challenges to federal land managers' decisions.

⁹Forest Service: The Flathead National Forest Cannot Meet Its Timber Goal (GAO/RCED-91-124, May 10, 1991).

Ecosystem management's emphasis on maintaining and restoring the health of ecosystems does not, however, necessarily mean returning ecosystems to any particular historic condition. The ecology of many areas has been fundamentally—and, in some instances, apparently irreversibly—altered by human activities. Moreover, ecosystem management recognizes that managing natural resources to meet the needs of humans and other species will require both natural and altered areas. Although altered areas, such as farms and single-species tree stands, contain less biodiversity, the nation and some local economies depend on such areas. An ecosystem management approach that recognizes the continuous interactions between natural and altered areas within an ecosystem can accommodate both kinds of land uses while maintaining or restoring the integrity and functioning of the ecosystem. Such an approach is directed at maintaining an ecosystem's ability to recover from natural disturbances and human activities.

Objectives, Scope, and Methodology

The Chairman of the House Committee on Natural Resources; the Chairman of the House Committee on Merchant Marine and Fisheries; the Chairman of the Subcommittee on Specialty Crops and Natural Resources, House Committee on Agriculture; and Representative Norm Dicks asked us to examine ecosystem management and its potential use in managing federal lands and natural resources. As agreed with their offices, this report identifies (1) the status of federal initiatives to implement ecosystem management, (2) additional actions required to implement this approach, and (3) barriers to governmentwide implementation. As further agreed with their offices, we limited the scope of our work primarily to relevant activities of the four primary federal land management agencies.

To identify the status of federal efforts to implement ecosystem management, we reviewed agency directives and met with officials from the National Park Service, BLM, FWS, the Forest Service, the White House Office on Environmental Policy and CEQ in the Executive Office of the President, and other federal agencies involved in implementing an ecosystem approach to managing federal lands and natural resources. We also met with these agencies' field office representatives in the greater Yellowstone and Pacific Northwest old-growth forest areas where the agencies have attempted to coordinate their management activities. Finally, we reviewed the administration's fiscal year 1995 budget as well as the individual budget justifications for the four primary federal land management agencies.

To identify additional actions required to implement ecosystem management, we reviewed the steps and criteria (1) used by the four primary federal land management agencies and other federal agencies when proposing to replace one management strategy with another, including those specifically related to implementing ecosystem management, (2) included in the administration's fiscal year 1995 budget, and (3) identified in other studies and reports. We also drew heavily on the criteria for (1) creating a framework for addressing management problems, (2) ensuring strategic management, and (3) developing a strategic plan in GAO's December 1992 Transition Series reports on Government Management Issues (GAO/OCG-93-3TR), Information Management and Technology Issues (GAO/OCG-93-5TR), Food and Agriculture Issues (GAO/OCG-93-15TR), Veterans Affairs Issues (GAO/OCG-93-21TR), Justice Issues (GAO/OCG-93-23TR), Internal Revenue Service Issues (GAO/OCG-93-24TR), NASA Issues (GAO/OCG-93-27TR), and General Services Issues (GAO/OCG-93-28TR) as well as on the elements of a working definition and goals for ecosystem management identified at the November 1993 National Ecosystem Management Forum convened and facilitated by the Keystone Center (the Keystone Forum). This forum focused on the experience of people working with ecosystem management in the field and at the policy level, as well as on the role of science in ecosystem management initiatives. The forum—which involved approximately 40 participants from federal agencies, the White House Office on Environmental Policy, research institutions, county and state governments, citizen and environmental organizations, tribes, and commodity and user groups—represented a cross-section of interests that must be involved in implementing the concept.

To identify barriers to implementing ecosystem management, we reviewed applicable reports, studies, and articles by executive and congressional agencies and public and private research and policy analysis organizations. These documents included the summary of the Keystone Forum and the report of a national workshop on ecosystem management, held in October 1993 at Yale University (the Yale Workshop). This workshop was convened by the Forest Policy Center, a program of American Forests (formerly the American Forestry Association), and was attended by over 100 resource managers, scientists, and policy analysts representing federal and state agencies, major corporations, and environmental organizations involved in implementing ecosystem management. The focus of this workshop was on building effective partnerships across ownership boundaries. In addition, we met with representatives from academia; various state government associations;

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and environmental, natural resource professional, and industry organizations.

We conducted our work primarily from April 1993 through April 1994 in accordance with generally accepted government auditing standards. We obtained comments on a draft of this report from the Department of the Interior, the Forest Service, and the White House Office on Environmental Policy. The agencies' comments and our responses are presented fully in appendixes I through III.

Federal Agencies Are Beginning to Implement Ecosystem Management

Over the past 2 years, all four of the primary federal land management agencies have independently announced that they are implementing or will implement an ecosystem approach to managing their lands and natural resources, and each has been working to develop its own strategy primarily within its existing framework of laws and land units. In addition, in a few geographic areas, often in response to court orders or congressional concerns, the agencies have entered into cooperative agreements with each other or with other federal agencies to address specific ecological concerns. At the local level, some of the agencies' field offices have entered into collaborative arrangements with both federal and nonfederal agencies, as well as with private landowners and other interests, to address transboundary problems or other issues of mutual concern. Efforts by the four agencies, as well as those by 14 other federal agencies, to implement ecosystem management are compiled in an April 19, 1994, Congressional Research Service (CRS) report to the Congress.¹

The September 1993 Report of the National Performance Review: *Creating a Government That Works Better and Costs Less*, recommended that the President issue an executive order establishing ecosystem management policies across the federal government and that the concept be phased in using selected demonstration projects. Responding to these recommendations, the administration proposes in its fiscal year 1995 budget, among other things, to undertake four ecosystem management pilot projects and states that it is considering managing along ecological rather than political or administrative boundaries.

Agencies Are Adopting Ecosystem Management Policies and Strategies

All four of the primary federal land management agencies have announced that they are using or will use an ecosystem approach in managing their lands and natural resources. For example, on June 4, 1992, the Chief of the Forest Service announced a new policy of multiple-use ecosystem management on the national forests and grasslands. According to the Chief, the announcement was based on the results of experiments to develop more environmentally sensitive ways to manage the forests. In conjunction with this new ecosystem management policy, the Forest Service announced plans to reduce the amount of timber harvested by clearcutting by as much as 70 percent from fiscal year 1988 levels. Since June 1992, the Forest Service has, through its Office of Ecosystem Management, been working to develop a strategy and policies for ecosystem management and internal guidance for doing so. It is also

¹Ecosystem Management: Federal Agency Activities (94-339 ENR).

drafting revisions to the regulations implementing NFMA, to, among other things, better support an ecosystem management approach. Also, in the explanatory notes to its proposed fiscal year 1995 budget, the Forest Service states its intent to accelerate the implementation of ecosystem management through increased funding for research and on-the-ground ecosystem protection and restoration efforts, as well as through a simplified budget structure that reduces the number of main appropriations from 13 to 8 and of funding line items from 72 to 42. The Service believes that this restructuring is the necessary first step to provide support and flexibility for implementing ecosystem management. A specific line item has been requested for ecosystem planning, inventorying, and monitoring.

Similarly, on December 14, 1993, the Director of BLM issued a concept paper entitled *Ecosystem Management in the BLM: From Concept to Commitment*, which states that the agency has adopted the principles of ecosystem management to guide its management of the public lands and their natural resources. These principles include (1) sustaining the productivity and diversity of viable ecological processes and functions, (2) adopting an interdisciplinary approach to land management in which program advocacy will yield to ecosystem advocacy, and (3) basing plans and management on long-term horizons and goals. This paper culminated an initiative begun about a year earlier to develop the agency's policies and strategy for ecosystem management. In its fiscal year 1995 budget justifications, BLM states that it is continuing to move toward ecosystem management and proposes to streamline its budget structure to focus on larger-scale, integrated resource management issues to provide, among other things, the flexibility needed to support the concept's implementation.

In late 1992, FWS established a working group to develop its policies and strategy for biodiversity management. Later, this effort was expanded to address ecosystem management. In March 1994, FWS sent a concept paper to all employees that outlined how FWS intends to apply principles of an ecosystem management approach to fish and wildlife conservation. Among other things, the paper proposed that teams of staff from various FWS programs be established in 52 ecosystems that FWS has tentatively identified covering all 50 states. In its fiscal year 1995 budget justifications, FWS states that it plans to enhance its biodiversity management efforts to provide for (1) ecosystem-oriented long-range planning and (2) ecosystem management approaches to endangered species conservation. This latter proposal reflects a February 1992 decision by FWS to take a multispecies

approach—rather than a species-by-species approach—to protecting plants and animals. FWS is proposing to implement ecosystem management within the existing budget structure but will reevaluate the need to restructure the budget or its organization in 1995.

The National Park Service recently established a working group to develop its ecosystem management policies and strategy. In its fiscal year 1995 budget justifications, the Service calls for greater emphasis on environmental protection and states that it will pursue new partnerships, alliances, and coalitions to do so. It further states that it will be promoting comprehensive regional ecosystem restoration and management. For example, the more than 20 national park units that are located within the Colorado Plateau have formed a regional partnership to share information, develop cooperative programs based on the ecology of the area, and seek partnerships with interested organizations. The potential zone of cooperation for this partnership includes southwest Colorado, southeast Utah, northeast Arizona, and northwest New Mexico. The Service does not plan to restructure its budget to accommodate ecosystem management.

Midlevel staff from the 4 primary federal land management agencies, together with staff from 16 other federal agencies involved in ecosystem management initiatives, have been meeting periodically on an informal basis since 1992. This group, known as the Interagency Ecosystem Management Coordination Group, has been exchanging information and ideas on ecosystem management approaches and other areas of common interest, such as training.

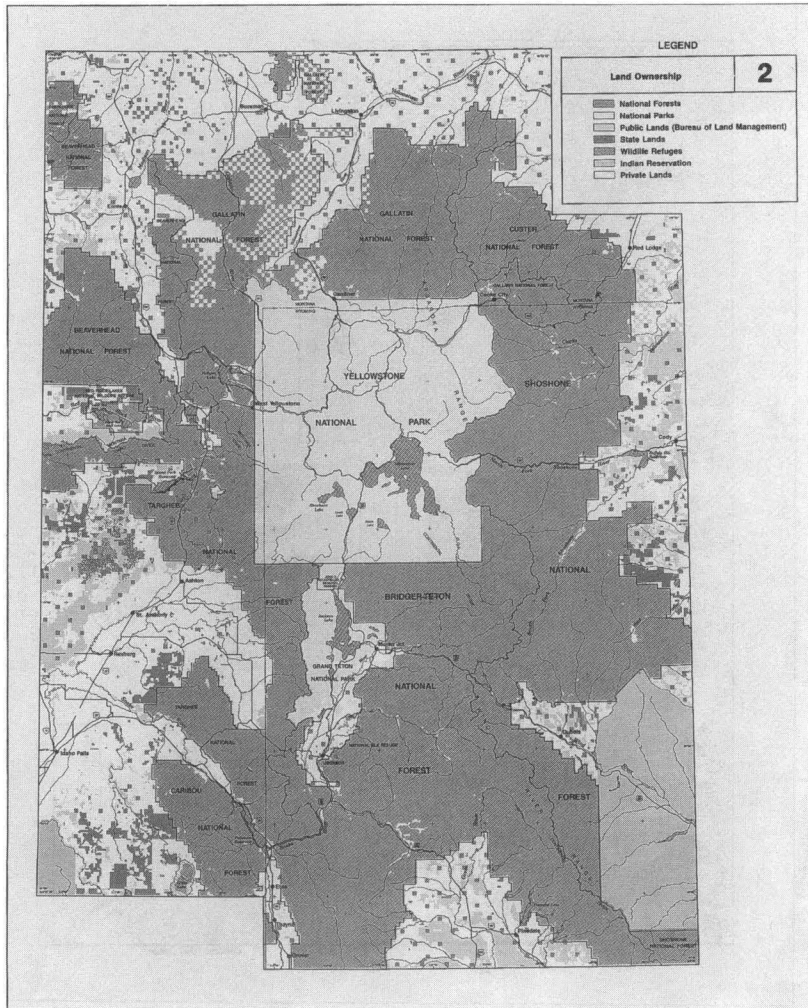
Agencies' Field Offices Are Pursuing Cooperative Efforts

In response to court orders or congressional or agencies' concerns, the federal land management agencies have begun to coordinate their activities across land unit boundaries in a few geographic areas to address specific ecological concerns. Some efforts predate the agencies' recently announced ecosystem management initiatives and strategies. For example, in the early 1960s, the National Park Service and the Forest Service began to coordinate management goals and standards for and activities on the national forests and parks in the greater Yellowstone area (in Wyoming, Montana, and Idaho). Figure 2.1 shows the federal land units in the greater Yellowstone area. Congressional concerns expressed in 1985 gave further impetus to improving coordination in the area. Similarly, the Forest Service, BLM, and several other federal agencies, at the direction of the President, drafted a plan for coordinating the management of federal activities in the old-growth forest ecosystem of the Pacific Northwest (in

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Oregon, Washington, and California). The agencies undertook this effort in response to federal court orders suspending federal timber sales until the sales' cumulative effects on the threatened northern spotted owl could be examined. Figure 2.2 shows these old-growth forest areas in the Pacific Northwest. In southern Utah, BLM and the National Park Service are attempting to better coordinate human activities and uses on their neighboring lands.

Figure 2.1: Map of the Greater Yellowstone Area

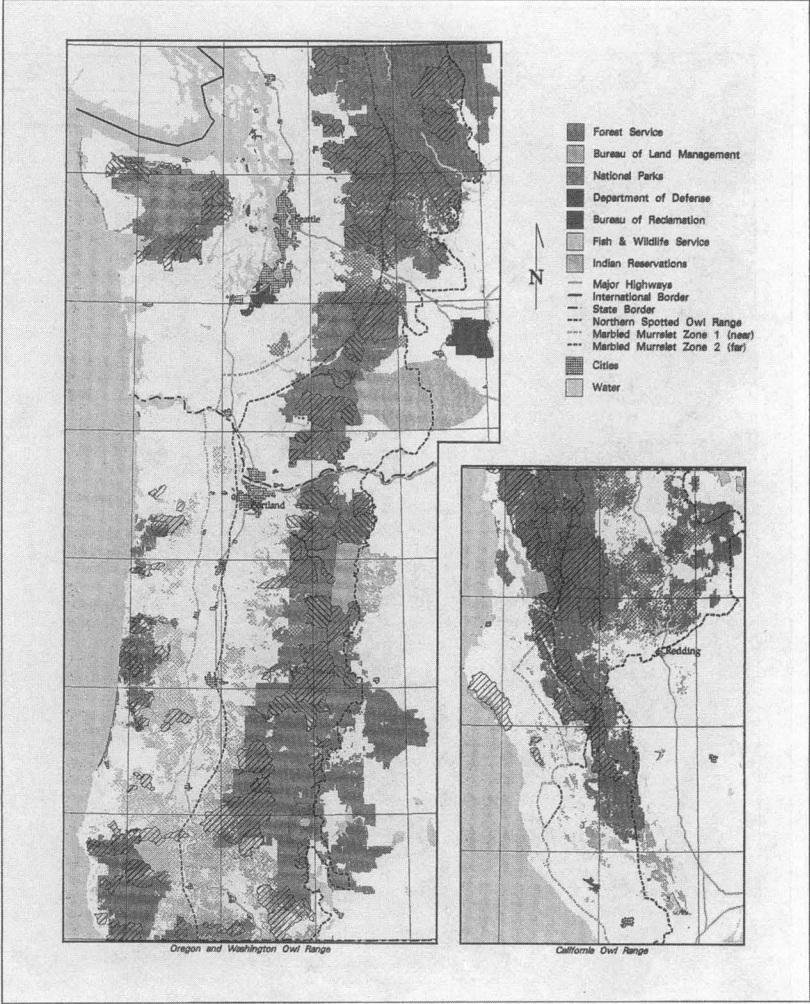


Source: Forest Service

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Figure 2.2: Map of Pacific Northwest Old-Growth Forests



Source: BLM.

In other locations, agencies are participating in ecosystem studies and activities jointly and with nonfederal entities to identify ways of preventing issues or concerns from becoming intractable conflicts. For example, in California's Sierra Nevada mountains, the Forest Service and the National Park Service are working with state and private parties to, among other things, avoid declines in water quality that are expected to adversely affect fish stocks in the future. The Forest Service, the National Park Service, FWS, and five other federal agencies are working with private groups and state agencies in the southern Appalachian highlands to identify ways of addressing common problems associated with air and water quality, conservation, biological diversity, and sustainable economic growth in an area straddling the borders of six southeastern states (Alabama, Georgia, North Carolina, South Carolina, Tennessee, and Virginia). This area has been designated as a biosphere reserve by the United Nations under its Man and the Biosphere program.² Similarly, the National Park Service is working with other federal agencies and nonfederal parties in another biosphere reserve in southwestern Kentucky to address the effects of regional land use and development on surface and groundwater resources within a zone of cooperation defined by the groundwater recharge area for the Mammoth Cave National Park.

Agencies' field offices have largely directed their initiatives to activities on their own lands. However, some field offices have entered into cooperative arrangements with other public agencies as well as with private landowners. Generally, they have undertaken these efforts to address transboundary problems and other issues of mutual concern. For example, Forest Service and BLM field offices are participating in a partnership with industry, conservation groups, other public agencies, research organizations, and private landowners to protect and restore the ecological health of the Applegate River watershed in southwestern Oregon (encompassing about 500,000 acres) while sustaining economic productivity and community stability. Similarly, all four agencies are party to a recent agreement with state agencies that, in turn, are working with local governments, environmental groups, and industry to develop a coordinated statewide biodiversity planning strategy for ecologically similar regions throughout California. This strategy's long-term goal is to

²The Man and the Biosphere program was established by the United Nations in 1970 to solve management problems arising from interactions between human activities and natural systems. In the United States, 47 areas have been designated as part of an international network of 323 "biosphere reserves." These reserves are unique, multipurpose areas dedicated both to the conservation of characteristic ecosystems and species and to the management of land, water, and other resources for sustainable development to meet human needs. Twelve federal departments and agencies participate in the U.S. national committee, and more participate in the biosphere reserves.

conserve the natural heritage of each major region in the state while sustaining economic growth and development.

Governmentwide Initiatives Are Under Way

In 1993, the White House Office on Environmental Policy, created in the same year by the President, established an Interagency Ecosystem Management Task Force to implement an ecosystem approach to environmental management. The task force was charged with establishing overarching goals for all federal agencies; removing barriers that frustrate more effective, efficient interagency cooperation; and learning from large-scale ecosystem-based management efforts. The task force is chaired by the Director of the White House Office on Environmental Policy and is composed of assistant secretaries from 12 departments and agencies as well as representatives from the Office of Management and Budget and the White House Office of Science and Technology Policy.

Consistent with recommendations in the September 1993 Report of the National Performance Review, the interagency task force developed the administration's fiscal year 1995 budget proposal to fund the initial stage of a governmentwide approach to ecosystem management. This proposal requests \$610 million in discretionary spending for ecosystem management initiatives, or 19 percent (\$99 million) more than in fiscal year 1994 for similar activities. Of the \$610 million, \$433 million, or 71 percent, is to accelerate three ongoing interagency restoration efforts that are being designated as pilot ecosystem management projects. The remaining \$177 million is to collect information to support decision-making for protecting and preserving the nation's biodiversity. In addition, \$90 million in mandatory spending is to be used to fund a fourth pilot project.

The budget document states that under the administration's ecosystem management approach, "emphasis on managing whole ecosystems replaces the piecemeal approach of the past wherein land, water, air, endangered species, and mineral and other resources were primarily dealt with one by one." It also states that several agencies have issued new or revised statements and policies supporting ecosystem management to "maintain the sustainability and biodiversity of ecosystems as well as economies and communities. The human component is fundamental." The document further states that the administration is considering the following principles for ecosystem management:

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- Manage along ecological, rather than political or administrative, boundaries.
- Ensure coordination among federal agencies and increased collaboration with state, local, and tribal governments; the public; and the Congress.
- Use monitoring, assessment, and the best science available.
- Consider all natural and human components and their interactions.

One of the four pilot projects—to restore the old-growth forests of the Pacific Northwest—is limited primarily to federal lands and agencies. Another—to restore natural resources damaged by the March 1989 oil spill from the supertanker Exxon Valdez in Alaska's Prince William Sound—involves primarily federal agencies and the state of Alaska. A third—to restore the ecological health of south Florida, including the Everglades and Florida Bay—involves collaboration among federal and nonfederal agencies, private landowners, and other interests. The fourth pilot project—to restore the ecological health of the Anacostia River in Maryland and the District of Columbia—is being led by state and local governments and includes participation by several federal agencies.

In the interim, the interagency task force has been developing definitions, goals, and principles of ecosystem management and identifying barriers to its implementation within the federal government. A draft "Ecosystem Management Initiative Overview," prepared and approved by the task force, summarizes the efforts of the agencies to clarify goals, translate principles, and derive lessons from ongoing ecosystem management efforts that can be applied to other ecosystems. The task force has also formed an interagency work group to examine major issues that influence the effectiveness of ecosystem management—such as the budget process, legal authorities, and information management—and to make recommendations to the task force for improvements.

Additional Actions Are Needed for Implementation

In its fiscal year 1995 budget, the administration proposes to fund the initial stage of a governmentwide approach to ecosystem management. However, implementing this initial stage will require clarifying the policy goal for ecosystem management and taking certain practical steps to apply the principles being considered by the administration. These steps include (1) delineating ecosystems, (2) understanding their ecologies, (3) making management choices, and (4) adapting management on the basis of new information. In taking these steps, the federal government will have to make difficult public policy decisions about how it can best fulfill its stewardship responsibilities.

Implementation Requires Clarifying the Policy Goal for Ecosystem Management

In its budget document, the administration says that its ecosystem management approach emphasizes "managing whole ecosystems" so as to "maintain the sustainability and biodiversity of ecosystems, as well as economies and communities." As experience has shown in the old-growth forests of the Pacific Northwest and elsewhere, it is not always possible to maintain or restore healthy ecosystems and, at the same time, sustain historic types, levels, and mixes of human activities. The administration's budget document does not clearly identify the priority to be given to the health of ecosystems relative to human activities when the two conflict.

Currently, there is no governmentwide legal requirement to maintain or restore ecosystems as such. However, (1) the purpose statement of the Endangered Species Act, which states that a purpose of the act is to provide a means for conserving the ecosystems upon which endangered and threatened species depend, and (2) regulations adopted under NEPA that require all federal agencies to identify and consider the impacts "... on natural resources and on the components, structures, and functioning of ecosystems ..." of their activities both alone and in conjunction with those of other nearby agencies and landowners. But neither these nor any other acts or implementing regulations define or delineate ecosystems or specifically require federal agencies to act to maintain or restore the health of ecosystems. Other laws do require federal agencies to give priority to (1) sustaining multiple uses on federal lands and (2) providing minimum levels of protection to individual natural resources. If meeting these mandates depends on healthy ecosystems, then priority will have to be given to maintaining or restoring a minimum level of ecosystem integrity and functioning over production and other uses of resources at nonsustainable levels.

Confusion Exists Over the Goal of Ecosystem Management

In the absence of a clear statement of federal priorities for sustaining or restoring ecosystems and the minimum level of ecosystem health needed to do so, ecosystem management has come to represent different things to different people. As CRS noted in a July 14, 1993, report to the Congress,¹ many disparate groups—from multiple-use supporters to wilderness proponents—are advocating an ecosystem approach to land management in the United States; however, “there is not enough agreement on the meaning of the concept to hinder its popularity.”

This confusion was noted in the report of the November 1993 Keystone Forum on ecosystem management, which stated that “people’s interpretations, and thus perceptions, of ecosystem management varied—sometimes significantly.” Some participants said that ecological values and concerns should take precedence over social or economic considerations, others said that ecological concerns should be secondary to social or economic ones, and still others said that the three are equally important and should be balanced when implementing the concept.² Although Forum participants could not reach a consensus on a specific priority, they generally supported a working definition of ecosystem management with a goal of “preserving, restoring, or, where those are not possible, simulating ecosystem integrity as defined by composition, structure, and function that also maintains the possibility of sustainable societies and economies.”

This goal appears to give priority to maintaining or restoring the integrity and functioning of ecosystems over short-term use levels that cannot be sustained indefinitely. Some participants observed, however, that the federal government should provide a clear national policy and guidance to federal agencies that outlines the goals of ecosystem management.

In its recent draft “Ecosystem Management Initiative Overview,” the Interagency Ecosystem Management Task Force states that the goal of ecosystem management is to “restore and maintain the health, sustainability, and biological diversity of ecosystems while supporting sustainable economies and communities.” While this statement may indicate that greater priority will have to be given to maintaining or restoring the health of ecosystems relative to unsustainable uses, other

¹Ecosystems, Biomes, and Watersheds: Definitions and Use (93-656 ENR).

²In this report, social and economic values and concerns are hereafter referred to as “socioeconomic considerations.” These considerations include those related to the conditions and trends of local economies and industries, the stability of communities, their populations, and institutions, and aesthetic responses to nature.

definitions leave no doubt. For example, in its December 1993 concept paper, BLM states that "since the production of all goods and services is dependent on ecosystem health, BLM's overriding objective will be to maintain naturally diverse and sustainable ecological systems." BLM continues that the "primary goal of ecosystem management is to develop management that conserves, restores, and maintains the ecological integrity, productivity, and biological diversity of public lands." Similarly, in its March 1994 concept paper, FWS defines ecosystem management as "protecting or restoring the function, structure, and species composition of an ecosystem, recognizing that all components are interrelated."

We believe that the varied interpretations and perceptions of the goal of ecosystem management must be replaced by a common interpretation of what is to be accomplished within and across ecosystems on the basis of clearly stated priorities.

A Minimum Level of Ecosystem Integrity and Functioning Needs to Be Defined

The Congress has enacted laws to protect individual natural resources—for example to protect and restore plant and animal species whose survival is threatened or endangered, to protect and enhance air quality, or to restore and maintain the chemical, physical, and biological integrity of the nation's waters—that define minimum levels of protection to be met or assign responsibility for defining these levels to executive branch officials. In addition, the Congress has enacted laws to sustain outputs of various renewable natural resource commodities and other uses.

As a starting point, ecosystem management will need to maintain or restore the minimum level of ecosystem integrity and functioning necessary to meet existing legal requirements. As the understanding of ecosystems increases through the experience gained from ecosystem management initiatives, including the four pilot projects, needed changes to existing legislation can be sought to better define and achieve the minimum required level of ecosystem integrity and functioning.

For example, under the Endangered Species Act, a determination about whether a plant or animal species or a specific population of a species is threatened or endangered generally requires a detailed examination, and efforts to list and protect it can be quite lengthy and expensive. Some agency officials and scientists believe that a multispecies approach focused on broader geographic areas, such as some ongoing FWS efforts, may (1) be more efficient and effective, (2) identify ways to prevent many

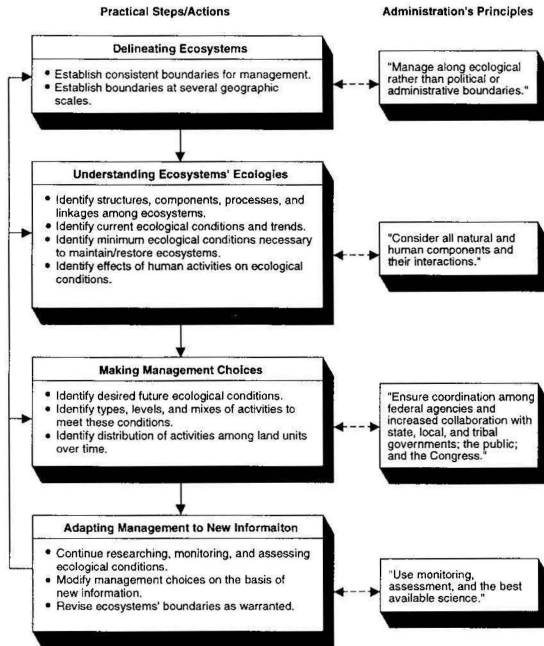
species from becoming threatened or endangered in the first place, and (3) result in fewer limitations on human activities. An approach that focuses on ecosystems rather than on individual species or populations may require some changes to, or flexibility in applying, existing law. For example, protection for specific populations of species in ecosystems may have to be adjusted in accordance with their importance in maintaining or restoring the ecosystems' integrity and functioning.

Practical Steps Are Required to Implement Ecosystem Management

The principles for implementing ecosystem management being considered by the administration appear to be consistent with those identified in various scientific and policy studies and reports on ecosystem management, as well as with the elements of the working definition for ecosystem management identified at the Keystone Forum. However, implementing ecosystem management will require translating these principles into certain practical steps that clearly identify what must be done and which agencies and parties must be involved.

On the basis of our review of numerous scientific and policy studies of ecosystem management and consultation with ecosystem management experts representing a wide range of views, we identified four practical steps that we believe need to be taken to implement the principles being considered: (1) delineating ecosystems, (2) understanding their ecologies, (3) making management choices, and (4) adapting management on the basis of new information. Figure 3.1 shows these steps and relates them to the principles in the fiscal year 1995 budget document.

Figure 3.1: Relationships Between Practical Implementation Steps and Ecosystem Management Principles



**Ecosystem Boundaries
Need to Be Delineated**

Although one of the principles in the administration's budget is to "manage along ecological rather than political or administrative boundaries," the existing boundaries of most federal lands were not drawn along ecological lines. As CEQ noted, the impetus for establishing many national parks was to preserve scenic beauty rather than ecological function, and the parks operate under these dual mandates of conservation and recreation. Similarly, many wildlife refuges operate under game management objectives that can conflict with the well-being of other plant and animal species, and consideration for the character of the wilderness, rather than attention to the functioning of ecosystems or the preservation of biodiversity, determined the boundaries of many wilderness areas. Finally, the boundaries of national forests and public lands were generally not established on the basis of ecological considerations.

To date, much attention has focused on delineating the boundaries of ecosystems and, in particular, on determining their appropriate spatial or geographic scale. Such delineations are problematic because (1) several smaller ecosystems may exist within a larger one, (2) ecosystems are interlinked and difficult to separate, (3) boundaries of ecosystems expand and contract over time in response to natural disturbances and human activities and (4) ecosystems are ecological—rather than legislatively or administratively established—units. However, delineating the boundaries of the geographic areas to be managed as ecosystems is a prerequisite to planning for, budgeting, authorizing, and appropriating funds for, and ultimately managing activities on the basis of, ecological units.

In its July 1993 report, CRS concluded that further research will not make the boundaries of ecosystems clearer. Even if not perfectly defined, these boundaries can be delineated for management purposes in a way that meets certain tests of reasonableness to provide a needed starting point. One scientific criterion of reasonableness was articulated by some participants at the November 1993 Keystone Forum, namely, that a geographic area to be managed as an ecosystem be large enough to capture the complexities and linkages among the components and processes of the ecosystem.

Various alternatives have been suggested for meeting this basic scientific criterion. Some scientists have suggested using the physical components of river basins and smaller watersheds as the primary building blocks for delineating and managing ecosystems. They note that the boundaries of river basins and watersheds (1) are relatively well defined, (2) can have major ecological importance, (3) are systematically related to one another

hierarchically and thus include smaller ecosystems, (4) are already used in some water management efforts, and (5) are easily understood by the public. Other alternatives suggested for delineating ecosystems include (1) areas that are large enough to encompass the primary habitat required to sustain the largest carnivore in a region, (2) "biomes,"³ or (3) "ecoregions" and "subregions" based on combinations of similar climate, landforms, and vegetation.

Additional criteria for reasonableness in delineating ecosystems mentioned by several analysts, as well as by participants at the Keystone Forum, are derived from management considerations of spatial or geographic scale. Boundaries should not be so large that managers will not be able to adequately focus on specific local problems or issues of mutual concern. Nor should they be so small that managers will be unable to address the effects on the ecosystem of activities originating across ownership boundaries.

Although not yet precisely or systematically defined, "landscapes" have been recommended by many scientists and analysts as the primary management scale. "Landscapes" are described as dynamic, interacting, and interconnected patterns of habitats affected by climate, landforms, and human activity. They will generally include a mix of government and private lands, often be smaller in size than a state, and frequently cross state boundaries. Since ecosystems exist at several geographic scales in a hierarchy and are functionally linked to one another, analysts believe that ecosystems at the next higher and next lower scales from the primary management scale should also be identified in order to assess whether their integrity and functioning are being affected by activities at the primary management scale and vice versa.

Although we have not examined them closely, the boundaries of the four pilot projects in the administration's fiscal year 1995 budget appear to address at least some of these tests of reasonableness. All generally appear to be (1) based on watersheds or other ecological criteria, (2) large enough to allow for consideration of the effects on the ecosystem of activities originating across ownership boundaries, but (3) small enough to focus on local problems or issues of mutual concern.

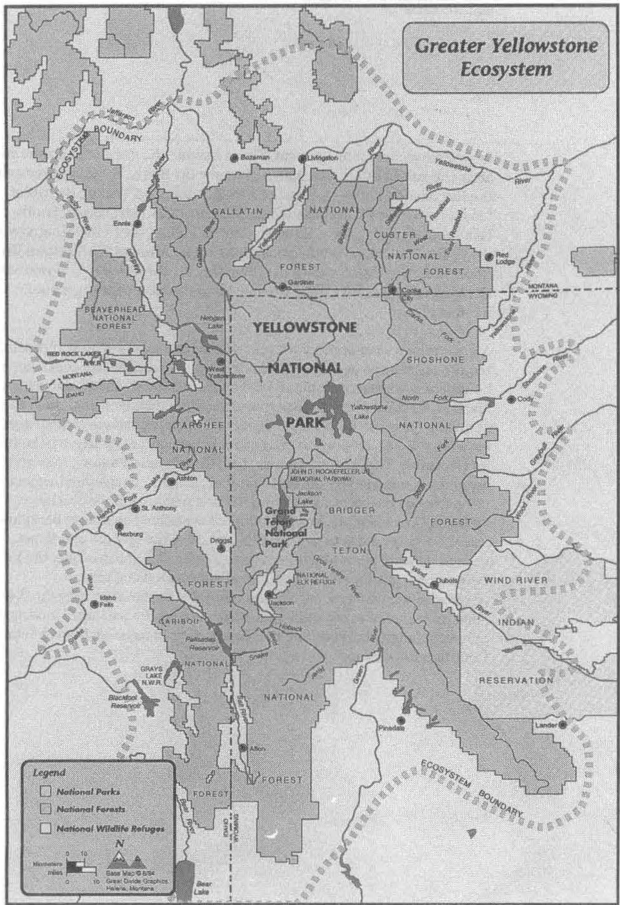
In addition to the four pilot projects, other geographic areas have been identified by agency officials and scientists as potential locations for

³A biome is a major regional community of plants and animals with characteristic life forms and environmental conditions. It is the largest geographical biotic unit and is named after the dominant type of life form, such as tropical rain forest, grassland, or coral reef.

testing ecosystem management. These include the greater Yellowstone area; the southern Appalachian highlands; the Sierra Nevada ecosystem; the Rio Grande Valley (Colorado, New Mexico, and Texas); the Great Lakes; the Great Plains grasslands (Minnesota, North Dakota, South Dakota, Nebraska); the California Central Valley Bay Delta; Monterey Bay; the coastal Louisiana wetlands; and the upper Mississippi/Missouri River flood zone. Figure 3.2 shows the boundary for the Greater Yellowstone Ecosystem suggested by the Greater Yellowstone Coalition, a public interest group.

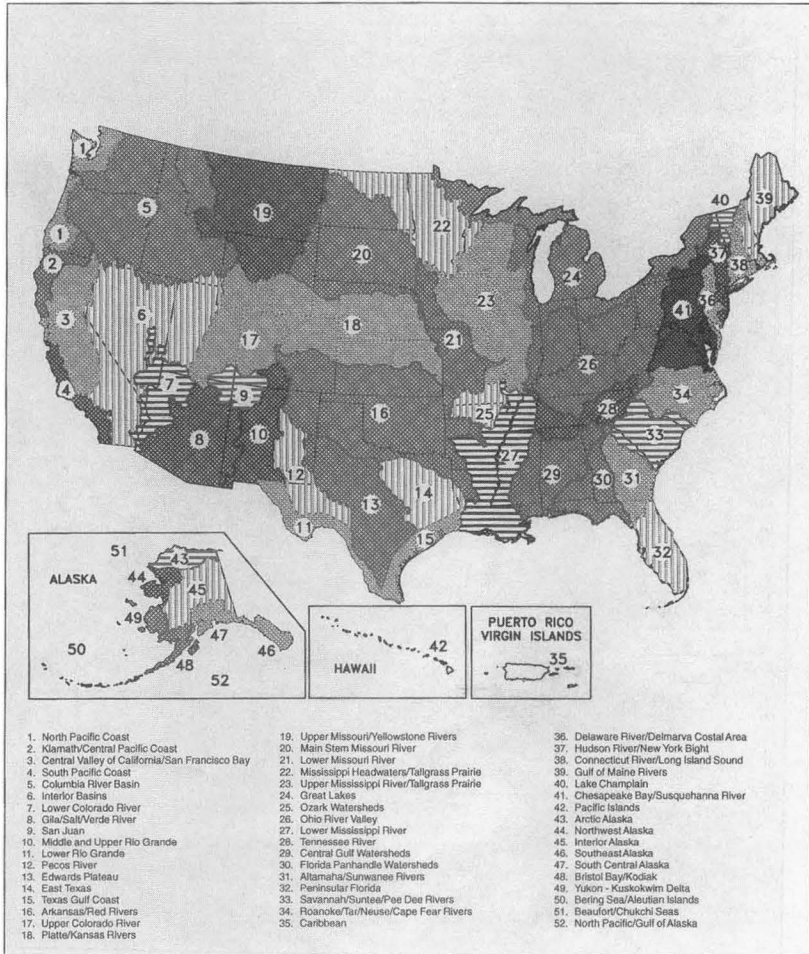
A governmentwide approach to ecosystem management may ultimately require agreement among federal agencies on delineating ecosystem boundaries across the national landscape. However, as FWS notes in its March 1994 draft concept paper on ecosystem management, "Regrettably, at present, there is no ecologically based mapping system that all agencies have adopted to support an ecosystem approach." Similarly, BLM states in its December 1993 concept paper that "Coordination among management agencies is impeded by the fact that federal land management agencies often employ different data standards and resource classification systems." For example, FWS has adopted tentative ecosystem boundaries based on watersheds to organize its activities nationwide and to set ecosystemwide goals and objectives. (See fig. 3.3.) Meanwhile, the Forest Service has developed an ecoregional approach using climate, physiography, water, soils, air, and natural communities. (See fig. 3.4.) The need to delineate ecosystem boundaries across the national landscape is currently being addressed by the Interagency Ecosystem Management Coordination Group.

Figure 3.2: Boundary Suggested for the Greater Yellowstone Ecosystem



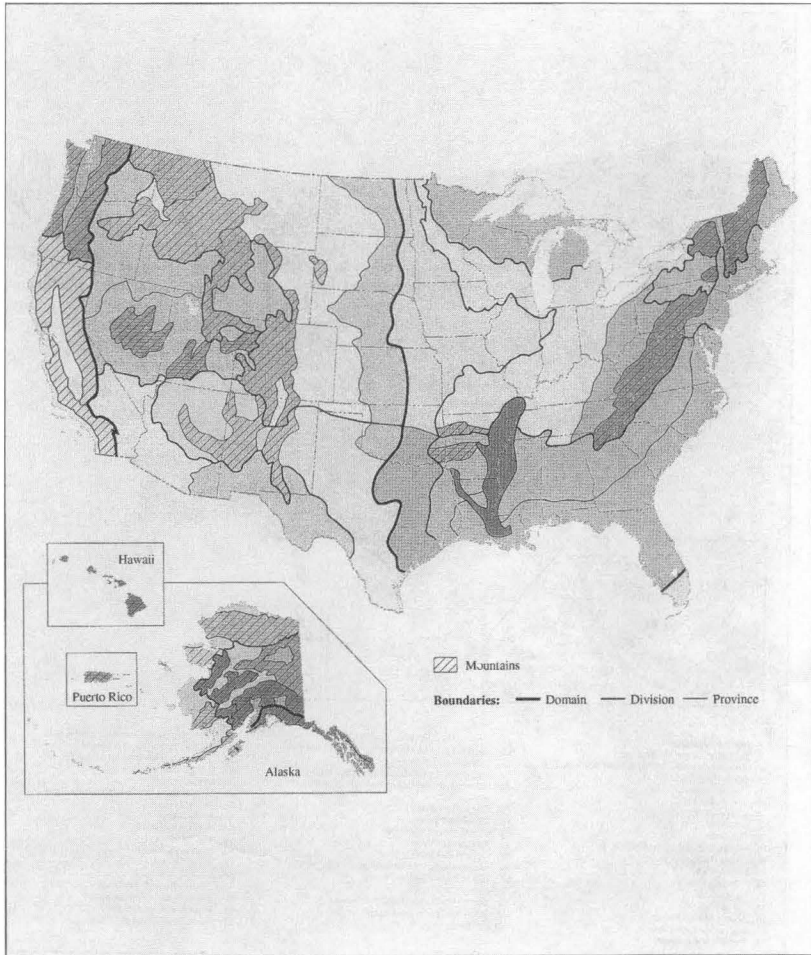
Source: Greater Yellowstone Coalition.

Figure 3.3: Fish and Wildlife Service Ecosystem Unit Map



Source: FWS.

Figure 3.4: Forest Service Ecoregion Map



Source: Forest Service.

An Ecosystem's Ecology Needs to Be Understood

Once a geographical area to be managed as an ecosystem has been delineated, its ecology needs to be understood on the basis of the best available data in order to determine how the ecosystem's integrity and functioning can be maintained or restored. This step consists of a set of specific actions that we believe are required to address two principles in the administration's budget document—"considering all natural and human components and their interactions" and "using the best science available." These actions are to determine (1) the ecosystem's structure, components, processes, and functional linkages to other ecosystems, (2) the ecosystem's current ecological conditions and trends, (3) the minimum level of integrity and functioning needed to maintain or restore a healthy ecosystem, and (4) the effect of human activities on the ecosystem.

On November 11, 1993, the Secretary of the Interior transferred biological research and monitoring programs from eight agencies within the Department of the Interior to make operational a new agency called the National Biological Survey (NBS). This agency is tasked with gathering, analyzing, and disseminating the biological information necessary for sound stewardship of the nation's natural resources. According to the administration's fiscal year 1995 budget, the agency will be responsible for providing better, more reliable, objective information on key ecosystems. Therefore, NBS has been designated to develop information that will be needed to improve the understanding of ecosystems' ecologies. In addition, the Interagency Ecosystem Management Task Force's working group is identifying the information needed to understand the ecologies of ecosystems.

The information to be developed by NBS will be critical to federal land management agencies in acquiring an adequate understanding of the minimum levels of integrity and functioning necessary to (1) maintain or restore healthy ecosystems and (2) meet existing legal requirements.⁴ For example, the federal interagency team assigned to examine ecosystem management in the old-growth forests of the Pacific Northwest found that one of the first things that they needed to do before they could draft a plan was to determine how the various agencies' existing statutory requirements for protecting natural resources jointly applied across the different federal land units in the ecosystem. This determination became the basis for identifying and deciding on the minimum level of ecosystem integrity and functioning that needs to be maintained or restored.

⁴A minimum level of integrity and functioning necessary to maintain or restore a healthy ecosystem is also referred to as a "threshold" below which the integrity of the ecosystem is diminished to the point that its functions are not adequately performed.

Management Choices Need
to Be Made Within
Ecosystems

After gaining an understanding of an ecosystem's ecology, land managers must identify (1) the desired future ecological conditions, (2) the types, levels, and mixes of activities that can be sustained while still achieving these conditions, and (3) the distribution of these activities over time among the various land units within the ecosystem. We believe that these actions are required to address the administration's principle to "ensure coordination among federal agencies and increase collaboration with state, local, and tribal governments; the public; and the Congress."

The extent to which ecosystems receive protection above the minimum levels necessary to maintain or restore their integrity and functioning will depend on public policy decisions involving trade-offs among ecological and socioeconomic considerations and will likely vary by ecosystem. In reaching these decisions, policymakers will need to understand the ecological and socioeconomic considerations involved. Many of the required socioeconomic data—on employment, production, and commerce—are maintained by states, firms, and industry organizations with which collaboration will be necessary.

The extent to which desired future ecological conditions can be maintained or restored and long-term commodity production and use can be sustained will depend in large measure on the extent to which disparate private landowners and government agencies—including not only the federal, state, and local agencies that manage land but also the agencies that regulate, tax, or otherwise influence uses on private land—can reach agreement. As more landowners and others within an ecosystem collaborate, more activities are likely to be coordinated and managed across the ecosystem to address ecological and socioeconomic values and concerns.

Management Needs to Be
Adapted to New
Information

Just as ecosystems are continually changing over time, so, too, will the understanding of their ecology and, by implication, the management choices based on this understanding. Scientists and policy analysts generally recognize that their understanding of how different ecosystems function and change and how they are affected by human activities is incomplete. For this reason, they see a need for continually researching, monitoring, and evaluating the ecological conditions of ecosystems and, where necessary, modifying management on the basis of new information to better accommodate socioeconomic considerations while ensuring that minimum or desired ecological conditions are being achieved.

Chapter 3
Additional Actions Are Needed for
Implementation

This process, sometimes known as "adaptive management," has been identified as a requirement for ecosystem management by both BLM and the federal interagency team tasked to examine ecosystem management in the old-growth forests of the Pacific Northwest. It is also reflected in the administration's principle to "use monitoring and assessment and the best science available." Thus, applying this principle will require (1) continually researching, monitoring, and assessing ecological conditions as well as the effects of activities on ecosystems and (2) modifying prior management choices on the basis of this new information. This fourth step underscores the continuing, iterative nature of ecosystem management. Figure 3.1 at the beginning of this chapter illustrates the cycle of adaptive management.

Barriers Impede the Implementation of Ecosystem Management

The administration's initiatives to implement ecosystem management governmentwide face several significant barriers. For example, noncomparable and insufficient data—whose limitations stem from uncoordinated, incomplete collection efforts—and scientific uncertainty hinder the understanding of ecosystems' ecologies and of the trade-offs among ecological and socioeconomic considerations. Also, the disparate missions and planning requirements statutorily rooted in the federal land management framework hamper interagency coordination of federal actions across ecosystems. Moreover, incentives, authorities, interests, and limitations embedded in the larger national land and natural resource use framework constrain effective collaboration and consensus-building among private and government parties within an ecosystem but are often beyond the ability of the federal land management agencies individually or collectively to control or affect.

The four pilot projects proposed in the administration's fiscal year 1995 budget afford an opportunity to identify these and other barriers as well as statutory, regulatory, institutional, and procedural options for resolving them. In addition, ecosystem management offers the potential to avoid or mitigate future ecological and economic conflicts. However, to adequately demonstrate this potential, we believe that it will be necessary to test the approach in geographic areas where problems or issues of mutual concern have not become as intractable as they have at the four pilot projects and where greater flexibility exists to coordinate activities across ecosystems while still maintaining or restoring their ecological health. The Interagency Ecosystem Management Task Force is considering additional projects that should provide opportunities to demonstrate ecosystem management's potential for avoiding or mitigating ecological and economic conflicts.

Ecological and Socioeconomic Data Are Inadequate

Agency officials and scientists have noted that ecosystem management will require collecting and linking large volumes of scientific data about ecosystems' structures, components, processes, and functions at several geographic scales to determine current conditions and trends. It will also require consistently collecting, organizing, and analyzing large volumes of socioeconomic data in order to identify important relationships between human activities and ecological conditions and trends and making necessary or desired trade-offs among ecological and socioeconomic values and concerns. Currently, available data are often not comparable, and large gaps in information exist.

Chapter 4
Barriers Impede the Implementation of
Ecosystem Management

In 1992, OTA found that the Forest Service does not have adequate data to support full-scale ecosystem management.¹ CEQ also noted that there are major gaps in knowledge about the status of plants, animals, and ecosystems in the United States.²

Although many of the data that federal agencies and others have collected independently might be aggregated, organized, and shared among them on an ecosystemwide basis, the data are not always comparable. For instance, as a federal interagency team found in developing a plan for the old-growth forest ecosystem of the Pacific Northwest, even the aggregation and sharing of available information was difficult because many of the data had not been collected, analyzed, or tabulated consistently and were therefore difficult to compare. A major effort was required to integrate noncomparable data from various agencies' information systems. The team also noted that many of the available data important to ecosystem management are collected by other federal and state agencies and by The Nature Conservancy,³ whose geographical and other data systems are also often not comparable.

Besides being noncomparable, empirical data are often insufficient. Inventories of many natural resources are incomplete or out of date. For example, the 1992 OTA study found that (1) many inventory data are not available for many national forests, (2) the available data are often classified on the basis of potential commodity production rather than present vegetation, (3) the data may typically be updated only every 10 or 15 years, and (4) the data are often inaccurate.

Furthermore, scientific understanding of ecosystems is far from complete, and there is still much uncertainty about how they function. This uncertainty contributes to strong differences in the interpretation of scientific evidence, such as in the definition of habitat requirements for the northern spotted owl and other species in the old-growth forests of the Pacific Northwest.

¹Forest Service Planning: Accommodating Uses, Producing Outputs, and Sustaining Ecosystems, OTA-F-505 (Washington, D.C.: Feb. 1992).

²Linking Ecosystems and Biodiversity, undated reprint from the 21st annual report of the Council on Environmental Quality (Washington, D.C.: May 8, 1992).

³The Nature Conservancy is a conservation organization whose state-by-state National Heritage Data Center network contains the most comprehensive available information on rare plant and animal species. It is cooperating with NBS in a "Gap Analysis" project to map biodiversity in relation to protected areas, such as wilderness areas or wildlife refuges, as well as to nonprotected areas.

The socioeconomic data needs for implementing ecosystem management are just now being defined, and the available data have not been gathered with ecosystem management needs in mind. Like the ecological data, these data are often noncomparable, insufficient, or uncertain. Many of the existing data have been gathered by many different federal, state, and local agencies and private researchers for many different purposes. Often organized and tabulated in a variety of inconsistent formats, these data are difficult to aggregate by ecosystem. Furthermore, analysts continue to substantially disagree on the conclusions that can be drawn from the data about the socioeconomic effects of different alternatives that might be chosen to maintain or restore an ecosystem's integrity and functioning. For instance, estimates have varied widely on how many jobs might be lost in efforts to protect the spotted owl's habitat as a part of restoring the Pacific Northwest old-growth forest ecosystem, in part, because assumptions have differed. These estimates have varied from fewer than 12,000 to up to 147,000 jobs and, when adjusted for differences in certain assumptions, have still varied from 19,000 to 34,000 jobs.

Finally, representatives of private industry and landowner groups have noted that issues—such as the invasion of privacy and the use of the data collected on ecological conditions and activities to enforce regulations on private lands—are major concerns of some in the private sector in considering the federal government's prospective ecosystem management approach. For instance, the Department of Agriculture collects data on individual farm production that would presumably be useful in analyzing conditions and activities in the ecosystems where farms are located. However, these data are subject to stringent privacy controls established in response to farm owners' concerns. Participants at the October 1993 Yale Workshop on ecosystem management concluded that certain guarantees must be established to allay private landowners' concerns about the use of data collected on private lands. Workshop participants also concluded that a better system is needed for gathering and sharing data on both public and private lands in ecosystems. They recommended that federal and state agencies agree on a common and uniform data base format to facilitate information sharing.

While the newly established NBS will apparently be well positioned to provide many of the ecological data needed for ecosystem management, it is only a few months old and has not yet established a comprehensive system for providing the agencies with data to support their ecosystem management initiatives. Thus, for the immediately foreseeable future,

Chapter 4
Barriers Impede the Implementation of
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inadequate data will hinder agencies in developing their understanding of ecosystems' ecologies.

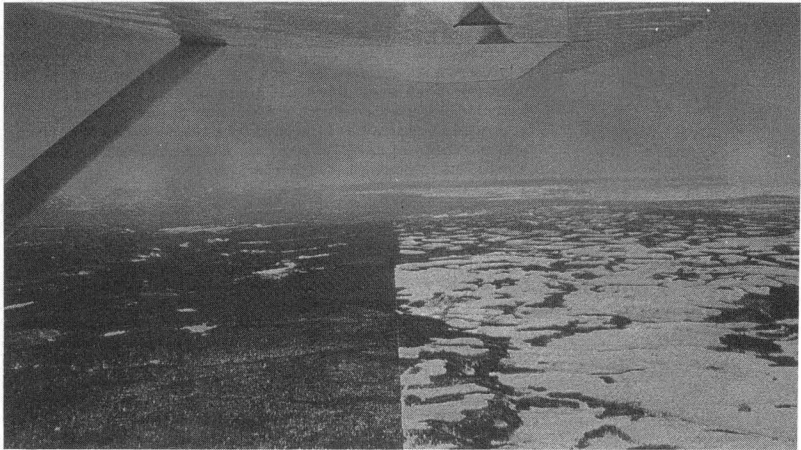
Recognizing the formidable barrier posed by noncomparable and insufficient data, the Interagency Ecosystem Management Task Force has established a Science and Information Issue Area Subgroup under its interagency work group. This subgroup is to focus on developing (1) the lessons to be learned about such problems from mature interagency ecosystem-based activities, (2) ecoregional assessments (see fig. 3.4 for a map of ecoregions), and (3) an ecosystem management research agenda, with an initial reporting date of October 1994.

**Existing Federal Land
Management
Framework Hampers
Federal Interagency
Coordination**

Virtually all analysts of ecosystem management note that the approach will require unparalleled coordination of activities among federal agencies managing lands in the same ecosystem. However, federal land management agencies are currently hampered in coordinating their activities within ecosystems because of (1) disparate missions and (2) separate, lengthy planning requirements—both of which are rooted in the existing federal land management framework of laws, agencies, and land units.

Federal land management agencies have disparate missions and user groups. For example, the Forest Service and BLM have legislatively based orientations and incentives toward producing resource commodities, while the National Park Service and FWS have significant statutorily defined conservation and protection mandates. The effect of these different missions is sometimes easily discernible where these agencies' lands are next to one another, as they are along sections of the boundary between Yellowstone National Park, where timber harvesting is prohibited, and the Targhee National Forest in Idaho, where large areas of trees were removed through clearcutting. (See fig. 4.1.)

Figure 4.1: Boundary Between Yellowstone National Park and Targhee National Forest



Source: Greater Yellowstone Coalition, courtesy of Tim Crawford.

In other instances, disparate agency missions lead to conflicting views, such as those held by FWS, on the one hand, and by the Forest Service and BLM, on the other hand, about the listing of species under the Endangered Species Act. For example, the Forest Service opposed FWS' listing of the Jemez Mountains salamander as endangered. This pale brown amphibian, which is between 1-1/4 inches and 5-1/2 inches long, is found only in the Jemez Mountains of north-central New Mexico. The Forest Service believed that the listing would place limitations on the agency's management of the Santa Fe National Forest.⁴ Similarly, the Forest Service did not comply with requirements to protect the northern spotted owl in the Pacific Northwest.

Procedural requirements for long-range planning may also pose significant barriers to interagency coordination. For example, the Forest Service under NFMA, the BLM under FLPMA, the Park Service under the National Parks and Recreation Act of 1978, and FWS under its own authority, separately develop plans for each of their land units, at different times, with disparate objectives, using independently determined interpretations of ecological requirements. This barrier to coordination was noted in a July 1993 report by the interagency team assigned to examine ecosystem management in the forests of the Pacific Northwest. The team further noted that under the agencies' planning statutes, they had to consider requirements of NEPA, the Endangered Species Act, the Clean Water Act, the Clean Air Act, and other laws. They stated that (1) "the objectives of some of these laws are not the same," (2) their "substantive and procedural requirements are not uniform," and (3) "their interpretation falls to different agencies." Even when interagency coordination is being pursued aggressively, as it is in the Applegate River watershed in southwestern Oregon, nonfederal participants have noted difficulty in obtaining timely agreement on planning issues among Forest Service and BLM officials because of separate agency processes and chains of command.

Furthermore, most agency officials agree that implementing ecosystem management will likely require extensive conforming amendments or comprehensive revisions to their long-range plans. However, completing a plan for an individual land unit usually takes a few years, and revising or significantly amending a plan takes nearly as long. For example, in 1991, the Greater Yellowstone Coordinating Committee, composed of the managers of seven national forests and two national parks, developed a

⁴See *Endangered Species: Factors Associated With Delayed Listing Decisions* (GAO/RCED-93-162, Aug. 5, 1993).

"Vision Statement" of desired future conditions for the area to serve as the basis for revising the individual units' long-range plans. But nearly 3 years later, the revisions have not been completed. Similarly, revising forest plans in the old-growth forests of the Pacific Northwest to reflect the administration's plan for restoring this ecosystem is likely to take several years.

National Land and Natural Resource Use Framework Constrains Collaboration With Nonfederal Parties

Although coordinating federal agencies' activities in ecosystems is essential to implementing ecosystem management, it may not suffice to maintain or restore the ecosystems' integrity and functioning. Many agency officials, scientists, and policy analysts agree that ecosystem management will generally fall short of its goal if it is limited to activities on federal lands. Rather, for ecosystem management to succeed in protecting natural resources and sustaining long-term natural resource commodity production and uses, it will require collaboration and consensus-building among federal and nonfederal parties within the larger national land and natural resource use framework. Federal land management agencies face significant barriers to achieving such collaboration and consensus-building because of constraints inherent in this framework.

Many nonfederal lands are privately owned. Private landowners' decisions are influenced by factors affecting the profitability of their activities, including land-use regulatory or tax authorities or financial or technical assistance programs. Responsibility for these authorities and programs often rests with states and localities or with other federal agencies whose missions, budgets, authorities, and operations are independent of the federal land management agencies.

The central focus of the October 1993 Yale Workshop on ecosystem management was on building effective partnerships across ownership boundaries. The participants concluded that federal, state, and local regulatory agencies and tax authorities often operate in a way that does not support, and in many cases impedes, ecosystem management. Specifically, they concluded that there was currently a

spotty patchwork of many, often contradictory, laws and regulations. Private landowners find it more and more difficult and costly to comply with the rules of multiple governments, multiple agencies, and multiple purposes—different authorities with competing, and often conflicting directives on protecting water quality, wildlife habitat, fish habitat, [and] . . . air quality . . .

They recommended that a more systematic approach be designed to maintain ecosystems and noted that

the mix of landowners and authorities (e.g., forestry agencies, fish and wildlife agencies, environmental protection agencies, local governments and planning commissions, private industrial and nonindustrial landowners) in the U.S. poses tremendous institutional challenges to coordinated landscape-level management,

and that

a voluntary approach to ecosystem management partnerships must not only recognize the effect of each law in isolation, but examine how and where laws interact and conflict, who is affected, and possible ways of reconciling priorities.

For example, private landowners whose actions attract or sustain a threatened or endangered species by protecting its habitat now run the risk of having their other management activities curtailed in order to avoid the illegal modification or degradation of the habitat. Meanwhile, others who actively eliminate suitable habitat before it can be occupied are able to continue their management activities unencumbered by the requirements of the Endangered Species Act.

Difficulties in building effective partnerships across ownership boundaries encourage private landholders to take actions that may not be consistent with protecting natural resources or sustaining long-term commodity production and other natural resource uses. For instance, in our report on the Flathead National Forest in Montana (cited in ch. 1), we reported that the Forest Service was prevented from achieving planned harvest levels and minimum required ecological conditions on its lands because it had not taken into account high levels of timber harvesting on private lands. Additionally, numerous studies have shown that harvest levels on private lands both there and elsewhere have often been designed to achieve short-term economic goals rather than sustain long-term timber production.

Participants at the Yale Workshop noted that private landowners do not always act to support desired ecological conditions for an area because incentives in the national land and natural resource use framework often are neutral or contrary to achieving these conditions. In particular, they noted the following:

- Federal and state income and inheritance taxes generally do not distinguish between landowners who undertake costly actions supporting desired ecological goals and those who do not. This can create a disincentive to do so.
- Technical assistance to individual landowners and cost-sharing assistance for coordinated management among multiple owners to support ecological goals are inadequate.
- The excessive time and expense associated with exchanging the ownership of public and private lands—in order to shift areas with critical ecological values to public ownership and areas best suited for sustainable production of commodities to private ownership—can deter landowners from participating in such exchanges.
- In the absence of market-based incentives (e.g., conservation credits or tradeable development rights) for influencing the level and distribution of human activities in an ecosystem to achieve minimum or desired ecological conditions, individual landowners currently undertake activities without regard to their cumulative impacts.
- Provisions of federal and state antitrust laws and strictures imposed by the Federal Advisory Committee Act (5 U.S.C., app. 2, sections 1-15) do not facilitate and may limit stakeholders' participation in federal land management agencies' decision-making, nor do they foster the trust that is critical to cooperation.

Unlike the barriers posed by inadequate data and the existing federal land management framework, the barriers presented by the national land and natural resource use framework are often beyond the reach of federal statutory or regulatory action. Many of these barriers can be addressed only by states and localities. Additionally, the Fifth and Fourteenth Amendments to the Constitution prohibit the federal and state governments from taking private lands for public uses without just compensation. Courts have ruled that certain government regulations of land use have constituted takings requiring payment of just compensation. This requirement to pay compensation may limit the willingness or ability of federal and state governments to regulate certain land uses. Moreover, private landholder organizations and others maintain that the taking of private property should generally be considered as against good public policy and reserved only for isolated circumstances of extreme public necessity. Thus, efforts to establish effective collaboration and achieve consensus with other federal and nonfederal parties in support of ecosystem objectives will necessarily require an approach largely based on voluntary cooperation and incentives.

Pilot Projects Should Test Ecosystem Management's Potential to Avoid or Mitigate Conflicts

The four pilot projects proposed in the administration's fiscal year 1995 budget are directed at restoring ecosystems whose integrity and functioning have been significantly altered by human activities. Because these projects are located in areas where ecological and economic conflicts may have become intractable, they may afford less management flexibility for accommodating activities because of the deteriorated ecological conditions. Furthermore, if ecological conditions have already deteriorated and existing court orders have already imposed specific requirements or limitations, there may be less opportunity or likelihood for private and government interests to reach agreement on such issues as (1) the desired future ecological conditions, (2) the types, levels, and mixes of activities that can be sustained, and (3) the distribution of these activities over space and time among the various land units within the ecosystems.

In south Florida, for example, the administration, the state of Florida, and some sugar cane and vegetable growers could not agree on a plan to address the declining ecological health of the Everglades and Florida Bay. The administration announced an agreement in July 1993 in response to a court order, but this agreement was subsequently rejected by one of the state's two largest sugar companies, which controls about 30 percent of the state's sugar crop, as well as by some small growers. Although the state of Florida has since enacted legislation adopting an agreed-upon plan to reconcile many immediate concerns, a long-term ecological standard has not been adopted.

Various agency officials, scientists, and policy analysts have suggested that the ecosystem management approach should be tested in geographic areas where problems or issues of mutual concerns have not become intractable. Such areas would provide greater opportunities for management to devise solutions for maintaining or restoring the health of an ecosystem as well as for sustaining local economies and communities. Testing in these additional areas should provide a better opportunity for demonstrating ecosystem management's potential to avoid or mitigate ecological and economic conflicts—particularly conflicts between species at risk of extinction and local communities.

In responding to a draft of this report, the Department of the Interior indicated that the Interagency Ecosystem Management Task Force intends to test ecosystem management in additional geographic areas. We believe that the additional areas being considered by the task force should provide

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Barriers Impede the Implementation of
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opportunities for assessing ecosystem management's potential for avoiding or mitigating ecological and economic conflicts.

Conclusions and Recommendations

Conclusions

The administration's initiatives to implement a governmentwide approach to ecosystem management, as well as the four primary federal land management agencies' initiatives, reflect a growing recognition that the current practice of managing individual politically or administratively established land units and individual natural resources is not adequately addressing two basic legislative mandates: (1) sustaining multiple uses of federal lands and (2) protecting individual natural resources. These initiatives are also based on the desire to avoid or mitigate future conflicts between long-term ecological and socioeconomic goals and shorter-term socioeconomic values and concerns by providing greater flexibility to coordinate activities over larger land areas while still maintaining or restoring the areas' ecological health. Therefore, ecosystem management would not necessarily alter the federal land management agencies' basic legislative mandates. Rather, it would change these agencies' approach to fulfilling their stewardship responsibilities through a better scientific understanding of these mandates' relationship to one another.

Because ecosystems exist at several geographic scales, so, too, should efforts to coordinate activities that affect them. Thus, the initiatives by the four primary federal land management agencies to implement an ecosystem management approach within the existing framework of laws and land units, as well as similar efforts by other federal agencies, are important first steps in investigating and experimenting with an ecosystem management approach and should be encouraged. The efforts of federal agencies to better coordinate their activities in the same geographic areas and to develop alliances and partnerships with nonfederal landowners are also important to developing an ecosystem management approach. The land management agencies should continue to pursue these efforts wherever possible because such efforts should help to (1) foster voluntary cooperation among landowners in ecosystems and thereby help to mitigate or avoid ecological and economic conflicts and (2) identify barriers to interagency coordination and collaboration with nonfederal parties and options for overcoming them.

However, fulfilling ecosystem management's potential to protect natural resources and sustain long-term natural resource commodity production and other uses requires that the geographic areas to be managed as ecosystems be large enough to (1) capture the complexities and linkages among the components and processes of the ecosystems and (2) allow for consideration of the effects on the ecosystems of activities originating across ownership boundaries. Hence, the areas to be managed as ecosystems will generally have to be larger than any one federal land unit

or ownership, include private and other nonfederal landholdings, and cross state boundaries.

While the administration's fiscal year 1995 budget proposes to fund the initial stage of a governmentwide approach to ecosystem management, additional actions are needed. These actions include clarifying the policy goal for ecosystem management and taking certain practical steps to apply the principles being considered by the administration.

Neither the administration's fiscal year 1995 budget document nor the draft "Ecosystem Management Initiative Overview" prepared and approved by the Interagency Ecosystem Management Task Force clearly identifies the priority to be given to the health of ecosystems relative to human activities when the two conflict. Other definitions leave no doubt that greater priority will have to be given to maintaining or restoring a minimum level of ecosystem integrity and functioning over nonsustainable commodity production and other uses. The practical starting point for ecosystem management will be to maintain or restore the minimum level of ecosystem health necessary to meet existing legal requirements.

The principles being considered by the administration appear appropriate, but implementing ecosystem management will require translating these principles into certain practical steps that clearly identify what must be done and which agencies and parties must be involved. These steps include (1) delineating ecosystems, (2) understanding their ecology, (3) making management choices, and (4) adapting management on the basis of new information.

However, the results of federal ecosystem management initiatives to date indicate that implementing ecosystem management governmentwide faces several significant barriers, including the following:

- Although ecosystem management will require greater reliance on ecological and socioeconomic data, the available data, collected independently by various agencies for different purposes, are often noncomparable and insufficient, and scientific understanding of ecosystems is far from complete.
- While ecosystem management will require unparalleled coordination among federal agencies, disparate missions and planning requirements set forth in federal land management statutes and regulations hamper such efforts.

- Although ecosystem management will require collaboration and consensus-building among federal and nonfederal parties within most ecosystems, incentives, authorities, interests, and limitations embedded in the larger national land and natural resource use framework—many beyond the ability of the federal land management agencies individually or collectively to control or affect—constrain these parties' efforts to work together effectively.
- Moreover, while ecosystem management should provide a more scientifically informed basis for making policy decisions and more accurately predicting their consequences, it cannot provide scientific answers to what will always be essentially public policy questions, such as (1) the importance or relative priority of maintaining or restoring healthy ecosystems and (2) the types, levels, mixes, and distribution of activities over time among the various land units within an ecosystem.

The four pilot projects proposed in the administration's fiscal year 1995 budget, as well as other ecosystem management initiatives, afford an opportunity to establish outcome-oriented and measurable objectives and milestones for identifying these and other barriers as well as specific statutory, regulatory, institutional, and procedural options for resolving them. In addition, the increased funding and flexibility that are to accompany these initiatives must be accompanied by greater accountability to the Congress.

Recommendations

To effectively implement a governmentwide approach to ecosystem management, we recommend that the Director of the White House Office on Environmental Policy, through the Interagency Ecosystem Management Task Force, develop a strategy that

- clarifies a policy goal for ecosystem management that specifies the priority to be given to maintaining or restoring minimum levels of ecosystem integrity and functioning relative to unsustainable short-term uses, including commodity production;
- translates the principles in the administration's fiscal year 1995 budget into practical steps that clearly identify what must be done and which agencies and parties must be involved, including (1) delineating the boundaries of the geographic areas to be managed as ecosystems, (2) understanding their ecologies (including their structures and links to each other, their current ecological conditions and trends, the minimum level of integrity and functioning needed to maintain or restore their health, and the effects of human activities on them), (3) making management choices about

desired future ecological conditions, about the types, levels, and mixes of activities that can be sustained, and about the distribution of activities over time among land units within the ecosystems, and (4) adapting management on the basis of new information; and

- identifies barriers to governmentwide implementation of ecosystem management and specific statutory, regulatory, institutional, and procedural options for overcoming them.

We further recommend that progress in implementing this strategy in the pilot projects and other ecosystem management initiatives be collectively assessed and reported as part of the yearly budget and appropriations process.

Agency Comments and Our Evaluation

The Forest Service and the White House Office on Environmental Policy agreed with both of our recommendations: The Forest Service stated that the recommendations need to be addressed if agencies are to succeed in fulfilling ecosystem management's potential, and the White House Office on Environmental Policy stated that the recommendations are consistent and compatible with the core components of the administration's ecosystem management initiative. Interior agreed with our first recommendation and the intent of the second recommendation. However, Interior said it would prefer to see the collective assessment and reporting of progress in implementing ecosystem management included in the interagency task force process rather than in the yearly budget and appropriations process.

While Interior's preference would meet the executive branch's need for a collective assessment of federal agencies' progress in implementing an ecosystem management strategy through pilot projects and other initiatives, it would not make federal agencies as accountable to the Congress as our recommendation. In our view, the greater flexibility in at least some of the agencies' budget structures, which the agencies believe ecosystem management requires, needs to be balanced or offset by greater accountability to the Congress for the agencies' ecosystem management expenditures. We believe that this accountability can be better ensured by assessing and reporting progress toward achieving measurable performance objectives as part of the yearly budget and appropriations process. These objectives should focus on end results and improvement in resource conditions, rather than on near-term commodity output levels (outcomes rather than outputs). BLM agrees, stating in its comments that

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Conclusions and Recommendations

fiscal accountability mechanisms and on-the-ground performance measures must be critical components of the new BLM budget structure.

The agencies' comments and our responses are presented fully in appendixes I through III.

Appendix I

Comments From the Department of the Interior



United States Department of the Interior

OFFICE OF THE SECRETARY
Washington, D.C. 20240

JUN - 7 1994

Mr. James Duffus III
Director, Natural Resources
Management Issues
Resources, Community and Economic
Development Division
U.S. General Accounting Office
Washington, D.C. 20548

Dear Mr. Duffus:

We appreciated the opportunity to review the draft report entitled "Ecosystem Management: Additional Actions Needed to Adequately Test a Promising Approach" (GAO/RCED-94-111). We are pleased to see the General Accounting Office address this timely topic, which is of high interest to the Department of the Interior, as well as other Federal land managing agencies. This thoughtful report provides much useful guidance to the agencies that are attempting to implement an ecosystem management approach. As you know, the Department of the Interior, under the guidance of Secretary Bruce Babbitt, has stepped out vigorously to apply ecosystem management concepts to its own lands.

We are pleased that your report recognizes the interagency activities coordinated by the White House Office of Environmental Policy, in addition to the specific programs of the four land management agencies that were the focus of the report. I serve as the Department of the Interior representative to the Interagency Ecosystem Management Task Force, which has been working very hard to develop definitions, goals, and principles of ecosystem management, and to identify barriers to implementation of ecosystem management within the Federal government, all activities recommended in your report. We are in agreement with your first recommendation. We also agree with the intent of the second recommendation, but believe that assessment and reporting of the ecosystem management initiatives should be conducted through the Interagency Task Force process, rather than through the more rigid yearly budget and appropriations process.

Many of the achievements of the Interagency Task Force are too recent to have been included in your draft report, but we believe the final report should recognize them. I am attaching as Enclosure 1 the most recent draft of "Ecosystem Management Initiative Overview," prepared and approved by the Interagency Ecosystem Management Task Force. This document summarizes the effort of the agencies to clarify goals, translate principles, and to learn from ongoing ecosystem management efforts in order to apply the findings to other ecosystems. These accomplishments represent partial fulfillment of your first recommendation.

See comment 1.

See comment 2.

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In addition, observations and comments from the Bureau of Land Management, National Park Service, and U.S. Fish and Wildlife Service, are included in Enclosures 2, 3, and 4, respectively. The National Biological Survey believes the report is adequate and has no comments.

If you have any questions or need further clarification of our comments, please contact Deborah Williams, Departmental GAO Liaison Officer, at 208-3963.

Regards,



Bonnie Cohen
Assistant Secretary for
Policy, Management and Budget

Enclosures

DRAFT

ECOSYSTEM MANAGEMENT INITIATIVE OVERVIEW

One of the most far-reaching environmental recommendations of Vice President Gore's National Performance Review was to develop "a proactive approach to ensuring a sustainable economy and a sustainable environment through ecosystem management."¹ The link between a healthy economy and a healthy environment has highlighted the need to actively maintain our natural infrastructure before problems arise, as we do with our highways and bridges. The report recommended the President issue a directive on ecosystem management and begin phased-in implementation with ecosystem management projects.

The goal of ecosystem management is to restore and maintain the health, sustainability, and biological diversity of ecosystems while supporting sustainable economies and communities.¹ Many factors, such as interagency conflicts, incompatible data bases, a lack of research on ecosystem functioning, inconsistent planning and budgeting cycles, and differing agency organizational structures, have hampered development of a coordinated approach to actively maintaining or restoring the health of ecosystems that are the cornerstones of sustainable economies.

The Interagency Ecosystem Management Task Force.

The Interagency Ecosystem Management Task Force was established to implement an ecosystem approach to environmental management. The Task Force, chaired by Katie McGinty, the Director of the White House Office on Environmental Policy, is made up of Assistant Secretaries from 12 departments and agencies, as well as representatives from the Office of Management and Budget and the White House Office of Science and Technology Policy. The Task Force is in a unique position to advance a consistent approach to environmental management by establishing overarching goals for all agencies, removing barriers that frustrate more effective, efficient interagency cooperation, and learning from large scale ecosystem-based management efforts. The Task Force has formed an interagency work group to assist in its work. One of the work group's most important tasks will be to examine major issue areas that influence the effectiveness of ecosystem management such as, the budget process, legal authorities, and information management and make recommendations for improvements.

Because ecosystems do not follow administrative boundaries, such as the borders of National Parks or Forests, working to maintain or restore ecosystem sustainability involves a perspective that crosses those artificial boundaries. This entails a shift from the Federal government's traditional focus on individual agency jurisdiction to considering the actions of multiple agencies within larger ecological boundaries. Just as interagency collaboration is important, finding ways to increase voluntary cooperation with state, tribal, and local

¹ An ecosystem is an interconnected community of living things, including humans, and the physical environment with which they interact.

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governments, as well as nongovernmental organizations and the public, is key to effective ecosystem management.

Several ecosystems will be selected by the Task Force based on nine criteria: (1) ongoing interagency and intergovernmental management activities; (2) a mix of resource management and infrastructure agency involvement; (3) a mix of geographic scales and efforts in various stages of development; (4) availability and accessibility of data on the ecosystem; (5) environmental importance of the area; (6) a variety of environmental, economic, and social issues; (7) public and private support of, and interest in, the ecosystem; (8) agency support for the selection; and (9) geographic distribution.

There are many other large scale, integrated management projects around the country that may also meet the criteria above. The Task Force has chosen to focus the learning process on several areas which should serve as case studies or laboratories for ecosystem management by building on existing efforts, in addition to providing opportunities for achieving significant environmental and socioeconomic benefits. Limiting the focus of this learning process to the selected ecosystems does not mean that these ecosystems are the only areas in which the Federal government will, or should, pursue ecosystem management. The Task Force can gain significant insight from other ongoing ecosystem-based approaches, both Federal and non-Federal, and will develop a mechanism to receive input from and support these other efforts.

Ecosystem management case studies and laboratories.

The ecosystems are divided into two categories: (1) "Survey and Assist" case studies—ecosystems where mature interagency ecosystem-based activities are ongoing, but may need some assistance and (2) "New Initiatives" laboratories—locations where the interagency, ecosystem-based activities are not as well developed, but where the development of new, integrated approaches hold great promise. Each ecosystem will have a Federal agency that serves as the lead for Federal efforts in the ecosystem and will be held responsible for any information, reports, or other deliverables requested by the Task Force.

Survey and Assist Case Studies

The Task Force will conduct a survey and assessment of the ecosystem-based activities of these case study ecosystems to elicit lessons learned from local representatives about their ecosystem-based management efforts to date and to identify opportunities to assist these efforts, either through the elimination of existing impediments or the encouragement of successful approaches and techniques. The Task Force will seek answers to two basic questions:

- As the initiative proceeds, what can we learn from the experiences of these ecosystem management efforts, and

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- What can the Task Force do to support efforts in the field and facilitate more effective ecosystem management in the future?

New Initiatives Laboratories

In the laboratories, the Task Force will ask Ecosystem Management Teams, comprised of local representatives from the relevant Federal agencies, to work with State, tribal, and local governments and the public through a collaborative process to:

- Characterize the historical ecosystem (i.e., its composition, structure, function, and natural range of variability, and human settlement patterns) and the present economic, environmental, and social trends for the ecosystem.
- Develop a vision of the ecosystem's desired future condition, as well as alternative means to achieve the vision. The vision should be consistent with the overarching goal of the initiative to maintain the health, sustainability, and biological diversity of the ecosystem while supporting communities and their economies and alternative means of achieving this vision.
- Analyze how current Federal and non-Federal activities in the ecosystem will address the problems and how they will capitalize on opportunities in furthering the goals and objectives of ecosystem management, including factors that may limit or inhibit full participation of non-Federal parties.

In addition, the teams will be asked to develop and implement an ecosystem management implementation strategy for Federal lands and Federally-managed programs and to develop and submit to the Task Force an integrated, interagency budget submission for the ecosystem for fiscal year 1996.

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Comments of the Bureau of Land Management

We appreciated the opportunity to review the subject General Accounting Office (GAO) report. We are pleased to see the GAO address this timely topic, which is of high interest to the Bureau of Land Management, as well as the other Federal land managing agencies. We find the report to be well researched and well prepared. As you know, the Bureau of Land Management, under the guidance of the Secretary of the Interior, Bruce Babbitt, has stepped out vigorously to apply ecosystem management concepts to the Public Lands. The draft report reveals a sound understanding of ecology and its relationship to ecosystem management. The discussion of the relationship of biological diversity to ecosystem health and stability is a good example and illustrates that writers of the report are aware of the current thinking of ecologists on this issue.

See comment 2.

The Bureau of Land Management concurs with the recommendations stated in the subject report. In fact, we have already been working together with other Federal agencies on several actions which will, we believe, contribute to implementing each of the proposed recommendations.

See comment 3.

We bring to your attention one potential barrier to effective ecosystem management. The Bureau of Land Management experience indicates that the provisions of the Federal Advisory Committee Act (FACA) may actually deter effective ecosystem management. The FACA prescribes elaborate and costly procedural requirements whenever an agency acts to include nongovernmental access to Federal decision officials. Yet, the effectiveness of ecosystem management depends upon establishing open and collaborative relationships with key stakeholders. This issue deserves greater attention to determine whether FACA should be amended so it does not unwittingly frustrate productive ecosystem management partnerships.

See comment 4.

The report should also identify the need to develop staffing and skill mixes necessary to administer ecosystem management. The Bureau of Land Management believes that, in some areas and agencies, there is a lack of specific skills, such as hydrologists and ecologists, needed to properly implement ecosystem management. Interagency teams may help to solve this problem.

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Comments of the National Park Service

The draft report nicely brings together the current situation regarding ecosystem management, some of the problems being experienced now with implementing it, and some options of what to do to overcome those problems. The following specific comments are offered to strengthen the report:

Now on p. 14.
See comment 5.

Page 17, para. 2: Minerals and land allocated under the 1872 Mining Law are transferred permanently by claim and patent, rather than temporarily by lease.

Now on p. 17.
See comment 6.
Now on p. 25.
See comment 7.

Page 21, para. 2: The National Park Service also is required to prepare and periodically revise general management plans for parks (National Parks and Recreation Act of 1978).

Page 30, para. 2: Even where the alteration is not irreversible, humans may want to maintain ecosystems in the altered condition for long periods of time, as is done with agricultural areas or planted forests. Ecosystem management requires maintaining ecosystems to meet both sustainable biodiversity and sustainable economic goals, not what is stated here.

Now on p. 30.
See comment 8.

Page 36, para. 3: The National Park Service now has an ecosystem management working group, and several of the National Park Service regional offices have established either designated persons or offices for ecosystem management. The 21 parks mentioned probably are in the Colorado Plateau ecoregion (Utah, Colorado, Arizona), not in the southwest. Even though the management of these parks will be coordinated along ecosystem management principles, the parks still are supervised administratively by the three parent regions. The key change is the ecosystem-based coordination among all of the affected park managers and their parent regional offices. Other possible examples include South Florida, Mammoth Cave Area Biosphere Reserve, or the Sierra cooperative program.

Now on p. 30.
See comment 9.

Page 37, para. 1: The Interagency Ecosystem Management Coordinating Group has been meeting at least since 1992, and perhaps slightly earlier. It also is engaging in sharing ideas and information in other areas of common interest, such as training, ecoregion assessment, and interpretation.

Now on p. 30.
See comment 10.

Page 37, para. 2: Some of the Federal coordination has been conducted in response to self-generated agency concerns, not to external pressure. The Greater Yellowstone Area coordination began in the mid-1970's, not 1986, and pre-dated the congressional concerns of the mid-1980's.

Now on p. 34.
See comment 11.

Page 38, para. 1: The National Park Service also participates in aspects of the Sierra project. The Southern Appalachian Man and the Biosphere Program is a U.S., not a U.N., program that involves biosphere reserves that, in response to formal U.S. nomination, have been designated by UNESCO as part of the international network of biosphere reserves. The Mammoth Cave Area Biosphere Reserve is another good example, where subsurface water--quality and flow--is the key resource that links the partners.

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Now on p. 34.
See comment 12.

Now on pp. 34-35.
See comment 13.

Now on p. 51.
See comment 2.

Now on p. 52.
See comment 14.

Now on p. 57.
See comment 15.

Now on p. 57.
See comment 16.

Now on p. 60.
See comment 2.

Now on p. 60.
See comment 2.

Now on p. 61.
See comment 17.

Page 38, Footnote: The U.S. now has 47 biosphere reserves out of a world total of 323. Twelve Federal bureaus (includes the Smithsonian) participate in the national committee, more participate in biosphere reserve programs.

Page 39, para. 1: All four of these agencies participate at the regional office level—an important principle for ecosystem management that the cooperation occurs at the appropriate scale in relation to the system being coordinated.

Page 54, para. 2: There may be a number of areas where ecosystem management principles already are being applied and where the potential could be examined, including the Mammoth Cave Area Biosphere Reserve, the Pinelands National Reserve, the Champlain-Adirondack Biosphere Reserve, the Southern Appalachian Man and the Biosphere Cooperative, individual actions under the California Biodiversity Agreement, the developing Colorado Front Range partnership, interorganizational management programs for the Delaware - Upper Delaware National Rivers, the International Joint Commission for the Great Lakes, or perhaps the Chesapeake Bay program. Most of these areas are less "intractable" than the pilot project areas.

Page 56, footnote: The Gap Analysis project, which began in the Fish and Wildlife Service, has been transferred to the new National Biological Survey.

Page 60, para. 2: The human population element of the ecosystem should be recognized explicitly as part of the ecosystem management equation.

Page 61, para. 1: The National Park Service, Fish and Wildlife Service, and U.S. Forest Service are Federal land managing agencies that also have financial and technical assistance programs that are separate from their land management responsibilities.

Page 65, para. 1: The status report on South Florida needs to be updated, given the recent passage by the State Legislature of a measure to implement some of the State's duties under the agreement.

Page 65, para. 2: The Mammoth Cave Area Biosphere Reserve also seems to meet the criterion.

Page 67, para. 1: A voluntary decision to participate often brings a stronger personal commitment than does a forced decision to participate.

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Comments of the U.S. Fish and Wildlife Service

Now on p. 14.
See comment 18.

The U.S. Fish and Wildlife Service welcomes an opportunity to comment on the subject General Accounting Office report. The report provides a well-written and comprehensive analysis of the issues. The report introduction provides a broad overview of pertinent history and policies. It is important to note, however, that there are important differences between agency missions. The implication of the report (except as noted on page 38) is that all Federal land units function to sustain long-term commodity production and uses and to protect natural resources. Both the National Park System and the National Wildlife Refuge System are primarily oriented to resource protection, not to commodity production. It is noteworthy that lands "set aside" to "protect their natural conditions" represents over 180 million acres of land (27 percent of the four agencies detailed in the report).

Now on p. 37.
See comment 19.

Page 41, para. 3: The report states there is no governmentwide legal mandate to maintain or restore healthy ecosystems. Actually the Endangered Species Act does direct Federal agencies to use their authorities to promote the recovery of listed species and specifically encourages the conservation of ecosystems upon which they depend (for example, in section 2(b)). "The purposes of this Act are to provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved....".

See comment 20.

Chapter 4 provides a thoughtful analysis of "barriers to implementing ecosystem management." While the "disparate missions" of different agencies make ecosystem management more difficult, we should not equate sharing of ideas and collaboration with homogenization of agencies. Our objective should be to advance common approaches, where appropriate, while encouraging and fostering different, but complementary, roles when it promotes effective ecosystem management across the landscape. Even disparate planning requirements need not be an insuperable barrier to ecosystem management, if agencies and other partners collaborate to establish ecosystem-wide resource objectives within which individual agency land unit plans may be developed.

Now on p. 51.
See comment 2.

Page 54, para 2: The Fish and Wildlife Service has found many areas of the country where intractable resource problems are not the norm. For example, private landowners seek out the Service to join in voluntary cost-share projects which restore wetlands, grasslands, and riparian areas in the Blackfoot River Valley of Montana, the Sandhills and Rainwater Basin in Nebraska, the Upper Mississippi River Basin and Lower Mississippi Valley, the Sacramento River Valley of California, and the Connecticut River Valley.

See comment 2.

The Service's Coastal Program has brought together partners in pursuit of an ecosystem approach in nine of the most biologically important estuaries including: Chesapeake Bay, Delaware Bay, Gulf of Maine, Galveston Bay, and Puget Sound. The Fish and Wildlife Service is a partner in many successful ecosystem management projects including the Greater Yellowstone, the ACE Basin and other coastal watershed projects in South Carolina, the Upper Colorado River Fish Recovery Program, the Lower Rio Grande Valley project, and other watershed projects associated with national wildlife refuges.

Enclosure 4-1

The following are GAO's comments on the Department of the Interior's letter dated June 7, 1994.

GAO's Comments

1. While Interior's preference would meet the executive branch's need for a collective assessment of federal agencies' progress in implementing an ecosystem management strategy through pilot projects and other initiatives, it would not make these agencies as accountable to the Congress as our recommendation. In our view, the greater flexibility in at least some of the agencies' budget structures that ecosystem management requires needs to be balanced or offset by greater accountability to the Congress for the agencies' ecosystem management expenditures. We believe that this accountability can best be ensured by assessing and reporting progress toward achieving measurable performance objectives as part of the yearly budget and appropriations process. These objectives should focus on end results and improvement in resource conditions, rather than on near-term commodity output levels (outcomes rather than outputs). BLM agrees, stating in its comments that fiscal accountability mechanisms and on-the-ground performance measures must be critical components of the new BLM budget structure.

2. We have revised the report to include the recent achievements of the Interagency Ecosystem Management Task Force, including its most recent draft of the "Ecosystem Management Initiative Overview." In addition, we have revised the section in our draft report and the corresponding conclusion and recommendation dealing with the need for testing the approach in other geographic areas. We believe that the criteria being used by the task force to select additional pilot projects, together with the specific examples cited in the observations and comments by the four primary federal land management agencies, are sufficiently diverse to permit adequate testing.

3. We agree that the effectiveness of ecosystem management depends on establishing open and collaborative relationships with key stakeholders in an ecosystem and that the elaborate and costly procedural requirements of the Federal Advisory Committee Act (FACA) may actually deter effective ecosystem management. This concern was clearly stated in chapter 4 of our draft report and is addressed in our recommendation on the need to identify statutory barriers to governmentwide implementation of ecosystem management.

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4. We understand the importance of developing the staffing and skill mixes needed to implement ecosystem management and recognize that some agencies may not have the specific skills needed to properly implement the approach. We also note that CRS' April 1994 report on federal agencies' ecosystem management activities identified staffing and skill mixes as limits to the implementation of ecosystem management by other federal agencies. While this limitation could well prove to be a significant barrier to implementing ecosystem management governmentwide, we did not gather enough information to discuss it in any detail in this report. We have, however, revised the report to make it clear that other barriers, in addition to those we identified in our report, must be addressed.

5. We have revised the report to delete any reference to the type of system under which lands are used for mineral development.

6. We have revised the report to state that the National Park Service is required to develop general management plans under the National Parks and Recreation Act of 1978.

7. We have revised the report to state that ecosystem management recognizes that (1) managing natural resources to meet the needs of humans and other species will require both natural and altered areas and (2) both kinds of land uses can continue while ecosystems are being maintained or restored.

8. We have revised the report to (1) recognize the working group established by the National Park Service to develop its ecosystem management policies and strategy and (2) cite the efforts of the more than 20 national parks located within the Colorado Plateau to share information, develop cooperative programs based on the ecology of the area, and seek partnerships with interested organizations as examples of the Service's efforts to develop regional partnerships.

9. We have revised the report to state that the Interagency Ecosystem Management Coordination Group has been meeting since 1992 and that it has been exchanging information and ideas on areas of interest, including training and the delineation of ecosystem boundaries across the nation.

10. We have revised the report to recognize that (1) the efforts of some federal agencies to coordinate their activities across unit boundaries have occurred in response to the agencies' concerns and (2) efforts by the National Park Service and the Forest Service to better coordinate

management goals and standards and activities in the greater Yellowstone began in the early 1960s.

11. We have revised the report to (1) add the National Park Service as a participant in the Sierra Nevada cooperative program, (2) make clear that the Southern Appalachian Man and the Biosphere program is a U.S. program that has been designated by the United Nations as part of the international network of biosphere reserves, and (3) add the Mammoth Cave National Park area as another example of a biosphere reserve.

12. We have revised the report to state that (1) in the United States, 47 areas have been designated as part of an international network of 323 biosphere reserves and (2) 12 federal departments and agencies participate in the U.S. national committee and more participate in the biosphere reserve programs.

13. We have revised the report to avoid suggesting that federal participation in the coordinated strategy to address the diversity, ranges, and numbers of native plant and animal species in California is limited to the local level.

14. We have revised the report to recognize that the "Gap Analysis" project has been transferred to NBS.

15. We agree that humans are a biological component of ecosystems. We believe that this issue is adequately addressed in chapter 1 of the report.

16. We agree that the four primary federal land management agencies also have financial and technical assistance programs and have qualified our statement by adding that these agencies are "often" unable to control or affect the larger national land and natural resource use framework.

17. We agree that voluntary cooperation among landowners in ecosystems helps to avoid ecological and economic conflicts and have revised the report to make clear that such cooperation is desirable.

18. We make clear in chapter 1 that the approximately 77 million acres managed by the National Park Service and the approximately 89 million acres managed by FWS are primarily for the conservation and protection of natural resources and that legislation creating incentives to produce specific levels of certain natural resource commodities and uses are confined to Forest Service and BLM lands. However, previous GAO reports


have made clear that both parks and wildlife refuges are "multiple-use" lands. For example, in our report entitled National Wildlife Refuges: Continuing Problems With Incompatible Uses Call for Bold Action (GAO/RCED-89-196, Sept. 8, 1989), we state that virtually all refuges host many nonwildlife-related uses, including public recreation, mining, and livestock grazing.

19. We have revised the report to recognize that a stated purpose of the Endangered Species Act is to provide a means for conserving the ecosystems upon which endangered and threatened species depend. We have also noted that the National Environmental Policy Act speaks to concerns closely related to ecosystems. However, we note that neither act defines or delineates ecosystems or requires any agency to take specific actions for maintaining or restoring ecosystems as such.

20. The degree to which the disparate missions and planning requirements statutorily rooted in the federal land management framework will hamper interagency coordination of federal actions across ecosystems is still unknown. As we state in our report, we believe that the four pilot projects proposed in the administration's fiscal year 1995 budget, as well as other mature and new initiatives to implement ecosystem management, provide opportunities to identify this barrier and specific statutory, regulatory, institutional, and procedural options for resolving it.

Appendix II

Comments From the Forest Service

	United States Department of Agriculture	Forest Service	Washington Office	14th & Independence SW P.O. Box 96090 Washington, DC 20090-6090
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Reply To: 1420/1330-1

Date: JUN 30 1994

Mr. James Duffus III
Director, Natural Resources Management Issues
General Accounting Office
441 G Street, N.W.
Washington, DC 20548


Dear Mr. Duffus:

This reply pertains to your request for comments on the U.S. General Accounting Office (GAO) Draft Report RCED-94-111, Ecosystem Management: Additional Actions Needed to Adequately Test a Promising Approach. The Forest Service was assigned the lead to coordinate responses to the draft report. We did not receive comments from other agencies, hence our response reflects information that pertains to the Forest Service only.

We find the report to be in line with the Agency's history and thinking of ecosystem management philosophy and subsequent implementation policy. We recommend that you consider the following comments in issuing the final report.

The report implies that Federal agencies only recently began to work together in coordinated and cooperative efforts and only when directed to do so by the courts. However, the Forest Service has a long history of cooperation with other Federal, State, private, and Native American organizations. A shared adoption of an ecosystem management policy will continue to enhance these cooperative efforts.

The "scientific understanding of ecosystems" is an area that is well on its way to development. The Office of Science and Technology Policy's Committee on Environment and Natural Resources is currently formulating the Research and Development agenda for Biodiversity and Ecosystem Dynamics and for Resources Use and Management. Fourteen agencies have formed the Ecosystem Management Task Force to implement an ecosystem approach to environmental management as recommended in the National Performance Review. The charge to the Task Force's Science and Information Issue Area Subgroup is to focus on (1) lessons to be learned from "Survey and Assist" cases, (2) the development of ecoregional assessments, and (3) the development of an ecosystem management research agenda. Ecoregional assessment protocols that will consider the biological, physical, and human dimensions of ecosystem management will be available for use by October 1994.



Caring for the Land and Serving People

FS-6206-28b(3/92)

See comment 1.

See comment 2.

See comment 3.

Appendix II
Comments From the Forest Service

See comment 4.

See comment 2.

See comment 5.

See comment 6.



Mr. James Duffus III

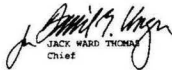
2

The question of ecological classification systems is being addressed by the Interagency Ecosystem Management Coordination Group. The subject of conducting a non-biased review of the current systems, their strengths and weaknesses, and how best to use the various systems in combination at various scales has been discussed with the National Academy of Sciences. The Academy expressed an interest in conducting this assessment. There is general agreement that one size does not fit all systems. The process should not be one of selecting between a watershed approach over an ecoregion approach, but how best to use these tools to assess the conditions of the Nation's ecosystems.

The role of non-Federal forest lands in helping to protect and sustain ecosystem values is a critical element for the future. Our influence on these lands, however, will continue to be more indirect, providing knowledge and assistance, while recognizing landowner needs and their specific objectives as paramount. Existing mechanisms for assisting non-Federal landowners should be reassessed in light of the goal of forest sustainability. Additionally, new approaches for encouraging greater cooperation and coordination should be identified and evaluated while continuing to respect private property rights. It will be through cooperation and collaboration that we jointly accomplish a shared desired end.

We concur that the recommendations for implementing a Government-wide approach to ecosystem management do need to be addressed if we are to be successful in fulfilling ecosystem management potential. For the Forest Service, that potential calls for promoting the long-term sustainability of ecosystems by ensuring they are healthy, diverse, and productive. This report reflects that posture.

Sincerely,


JACK WARD THOMAS
Chief



Caring for the Land and Serving People

FS-6200-28b(3/92)

The following are GAO's comments on the Forest Service's letter dated June 30, 1994.

GAO's Comments

1. We have revised the report to recognize that (1) the efforts of some federal agencies to coordinate their activities across unit boundaries have been in response to the agencies' concerns and (2) efforts by the National Park Service and the Forest Service to better coordinate management goals and standards and activities in the greater Yellowstone area began in the early 1960s.
2. As CRS' April 1994 report on federal agencies' ecosystem management activities shows, ecosystem management initiatives are being undertaken throughout the federal government. As we stated in discussing our report's objectives, scope, and methodology, we limited our work primarily to relevant activities of the four primary federal land management agencies. The roles of the Office of Science and Technology Policy, the National Academy of Sciences, and other organizations and agencies were, therefore, beyond the scope of our review.
3. As we state in chapter 3, understanding an ecosystem's ecology is one of four practical steps that need to be taken to implement the principles of ecosystem management being considered by the administration. We have revised chapter 4 of the report to recognize the establishment of the Science and Information Issue Area Subgroup, its focus, and reporting milestone.
4. We have revised the report to recognize that the issue of ecological classification systems is currently being addressed by the Interagency Ecosystem Management Coordination Group.
5. We are aware that there is general agreement that various ecological classification systems should be used in combination at various scales. We are also aware, however, that there is growing consensus that a governmentwide approach to ecosystem management may ultimately require agreement on delineating ecosystem boundaries across the national landscape.
6. We agree that the role of nonfederal lands in helping to maintain and restore the health of ecosystems is a critical element for the future. Our report emphasizes that ecosystem management will generally fall short of its goal if it is limited to activities on federal lands and that efforts to

Appendix II
Comments From the Forest Service

establish effective collaboration and achieve consensus with nonfederal parties in support of ecosystem objectives will necessarily require an approach largely based on voluntary cooperation and incentives.

Appendix III

Comments From the White House Office on Environmental Policy

THE WHITE HOUSE
WASHINGTON

June 10, 1994

Dear Mr. Duffus:

I want to thank you for the opportunity to comment on the draft report entitled Ecosystem Management: Additional Actions Needed to Adequately Test a Promising Approach (GAO/RCED-94-111).

In general, the draft report is a well-framed and lucid presentation of the basic facets of ecosystem management. I believe the recommendations to be consistent and compatible with the core components of the Administration's ecosystem management initiative.

See comment 1.

I would offer several observations. First, I must emphasize the value of the many on-going creative approaches to natural resource management. These "on-the-ground" efforts are vital to the success of the ecosystem initiative nationwide because they provide viable alternatives to managing natural resources and improving environmental quality. As such, they should, and will serve as important guides in the development of an overall national framework that will be well-grounded in practical field experience.

See comment 2.

Second, I would also emphasize the importance of intergovernmental and public-private aspects of ecosystem management. Developing new and better management strategies is not exclusively a Federal issue, nor is it entirely a state and local issue. Major improvements in resource management must involve better integration of governmental activities at all levels, as well as enhanced coordination among public and private endeavors. This exemplifies the significance of addressing institutional complexities in natural resource management.

Once again, I want to thank you for the opportunity to review the draft, and I look forward to its publication.

Sincerely,


Kathleen A. McGinty
Director, White House Office on
Environmental Policy

KAM/mmg

Appendix III
Comments From the White House Office on
Environmental Policy

The following are GAO's comments on the White House Office on
Environmental Policy's June 10, 1994, letter.

GAO's Comments

1. We agree that ongoing and new initiatives to implement ecosystem management will serve as important guides in the development of an overall national framework that is well grounded in practical field experience. As we state in our report, we believe that the four pilot projects proposed in the administration's fiscal year 1995 budget, as well as other initiatives to implement ecosystem management, provide opportunities to address barriers and identify statutory, regulatory, institutional, and procedural options for resolving them.
2. We agree that major improvements in natural resource management must involve better integration of government activities at all levels, as well as enhanced coordination among public and private endeavors. The importance of interagency coordination and federal and nonfederal collaboration and consensus-building are emphasized throughout our report.

Appendix IV

Major Contributors to This Report

Natural Resources Management Issues

Carole J. Blackwell
Charles S. Cotton
Ralph J. Domenick, Jr.
Brian W. Eddington
Elizabeth R. Eisenstadt
Chester M. Joy

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U.S. House of Representatives
Committee on
Natural Resources
 Washington, DC 20515-6201

October 18, 1994

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Mr. James Pipkin
 Counselor to the Secretary
 U.S. Department of the Interior
 Washington, D.C. 20240

Dear Mr. Pipkin:

I would like to thank you for testifying at the September 20, 1994 joint hearing on ecosystem management and the report "Ecosystem Management -- Additional Actions Needed to Adequately Test a Promising Approach" prepared by the General Accounting Office.

I have several followup questions. I have posed the same questions to all of the Administration witnesses; if it is easier for you to coordinate your response, rather than respond individually, please feel free to do so.

1. The GAO report recommends that the Administration develop a strategy that (1) clarifies the policy goal for ecosystem management, (2) translates the general principles in the Administration's Fiscal Year 1995 budget into specific, practical steps that clearly identify what must be done and who should be involved, and (3) identifies specific statutory, regulatory, institutional, and procedural barriers to implementing ecosystem management and options for overcoming them.

Will the Administration's planned Interagency Task Force report on ecosystem management address each of these recommendations? Of particular interest to me: will it contain a list of specific statutory, regulatory, institutional and procedural barriers along with your recommended options for overcoming such barriers?

Asked another way, does the Administration need legislation to implement ecosystem management? To make changes in budget constraints which may affect ecosystem management? Changes in boundaries or administrative units? Changes in planning requirements? To resolve impediments or conflicts in laws?

Can you identify any barriers now -- budget constraints, legal authorities -- which you may ask the Congress to remove or modify next year?

Page 2
Mr. James Pipkin
October 18, 1994

2. It appears to me that the various agencies have different definitions of and goals for "ecosystem management" and, from the maps in the GAO report, it appears that the agencies are defining and mapping bioregions (ecosystems) in different ways. In addition, many current administrative boundaries and units are basically historical accidents or political decisions that do not relate to ecosystems.

Will a common definition and goal for ecosystem management be established by the Administration? Will a common delineation of bioregions or ecosystems be established by the Administration? Does it make sense to restructure all federal land management units on the basis of bioregions or ecosystems so that the different agencies are, at least, working with the same boundaries and definitions?

3. What are the plans for the Administration to establish priorities as it attempts to manage on an ecosystem basis?

4. When there are conflicts between the management of the natural resources (i.e. meeting the requirements for ecosystem health) and other concerns, such as economic development or social concerns, what will be the guidance for resolving these conflicts?

5. The field personnel seem to be the front-line for implementing ecosystem management. Not only will they be charged with fulfilling their statutorily imposed requirements and working within budget constraints, it seems they are also supposed to develop consensus within the local communities. The GAO recommends that a minimum level of ecosystem integrity needs to be defined; in other words, a "bottom-line" or clear standard for ecosystem health needs to be established, in part to provide guidance to the field staff.

Has or will the Administration communicate a "bottom-line" or clear standard for ecosystem health below which the field personnel cannot go?

6. Are personnel evaluation systems being altered to reward ecosystem management implementation?

7. I understand the Department of Agriculture is trying to bring all of its data bases under one compatible and understandable system.

Is a similar effort underway at Interior? Will the pertinent data bases government-wide be made consistent, comparable, and available to other agencies?

GAO notes the need to collect more data, including information on socioeconomic considerations.

Page 3
Mr. James Pipkin
October 18, 1994

What interagency efforts are underway to determine the needs for additional information and the best way to collect that data?

8. Resource management (with or without ecosystem management) is changing. There is less emphasis on commodity output from the federal lands and there is increasing pressure on those lands for quality of life amenities. The rapidly growing areas of Denver, Phoenix, Boise and others speak to the changing west, as do the economic difficulties of the traditional resource-dependent communities.

Humans, human activities, cities and communities are part of the ecosystem.

How is the Administration building this into their plans? (Assessing the impact of human activities on the resource? Working with local, State, tribal governments on resolving issues? Providing technical and other assistance to communities to help them plan for a different future?)

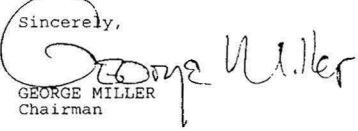
What efforts are being taken to provide information and technical assistance to private landowners on ecosystem management?

What efforts are being taken to include non-federal "stakeholders" in ecosystem management?

Are you looking at the role incentives and disincentives can play in encouraging widespread acceptance and participation in ecosystem management?

I am encouraged by the Administration's ecosystem initiative. Your efforts to date represent a major step toward better management of our lands -- for both the resource and for the people of this country. I look forward to the report of the Interagency Task Force. And, I look forward to working with you to make a transition to ecosystem management go smoothly.

Sincerely,


GEORGE MILLER
Chairman

CD/lgs

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Ms. Diane Gelburd
 Associate Deputy Chief for Programs
 Soil Conservation Service
 U.S. Department of Agriculture
 Washington, D.C. 20013-2890

Dear Ms. Gelburd:

I would like to thank you for testifying at the September 20, 1994 joint hearing on ecosystem management and the report "Ecosystem Management -- Additional Actions Needed to Adequately Test a Promising Approach" prepared by the General Accounting Office.

I have several followup questions. I have posed the same questions to all of the Administration witnesses; if it is easier for you to coordinate your response, rather than respond individually, please feel free to do so.

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Page 2
 Ms. Diane Gelburd
 October 18, 1994

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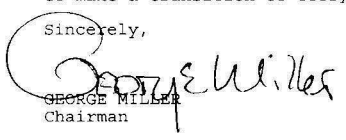
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October 18, 1994

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Mr. George T. Frampton, Jr.
 Assistant Secretary
 Fish Wildlife and Parks
 U.S. Department of the Interior
 Washington, D.C. 20240

Dear Mr. Frampton:

I would like to thank you for testifying at the September 20, 1994 joint hearing on ecosystem management and the report "Ecosystem Management -- Additional Actions Needed to Adequately Test a Promising Approach" prepared by the General Accounting Office.

I have several followup questions. I have posed the same questions to all of the Administration witnesses; if it is easier for you to coordinate your response, rather than respond individually, please feel free to do so.

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Mr. George T. Frampton, Jr.
October 18, 1994

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Mr. George T. Frampton, Jr.
October 18, 1994

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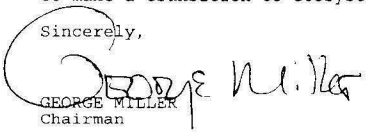
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Sincerely,


GEORGE MILLER
Chairman

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U.S. House of Representatives
Committee on
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October 18, 1994

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Mr. James Lyons
 Assistant Secretary
 Natural Resources and Environment
 U.S. Department of Agriculture
 Washington, D.C. 20090-6090

Dear Mr. Lyons:

I would like to thank you for testifying at the September 20, 1994 joint hearing on ecosystem management and the report "Ecosystem Management -- Additional Actions Needed to Adequately Test a Promising Approach" prepared by the General Accounting Office.

I have several followup questions. I have posed the same questions to all of the Administration witnesses; if it is easier for you to coordinate your response, rather than respond individually, please feel free to do so.

1. The GAO report recommends that the Administration develop a strategy that (1) clarifies the policy goal for ecosystem management, (2) translates the general principles in the Administration's Fiscal Year 1995 budget into specific, practical steps that clearly identify what must be done and who should be involved, and (3) identifies specific statutory, regulatory, institutional, and procedural barriers to implementing ecosystem management and options for overcoming them.

Will the Administration's planned Interagency Task Force report on ecosystem management address each of these recommendations? Of particular interest to me: will it contain a list of specific statutory, regulatory, institutional and procedural barriers along with your recommended options for overcoming such barriers?

Asked another way, does the Administration need legislation to implement ecosystem management? To make changes in budget constraints which may affect ecosystem management? Changes in boundaries or administrative units? Changes in planning requirements? To resolve impediments or conflicts in laws?

Can you identify any barriers now -- budget constraints, legal authorities -- which you may ask the Congress to remove or modify next year?

Page 2
 Mr. James Lyons
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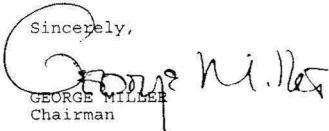
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GEORGE MILLER
Chairman

CD/lgs

HOUSE OF REPRESENTATIVES
WASHINGTON, D. C. 20515

MICHAEL J. KOPETSKI
FIFTH DISTRICT
OREGON

September 23, 1994

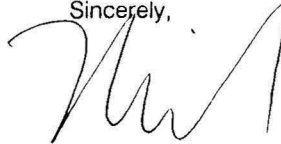
Dear Gerry: 

I was contacted during the summer by Mr. Jack Johnson of Roseburg, Oregon.

Mr. Johnson's letter outlines in a cogent and articulate manner his observations of the impact of the Endangered Species Act and ecosystem management generally on local communities and their residents. Mr. Johnson's letter is particularly interesting, I believe, because it also notes the juxtaposition of federal ecosystem management statutes and the State of Oregon's highly successful reforestation program.

In reviewing Mr. Johnson's letter, I thought it would make an excellent addition to the hearing record your subcommittee has established on the Endangered Species Act and ecosystem management, and I would appreciate it if you could include Mr. Johnson's letter. Thank you for your consideration and continued assistance.

Sincerely,



The Honorable Gerry E. Studds
Chairman
Committee on Merchant Marine and Fisheries
1334 Longworth House Office Building
Washington, D.C. 20515

Jack Johnson
1659 SE Main St.
Roseburg, OR 97470

June 21, 1994

The Honorable Mike Kopetski
United States Congress
Washington, D.C.

Dear Representative Kopetski,

I am writing to express my concern about the devastating impact of the Endangered Species Act on my fellow residents of Douglas County, Oregon. As you know, the Endangered Species Act was written over two decades ago. It was the intent of those who framed the Act that it should be subject to periodic evaluation and review. The act was initiated at a time when there were few laws or regulations pertaining to the protection of the environment. Our nation's rivers and waterways were sometimes cesspools of industrial waste, the air in many cities was unbreathable and there was growing fear that we would sacrifice too much of our forest lands for the sake of development and profit.

Much has changed, however, since the early 1970's. New local, state and federal laws have brought about many needed changes, and the quality of our air and water has improved dramatically. Changes have also taken place in timber management practices over the past years. The "cut and run" logging practices that were commonly employed in the first years of Oregon logging were replaced in the 1950's by a carefully managed program of replanting. Oregon now plants six trees for every one that is harvested. The concepts of multiple use and sustained yield predominant Oregon's timber industry and forest management practices. Further, many wilderness areas have been added to Oregon's state and national parks, assuring that millions of acres of old-growth timber will remain for future generations to enjoy. Changes in timber management and environmental practices were once needed. These changes have been made, and maintain healthy forests while continuing to provide a renewable yield of raw materials for the wood product industry and jobs for our work force.

Unfortunately, despite a successful program of reforestation, there are some who seek to take to take advantage of the Endangered Species Act to go beyond the scope of its original intent. They seek to use the law and the courts not merely to protect the habitat of a single species of bird, but as a ploy to block the harvest of timber on both public and private lands. This interpretation of the Act far exceeds the original intent of the law. In the past, species protection has had limited geographic impact, but with the listing of the spotted owl as a threatened species, seven million acres of "habitat" have been set aside, wreaking havoc on the timber industry and families in the Pacific Northwest.

[continued]

This abuse of the Endangered Species Act has caused great suffering for the timber workers of the region. Timber jobs provide the primary family wage jobs in Douglas County, with many other businesses being heavily dependant on timber dollars for their survival. Many timber-related jobs have been lost as a result of forests being closed to harvest as an outcome of court interpretations of the Endangered Species Act. Many societal problems have followed in the wake of these court rulings. As families lose their source of income, many are uprooted. Older workers have difficulty making a career change, and even when they are able to receive retraining, jobs in other fields often do not exist locally. Some displaced workers have been economically forced to leave the area, other families are scraping by with income from a combination of part-time low paying jobs, and others are sinking into despair as they forfeit their homes and vehicles to creditors.

As a life-long educator, I have witnessed the impact of this tragedy first hand. Last year a child in my class that I will refer to as "Bobby" came to school hungry and ill-clothed. His father had lost job in the timber industry. Bobby was having a tough time at home and it was apparent that his father was venting his frustration on members of the family. Bobby became increasingly bitter. He was seldom able to bring needed supplies to school, never had money for trips or special activities, and always took advantage of the school's free breakfast and lunch program for the needy. Bobby's childhood is not a happy one. We did what we could to help him, but I fear that he will bear the scars of this troubled time well into his adult life. Unfortunately, situations like Bobby's are becoming all too common as families lose their dignity and their self-respect.

The Endangered Species Act must be changed so that it takes into consideration not only the interests of wildlife, but the interests of people as well. We need to effectively balance wildlife protection with the human, social and economic costs involved with such protection. Changes must be implemented that will ensure that 1)human concerns become an integral part of species protection and recovery efforts; 2)science, not politics, dictate listing decision and recovery programs; 3)the rights and livelihoods of people affected by the Endangered Species Act are carefully considered; and 4)incentives complement regulation as the primary means of protecting species.

Times have changed since the Endangered Species Act was passed in 1973. The law must be reformed to reflect changing times. I encourage all Members of Congress to carefully review this important legislation and urge your support of this balanced approach to species protection.

Sincerely,

/S/

Jack Johnson

Jack Johnson
1659 SE Main St.
Roseburg, OR 97470

June 21, 1994

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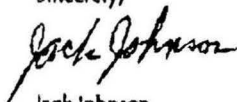
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Sincerely,



Jack Johnson



COMMITTEE ON MERCHANT MARINE AND FISHERIES
UNITED STATES HOUSE OF REPRESENTATIVES
WASHINGTON, D. C. 20515

GERRY E. STUDDS
CHAIRMAN

September 28, 1994

Dear Mike:

Thank you for your recent letter and for the thoughtful and rendering views of Mr. Jack Johnson on endangered species conservation.

The Subcommittee on Environment and Natural Resources recently held a hearing on "ecosystem management" which, I am sure you are aware, is becoming a major new organizing principle in the field of conservation. Mr. Johnson's remarks will make an excellent addition to the record of this hearing.

Thank you again for your letter.

Sincerely,

Gerry E. Studds
Chairman

The Honorable Michael J. Kopetski
Member of Congress
218 Cannon House Office Building
Washington, DC 20515-3705

cc: The Honorable George Miller
The Honorable Charlie Rose

103d Congress }
2d Session }

COMMITTEE PRINT NO. 6

ECOSYSTEM MANAGEMENT: SUSTAINING THE NATION'S NATURAL RESOURCES TRUST

MAJORITY STAFF REPORT
OF THE
COMMITTEE ON NATURAL RESOURCES
OF THE
U.S. HOUSE OF REPRESENTATIVES
ONE HUNDRED THIRD CONGRESS
SECOND SESSION



APRIL 1994

Printed for the use of the Committee on Natural Resources
George Miller, *Chairman*

U.S. GOVERNMENT PRINTING OFFICE

WASHINGTON : 1994

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April 30, 1994

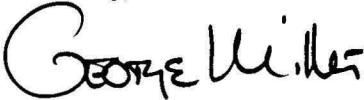
MEMORANDUM OF TRANSMITTAL

**COMMITTEE ON NATURAL RESOURCES,
 U.S. HOUSE OF REPRESENTATIVES,
 WASHINGTON, DC.**

*To Members of the
 Committee on Natural Resources
 of the U.S. House of Representatives*

The following Majority Staff Report entitled, "Ecosystem Management: Sustaining the Nation's Natural Resources Trust," is hereby made available to all members of the Committee.

Sincerely,



GEORGE MILLER
 Chairman

(III)

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FOREWORD

Few areas of public policy have become as prominent, or as contentious, in recent years as the issue of the proper management of natural resources. Loggers, fishermen, environmentalists, urban dwellers, power users, Native American interests, farmers and ranchers, and others have all conflicted with one other and with the government over the use and management of these resources. Government agencies—with differing, overlapping, and sometimes conflicting mandates, constituencies, and management—disagree with each other over the management of these resources.

The losers in these conflicts are the resources themselves as well as the people of this country who value and depend on them.

The House Committee on Natural Resources has given a high priority to an initiative designed to reassess the way the government protects, maintains, sustains, and manages the natural resources of this country. We must ask ourselves whether the structures, institutions, and practices of the past are appropriate to the needs of the present—and to the even greater demands of the future.

Too often, the answer to that question is "no." Too often, Federal policy (and State and local policy, too, as well as the practices of private interests who use the public's resources) are unhelpful and unenlightened. Too often, these policies and practices obstruct good resource management instead of facilitating or rewarding it.

Our Nation must find new ways of addressing these challenges, especially in the rapidly growing western United States—an area marked by a declining emphasis on resource extraction as the primary economic base, a rapidly growing population with modern demands on the resources (such as recreation), and communities attempting to adjust to vastly altered circumstances.

One of the most promising new approaches to resource management is to manage, not along the narrow lines drawn up by legislators and cartographers years ago, but on a more scientific basis known as **ecosystem management**. Although the subject of much discussion and dispute, we intend this term fundamentally to mean the management of resources in a coordinated and integrated manner in an area defined by its biological and ecological boundaries. While some question aspects of our definition, it is worth noting that all sides—conservationists, State and local governments, sportsmen, and business people—agree that it allows us to broaden the narrow, fragmented approach that has characterized much of the Federal Government's past stewardship of public lands.

Ecosystem management means that decisions about the use and management of natural resources will be based on science, not politics, to the maximum extent possible. The Federal Government will manage its lands in a broad-based, coordinated manner to avoid crises like those occurring in dozens of areas around the United States, such as the timber dispute over spotted owl habitat in the Pacific Northwest and the continuing decline of the Everglades in Florida, including the loss of commercial fisheries in Florida Bay.

Now is the appropriate time to embrace ecosystem management on a government-wide basis. As the Federal budget for natural resources shrinks,

we must become more efficient. We must streamline the management of those resources by eliminating duplicate functions among the agencies and bureaus, consolidating overlapping management responsibilities, and perhaps most helpful, identifying and resolving interdepartmental disputes that leave both administrators and the private sector confused and frustrated.

The Clinton Administration has wisely endorsed the ecosystem management approach by proposing four ecosystem pilot projects in the Fiscal Year 1995 budget. Vice President Al Gore endorsed and encouraged ecosystem management as part of the National Performance Review, and the White House Office of Environmental Policy is working on an expanded ecosystem management approach for the Federal Government.

At the beginning of the 103d Congress, the Committee on Natural Resources initiated an extensive review of the ecosystem management approach as a means of improving the management of our Nation's diverse resources. Two workshops and one field hearing were held. In addition, committee members and staff participated in several conferences on ecosystem management sponsored by outside organizations.

This report is a compilation of the findings and conclusions that emerged from those events. As the committee continues to monitor the progress the Administration is making in implementing ecosystem management and contemplates legislation to facilitate ecosystem management, this report should serve as useful background.

I want to thank all of those who assisted the committee in planning and conducting the meetings and hearing that served as the basis for this report. Their generous assistance and candid comments have made it possible for both members and staff of the committee to gain far greater insights into every facet of ecosystem management.

My appreciation also goes to Tom Marshall, the principal author of this report. He undertook the difficult task of synthesizing and condensing the discussions from the various events into this report. Tom carried out this work while on a eight-month assignment to the Committee on Natural Resources as a Legislative Fellow.

The findings and conclusions derived from each event are those of the Chair and the majority staff.

Sincerely,

GEORGE MILLER, *Chair*

SUMMARY OF FINDINGS

Ecosystem management is generally viewed as management that promotes ecological, economic, and social sustainability by:

- managing across whole landscapes, watersheds, or regions and taking into account ecological time frames;
- promoting sustainable economic development and communities;
- maintaining biological diversity and essential ecosystem processes;
- utilizing cooperative institutional arrangements (interagency and Federal/non-Federal);
- integrating science and management;
- generating meaningful stakeholder and public involvement and facilitating collective decisionmaking; and,
- adapting management over time based on conscious experimentation and routine monitoring.

Ecologically healthy public lands and natural resources contribute directly to local and regional economic health (community and regional sustainability), and economic declines have been tied to ecological declines in such areas as the Everglades National Park and the Florida Bay.

Because Federal lands and natural resources are interconnected and interdependent parts of larger ecosystems in which the Federal land boundaries do not generally correspond to ecosystem boundaries, the Federal lands and resources are rarely self-sustaining.

Maintaining the health of the ecosystems of which Federal lands and natural resources are a part is an effective and efficient way to sustain their long-term productivity, genetic resources, biological diversity, ecosystem goods and services, and provide for local and regional economic stability.

Involvement of non-Federal entities (State, local and tribal governments and private citizens) is a crucial component of ecosystem planning and management; improved incentives and opportunities for the involvement of non-Federal interests in ecosystems management should be explored.

Management that restores and maintains ecosystem health is likely to prevent species from becoming endangered and facilitate recovery of already-

endangered species in ways that are less costly and more flexible than species-by-species strategies.

The health of the ecosystem should be evaluated on a multiple geographic scale in which landscape- and watershed-scale perspectives are considered as well as large, regional-scale perspectives.

Data gathering and data management are not adequately coordinated among Federal agencies or with non-Federal entities.

Laws governing Federal natural resources management do not direct Federal agencies to maintain the ecological integrity of Federal lands and natural resources or the health of the ecosystems of which they are a part.

Laws governing Federal actions protecting and affecting ecosystems create fragmented substantive and procedural approaches to environmental management.

The voluntary nature of ecosystem management initiatives results in minimal Federal agency accountability.

Current institutional structures inhibit creative and cooperative ecosystem management.

Current budgeting practices create serious impediments to integrated, interagency, and intergovernmental ecosystem management.

Although virtually all Federal environment and natural resources agencies have adopted nonbinding, general statements of policy on ecosystem management within the last two years, the policy statements were issued separately by individual agencies, and refinements to such policies are made without coordinating with other Federal agencies or non-Federal entities.

A significant number of the experienced scientists and natural resources professionals who participated in the committee's year-long Ecosystem Initiative stated that, in order for ecosystem management policies to improve, management on the ground, the Administration, and/or Congress will need to exert strong leadership and establish a clear, enforceable policy direction.

I. INTRODUCTION

[W]e have these grand assets that the people of this country made a decision to preserve for their use and for enjoyment by the people of this country and by people around the world who come to visit those assets. In each case, those national parks sit in a very threatened ecosystem because of the changes that have taken place since the time that we dedicated that park and made those decisions. . . . It is the obligation of the Federal Government to defend those parks. . . . We are not prepared to designate, if you will, the Everglades, Yellowstone or Yosemite. . . .

This is a recognition of an ongoing trust relationship, a fiduciary relationship to the people of this country for the investment and the decisions they have made about these world-class resources and all that they mean to the communities surrounding them in terms of the economic engines that they have become¹

As trustees not only of our national parks, but also another 600 million acres of Federal lands and a considerable portion of our water resources, Federal agencies are responsible for ensuring that our children inherit a "natural resources trust" with assets as valuable and productive as they are today.

The "income" from our public lands and resources, meanwhile, provides a steady stream of benefits—including recreational opportunities, timber, water, minerals, livestock forage, and spiritual renewal.

Although this income is significant, sound long-term stewardship of the trust is paramount if it is to retain its value and continue generating income over time. Notwithstanding, increasing visitation levels and external threats are taking a serious toll on many of our national parks.² Intensive resource extraction permitted—and arguably promoted—by the Forest Service and Bureau of Land Management (BLM), moreover, is causing potentially

¹ Introductory remarks of Committee on Natural Resources Chair George Miller, *Joint Oversight Hearing on Efforts To Protect and Restore the Everglades Ecosystem With Special Emphasis on Florida Bay* ("Hearing"), Serial No. 103-42, Committee on Natural Resources, p. 14 (1993).

² From 1984-1993, total visitor use of the national parks increased from 248,785,509 to 273,120,925. Examples of specific park visitation increases in this time period include: Big Cypress National Park (NP) from 0 to 234,830; Everglades NP from 628,658 to 973,706; Grand Canyon NP from 2,173,584 to 4,575,602; Rocky Mountain NP from 2,231,448 to 2,780,342; Yellowstone NP from 2,222,027 to 2,912,193; and Yosemite NP from 2,738,467 to 3,839,645.

See also, *National Park Service: Activities Outside Park Borders Have Caused Damage to Resources and Will Likely Cause More* (GAO/RCED-94-59, January 3, 1994).

irreversible degradation of the Nation's "multiple-use" lands.³ Watersheds and waterways have been polluted, diverted, and dammed by Federal agencies, causing the loss of whole fisheries. Wildlife habitat have been fragmented and are shrinking.

We have begun, in effect, to deplete the assets in our natural resources trust rather than to live off its income. As a result, we squarely face the prospect of passing on to the next generation of Americans a diminished legacy of natural wonders, lands, and river systems. Even today, painful social and economic "train wrecks" occur because of mismanagement of public natural resources. Logging on public lands in the Pacific Northwest has been at a virtual standstill for years, halted by Federal court injunctions of unprecedented scope. One of the judges enjoining the timber sales has characterized the Federal agencies' violation of resource laws as "systematic and deliberate." Local timber-dependent communities in that region and elsewhere have suffered.

The long-delayed transition to more careful forest management policies is now difficult and costly. Ironically, taxpayer dollars continue to subsidize activities that many scientists believe damage the natural systems upon which the health of our public land and water resources depend. Taxpayers are then charged a second time when expensive environmental restoration is necessary.⁴

Not surprisingly, a consensus is emerging that Federal natural resources managers need to change the way they do business. One promising new paradigm, "ecosystem management," has already been embraced by a number of States and local governments, Indian tribes, community and civic groups, industry, and environmental groups.⁵ It is now taking hold at the Federal level. A working definition of ecosystem management was recently adopted at a consensus-building forum involving a wide range of public and private interests:

Ecosystem management is an approach to environmental management that:

- (1) is at a scale that is compatible with natural processes;
- (2) is cognizant of nature's time frames;
- (3) recognizes social and economic viability within functioning ecosystems; and
- (4) is realized through effective partnerships among private, local, state, tribal, and federal interests.

With a goal of: preserving, restoring, or where those are not possible, simulating ecosystem integrity as defined by composition, structure, and

³ A recent majority report of the Committee on Natural Resources documented large-scale toxic pollution on Forest Service, BLM, and other public lands. See *Deep Pockets: Taxpayer Liability for Environmental Contamination*, Committee Print No. 2, 103d Congress. Numerous native plant and animal species dependent on healthy public lands now face extinction—BLM alone has 191 federally listed threatened and endangered species on its holdings, with over 1,000 additional species that are formal candidates for listing. *Ecosystem Management at the BLM: From Concept to Commitment*.

⁴ Elizabeth Losos, *A Living Landscape, Vol. III: Taxpayers' Double Burden*, The Wilderness Society.

⁵ See, e.g., *Proceedings from the Congressional Research Service's Seminar On Ecosystem Management*, March 24-25, 1994 (forthcoming).

function that also maintain the possibility of sustainable societies and economies.⁶

Management that seeks to sustain ecosystem integrity over time gets income from the land without depleting its productive assets. Although scientists have advocated this approach for years, the foundations of our present natural resources management framework—its laws, institutions, and conceptual underpinnings—were developed decades ago and do not reflect the idea of sustaining ecosystems in order to preserve the long-term potential of our natural resources. Given the breadth of early support for ecosystem-based management, the Committee on Natural Resources developed an Ecosystems Initiative in April 1993. The purpose of the initiative was to deepen committee members' understanding of ecosystem management theory and practice, to work with the Administration as it adopts new policies under existing law, and to identify legal and institutional barriers that might prevent effective implementation of ecosystem management.

While the importance of maintaining healthy ecosystems is by no means limited to their value in sustaining the public lands, the Ecosystems Initiative focused its efforts on the implementation of ecosystem management in the Forest Service, BLM, and the National Park Service. These agencies are the trustees of some of the largest parcels of Federal lands and could, therefore, readily contribute to large-scale endeavors necessary to sustain entire ecosystems.

As part of the Ecosystems Initiative, the committee conducted two workshops, a field hearing, and several site visits. Committee members also attended related conferences held by outside organizations.

- The first committee workshop, held in Montana, involved a day-long discussion between members and prominent scientists of the concepts underlying ecosystem functioning and the scientists' views on the emergence of ecosystem management policies.
- A field hearing in the Greater Everglades Ecosystem was designed for members to learn about the initial stages of a Federal undertaking in South Florida to restore a 17,000 square-mile regional ecosystem that has an urban population of 5 million and 1,500 miles of flood-control canals and dikes.
- The third and final event of the Ecosystems Initiative brought members together with seasoned natural resources managers and legal scholars in Colorado to assess the legal and institutional barriers to ecosystem management.

This report summarizes the findings and basic background gathered from the Ecosystems Initiative. It includes information collected informally from scientists, State and Federal agencies, and nongovernmental organizations. The report makes a number of recommendations based on its findings, with

⁶ The Keystone Center, "National Ecosystem Management Forum," Meeting Summary, pp. 8–9, November 16–17, 1993. An ecosystem is "[a] unit comprising interacting organisms together with their environment (e.g., marsh, watershed and lake ecosystems)." *Forest Ecosystem Management: An Ecological, Economic, and Social Assessment*, p. IX–10, Report of the Federal Ecosystem Management Assessment Team (FEMAT), July 1993. Ecosystems exist at different geographical scales. The FEMAT, for example, recommended that ecosystem management consider watershed (10–200 square miles), river basin or physiographic province (1,000–10,000 square miles), and regional (10,000–20,000 square mile) scales. Ibid. at p. VIII–14 to VIII–16.

a view toward highlighting issues that the Administration and Congress will likely face as they turn to more scientific, collaborative, and preventive approaches to Federal stewardship of our public natural resources.

II. DISCUSSION

A. MONTANA WORKSHOP: THE SCIENTISTS' VIEW

1. BACKGROUND

The committee's first workshop took place on May 16, 1993, at the Black Butte Ranch near Bozeman, Montana. The workshop engaged committee members and experienced scientists in a wide-ranging discussion of ecosystem management basics, the merits of the approach, and obstacles to its effective implementation. Members of Congress participating included Representatives Peter DeFazio, Larry LaRocco, Karen Shepherd, and Chair George Miller. The group of scientists represented a diverse range of interests and expertise within the scientific community. Although the discussion at the workshop focused on the Greater Yellowstone Ecosystem and Northern Rockies, the scientists identified broad concerns relevant to public land management throughout the country.⁷

Two-thirds of the 18,000-square-mile Greater Yellowstone Ecosystem is owned by the Federal Government: 2.5 million acres in Yellowstone and Grand Teton National Parks, over 9 million acres in seven national forests (nearly 1 million acres are designated as wilderness), and 1 million acres managed by the U.S. Fish and Wildlife Service (FWS) and the BLM. Over 6 million acres are State, tribal, and private lands. The largely intact regional ecosystem includes parts of three states—Wyoming, Idaho, and Montana—and is world-renowned for its geothermal, wildlife, and scenic values. Federal land management activities in the area include selling timber; permitting livestock grazing; permitting mining, oil, and gas development; managing recreation, fish, and wildlife; and recovering endangered species, including wide-ranging grizzly bears and wolves. The integrity of the ecosystem is threatened by, among other things, clearcutting up to the boundaries of Yellowstone National Park, proposed mining just north of Yellowstone National Park, and wildlife migration corridors cut off by development.

A summary of the findings from the workshop is set forth below.

2. FINDINGS

a. Ecosystem Management Makes Scientific Sense. The workshop identified piecemeal, uncoordinated administration of the public lands as a serious management defect from a scientific standpoint. Generally speaking, national parks, forests, and other public lands are managed as if they existed in isolation from one another, even when they are interconnected and interdependent parts of the same ecosystem. Ecosystem management, in theory, helps correct this defect by integrating Federal management around the well-being of the entire ecosystem upon which the public lands depend in the long run.

⁷ See Appendix 1 for a list of participants in the committee's Ecosystem Initiative.

The Greater Yellowstone Ecosystem—a vast jigsaw puzzle of Federal and non-Federal lands—illustrates the nature of the adjustments necessary to move to ecosystem-based management. The boundaries of Federal properties reflect political boundaries, not the functional limits of natural systems. An ecosystem-management perspective would treat the public lands in the Greater Yellowstone as component parts of an integrated regional system. An ecosystem approach would also focus managers on a shared goal: maintaining the health and sustainability of the ecosystem. Ecosystem management is not an attempt to expand Federal jurisdiction, rather it is an attempt to manage the various Federal natural resources programs in a coordinated, and not contradictory, manner and foster greater cooperation between the Federal managers and the managers and owners of non-Federal lands.

The discussion also highlighted the urgency of moving to a more scientific approach to land management. The margin for error that in the past allowed natural systems to rebound after intensive natural resources extraction or naturally occurring major events such as drought, insect infestations, and fires, is no longer available according to the scientists. The dramatic rise in the number of endangered species and candidates for future listings, concerns about the health of forests and rangelands, reforestation failures, and other indicators of increasingly fragile natural systems demonstrate the need for significant management changes. Human stresses on ecosystems have now reached the point where, as the Interagency Scientific Panel on Late-Successional/Old-Growth Forests once concluded, "There is no free lunch."

b. Agencies Are Reluctant to Cooperate With Each Other and With Non-Federal Landowners. Many scientists expressed frustration with Federal agencies' tendency not to work together within their different missions and cultures to maintain the integrity of the regional ecosystem. Similarly, given that management improvements in one part of the ecosystem may be of little consequence if management nullifies its effect elsewhere in the same system, participants agreed that Federal agencies should explore opportunities for expanding cooperative efforts with non-Federal landowners. This could include increased outreach, information sharing, technical assistance, cooperative monitoring and analysis, and improved targeting of grant and assistance programs. The scientists also generally agreed that developing new, additional incentives for non-Federal participation in ecosystem management efforts is important.

c. Ecosystem Management Goes Beyond Preservation vs. Production. The scientists stressed that ecosystem management is not a synonym for "locking up" lands now managed for multiple uses.⁸ Rather, it is a more scientific means for understanding the long-term potential of the land, which assists policymakers in meeting human needs while preserving a wider range of long-term options and values. Management that ignores ecosystem boundaries or that tries to preserve isolated parcels of land, neglects the possibility that ecological functioning on adjacent lands essential to sustaining the isolated parcel may be impaired.

Although wilderness areas can be important components of ecosystem management, there was general agreement that maintaining ecosystem integrity across whole landscapes will frequently involve active management.

⁸ The BLM and National Forest Service manage their lands under a "multiple-use, sustained-yield" policy, which mandates a combination of diverse uses—including recreation, range, timber, minerals, and wildlife—that maintain long-term, high-level production of renewable resources without permanently impairing the land's productivity and environmental quality. See, e.g., 16 U.S.C. § 528-531.

The participants pointed out, however, that an ecosystem perspective reveals that certain areas, such as low-elevation lands and other productive forestlands, are not adequately represented in the Federal Wilderness System.

Several participants emphasized that even as management goals are broadened beyond short-term commodity production and wilderness values, supporting stable human communities should remain a significant part of ecosystem management.

d. New Approaches Should Not Be Discretionary. A number of the participants believed that the Federal lands provide the best opportunity for instituting effective ecosystem management policies. There was general agreement among the scientists, however, that for the policy shift to ecosystem management to be successful, clearer goals and directions than those currently articulated will need to be provided to Federal managers on the ground. There was general agreement that nonbinding policies will assure, for the most part, the continuation of "business as usual" within and among the Federal land management agencies. Finally, the discussions revealed a widely shared view that strong leadership from the highest levels in the government is a necessary prerequisite for ecosystem management to make any kind of substantial difference.

e. Science Must Be Integrated Consistently Into Management. The scientists emphasized that the link between scientists (both within and outside the Federal agencies) and managers must be clear, direct, and strong. The role of science in management decisions, the group generally concurred, is ill-defined and should be formalized. To improve existing knowledge and steer management over time, the scientists stressed that experimental approaches and continual monitoring should be an integral part of ecosystem management. The agencies should also build in flexibility or otherwise anticipate the need to manage on the basis of new information.

f. Agencies Should Develop Joint or Compatible Data Bases. The consensus among the scientists was that data bases concerning natural resources and processes are inadequate in or uneven among some regions. Where good data are available, data from one agency is often in a form that is not complementary or coordinated with that of another agency. The group also recommended that the basic science for ecosystem management be augmented.⁹

g. Institutional and Budgetary Reforms are Necessary to Remove Obstacles to Ecosystem Management. The scientists generally agreed that ecosystem management policies should be accompanied by institutional reforms. Possible reforms include the consolidation or adoption of land management units that reflect ecological boundaries. Ecosystems are carved up not only by mixed land-ownership patterns, but by different units of the same agency. The scientists also emphasized that restrictions or limitations in agency budgets pose an impediment to integrated ecosystem-based approaches on both an interagency and intragency basis. For example, they pointed out, some of the agency budget processes are based upon commodity production. Accordingly, budget reform as part of the evolution toward ecosystem management is deemed important.

⁹ Similarly, the National Research Council concluded in a report on the new National Biological Survey that organizing existing information, making it more readily available, and coordinating future data collection and exchange are imperative if existing knowledge is to be used effectively. *A Biological Survey for the Nation*, National Research Council, October 5, 1993. Finally, it should be noted that the U.S. Geological Survey is coordinating an ongoing effort to make the Geographic Information System consistent across agency lines, which is an important step toward creating compatible data bases.

B. SOUTH FLORIDA ECOSYSTEM HEARING: THE ENVIRONMENT AND ECONOMIES AT RISK

1. BACKGROUND

The second event of the committee's Ecosystems Initiative examined the status of efforts to manage natural resources trust assets within the Greater Everglades Ecosystem, home to three national parks, a national preserve, six national wildlife refuges, and the Florida Keys Marine Sanctuary. On July 31, 1993, the committee's Subcommittee on National Parks, Forests and Public Lands and Subcommittee on Oversight and Investigations held a joint oversight hearing in Key Colony Beach, Florida, with the Subcommittee on Environment and Natural Resources of the Committee on Merchant Marine and Fisheries. The hearing was designed to place special emphasis on the Florida Bay. A temporary breakthrough in a lawsuit over Everglades water quality attracted additional attention.

The Greater Everglades Ecosystem is approximately 200 miles long, stretching from the headwaters of the Kissimmee River below Disney World to the coral reefs off the Florida Keys. Florida Bay lies between the Keys and the southern end of mainland Florida. The world-renowned Everglades sawgrass marshes are half their historical size due to agricultural development and urbanization. The ecological health of what remains, found mainly within Everglades National Park, has declined over time due to the continued disruption of an essential ecosystem process that sustains the park—the seasonal flow of water from the north (Lake Okeechobee) through the Everglades down into Florida Bay. A massive system of dikes and canals built by the U.S. Army Corps of Engineers for controlling floods and augmenting water supplies in the region now chokes off the park's historic nourishment. The flood-control works divert an estimated 2.5 million acre-feet of water a year into the Atlantic Ocean.

Much of the water that does make it into the park is the polluted runoff from sugarcane farms. This pollution is further impairing the park's ecology by changing the dominant plant community to pollution-tolerant cattails. This erosion of the ecosystem's historic characteristics reduces the habitat of native plant and animal diversity unique to the Everglades.

The Federal Government filed suit in 1988 against the State of Florida for failure to enforce State water quality standards against the farmers. A 1991 settlement established pollution restrictions for water entering the park and the Loxahatchee National Wildlife Refuge, and required construction of filtering marshes below the Everglades Agricultural Area (EAA) as well as on-farm pollution reductions.

Some 60 lawsuits have been filed in State court by agricultural interests to block implementation of the Federal court settlement.¹⁰ Shortly before the committee's field hearing, the Federal Government, State government, and the two largest agricultural interests agreed to a statement of principles as a first step toward settling the State court challenges. The principles called for increasing the area of filtering marshes and changing the timing and quantity of water flowing from the EAA to mimic more closely historic flows in the ecosystem. At the time, it was anticipated that these and related restoration efforts would be part of an agricultural industry, Federal, and State government plan estimated to cost \$465 million.

¹⁰ Hearing at p. 17.

In January 1994, the Federal Government reached an agreement with Flo-Sun (one of the major sugar producers) to pay \$100 million over the next 20 years to help finance cleanup activities. The company also agreed to refrain from further litigation blocking the earlier agreement. Litigation by other affected parties continued. Recent action by the Florida State Legislature regarding the financing and other arrangements for the cleanup may have the effect of superseding most litigation.

Farther south in the Greater Everglades Ecosystem, the southern portion of Everglades National Park, encompassing most of Florida Bay, has undergone changes that scientists have described as catastrophic. The biological diversity, productivity, and stability of Florida Bay has deteriorated rapidly. Since 1987, 55 square miles of seagrass have died and microscopic algae blooms have turned spectacularly clear waters dark green. The algae blooms at the time of the hearing covered 600 square miles of the 1,000-square-mile bay. Populations of water birds and juveniles of many fish species appear to have dropped. Florida Bay is the principal nursery for the largest commercial and sport-fishing fisheries of Florida. The number of pink shrimp caught after maturing in Florida Bay is near a 30-year low, a die-off of sponges threatens a major decline in spiny lobsters, and mangroves are dying at an alarming rate. The ecological dysfunction in the bay, finally, threatens interconnected portions of the regional ecosystem, including the coral reefs through which bay waters circulate.

Florida Lieutenant Governor Buddy MacKay testified first at the day-long hearing, followed by four panels that included scientists, community and business representatives, environmental groups, agriculture and tribal representatives, and State and Federal officials. Seven members of Congress participated in the hearing: Representatives Bruce Vento, Larry LaRocco, Carlos Romero-Barceló, Peter Deutsch, Carrie Meek, Clay Shaw, and Chair George Miller. Members were joined by Senator Daryl Jones of the Florida State Legislature. Findings from the hearing relevant to the committee's Ecosystem Initiative are set out below.

2. FINDINGS

a. The Natural Resources Trust Contributes to Regional Economic Health. Witnesses at the hearing highlighted that the natural values, productivity, and health of the Greater Everglades Ecosystem are an integral part of South Florida's economy. The Honorable Jack London, Mayor of Monroe County, testified:

Today, you will hear from commercial and recreational fishermen, business people, dive shop operators, hotel/motel owners, and others whose livelihoods depend on an uncontaminated marine environment. . . . To the citizens of the Keys, the bay is more than a magic place, it is a critical component of the greater ecosystem which provides tens of thousands of jobs¹¹

Although tourism alone translates to \$2 billion a year for the Keys, the hearing identified other large economic sectors that rely on a healthy natural ecosystem. Real estate sales alone in Monroe County, Florida, exceed \$250 million annually, and mortgage-loan closings are presently worth over \$400

¹¹ Hearing at p. 42.

million.¹² The commercial and recreational fishing industry in the region generates more than a \$100 million in annual revenue.¹³

Based on renewable resources, this portion of the region's economy is sustainable in the long-term; it is, however, directly dependent on the health of the ecosystem that produces and sustains the natural resources. The consequences of an impaired ecosystem are not limited to the Keys or to the tourism and natural resources sectors. The ecosystem's urban population to the east, for example, depends on drinking water from the Biscayne Aquifer, an underground component of the ecosystem no longer recharged naturally as in the past. This forces the urban population to import drinking water during droughts.

b. Efforts To Address Environmental Problems in the Region Must Be Formulated On An Ecosystem Basis To Be Effective. The scientists at the hearing consistently stressed that the Greater Everglades Ecosystem is an interconnected, interdependent landscape and seascape that together form a functioning ecosystem. Dr. Ron Jones explained it simply:

One of the things people need to understand when they examine the Everglades is that it is a very complete and intact system, and what we do very, very far to the north affects many things that occur all the way down here in Florida Bay.¹⁴

State and Federal policymakers' testimony endorsed this view. Lieutenant Governor Buddy MacKay, for example, recounted two decades of involvement in piecemeal State and Federal responses to seemingly isolated problems, concluding:

[I]n summary, we have been developing partial solutions. We have been struggling to get our vision and our understanding of the problem to be as complete as it needs to be to deal with this entire system The lessons are we have got to move faster—we have got to stay together.¹⁵

A scientific assessment of the status of Florida Bay completed after the hearing provides a clear illustration of the importance of taking an ecosystem-wide perspective:

A restoration activity which may offer some benefits to the Bay ecosystem, such as "reopening" channels through the Keys [to restore historic water circulation rates] may have deleterious effects on patch and barrier reefs within the Sanctuary if the transport of harmful algal blooms or water of high nutrient content and excessively high or low salinity offshore is increased.¹⁶

Although a comprehensive, fully integrated plan for the ecosystem is not yet in place, interagency efforts are under way to develop a coordinated ecosystem restoration plan. [See section "h" below.]

¹² Hearing at p. 52.

¹³ Hearing at p. 188.

¹⁴ Hearing at p. 29.

¹⁵ Hearing at pp. 18-19.

¹⁶ *Federal Objectives for South Florida Restoration*, A Report of the Science Subgroup of the Interagency Working Group ("Report"), November 15, 1993, at pp. 16-17.

c. Ecological Restoration After Problems Have Developed Is Expensive, Slow, and Contentious. The hearing demonstrated that the economic and social consequences of restoring a degraded ecosystem can be quite high. The cost of restoration already planned for the Greater Everglades Ecosystem exceeds a billion dollars. This cost, moreover, reflects restoration activities developed without a comprehensive, integrated plan. In the upper watershed, the Army Corps of Engineers will spend five times more to restore the Kissimmee River than it spent to turn the river into a concrete canal 30 years ago.¹⁷ In the central watershed, the half-billion-dollar pollution prevention effort to protect Everglades National Park is slated to take 11 years, at a minimum.¹⁸ Estimates of the cost of delaying the start of its implementation have been placed at almost \$3 million a year.¹⁹ The effort, moreover, is only designed to meet interim standards that will become more stringent over time.

Enforcement of existing laws through litigation, though sometimes necessary to ensure that difficult policy decisions are made, has proven an expensive, time-consuming tool where, as in South Florida, some major interests are vested in maintaining the status quo.²⁰ Beyond the millions of public dollars spent on the lawsuit, personnel who might otherwise work on restoration activities were tied up in court. For example, State officials at one point were scheduled six hours a day, five days a week, for nine straight months of legal depositions.²¹

Finally, even when ecological priorities are clear, environmental restoration can be highly controversial. Although there is general consensus among scientists and lawmakers in South Florida about the desirability of purchasing and flooding land in the East Everglades to mimic historic fresh-water flows into Florida Bay, some current landowners are unwilling to sell their land.

d. Ecosystem Management Provides an Opportunity to Improve the Fiscal Soundness of Ecosystem Restoration Efforts. In addition to the billion dollars committed to South Florida Ecosystem restoration, billions more are being spent on environmental restoration elsewhere in the country.²² As in South Florida, these efforts were developed before comprehensive, interagency ecosystem restoration plans were developed.

Thomas Martin, on behalf of the Everglades Coalition, a group of 28 environmental and conservation organizations, suggested at the hearing that Congress or the Administration put together an integrated, cross-agency budget for Greater Everglades Ecosystem restoration on a regular basis. In this manner, restoration expenditures, agency responsibilities, activities funded, progress made, and whether expenditures were spent based on ecological priorities could be tracked for the first time.²³

¹⁷ Hearing at p. 17.

¹⁸ *Everglades Restoration Issues*, U.S. Department of the Interior, July 1993.

¹⁹ *Ibid.*

²⁰ At the hearing, Congressman Shaw, for example, stated: "I think this panel knows that if [former U.S. Attorney] Mr. Lehtinen had not taken the courageous step some years ago in bringing this lawsuit, which was controversial at birth and remains very controversial today, nothing would have been done." Hearing at p. 12.

²¹ Hearing at p. 17.

²² For example, expenditures for the Great Lakes, Chesapeake Bay, and Prince William Sound are an estimated \$9 billion, \$1.1 billion, and \$1 billion, respectively.

²³ Hearing at p. 70.

e. "Environment vs. Jobs" Tradeoffs In the Region Are "Jobs vs. Jobs" Tradeoffs. P.L. 103-219, amending the Everglades National Park Protection and Expansion Act of 1989, authorizes the Federal Government to contribute funds to the acquisition of lands in the East Everglades so that they may be flooded as a first step toward stabilizing Florida Bay. General agreement has been reached that it is necessary to flood lands in the East Everglades that are being farmed, giving rise to a seeming tradeoff between protecting the bay and maintaining farm jobs. The legal challenge to force agriculture to stop polluting the Everglades National Park creates the appearance of a similar tradeoff: protecting the park vs. maintaining farm jobs. Nevertheless, as a report by the Congressional Research Service issued prior to the hearing emphasizes:

It should be stressed at the outset that *the debate is not jobs versus environment or birds versus farmers*. The choices are more difficult: agricultural jobs versus fishing and tourism jobs; abundant water as currently delivered versus safe, long-term, salt-free water supplies; restoration of water flows versus protection of some areas from flooding . . . and so on.²⁴ (Emphasis in text.)

Even viewed in terms of jobs vs. jobs, substantial public subsidies have promoted ecologically harmful farming practices over more sustainable jobs and natural values. Both the East Everglades farmers, in the form of flood control, and the sugarcane growers, in the form of price supports, receive substantial public assistance. Sugarcane growers have also failed to pay for cleaning up their pollution for years. Looking at the Greater Everglades Ecosystem as a whole, rather than in a piecemeal fashion, enables policymakers to understand that activities within the Everglades Agricultural Area, for example, have economic and employment consequences in the Keys. Similarly, this approach helps policymakers understand the importance of East Everglades agricultural lands to the restoration of Florida Bay and employment in the Keys.

f. The Public Trust Is Not Being Adequately Protected By Federal Agencies. The Department of the Interior, charged by law with conserving the Everglades National Park so as to leave it "unimpaired for the enjoyment of future generations," testified that the park is dying.²⁵ Interior officials have known for more than 25 years that Army Corps of Engineers water-management policies disrupt the natural processes upon which the health of the park depends. Yet the park has few, if any, effective tools to require even a Federal agency to stop degrading the park.²⁶ The Corps, for its part, is responsible for a project that has among its explicitly authorized purposes "preservation of Everglades National Park" and "flood control"—potentially conflicting purposes both for the Corps to reckon with on its own as well as for a Federal agency with a fiduciary duty to protect the park.²⁷

²⁴ Hearing at p. 211.

²⁵ 16 U.S.C. § 1; Hearing at p. 131.

²⁶ See, e.g., Robert Keiter, "Taking Account of the Ecosystem On the Public Domain: Law and Ecology in the Greater Yellowstone Region," *Univ. of Colorado L. Rev.*, Vol. 60:923-1007 (1989); Sax and Keiter, "Glacier National Park and Its Neighbors: A Study of Federal Interagency Relations," *Ecology Law Quarterly*, Vol. 14:207-263 (1987).

²⁷ Hearing at p. 187.

In a situation of ambiguous laws and responsibilities, the agencies are left to work out their differences voluntarily at their discretion, with little or no accountability. Despite authority granting the Corps authority to protect the park, so far the Corps has made only nominal changes to its system. The Corps, in response to Congress' most recent direction in the Water Resources Development Act of 1992, is now studying the feasibility and advisability of making changes to, among other things, protect water quality. The studies are estimated to take five years. Upon completion, the Corps will report to Congress with its recommendations. In spite of a multitude of existing laws and its verbal testimony to the contrary, the Corps' written testimony at the hearing asserts that "[a]dditional authority will probably be required to implement many of the proposed [restoration] projects."²⁸

g. Fragmented Management Responsibilities Reduce Public Accountability. Tom Martin, on behalf of the Everglades Coalition, also contended that the diffused responsibilities for the health of the Greater Everglades Ecosystem among numerous Federal agencies in the region reduces public accountability and renders effective public oversight of agencies' actions difficult. Martin also proposed that interagency, ecosystem-wide cooperation be mandated in law and that one agency be held legally responsible for ecosystem restoration in the Everglades. He recommended that this lead agency have the power to resolve disputes among Federal agencies. To further increase public accountability, he proposed that Congress require annual, coordinated ecosystem restoration plans along with progress reports. The reports would be tied to congressional budget cycles, so that Congress would be more aware of funding needs for restoration and could be sure that Federal agencies are working together efficiently on shared priorities.

h. Federal Ecosystem Cooperation Is Proceeding On A Regional Scale Under A Voluntary Memorandum of Understanding (MOU). On September 23, 1993, shortly after the Committee on Natural Resources hearing, five Federal departments and the EPA—representing ten Federal agencies—signed an Interagency Agreement on South Florida Ecosystem Restoration.²⁹ Explicitly recognizing the need to work with the State of Florida, the South Florida Water Management District, and tribal and local governments, the agreement sets up a Federal interagency task force to "coordinate the development of consistent policies, strategies, plans, programs, and priorities for addressing the environmental concerns of the South Florida Ecosystem."

A working group of the task force is to meet at least quarterly. The group, among other things, is to "[d]evelop an integrated financial plan, which includes the coordination of Federal funding requirements, in conjunction with State and local funding and funding from private sources." Meetings are open to the public and an opportunity for public comment is provided at each meeting. To address interagency disagreements, the group is to "facilitate the expeditious resolution of issues by quickly elevating them to the [higher level] Task Force."

While this is an important step toward ecosystem management in the Greater Everglades Ecosystem, the agencies ultimately remain largely unaccountable to the public. The voluntary, unenforceable nature of the

²⁸ Hearing at p. 151.

²⁹ The participating agencies are the National Park Service, the Fish and Wildlife Service, the U.S. Geological Survey, the National Biological Survey, the Bureau of Indian Affairs, the National Oceanic and Atmospheric Administration, the Soil Conservation Service, the U.S. Attorney for the Southern District of Florida, the EPA, and the Army Corps of Engineers. See MOU, Sept 23, 1993.

arrangement appears to leave unaddressed concerns expressed at the hearing that comprehensive Federal efforts in the region will slow down once the litigation is resolved.³⁰

i. Preliminary Federal Restoration Objectives Have Been Developed for the Region and Subregions. On November 15, 1993, a science subgroup of the Federal interagency task force completed a report entitled *Federal Objectives for South Florida Restoration*. The report defines the following vision for ecosystem restoration:

[W]hat is sought is a partnership between man and nature in developing a healthy economy within a fragile, but highly supportive ecosystem. Sustainable ecosystems integrating economic and ecologic processes is the restoration target for the overall South Florida Ecosystem

The idealized goal for the natural areas of South Florida is to restore to predrainage conditions the landscape-scale hydrologic and ecologic structure and function in order to reinstate ecosystem integrity and sustainable biodiversity. The goal is an ecosystem that is resilient to both chronic stresses and catastrophic events with as little human intervention as possible.³¹

More specific restoration objectives and measurable success criteria were formulated for the entire region as well as nine subregions. Three options were developed for the restoration of the hydrologic system, differing as to the amount of land area required for restoration and the risk involved to the sustainability of the ecosystem.³²

At the regional level, success is defined by 16 criteria, including reinstatement of natural hydrology, increase of native landscape diversity, increase of native faunal diversity, and reappearance of missing vegetative landscapes. For each subregion, ecological characteristics are described, restoration objectives are established, and success criteria are defined. The report emphasizes that each subregion management unit is part of an integrated regional ecosystem approach: "*[a]n important lesson from history is that, in this ecosystem, any successful restoration plan developed must encompass the whole regional system, not geographic areas in isolation.*"³³ (Emphasis in text.)

The report was distributed for public review and will eventually be the basis for recommendations by the Federal interagency task force to the Corps for a comprehensive, preliminary study to determine whether it is advisable

³⁰ Hearing at pp. 170 and 176.

³¹ Report at p. 19.

³² *Federal Objectives for South Florida Restoration* at p. 23 explains these options as follows:

The "unconstrained," which recognizes and accepts the economic and social structure of South Florida but makes repairs to the hydrologic system even on developed urban lands, provides the greatest chance of success in restoring the South Florida Ecosystem. The "minimum" involves the most risk [although it is designed to result in a sustainable ecosystem] because it minimally addresses losses of wetlands, hydrologic function, and habitat heterogeneity. In between are many possible increments that can increase the success potential of the restoration effort, one of which is outlined in this document.

³³ Report in Introduction, p. 1.

to modify its flood-control project to improve environmental quality and protect the Biscayne Aquifer and urban water supply.

C. COLORADO WORKSHOP: LEGAL AND INSTITUTIONAL BARRIERS TO ECOSYSTEM MANAGEMENT

1. BACKGROUND

The committee's final Ecosystem Initiative event brought together former public land managers, natural resources legal scholars, a cross section of current leadership of the Department of the Interior, and Members of Congress for a workshop on the legal and institutional barriers to ecosystem management.³⁴ Prior to the workshop, committee members and staff received extensive briefings on a two-day field trip through the northern Colorado Rockies while observing ecosystem management implementation on the ground. Four members participated in the September 19 workshop, Representatives Karen Shepherd, Larry LaRocco, David Skaggs, and Chair George Miller. Findings from the discussions are set out below.

2. FINDINGS

a. Ecosystem Management Has a Set of Core General Principles. Through the course of the workshop, participants generally agreed on a number of core ecosystem management principles:

- managing across whole landscapes or watersheds taking into account ecological time frames;³⁵
- maintaining biological diversity and essential ecological processes;
- encouraging sustainable economic development and social well-being;
- utilizing cooperative institutional arrangements (interagency and Federal/non-Federal);
- integrating science into management;
- improving opportunities for public and stakeholder involvement and facilitating collective decisionmaking;
- working toward a goal of ecological, socioeconomic, and cultural sustainability; and
- adapting management over time based on conscious experimentation and routine monitoring.

³⁴ On March 8, 1993, Chair Charlie Rose of the Subcommittee on Specialty Crops and Forestry of the Committee on Agriculture and Chair George Miller of the Committee on Natural Resources asked the General Accounting Office to conduct a detailed examination of the status of Federal agency ecosystem management efforts and to identify the institutional and legal impediments that stand in the way of coordinated ecosystem protection and management. The report is expected in 1994.

³⁵ An example of management that considers ecological time frames can be found in the FEMAT report, where management options were designed to ensure for a century or more ecosystem persistence and viable populations of plant, animal, and fungi species associated with the ecosystem. Such a time frame is chosen to reflect the length of time over which important ecological changes occur.

b. Current Law Poses Obstacles to Effective Implementation of Ecosystem Management. The legal experts in the group agreed, for the most part, that Federal agencies have discretionary authority to implement ecosystem management under existing law.³⁶ At the same time, there was a consensus that maintaining healthy ecosystems is not affirmatively required by existing law. A number of the participants believed that, unless binding minimum standards for ecosystem management are set by law or regulation, significant and systematic improvements under new policies are unlikely.

There was a general recognition that some statutes, such as the National Forest Management Act and the Endangered Species Act, provide a foothold for the agencies to move toward ecosystem management. The application of these laws, however, may not coincide with the natural boundaries of the ecosystem. They may be applied on a limited basis, e.g., a species-by-species basis rather than in a more comprehensive and proactive manner; and the interpretation and implementation of these laws "on the ground" may vary widely from one area to another.

The group identified other barriers to ecosystem management. Substantive laws outside the land management framework, such as hard rock mining laws or some appropriations riders, allow activities that can result in the ecological impairment of public lands. Concerns were expressed that procedural laws may also limit agencies' flexibility. Some believed that issues regarding the applicability of the Federal Advisory Committee Act will prove difficult to manage. Management units set by statute, planning processes, and time constraints were also highlighted as potential obstacles to implementing ecosystem management.

Moreover, several participants believed that agencies may lack important ecosystem management tools. For example, land exchanges between Federal agencies and non-Federal landowners were identified as cumbersome, inhibiting consolidation of ownership patterns that could facilitate ecosystem management. Similarly, the ability to adjust management in a timely fashion based upon monitoring results may be constrained by slow agency planning, environmental review, and decisionmaking processes. Finally, it was suggested that agencies should review their existing regulations to identify opportunities to promote ecosystem management or at least remove impediments.³⁷

Participants, for the most part, believed it was important for the Federal agencies to review existing laws to determine the legal barriers to ecosystem management and that such a review should include more than the natural resources management agencies, but include those whose activities affect the

³⁶ Note, however, that the *Task Force Report on Sustaining Long-term Forest Health and Productivity*, p. xiv (1993) of the Society of American Foresters (SAF) finds "traditional sustained-yield management insufficient if we are to achieve the long-term productivity of all forest values, at the landscape level. . . because, among other things, it does not ensure ecosystem integrity. See also, *Multiple Use and Sustained Yield: Changing Philosophies For Federal Land Management?*, The Proceedings and Summary of A Congressional Research Service Workshop (March 5 and 6, 1992).

³⁷ The FEMAT report, for example, recommended that: The federal forest management agencies in collaboration with regulatory agencies and public and private interests should develop a planning process that addresses the contemporary requirements of ecosystem management, multiple scales, public participation, current law, non-Federal land relationships, adaptive management, impartial review, and multi-agency oversight. *Forest Ecosystem Management* at p. VIII-40.

condition of lands and waters under the jurisdiction of the Federal Government.

c. Powerful Budgetary and Other Incentives Cut Against Ecosystem Approaches. Although several participants believed that tight budgets will bring agencies together in an effort to share resources and avoid duplication of effort, many agreed that the BLM and Forest Service budgets currently encourage commodity production over ecosystem health and other noncommodity values. Written and unwritten policies tying promotions to commodity production were identified as another area of concern. Moreover, existing law allocates receipts from commodity extraction to local communities, creating significant pressure against shifting management from output targets to restoring the ecological health of land.

Where funding is allocated for noncommodity values, it is allocated to specific programs and functions with little reprogramming flexibility. Agencies face difficulties, as a result, pooling resources within and outside their agencies to work on integrated, multidisciplinary projects. Given these disincentives, participants stressed that budget reform could be a critical success factor influencing how effective ecosystem management policies can be.

d. Supporting State and Local, Tribal, and Private Landowner Involvement in Ecosystem Management Is Critical. A general consensus was reached at the workshop that Federal agency efforts to work with private landowners and non-Federal entities will be essential if agencies are to manage large ecosystems on a sustainable basis. They also agreed that current agency outreach programs are deficient. The participants believed that Federal agencies and the Congress should improve and expand such programs, emphasizing the need to support "bottom up" initiatives started by States, grassroots groups, and others. At the same time, many of the participants agreed that non-Federal participation in cooperative efforts should remain voluntary in nature and that positive incentives rather than regulatory approaches should be encouraged. It was also stated that agencies should be more aggressive in identifying Federal programs and other assistance that can be made available to communities which are moving out of resources-based economies.

e. Agencies Should Look for Opportunities to Reorganize Offices and Programs Along Ecological Lines. Several participants highlighted agency restructuring due to budget constraints and implementation of National Performance Review recommendations create a window of opportunity for agencies to make institutional changes to support ecosystem-based management. Examples discussed included shifting from existing administrative units and regional boundaries to more ecological ones. Institutional streamlining would begin to address the concerns of some at the workshop that a policy that increases cooperation within and among Federal agencies must reckon with increased transaction costs associated with cooperative planning and decisionmaking.

f. Federal Agencies Should Reexamine Their Role In Land Management Decisionmaking. Workshop participants discussed at length the particular role that Federal managers should play in the ecosystem management process. Agencies are currently subject to competing demands and typically seek to "balance" them. This encourages competing interests to take extreme positions, leaves few satisfied in the end, and encourages recourse to the political process to influence agency decisions. Agencies serve as referees in a "lose-lose" situation.

A number of participants strongly believed that agencies could reduce conflicts through more collaborative approaches. They suggested that Federal personnel act as "integrators" and create processes that solicit and empower the public and stakeholders to work out more collective decisions. One

workshop participant expressed this concept as a rule of thumb: "Empower Stakeholders—Disempower Tyrants." Negotiated rulemakings in which Federal agency employees participate as equals in the development of a regulation and sign on to any ultimate agreement, were offered as a useful model for ecosystem management processes.

In discussing this issue, several participants emphasized, however, that minimum standards and guidelines established at the national level must create "sideboards" for more local, collaborative approaches. In the case of irreconcilable conflicts, some took the position that national interests should win over local interests.

g. Federal Agencies Should Establish Clear Ecosystem Management Goals and Procedures That Allow For Flexible Implementation and Decentralized Decisionmaking. Given the competing demands on Federal personnel, participants generally agreed that ecosystem management policies need to provide clear, practical guidance. Once overarching goals are set, however, many stressed the importance of ceding as much implementation authority as possible to managers in the field. Greater authority in agency field offices would allow Federal employees to work more effectively with non-Federal players and in collective decisionmaking processes. The effectiveness and credibility of Federal personnel participating in cooperative efforts, it was argued, turns on having the authority to make and keep commitments. This delegation of power was viewed as particularly crucial in areas with mixed land ownership. Unlike the ecosystem-based planning and procedures now in place in the Pacific Northwest, most Federal initiatives cannot hope to rely on strategies that ignore non-Federal land management.

The significance of this issue was reinforced by the historical perspective offered by a participant who reviewed lessons from cooperative river basin planning that was tried a number of years ago. The participant concluded that the unwillingness of the executive branch, Congress, and the States to cede power to regional decisionmakers accounted for its eventual abandonment. This pointed to the fact that a high degree of cooperation is a necessary but not sufficient factor that should be supplemented with delegation of authority.

h. Agencies Should Increase the Integration of Economic and Social Concerns Into Agency Planning and Activities. A consistent theme throughout the workshop was that ecosystem-based management of the Federal lands should support sustainable economies and communities. Several participants emphasized that cultural sustainability must also be an explicit aim; cultural values form the foundation of stable communities that appreciate the importance of a healthy natural resources base and sound stewardship. The point was also raised again that agencies should provide support and technical assistance to communities that seek to diversify their economies and make the transition away from unsustainable activities.

The Forest Service, in part through access to other Department of Agriculture programs, is able to provide some support to help communities diversify their economies. Other agencies have some capabilities in this area, but it was felt that programs, authorities and funding for this work in the Federal natural resources agencies were insufficient. The workshop participants generally agreed that the agencies and Congress could benefit from a review of existing programs to determine how well they fit with ecosystem management and ensure that agencies have the means to address the socioeconomic dimensions of ecosystem management in a coordinated manner.

i. Ecosystem Management Should Reduce Endangered Species-Related Conflicts. Agencies currently protect the thousands of plant and animal species associated with the public lands, by and large, through an individual-species focus. By maintaining the health of whole ecosystems, however, not only is the capacity of ecosystems to produce goods and services over the

long term protected, but the basic requirements for sustaining biological diversity are fulfilled.

The workshop participants generally agreed that one driving force behind ecosystem approaches is to address Endangered Species Act requirements in as efficient a manner as possible. The participants, for the most part, believed that moving to ecosystem management offers not only a scientifically sound way to prevent species extinction, but also a way to prevent species from becoming endangered in the first place. In this manner, ecosystem management should reduce the risk, expense, and rigid management intrinsic to addressing species survival once they are in danger of extinction. Thus, ecosystem management should be a useful prevention tool despite its having been utilized to date in a reactive manner. One participant stressed that conserving species should not be viewed as a constraint on outputs but prudent management of our natural capital.

j. There Are a Number of Appropriate Ways for Congress to Address Ecosystem Management in Law.³⁸ Most of the participants agreed that, in addition to the option of closely monitoring executive branch implementation of ecosystem management policies over the near term, Congress should consider codifying or promoting its implementation in new, straight-forward ways.

At this point, a number of the participants agreed that Congress should not attempt to create highly detailed substantive standards for land management agencies. The participants also believed that Congress should avoid creating any significant new procedural requirements unless it streamlines existing processes. With that in mind, the following basic alternatives for Congress were generated over the course of the workshop discussions:

- Supplement existing land management authorities with a short amendment establishing an enforceable, substantive ecosystem management mandate and minimal procedural changes.
- Authorize a number of large-scale ecosystem management efforts throughout the country and/or where requested by States.

³⁸ The Acting Chief of the Forest Service and the Director of the BLM testified before the Senate Subcommittee on Agricultural Research, Conservation, Forestry and General Legislation on November 6, 1993, regarding the need for additional legislation to implement ecosystem management. David Unger, Acting Chief, stated:

We are looking at several areas where we may need to change our current policies to implement fully ecosystem management. There may be areas where changes in our existing statutory framework would be desirable. We do know that we will need to change our regulations to streamline our land management planning process and to base it upon ecosystem management principles. We expect to propose these regulatory changes in early 1994.

Jim Baca, then Director of BLM, testified:

I believe the BLM presently has the authority to do [ecosystem management] without further legislation, although amendments to existing law could enhance the BLM's management capabilities.

Finally, Jack Ward Thomas, the Chief of the Forest Service, stated at forest reform hearings held by the Committee on Natural Resources on February 3, 1994, that:

Ecosystem management is a holistic approach to natural resource management, moving beyond a compartmentalized approach focusing on the individual parts of the forest. It is an approach that steps back from the forest stand and focuses on the forest landscape and its position in the larger environment in order to integrate the human, biological, and physical dimensions of natural resource management. Its purpose is to achieve sustainability of all resources.

- Pass an act to protect threatened ecosystems nationwide.³⁹
- Inventory and remove the most significant statutory barriers to ecosystem management and increase the tools available to agencies to practice ecosystem management.
- Incorporate ecosystem management principles into individual laws as they are reauthorized or into new bills as they are drafted.

³⁹ This approach could be used to protect intact ecosystems of national significance as well as threatened systems.

III. CONCLUSIONS AND RECOMMENDATIONS

With regard to the non-Federal "stakeholders"—the communities, individuals, tribal and other governments, and the general taxpayers—key points raised include:

- involve the stakeholders early in the process of developing and implementing ecosystem management plans;
- identify Federal assistance—technical, economic, other—to assist communities and individuals to more effectively respond to altered resource conditions;
- build stronger partnerships and better communication between the stakeholders and the Federal agencies; and
- identify and develop incentives for landowners and others, rather than relying upon a regulatory framework, to encourage cooperative ecosystem management across broad landscapes.

Concerns repeatedly raised about the Federal role include:

- nonexistent, uneven, or discretionary nature of Federal interagency cooperation;
- little or no systematic Federal action to share technical expertise or work cooperatively with non-Federal entities and individuals in mixed-ownership ecosystems;
- the lack of minimum standards or guidance to protect the Federal interest or the public trust;
- the lack of accountability inherent in the present discretionary approach by the Federal agencies; and
- the hurdles posed by a multitude of institutional and legal barriers to ecosystem approaches make implementation of voluntary strategies all the more difficult.

A. RECOMMENDATIONS FOR THE ADMINISTRATION

- ▶ The Administration has launched a pilot program for ecosystem management, which is reflected in their Fiscal Year 1995 budget submission. The pilot ecosystems include the Pacific Northwest forests, the Everglades, Prince William Sound, and the Anacostia River. This is an important step in the right direction. The Administration's policy, however, should be strengthened.
- ▶ The Administration should establish an executive-wide policy to promote the restoration and maintenance of the productivity and ecological integrity of the American landscape. Although the policy should apply to all Federal agencies that significantly affect the environment, to improve Federal care for the Nation's public land and natural resources assets, encourage and protect sustainable economic development and the social and cultural well-being of affected communities, and provide guidance for future action by the Administration and the Congress, the policy should include at least the following:
 - Federal agencies should propose regulatory revisions that include a goal of restoring and maintaining the long-term ecological integrity and productivity of public lands, natural resources, and the ecosystems upon which they depend, to the extent permitted by existing law.
 - Agencies should propose binding regulations to achieve this goal, including consistent ecosystem planning processes, coordinated public participation opportunities, multiple-scale management units, impartial review, multi-agency oversight, and clear accountability. The proposed regulations should be developed with a view toward streamlining existing processes, reducing Federal overlap and conflicts, and increasing collaboration among Federal agencies. The regulations should be developed in consultation with non-Federal scientists and governments.
 - Federal land management agencies should, to the extent authorized by law, support non-Federal ecosystem management efforts and initiate new, cooperative, and voluntary ecosystem management initiatives with State and local governments, tribes, and private landowners.
 - Federal land management agencies should make support for sustainable economic development and communities an integral part of their ecosystem management activities. Agencies should assess their authority to provide such support, and if it is insufficient, seek new authority.
 - Federal land management agencies should, to the extent authorized by existing law, substantially increase efforts to cooperate on a voluntary basis with non-Federal entities and individuals in pursuing ecosystem management opportunities. Agencies should identify what additional authorities may be required to facilitate or encourage this cooperation.

- Federal agencies should identify activities to restore ecosystems, such as the watershed restoration component of the President's Forest Plan. To the extent authorized by law, the agencies should pursue these activities with the dual objective of restoring the ecosystem and providing jobs. Agencies should identify any additional authorities needed to carry out restoration work.
- All Federal agencies should be directed to avoid planning, authorizing, funding, or carrying out actions that may impair the long-term ecological integrity of the public lands and the ecosystems upon which they depend.
- ▶ Federal agencies should report to Congress by March 1, 1995, on the specific legal, institutional, budgetary, and other impediments encountered in continuing efforts to promote ecological, economic, and social sustainability in the Pacific Northwest, South Florida, Prince William Sound, the Anacostia River, and other areas which may be included in the Administration's pilot ecosystem management project.
- ▶ As part of the Administration's pilot program, the Federal natural resources agencies should conduct a comprehensive review of existing law and make recommendations to Congress for statutory revisions necessary to:
 - integrate ecosystem management principles into resources management;
 - provide adequate assistance to communities to make transitions necessitated by ecosystem management;
 - provide incentives to non-Federal stakeholders to manage their resources in a manner compatible with the ecosystem management plans on Federal lands; and
 - ensure stewardship of public natural resources assets that maintains the long-term productive and other potential of the public lands.

B. RECOMMENDATIONS FOR THE CONGRESS

- ▶ Congress should closely oversee the evolution of Federal ecosystem management policies within the executive branch to ensure that ecosystem management policies are scientifically sound, enforceable, consistent across agencies where appropriate, and administered efficiently, cooperatively, and effectively.
- ▶ Congress should work closely with land management agencies to reform their budgets to support ecosystem management. To ensure that Federal expenditures for environmental restoration are ecologically and fiscally sound, the Administration should make detailed interagency budget submissions based upon coordinated ecosystem management plans where large-scale restoration efforts involve significant expenditures of Federal funds.

- ▶ Congress should explore alternative ways to supplement Federal land management agency authorities with an enforceable requirement to promote the long-term ecological integrity of the public lands and the ecosystems upon which they depend. Additionally, Congress should work with the Administration to address the legal and institutional barriers identified in this report and by the Administration as part of their pilot ecosystem program.
- ▶ Congress should explore how to modify existing programs or create new programs, as appropriate, to support sustainable economic development and communities as part of Federal and non-Federal ecosystem management processes.
- ▶ Congress should explore alternatives to increase substantially the level of cooperation, communication, and coordination between Federal agencies and the non-Federal community within the same ecosystem.
- ▶ Congress should support measures to encourage and augment efforts to restore ecosystems. Efforts are under way to restore watersheds in the Pacific Northwest as a means of protecting riparian areas, rescuing salmon and other fish stocks which are at risk of endangerment, and providing jobs in the forests. Encouraging ecologically sound restoration activities should be a priority for the Congress and the Administration.

APPENDIX 1

ECOSYSTEM INITIATIVE EVENT PARTICIPANTS

1. Montana Workshop

- Dr. Jack Stanford, Flathead Biological Station, Polson, Montana
- Dr. Wayne Minshell, Ecology Department, Idaho State University, Pocatello, Idaho
- Mark Shaffer, The Wilderness Society, Washington, D.C.
- Andy Hansen, Biology Department, Montana State University, Bozeman, Montana
- Dr. Wendell Hahn, Regional Ecologist, U.S. Forest Service, Missoula, Montana
- Dr. Reed Noss, Oregon State University, Corvallis, Oregon
- Duncan Patten, Arizona State University, Tempe, Arizona

2. South Florida Hearing

- The Honorable Buddy McKay, Florida Lieutenant Governor

Panel 1

- Dr. John Hunt, Florida Marine Research Institute
- Dr. Ron Jones, Department of Biological Sciences, Florida International University

Panel 2

- Hon. Jack London, Mayor, Monroe County, Florida
- Scott Marr, Florida Keys Federation of Chambers of Commerce, Key Largo, Florida
- Capt. Mike Collins, Florida Keys Guide Association, Islamorada, Florida
- Karen L. Lee, Republic Security Bank, Islamorada, Florida
- Christian Fleisher, past President, Upper Keys Hotel/Motel Association, Islamorada, Florida
- Karl Lessard, President, Monroe County Commercial Fishermen, Marathon, Florida

Panel 3

- Thomas D. Martin, Chair, The Everglades Coalition
- James Humble, Vice President and Chief Executive Officer, South Dade Land Corp., and Chair, Key Lime/Avocado Administrative Committee
- George Barley, Chair, Florida Keys National Marine Sanctuary Advisory Council
- Dexter Lehtinen, General Counsel, Miccosukee Tribe of Indians, Miami, Florida

Panel 4

- Bonnie Cohen, Assistant Secretary for Policy, Management, and Budget, Department of the Interior
- Brooks Yeager, Director, Office of Policy Analysis, Department of the Interior
- Dick Ring, Superintendent, Florida Everglades National Park
- Col. Terrence C. Salt, Commander, Jacksonville District, U.S. Army Corps of Engineers
- Billy Causey, Manager, Florida Keys National Marine Sanctuary
- Tom MacVicar, Deputy Executive Director, South Florida Water Management District

3. Colorado Workshop

- Jim Ruch, Grand Canyon Trust, former California State Director, BLM
- Prof. Bob Keiter, University of Utah School of Law
- Prof. Charles Wilkinson, University of Colorado School of Law
- Prof. David Getches, University of Colorado School of Law
- Michael Brennan, Esq., Holland and Hart, former Assistant to the Director, Fish and Wildlife Service
- Frank Gregg, University of Arizona, former State Director, BLM
- Jim Baca, Director, U.S. Bureau of Land Management
- Dan Beard, Commissioner, U.S. Bureau of Reclamation
- Jo Clark, Director of Programs, Western Governor's Association
- John Leshy, Solicitor, U.S. Department of Interior
- Sarah Bates, Assistant Director, Natural Resources Law Center, University of Colorado School of Law
- Larry MacDonnell, Director, Natural Resources Law Center, University of Colorado

APPENDIX 2

SELECTED ECOSYSTEM MANAGEMENT REFERENCES

- Society of American Foresters, *Task Force Report on Sustaining Long-term Forest Health and Productivity*, January 1993.
- American Forest and Paper Association, *Recommendations on Ecosystem Management*.
- *Eastside Forest Ecosystem Health Assessment*, Vols. 1 and 2, "Executive Summary" and "Ecosystem Management: Principles and Applications," April 1993.
- *An Ecosystem Approach to the Conservation of Fish and Wildlife*, U.S. Fish and Wildlife Service, March 1994.
- *Ecosystem Management: Federal Agency Activities*, Congressional Research Service (Report 94-339 ENR), April 1994.



NATIONAL ECOSYSTEM MANAGEMENT FORUM
MEETING SUMMARY

NOVEMBER 16-17, 1993
AIRLIE, VIRGINIA

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THE KEYSTONE CENTER

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The Keystone Center, founded in 1975, is a non-profit organization located in the Rocky Mountains at Keystone, Colorado, 75 miles west of Denver. The Center is organized around three major programmatic areas: (1) The Keystone Science and Public Policy Program, which facilitates the resolution of public policy conflicts through the use of an innovative consensus dialogue approach; (2) The Keystone Science School Program, which provides residential natural science education programs for students of all ages with emphasis on sound scientific understanding of nature and our relationship to the environment; (3) The Symposia on Molecular and Cellular Biology, which offers an annual series of colloquies addressing critical developments in science and research. The Center's programs are funded by grants from foundations, corporations, government, individuals, and in the case of the Science School Program, fees paid by students.

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NATIONAL ECOSYSTEM MANAGEMENT FORUM

Airlie, Virginia
November 16-17, 1993

MEETING SUMMARY

I. INTRODUCTION

Currently, ecosystem management is being discussed as a potentially useful approach to guide natural resource policy and management in the United States and elsewhere in the world. Many initiatives in this area are being considered or are already underway by government agencies, citizen and environmental organizations, companies, tribes, researchers, and others. Most recently, this approach was highlighted in the President's National Performance Review.

The Keystone Center, a non-profit facilitation and mediation organization, was approached by a number of those involved with these initiatives to convene and facilitate a national forum of individuals actively involved with the emerging notion of ecosystem management to critically review how to implement this concept. On November 16-17, 1993, The Keystone Center, with support from the Emily Hall Tremain Foundation, convened the National Ecosystem Management Forum. The Forum focused on the experience of those individuals working with the ecosystem management concept on-the-ground, the role of science in ecosystem management initiatives, how science and on-the-ground experience affect policy, and how policy affects on-the-ground initiatives.

The Forum involved individuals from diverse perspectives and areas of expertise in an interactive discussion to share their knowledge, experiences, questions, and concerns (see attached participant list). Forty-two individuals participated in the two-day roundtable discussion. Approximately 10 observers, including congressional staff and political appointees, attended the meeting and offered comment during the Forum. Participants in the discussion represented: federal agencies; the White House Office of Environmental Policy; researchers; county and state government; citizen and environmental organizations; tribes; and, commodity interests.

The Forum focused on four key questions:

- 1) what are the key components of ecosystem management;
- 2) what are the critical scientific aspects of ecosystem management that will affect successful implementation, including the implications of what is known, what is not known, and what additional scientific information is required;

- 3) what have been the practical experiences of those who have been or are currently involved in applying ecosystem management approaches? What has worked and what has not? What are the implications for policy and practice;
- 4) how do participants view the opportunities and constraints (scientific, institutional, social, financial) of applying ecosystem management in the near term?

Additionally, much of the concluding discussion centered around the role of the federal government in ecosystem management initiatives.

Each part of the agenda— key components, scientific aspects, on-the-ground experience, implications for the future— began with comments from two participants who agreed to briefly state their perspective on the topic. The comments of these "provocateurs" were not intended to represent all viewpoints. Rather, it was hoped that their comments would engage the other participants and provide an environment for a productive and provocative discussion.

This summary, prepared by The Keystone Center, outlines the issues discussed and the range of perspectives expressed. This summary does not represent a consensus of the participants. Instead, it is a collection of ideas and a compilation of disparate points. At times, therefore, readers will find conflicting and contradictory points of view. The purpose of this document is to provide a brief overview of the range of points of view expressed at the meeting, not to serve as a comprehensive summary of participants comments or positions.

II. KEY COMPONENTS OF ECOSYSTEM MANAGEMENT

From The Keystone Center's initial conversations with participants and others involved and interested with ecosystem management, it was clear that people's interpretations, and thus perceptions, of the ecosystem management concept varied— sometimes significantly. Before examining ecosystem science or policy, it seemed prudent to ask the Forum participants to draw upon their experiences to identify key components of ecosystem management. Those identified included:

- clarity of scale (both geographic and temporal);
- nature of participation;
- science;
- economic and social implications;
- monitoring change within ecosystems; and

- clarity of goals/objectives for ecosystems.

Although the original intent was not to define ecosystem management, the components listed above served as the foundation for a working definition that emerged during the second day of the Forum (see Section II F).

A. SCALE

The participants focused their discussion on both geographic and temporal scale. Most attention was given to geographic scale, but because of the dynamic nature of ecosystems, temporal scale was also identified as a key component. Regardless of one's perspective, geographic scale (i.e., the geographic level at which one defines the ecosystem) was identified as a critical variable in the implementation of ecosystem management. The geographic scale determines the boundaries of consideration; it sets the context for action. For example, a watershed, a bioregion or the Great Lakes can all be considered an ecosystem. Thus, the geographic scale selected will determine resolution and scope and will provide a framework for addressing questions, such as: what habitat is considered; what species are of concern; what are the relevant political and institutional boundaries; what are the significant economic activities?

GEOGRAPHIC SCALE

Some participants perceived a need to identify a specific geographic scale at which ecosystem management initiatives should be undertaken. For them, the question of appropriate scale is a determining component of ecosystem management. That is, one must first define the geographic scale before undertaking planning or management activities. It was suggested by some participants that ecosystem management should occur at a small scale. Others believe a larger scale is more appropriate.

Along that continuum, some participants believe that successful ecosystem management initiatives can happen only at a small scale. Others commented that only broad scale initiatives incorporate the necessary connections between the components of an ecosystem. Advocates of small scale geographic initiatives stated that: data can be easily collected; the politics are more easily understood; and, effective and meaningful participation can occur.

Those advocating a larger geographic scale felt that a larger size is needed to capture the complexities of ecosystems and their components. A large geographic scale is needed because that is the scale at which ecosystem processes occur. From their perspective, many of the current natural resource problems are the result of considering resources in isolation and at too small of a scale. Additionally, several participants noted that a larger geographic scale allows one to consider management across institutional and ownership boundaries and provides greater flexibility because it provides more options for scientists, policy makers and natural resource managers.

Several participants suggested that ecosystem management is more difficult at large geographic scales because of current institutional arrangements and scientific complexity. They stated that at large geographic scales, ecosystem management must overcome a number of problems, including: problems resulting from the presence of a variety of agencies with differing mandates; a mosaic of property ownership patterns including private lands; a lack of data; and data collected in incompatible formats.

Reflecting on the discussion regarding scale, many participants commented that ecosystem management can be accomplished at multiple scales because ecosystems, however defined, are hierarchical in nature and are not closed systems. For these participants, the concept of ecosystem management provides a mechanism for looking at resources in a comprehensive manner across political and ownership boundaries. Others noted that ecosystems are fluid, dynamic, and permeable. Thus, any management approach must be flexible enough to expand the boundaries of the defined ecosystem when the need arises. It was suggested by some participants that ecosystem management is a way of thinking at varying scales, not an exercise in drawing boundaries and lines.

As the conversation became more focused, many participants noted that the geographic scale should be determined by the objectives and goals for individual efforts. For example, a watershed scale initiative would not protect grizzly bears in Yellowstone. Thus, a larger scale would be required. Although many people agreed that the objectives should determine the geographic scale, the conversation sometimes returned to a discussion of appropriate geographic scale. It was observed by some participants that although the objectives may determine an appropriate scale for a particular initiative, it is often necessary to look and work across boundaries. Because of the dynamic, permeable nature of ecosystem scale, it was suggested that resource managers should be adaptive and flexible.

In examining the question of appropriate geographic scale, it was observed that defining scale in a marine environment is more difficult because of the: fluid rather than static medium; size of the oceans; and, basic lack of understanding about the functioning of marine ecosystems. For example, while vegetation maps exist for terrestrial systems, similar maps do not exist for marine ecosystem types. Marine ecosystem management efforts are also stymied by a lack of tools to manipulate marine systems. Managers of aquatic ecosystems generally do not have tools such as prescribed fire which can be used by managers of terrestrial ecosystems to maintain and enhance ecosystem health.

Some participants expressed concern that discussions about ecosystem management often focus on the United States' West and its large tracts of land. They reminded Forum participants that significant ecosystems exist in the East which deserve attention. Other participants expressed concern that too often managers, scientists, and policy makers concentrate on ecosystems that have not been significantly impacted by humans. They expressed their belief that systems heavily impacted by humans deserve more attention.

TEMPORAL SCALE

In addition to the many comments on geographical scale, there were participants who identified temporal scale as an important element of ecosystem management. Ecosystems and their components are dynamic through time, thus management must not be conceived of in a static manner. It was observed that the cause of such change can be human driven. A plea was also made to remember that ecosystems function in a time frame much longer than a human time frame. Thus, as ecosystem management is implemented, it is necessary to look beyond the approaches which provide short-term answers. Managing for ecosystems means managing for the present and future.

B. PARTICIPATION IN DECISION MAKING

Participation of diverse stakeholders in the decision-making processes associated with ecosystem management initiatives was identified as a critical element of effective approaches. Individuals representing many different perspectives repeatedly stated that in addition to federal, state, county and private land owners, the public needs to be involved in these planning processes. Historically, the trend has been to involve the former but not the latter. Several participants stated that for participation to be truly meaningful, the various stakeholders in an initiative must be involved in its development and implementation. If involvement is not meaningful, support for the ecosystem management efforts will not result.

It was observed that local people— those people within an initiative's boundaries— need to be involved because they are affected by decisions and because they possess significant knowledge about the resources in question. It was also noted that local people must not only be included in ecosystem management initiatives, but must be brought into the initiatives' planning processes at the beginning so that they have a say in defining the objectives and goals. Specifically, attention was drawn to the role of tribes, and it was stated that tribes need to be included in decision-making processes from the beginning rather than as an afterthought.

The discussion on participation reflected an on-going tension between a primary emphasis on the involvement of stakeholders from a local level versus a broader level (e.g., regional, national). Several participants stated their view that cooperation among stakeholders works best at a smaller scale. From their perspective, at the local level: people are better informed about the intricacies of the resource; they have a sense of community with each other; and, a personal stake in the outcome. Other participants felt that stakeholders representing a broader geographical area— beyond the boundaries of the ecosystem initiative— should be included because of: the permeability of ecosystem boundaries; the specific ecosystem's role in the national context; and, the importance of setting a national precedent with particular management approaches.

Part of discussion regarding appropriate scale was about whether ecosystem management initiatives should be driven from the top-down or the bottom-up. It was observed by some

participants that the source of initiatives has great potential to influence who comes to the table and how the goals and objectives are defined.

C. ECOLOGY, ECONOMY, AND SCIENCE

During the discussion, many participants expressed the view that ecosystem management must consider economic, social, and ecological elements. It was suggested that these three values could be represented as a triangle with each value placed along one side of the triangle. Although the participants did not agree about the relative importance of each element (economic, ecological, and social), it was stated repeatedly by participants that all three elements need to be sustainable. Many participants stressed the importance of balancing ecological, social and economic factors when pursuing ecosystem management initiatives. While some participants believe ecological factors should take precedence over social and economic factors, others saw ecology as secondary to economic and social factors.

It was suggested that ecosystem management was controversial because of values. Because people have different values, they place more or less emphasis on the economic, social or ecological elements of ecosystem management. However, it was also observed that those present at the Forum, despite their different values, have common interests. For some that meant that economy, society, and ecology are not mutually exclusive. For example, economic interests are not necessarily in conflict with biological systems.

ECONOMIC AND SOCIAL

While much of the discussion of ecosystem management focused on the ecological and scientific aspects, the view was widely held among participants that ecosystems necessarily include humans. Thus, they suggested that economic and social factors, including community and cultural values, are an integral part of ecosystem management. However, participants disagreed about the relative importance of economic and social factors in ecosystem management initiatives (i.e., which should be given priority when making management decisions). Some people saw the three elements—ecology, society, economy— as equally important, while others believe that one element, either ecology, society or economy is more important.

ECOLOGICAL

Comments from participants on the ecological components of ecosystem management focused on:

- the importance of marine ecosystems;
- multiple species habitat management versus single species habitat management;
- ecological complexity and multiple indices;

- the importance of systems (i.e., linkages and interactions);
- the balance between ecology and economy; and
- maintenance of biological diversity.

Participants debated the merits of focusing management primarily on habitat or species. Some advocated continuing to manage for species as they are quantifiable. It was noted that current management focuses on a species-by-species approach because of the requirements of the Endangered Species Act (ESA). Others believe that species are part of a system and cannot be managed in isolation of the ecosystems on which they depend. Thus, a more prudent management strategy, according to some participants, would be managing for multiple indices. Several participants said that ecosystem management should result in an improvement over single species management. Thus, for them, a species approach is not sufficient.

It was observed that much of the discussion about science and key components had focused on terrestrial ecosystems despite the fact that 70 percent of the earth's surface is water. Concern was expressed that ecosystem management, as frequently discussed, is becoming equated with land management.

D. MONITORING

Monitoring and surveying were identified as integral components of ecosystem management. (It should be noted that participants often used the terms monitoring, surveying, and data collection interchangeably. Although technically these terms may differ, no attempt was made to identify the distinctions that may exist between them.) It was noted by some that baseline and monitoring data are needed to understand how an ecosystem is responding to management activities as well as natural and human threats. However, concern was expressed about government surveying and monitoring activities on private lands. The fear is that such activities on private lands would lead to takings of private property because of the identification of threatened or endangered species. Some participants also expressed concern that activities on private lands could potentially lead to federal land-use planning and zoning. It was stated by some that the federal government should not become involved in these traditionally local activities.

The importance of actually using monitoring data in management decisions was stressed by several participants. It was suggested that the use of monitoring data in management would be easier now due to new monitoring technology, especially geographic information systems (GIS).

As a part of the monitoring discussion, the establishment of the proposed National Biological Survey (NBS) was identified as an issue of concern by some. Some participants were supportive of the NBS and its goals because they believe it would provide a more complete picture of the

country's biological diversity on all lands. Others expressed concern that the NBS's activities could potentially lead to restrictions on the use of private lands.

A more in-depth conversation about monitoring occurred during the discussions that focused on science.

E. GOALS/OBJECTIVES

Before pursuing ecosystem management initiatives, most participants indicated that clear objectives need to be defined. Participants asked themselves and others about the desired future outcome of ecosystem management efforts. A number of participants stated their view of ecosystem management objectives. These included sustainability of:

- biodiversity;
- social systems;
- economic systems; and
- ecological processes.

While some people stressed the need for national objectives, other participants stated that individual initiatives should establish their own objectives.

On a more macro scale, questions were raised about the goals of ecosystem management and the difference between ecosystem management and current natural resource management activities. It was suggested that answers to these questions will determine individual's reactions to the concept.

F. A WORKING DEFINITION

Although it was not a goal of the Forum to develop a definition of ecosystem management, on the second day, during the continuation of the On-The-Ground discussion, participants began discussing a working definition and goals for ecosystem management. After identifying various components of a proposed definition, a small group met over lunch to refine the definition and goals that had been proposed and discussed by the full group. The resulting definition and set of goals was proposed to the full group after lunch. Following is the resulting working definition that was generally supported by the participants:

Ecosystem management is an approach to environmental management that:

- 1) is at a scale compatible with natural processes;

- 2) is cognizant of nature's time frames;
- 3) recognizes social and economic viability within functioning ecosystems; and
- 4) is realized through effective partnerships among private, local, state, tribal and federal interests.

With a goal of:

preserving, restoring or, where those are not possible, simulating ecosystem integrity as defined by composition, structure and function that also maintains the possibility of sustainable societies and economies.

III. SCIENTIFIC ASPECTS OF ECOSYSTEM MANAGEMENT

The discussion then turned to the critical scientific aspects of ecosystem management that will affect successful implementation, including: what is known; what is not known; and, what kind of science is needed. The discussions focused on:

- data collection/monitoring/surveying;
- use of data; and
- the linkage between science and policy.

A. DATA COLLECTION/MONITORING/SURVEYING

Many participants pointed to the need for establishing baseline information about ecosystems and their resources through surveying and subsequent monitoring. It was suggested that such information is critical for identifying ecosystem management goals as well as evaluating ecosystem management initiatives.

While the need for data was clear, disagreement existed among the participants about the neutrality of data. Some participants said that scientists view data as value neutral (i.e., just information). From their perspective, the data does not determine policy; policymakers determine policy. Others countered that although data may be value neutral, they are concerned about how it can be used by managers, regulators, and policy makers in decision-making processes. Their fear is that it will be used in a deleterious manner against their self interest. Thus, in many cases, they would prefer to have no data rather than data which might result in possible constraints on the use of their private property. Others suggested that people need to realize and accept that scientific findings may result in restrictions on some activities.

Some of those concerned with how data are used specifically identified their concerns with national efforts like the proposed National Biological Survey (NBS). They commented that if private landowners agree to provide access to their lands, they would need some assurance that the data will not be used against them.

To ensure that data were neutral, several participants suggested data acquisition partnerships among stakeholders. They believe that this would lead to increased trust and neutral data because of the manner in which the data collection effort would be designed and implemented. Other participants expressed their fear that even with data acquisition partnerships, data could be used in a negative manner. From their perspective, how you view data depends on who you are. Thus, data could be manipulated to support whatever conclusions were desired.

In response, several comments were made suggesting the use of independent scientific review boards that could review monitoring and inventory data. It also was suggested that the NBS could be a neutral data broker. In addition to the NBS's role as a collector of data, it was stated by a participant that the proposed NBS would promote electronic networking of existing databases.

Looking to the future, it was observed that the debate over data access may fade as satellite data becomes more sophisticated and widely distributed. Such broad dissemination of satellite data will allow a wider group of people to have access to data on lands of all ownership types.

Others raised questions about whether new surveying and monitoring projects should begin when existing initiatives are not being monitored adequately. The specificity of monitoring and surveying was also questioned since some believe that inventory activities will never become specific enough to affect site-specific activities.

The lack of money for inventory and monitoring activities was cited as a barrier to effective ecosystem management initiatives. Without monitoring, evaluating the effectiveness of ecosystem management initiatives would be difficult, if not impossible. Some federal agency staff noted that despite recent budget requests for monitoring, the amount appropriated has been insufficient to address their needs. Others warned that large infusions of cash would not be available for inventory and monitoring activities. Thus, it was suggested that there is a need for approaches to gather and analyze the needed data that do not require large budgetary outlays.

B. DATA: IS THERE ENOUGH?

The question of adequacy and sufficiency of data was raised many times. Participants discussed whether enough data currently exists. To some, there is an abundance of data. However, without ecosystem management objectives, they suggested that it is difficult to know which data can or should be used. To others, there may be an abundance of data, but there is a lack of knowledge. Other individuals commented that the problem is not a lack of data, but finding relevant data or compatible data when it comes from multiple sources. A number of participants

pointed to examples where multiple entities are gathering data in the same geographic region; however, the data are not compatible. Therefore, they believe a need exists for better integration of available data.

Other participants suggested that there is a need for more data. From their perspective, inventories are incomplete and ecological processes are not well understood. Several participants added that currently, data are not specific enough to analyze the impacts of site-specific activities. Thus, from their perspective, additional information is needed to guide decision making. A few participants stated that some organizations and agencies are currently collecting data that will not benefit ecosystem management projects because the data is not aligned with ecosystem management objectives.

Others pointed to the complexity of ecosystems as a factor which would continue to be problematic in terms of data collection. While additional research would provide new information, it would never be complete. Several participants noted that research always leads to new questions. Thus, decisions will have to be made with incomplete data.

While much of the discussion focused on ecological science, several participants identified their concern about the difficulty of quantifying the social science aspects of ecosystem management—human values, community involvement, and social involvement. Because these values are not easily measured, there was concern that these values will be overlooked.

Several times it was noted that decisions will have to be made with insufficient information. The group discussed the amount and types of information natural resource managers need before they can make decisions. The question was posed as to whether the amount of data needed for action depended on the activity (e.g., development or preservation).

Several participants observed that data collection and decision-making processes would need to be iterative. Decisions would need to be made with available information; research would continue simultaneously; monitoring would provide information to researchers; and new decisions would be made as new information is obtained.

C. LINK BETWEEN SCIENCE AND MANAGEMENT

Throughout the Science discussion, several participants observed that science, management, and policy need to be better integrated. Others saw the linkage between science and management as one of translation with the ecosystem management concept as the translator. Comments were also made by some participants that scientific research should be relevant to the needs of policy makers and managers. Other participants commented that while research should be aligned with needs of policy makers and managers, scientists should not be forced to consider economic and social factors in their research. They stated that scientific research should be conducted independently of the political process. Once completed, they suggested that the research as well as economic and social considerations can be used by policy makers and managers to help them

make decisions. Alternatively, some participants stated that ecosystem management initiatives should begin with a social and economic assessment rather than a scientific assessment. These participants noted that if communities which are stakeholders in ecosystem initiatives do not have the capability or willingness to participate, the efforts will struggle or fail.

IV. ON-THE-GROUND

Since a number of ecosystem management initiatives are underway around the United States, it seemed timely to examine these efforts and learn from their experiences. Of particular interest were the needs of those attempting to do ecosystem management on-the-ground. These needs should provide guidance to policymakers. The discussion of these issues was intended to provide two-way communication with policymakers expressing their concerns and constraints as well as listening to the needs of those on-the-ground. The discussion focused on:

- local versus national roles;
- financial constraints;
- partnerships;
- private property rights;
- barriers;
- measurement of success;
- education; and
- change and flexibility.

A. LOCAL VERSUS NATIONAL ROLES

The discussion on practical experience largely focused on the involvement of local people in ecosystem management initiatives and their role in management decisions. Although the conversation at times focused on whether ultimate authority for management decisions which affect local communities should reside at the local or national level, most participants recognized that both local and national support for ecosystem management initiatives is critical. Those who advocated for a local approach recognized that broad goals, policies and funding would come, at least in part, from higher levels such as federal and state governments. Those who favored strong national control acknowledged that local support is critical if initiatives are to be successful. Where the participants differed was about the appropriate balance between local and national control over decision making.

Many of the participants believe that decision making should occur at the local level because:

- people know each other at the local level making it easier for them to work together;
- people have familiarity with the resources;
- people have a personal stake in the outcome; and
- most land use planning is done at the local level.

However, other participants feared that national values and resources would be sacrificed to local interests if control over decision making resides at the local level. It was noted that the constituents of national organizations may have a strong interest in protecting species far from their home. Thus, such people and the organizations that represent them should have some say in the activities in that ecosystem. Several participants said that from their perspective, the federal government (e.g., administrative agencies and Congress) has an important role to play in providing broad ecosystem management guidance.

It was suggested that the federal role should be to: send clear budgetary signals; establish true priorities among the multiple uses; encourage and support comprehensive efforts such as the Forest Ecosystem Management Assessment Team (FEMAT) process in the Pacific Northwest; and clarify the policies contained in laws such as the National Environmental Policy Act (NEPA), the National Forest Management Act (NFMA), and the Endangered Species Act (ESA). They believe that local communities will have a tendency to sacrifice national interests in favor of their own well-being. It was noted that any ecosystem management project must comply with federal, state, and local laws and regulations. While most of these participants were supportive of local involvement, they expressed the need for federal oversight to guarantee the protection of national interests. Other participants favored a strong national role to guarantee consistency. For example, one participant indicated that differences in federal agencies' ecosystem policies made conducting their business operations difficult, especially when their activities were in areas where several federal land management agencies had jurisdiction.

As a part of the national versus local discussion, the appropriate role of the federal government in ecosystem management initiatives was discussed. Some of those comments included:

- the federal government should provide positive incentives, especially to private landowners;
- money spent on planning by communities should be matched by the federal government;

- the federal government should play the role of facilitator and should provide a framework within which local communities can work;
- cooperation among federal agencies should be encouraged;
- the budgets of federal agencies should be aligned with the objectives of ecosystem initiatives;
- the federal government should provide a clear national policy to federal agencies;
- the federal government should guarantee that entities experimenting with ecosystem management will not be penalized later under existing laws (i.e., certainty);
- federal employees should be encouraged to be innovative and flexible;
- the federal government needs to improve the implementation of current laws and policies;
- the organic acts of the federal land management agencies should be changed where necessary to encourage ecosystem initiatives; and
- the federal government should provide national guidance that outlines the goals of ecosystem management.

Rather than stating what the federal government should do, several people offered their thoughts about what it should not do. For example, it was suggested by some that the federal government should not add another layer of bureaucracy to what they consider already burdensome federal land management policies and state and local land use regulations. Another participant added that national regulations would not work for ecosystem management because every region has its unique characteristics that require different approaches.

Several participants commented they believe that agreement about ecosystem management objectives and principles exist among a large and diverse group of entities. However, they expressed their frustration that this agreement, defined by them as middle ground, is being threatened by individuals and organizations with extreme perspectives.

B. FINANCIAL CONSTRAINTS

Throughout the On-The-Ground discussion, participants commented on the need for additional money for ecosystem initiatives. It was noted that ecosystem initiatives have received little money because they are discretionary activities rather than mandatory programs. Concern was

expressed about continued support given the federal fiscal climate where budgets are being cut and thus, discretionary activities are being eliminated. Others suggested that the appropriate question is not if ecosystem initiatives would be funded, but how they would be funded.

A number of participants commented that current agency budget structures are impeding ecosystem management initiatives. Current budgets are defined by agency, by statute and by program area, not by ecosystems. It was pointed out that budgets for national parks and national forests are organized by line items such as fire, recreation and timber. Thus, it was proposed that budgets should be organized to better accommodate ecosystem planning. Others stated that budgets send messages to managers and suggested that structuring budgets around ecosystems would send a clear signal to managers and personnel on-the-ground that ecosystem management is a priority activity.

C. PARTNERSHIPS

Repeatedly, participants commented on the benefits of partnerships between government entities and various other interests. Several participants credited partnerships and cooperative efforts as contributing to successful ecosystem management projects in the Great Lakes, Pacific Northwest, California, Upper Midwest, and on the East Coast. According to the participants, the benefits of partnerships include:

- increased money and expertise;
- greater support for the initiative;
- access to different sources of data; and
- an ability to address issues which cross ownership.

For many of the participants, partnerships have been critical to the success they have achieved. A number of participants commented that a need exists for more partnerships, especially at the national level. During the discussion, it was noted that the Federal Advisory Committee Act (FACA) sometimes presents a barrier to partnerships between the federal government and other entities. Involving indigenous people in partnerships was also identified as a key area of consideration.

D. PRIVATE PROPERTY RIGHTS

In relating their experiences with ecosystem management, some participants expressed concern about the implications for private property rights, including:

- 1) ecosystem management is just a means for restricting the activities of extractive industries;
- 2) acreage and the ability to undertake production, whether harvesting timber or extracting minerals, will be locked up due to the Endangered Species Act; and
- 3) indecision, delay and uncertainty will lock up investments.

Many participants urged that priority be given to addressing the concerns expressed about the relationship between ecosystem management and private property rights. They said that unless private landowners' concerns are allayed, ecosystem management may be thwarted. They suggested that the need to address compensation to private property owners is critical. Others observed that compensation should be paid to property owners if they are required to go beyond their stewardship responsibility. Several participants suggested that a need exists for dialogue among the stakeholders to air and discuss the fears and realities of ecosystem management and the implications for private property rights.

Several participants noted the importance of using positive incentives to encourage the participation of private landowners in ecosystem management initiatives. One suggested incentive was the idea of "only one bite at the apple." Under this incentive, a company that has worked closely with relevant regulatory agencies and received permits would not be subject to requirements that may arise at a later date because of some circumstance, such as a listing of a species under the Endangered Species Act, that was not foreseen when the permit was issued.

E. BARRIERS

Barriers to ecosystem management were identified during the On-the-Ground discussion. They include:

- data problems;
- institutional arrangements;
- budgets; and
- land ownership patterns.

As discussed previously, several participants noted the collection and use of data are problematic. They pointed out that data collected by different entities are often incompatible. It was suggested by some that the problems of incompatible data could be overcome if entities collect and share data in compatible formats. However, a participant from a commodity perspective observed that they are hesitant to share data with other companies because it may

have anti-trust implications. Under anti-trust legislation, corporations are restricted in their ability to share information because of the potential for price fixing.

Institutional arrangements were identified as a barrier to ecosystem management efforts by many participants. Specifically, it was observed that agency jurisdiction can inhibit the ability of state and federal agencies and private entities to work together. For example, wildlife are managed by state agencies but often their habitat is on federal or private lands. Also, conflicts between the different federal agencies' mandates was identified as inhibiting the ability of the various agencies to work together on ecosystem management initiatives.

Several participants observed that budgets also present a barrier to ecosystem management because they provide money on a programmatic basis not an ecosystem basis. Such money allocation prevents agencies from developing comprehensive efforts since money must be used as allocated.

It was also observed many times during the discussion that land ownership patterns are also problematic. Few, if any, ecosystems are owned by one entity or organization. It was noted that even national parks do not encompass complete ecosystems. Thus, ecosystem management initiatives will require cooperation among public and private entities. It was observed that even between federal agencies, such cooperation has been problematic. As discussed previously, private land owners are hesitant to enter into cooperative efforts because of the possibility of restricting their property rights.

F. SUCCESS: HOW IS IT MEASURED?

Measuring the success of ecosystem management initiatives was an issue that surfaced throughout the On-The-Ground discussion. One participant noted that without inventory and monitoring data, evaluating the success of an initiative would be impossible. Another participant commented that the success of initiatives will be determined by the public. One participant stated that from their perspective one important measure of success will be whether their company remains economically viable. There were other comments that the success of ecosystem management projects should be judged by ecological factors as well as social and economic factors. One participant said that from their perspective a successful ecosystem project would protect species and habitat as well as provide for social needs such as community hospitals and schools.

G. EDUCATION

Some participants stressed that education should be an important element of any ecosystem management initiative. Education of the public, agency employees, and stakeholders was mentioned explicitly. Education, according to some participants, builds relationships and allays fears. One participant commented that education should provide people with tools to act in a

truly informed, ethical manner. Another participant believes that greater education will diminish the need for regulation over time.

H. CHANGE AND FLEXIBILITY

Several comments were made about ecosystem management requiring change in culture and behavior. Others added that ecosystem management efforts will require a significant reorientation because marginal reorientation will result in failure. One participant stated that ecosystem management requires people to ask new and different questions. Another participant suggested that it will require some federal employees to shift from a command-and-control mentality to one where agency staff are asking new questions about managing the resource.

The need for flexibility was reiterated by a number of participants. It was suggested that each ecosystem is unique and will require a different approach depending on the nature and extent of the threats facing the ecosystem. Specifically, several participants stated that federal agencies should have the ability to allow innovative ecosystem management efforts to move forward without being constrained by strict interpretations of existing laws and regulations. It was noted by these participants that they were not requesting that existing laws and regulations be discarded. Rather, they want some flexibility in the way they are applied.

Additionally, several participants observed that it is likely that some ecosystem management initiatives will fail as different entities experiment with the concept. They urged decisionmakers not to discard the entire concept because of these failures, but to learn from those efforts.

V. A FEDERAL PERSPECTIVE

One of the goals of the Forum was to provide those considering significant initiatives an opportunity to assess the existing experience with ecosystem management and identify the key issues associated with further implementation of the concept. Because ecosystem management received substantial attention in the President's National Performance Review, it seemed appropriate to focus some discussion on possible next steps by the Administration. An individual from the Administration said that from their perspective it seems clear that: there is a strong interest in the concept from many stakeholders; ecosystem management is appearing as an important concept at many levels in federal agencies; ecosystem management is here to stay; the Office of Management and Budget (OMB) is willing to develop a cross-cutting budget effort; and, ecosystem management is an opportunity for improvement.

Given the above, it was noted that the Administration is considering a range of options. Participants were asked for their perceptions about the relative usefulness of:

- issuing an executive order;

- developing ecosystem management models at the local and regional levels;
- combining federal efforts with local efforts; and
- working with OMB to improve budgets in a manner that better accommodates ecosystem management initiatives.

In response to the option of selecting several regional or local examples to use as models, a participant suggested that ecosystem management should not be viewed by society as something that happens in only a few locations. Others urged the Administration to pursue a hybrid approach that includes: an executive order with a statement of principles; support for ecosystem initiatives; and, economic incentives.

Several participants suggested that the Administration should encourage flexible approaches by those entities working with ecosystem management. Several participants urged the federal government to eliminate mixed messages (e.g., agency organic acts, budgetary processes) which are creating confusion among agency personnel. Several participants urged the Administration to provide broad guidance about ecosystem management to federal natural resource management agencies.

VI. CLOSING COMMENTS

In adjourning the Forum, Keystone staff thanked the participants for attending the Forum and for their active involvement in the discussions. Several participants noted that an intensive, interactive session such as the Forum was a very useful means of assessing current experience with ecosystem management and identifying key issues to consider as new initiatives unfold. Keystone Center staff thanked the Emily Hall Tremain Foundation for funding the meeting noting that such a gathering would not have been possible without their support.

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November 16-17, 1993
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