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THE NATIONAL FORESTS:
FOR WHOM AND FOR WHAT?

By Roger A. Sedjo
Julian Simon Fellow

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TO THE READER

This paper addresses the future of the United States Forest Service. Its author, Roger Sedjo, is well-known for incisive studies of the national forests and of forestry generally, both in the United States and around the world. Sedjo is a Senior Fellow in the Energy and Natural Resources Division of the Resources for the Future (RFF), a private nonprofit research organization in Washington, D.C. He directs RFF's Forest Economics and Policy Program.

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THE NATIONAL FORESTS: FOR WHOM AND FOR WHAT?

By Roger A. Sedjo

"We are confident that the nature of the physical world permits continued improvement in humankind's economic lot in the long run. . . . We are less optimistic, however, about the constraints currently imposed upon material progress by political and institutional forces…."
—Julian L. Simon and Herman Kahn,
The Resourceful Earth

Introduction

Julian Simon, in whose honor this paper is written, was very optimistic about the ability of humans to deal with problems. He was particularly interested in the relationship between humans and their environment. He was confident that humans would use their creativity to develop institutions—the laws, regulations and customs that guide human activity—that would allow them to overcome the problem of resource scarcity.

Contrary to the common pessimistic view, Simon believed that resource and environmental problems could be and are being effectively addressed. Much of his work and writings were dedicated to demonstrating that human conditions are improving, and he often assembled large amounts of data that made this case.

Julian Simon was interested in forests. Every written correspondence I received from him was accompanied by the leaf of a tree, inserted somewhere in the envelope. When his book *The Resourceful Earth* (Simon and Kahn 1984) was conceived, the conventional wisdom was that the world was running out of forests at a rapid pace. "Experts" had testified before Congress that by the year 2000, the globe would have only a few remnants of a tropical forest. This, of course, was a doom-and-gloom prediction based on gross exaggeration. Simon's book (edited with Herman Kahn) acknowledged that problems did exist but also pointed out the falsities and unwarranted assumptions underlying many of the exaggerated assertions and spurious extrapolations.

Julian Simon recognized that forests provide environmental resources ranging from watershed protection to habitat for diverse wildlife, as well as wood for homes and other buildings. He looked both at the long-term availability of commodities and at the current and future condition of the environment. This paper examines the National Forest System of the United States—that is, the forests managed by the Forest Service—from the perspective of these forests' ability to provide for diverse human needs. It presents a brief interpretation of the past and offers discussion about the alternatives for the future.

Today, the United States finds itself in a situation where some people want our entire national forest system to be devoted to addressing ecological and biodiversity concerns. The opportunity to do this would not have been possible without the innovative progress and productivity of the private sector. At the same time, such an approach is contentious because it responds to the desires of some, but surely not all, the people. Thus, the future management of the national forests is unlikely to be smooth because no political consensus exists.

The National Forests

The National Forest System consists of approximately 150 forests around the country that are managed by the U.S. Forest Service. These forests cover 192 million acres, represent about 27 percent of the nation's forested area but currently provide less than 5 percent of the nation's timber production, a percentage that is falling. The agency has an annual budget in excess of $3 billion.

One of the original concerns that led to the creation of the national forests was fear of a "timber famine." In the late nineteenth century, there was little confidence that the private market could provide for timber needs far into the future, and the national forests were viewed as a way of furnishing the United States with a continuous supply of timber. Of course, like so many of the anticipated disasters Julian Simon addressed, the timber famine never arrived. Today there is no longer concern that the national forests must be available for future timber famines. Indeed, the United States is the world's largest industrial (commercial) wood producer, accounting for over one-quarter of the world's total output. Yet little of this timber comes from government-owned forests. The function of the national forests as a timber reserve is no longer necessary and this purpose of the national forests has been almost forgotten. In essence, the future of the nation's timber supply is in private hands, once again vindicating Julian Simon's faith in human ingenuity and market forces.

With only a small role in timber production for commercial use, the Forest Service today faces a variety of competing interest groups that differ on what it should be doing. These decisions are made in the political arena where many of the values are up for grabs, going to those who can muster the most political clout.

Perhaps it is not surprising that our society should quarrel over the output mix of the Forest Service. Each American believes that the national forests belong to him or her. However, for the national forests there is no economic market to decide what is to be produced or to whom it should be provided. These decisions are reached bureaucratically and politically. Furthermore,

as individual citizens, we all believe we have the right to voice our demands, but for public forests individuals rarely bear the direct costs of meeting those demands. Because it is the political process that will decide and the taxpayer who will pay for the management of the national forests, in the end it is the best-organized voices of special interests that determine what will be done with these political lands.

Basic Questions

In 1975 Marion Clawson wrote a book entitled *Forests for Whom and for What?*[1] In that book Clawson raised basic questions regarding the American forest—both public and private. Who are to be the beneficiaries of the forest and what is the nature of those benefits? Specifically, what are the outputs for which the forest should be maintained or managed?

This question is more complicated for the United States than for many countries because in the United States forest ownership is very diverse, including individuals, corporations not primarily involved in the timber business, the forest industry, local and state governments, native peoples and the federal government. The various ownership groups have numerous reasons for owning and/or managing forestland, from love of natural lands and wildlife to timber-growing objectives. This paper will ask the same questions that Marion Clawson asked, but for the government-owned forests. It will suggest an approach that would rely more heavily on local markets and local people to determine output mixes and overall forest management.

Problems of National Forest Management

At the midpoint of the twentieth century, after a half-century of existence, the Forest Service was generally looked upon as a stunning success. It was regarded as a very well functioning public agency. A *Newsweek* (1952) magazine article discussed the agency and its activities in glowing terms. A 1960 book on public administration, *The Forest Ranger* (Kaufman 1960), used the Forest Ser-

vice as an example of how an ideal public agency ought to operate.

Today, a half-century later, the reputation of the Forest Service is in dismal disarray (e.g., see Nelson 2000). The major divisive issues remain the questions raised by Clawson: "for whom" and "for what" are the national forests to be managed?

The question of what specific outputs are to be produced has been reasonably clear, at least as found in the legislation, but the composition of the various outputs has never been well defined. In its early years, when the mandated task was producing timber, protecting water, and ensuring the maintenance of the forest asset, the Forest Service could perform its mandated task with relative ease and with heavy input from local communities surrounding the forests. Since then, however, the appropriate mix of outputs has been increasingly uncertain and a high degree of contention has overhung the operation of the Forest Service. As additional commodities and services were added to the list of legally required outputs, the complexity of management increased, as did the number of interest groups putting pressure on the Forest Service to provide the outputs.

As the management task became much more complex, the system faltered and then fundamentally failed. So serious have been the weaknesses of the system that for decades there have been calls for numerous organizational and institutional changes (Sedjo 2000a). These suggestions include privatization (Anderson 2000; Clawson 1983), management transfer to environmentalists (Baden and Stroup 1981), various types of decentralization (Forest Options Group 2000; Nelson 1995; O'Toole 1988), and the creation of corporations utilizing trust-type instruments (Fairfax 2000).

Many of these alternative organizational arrangements assume that the objective of management is clearly identified and/or focused on economic efficiency criteria. This management objective may be to provide funding for the local school system, as in the case of some proposed trusts, or profitable timber production within some set of forest sustainability constraints, as under some decentralization proposals. Instead of economic efficiency, however, politics has driven Forest Service management and has been at the core of the problems for the past several decades. In recent years de facto management has been moving away from management

for multiple uses and toward a focus on environmental protection, under what former Forest Service chief Jack Ward Thomas (1996) calls "the preservation of biodiversity."

A major problem is that there are essentially two independent Forest Service planning processes: one involving the creation of individual forest plans and a second that involves congressionally authorized appropriations. Congressional funding is based on supporting specific programs such as timber production or wildlife management, but these often bear little relation to the forest plans generated by the planning process.

The political pressures influencing Forest Service management and the various interest group struggles for the control of resources of the forest have made rational management impossible. Given the absence of either fundamental changes or reforms, some have questioned whether the Forest Service as we know it can survive (Fairfax 2000; Nelson 2000; O'Toole 1997; Sedjo 2000b). This view has been reinforced by the increasingly contentious nature of the relationship between Congress and the Forest Service and by threats from Congress to dramatically reduce the Forest Service budget.[2]

The management objective may become the unambiguous production of biodiversity. To the extent that management goals are clearer when a single interest group achieves political dominance, the management task may become somewhat less complex than the multiple-faceted, multi-political objective of multiple-use management, now perhaps on its way out. However, the appropriate management regime to achieve this goal is likely to be highly controversial. And a confounding element today is the changed nature of the forest due to fire suppression.

SOME SYSTEMS FOR MANAGEMENT

Webster defines management as "judicious use of means to accomplish an end." To succeed, management requires the identification of an end or an objective so that success or failure can be unambiguously recognized.

Private industrial forestry firms find their management objective in maximizing profitability, usually over the long run. To achieve profit maximization, firms must be economically efficient. Typically, private profit maximization is undertaken in the context of formal regulations and/or self-imposed constraints to reduce the probability of off-site damages, which could lead to lawsuits, or visual blemishes, which could generate poor public relations. Private industrial forests may also promote outputs such as wildlife, which can provide local good will or can earn revenues through hunting and other recreational leases.

Unlike the private sector, the national forests lack such well-defined, clearly articulated objectives. And they lack criteria for determining when the benefits of producing one output (such as timber) are exceeded by the costs in lost opportunities from producing other outputs (such as recreation). In spite of these serious lacks, a number of management systems have been applied to the national forests.

Multiple-Use Management

Management of the national forests in the first half of the twentieth century was driven largely by decisions made at the local level. The objectives of local forest management were to maintain the forest for the long term, to harvest modest amounts of timber while making sure that water flows were not seriously disturbed, and to provide for forest regeneration. Incidental outputs, not required by statute, included wildlife, recreation, and environmental amenities, but these were discretionary and largely took care of themselves.

The Multiple-Use Sustained Yield Act of 1960 identified additional specific targeted outputs, such as wildlife and recreation, and thus complicated management. While many mixes of outputs are possible under multiple use, the mix actually chosen reflected the budget and targets provided by Congress, which in turn were determined by a host of political considerations and pressures. The contentiousness of the process that followed led to the creation of the Resource Planning Act in 1973 and the National Forest Man-

agement Act (NFMA) in 1976. These laid out a multiple-use planning process that would involve public participation. Congress hoped that these laws would create a mechanism that would resolve the disputes. However, this was not to be.

During the 1980s, Bowes and Krutilla (1989) addressed the problem by trying to develop a planning approach that recognized the multiple outputs while also providing a conceptually sound means for selecting the economically optimal mix of outputs. They viewed the forests as a forest factory, capable of producing a host of desired outputs.[3] They argued that many of these outputs are joint in production; that is, the production of one output also involves the production of other outputs. For example, producing wildlife habitat might well involve improved water quality at the same time. This approach also recognized the conflicts in production that existed. For example, dense timber stands may reduce habitat for certain wildlife such as deer and elk.

Bowes and Krutilla proposed that the "forest factory" (the National Forest System) should produce the mix of outputs (market and nonmarket) that maximize the discounted net present value of the social benefits (market and nonmarket) of the forest through time. One can think of the Bowes and Krutilla forest factory as a healthy working goose that lays different types of eggs. The mix of egg types should be the ones that provide the maximum social value consistent with maintaining the long-term health and integrity of the goose.

Yet, in fact, the Forest Service has an output mix chosen through an essentially political process involving influence and pressure groups. Hence, the Bowes and Krutilla approach as outlined in their 1989 book turns out to be difficult to implement. There are four major reasons.

First, because the decisions involve some outputs that are not transacted in markets (although some of them, such as recreation, could be easily provided that way), they are difficult to value, and the values estimated by nonmarket approaches are not readily accepted. The real trade-offs with marketed goods such as timber are difficult to determine.

Second, the appropriate nonmarket prices almost surely vary

considerably across the national forests, just as they vary with marketed goods. For example, the amenity values provided by any single forest stand will depend importantly on the condition of the adjacent stands as well as its accessibility for human use.

Third, the underlying forest production relationships for the host of legally required outputs are extremely complex, and the nature of the production of joint outputs is often unclear. The basic economic problem becomes one of utilizing "knowledge not given to anyone in its totality" (Hayek 1945, 520). The dispersal of knowledge means that it cannot effectively be condensed into a single variable for planning purposes (Anderson 1982) and thereby limits the usefulness of any centralized planning system.

Finally, although Bowes and Krutilla argued that the maximization of social value was specifically called for in the 1976 NFMA legislation (Haigh and Krutilla 1978), a consensus never developed that the law called for economic optimization, which was inherent in the Bowes and Krutilla approach. Thus, consideration of optimization has been largely ignored. In fact, among many of the interest groups, the political process for determining the mix of outputs seems to be the generally preferred method and continues to operate today.

One result is a precipitous decline in the use of much of the earlier formalized economic forest planning modeling that came to dominate the Forest Service during the multiple-use era of the 1980s (see Barber 1986; Sample 2000). However, I also should note that modeling continues to be a common tool of forestry for examining certain relationships, e.g., biological relationships within forest ecosystems (LeMaster and Sedjo 1993).

Ecosystem Management

An alternative to multiple-use management is the concept of ecosystem management, which emerged in the early 1990s (e.g., Szaro et al. 1999). In this approach economic optimization and economic modeling play little if any role in ecosystem management. The focus is primarily on social and biological considerations.

At one level, ecosystem management is simply an alternative

management tool for achieving the legally mandated multiple-use outputs.[4] That is, ecosystem management is a means to the legally required ends. At another level, however, it is a means for identifying additional outputs or ends. And in some contexts, the process of ecosystem management becomes an end in itself.

Multiple-use management and ecosystem management do have some striking similarities. Both approaches can be viewed as management tools that treat the forests as a system rather than individual outputs such as timber production or recreation. Johnson (1997, 24), argues that economics should have a major role in both. In a discussion of ecosystem management, he writes that "the practice of examining complex systems and interactions is familiar to economists. Given the relatively broad view of ecosystems espoused under ecosystem management, economics would seemingly be an integral part of that approach."

Johnson complains, however, that once the goal of healthy ecosystems is added, traditional efficiency considerations are ignored in management. He states:

> Economists, however, tend to view healthy ecosystems as one desirable goal among many. . . . But because *a healthy ecosystem is the goal of ecosystem management*, little time is spent considering the benefits and costs of various actions such as protecting biodiversity. Trade-offs between preservation and logging, grazing, and mining on federal lands will continue to be made, but the criteria delineating for whom and on what basis these trade-offs will occur are not identified. . . . (emphasis added) (Johnson 1997, 24)

MacCleery and LeMaster (1999, 3) also stress the changed objectives of management under ecosystem management: "ecosystem management has greatly expanded the objectives for which federal lands are purposely managed." They go on to note that the effect has been a substantial de-emphasis on the role of federal lands in producing commodity outputs. The focus of multiple-use sustained yield has tended to be on resource outputs or "flows," whereas ecosystem management places relatively more

emphasis on ecosystem "states" and "conditions." A corollary to this view is that resource outputs under ecosystem management are often a consequence of achieving biodiversity or other ecosystem-centered objectives, rather than explicit objectives in their own right.

Elsewhere, I discuss the absence of an operational objective under ecosystem management (Sedjo 1996, 26). Ecosystem management replaces the traditional objectives of public forest management with a somewhat nebulous notion of 'desired forest condition.' However, that concept is not operationally useful in the absence of specific dimensions of that desired condition. In many cases, the objective of ecosystem management appears to be simply the practice of an ecosystem management approach: the means and the ends have merged.

By any of the above interpretations, the focus of management undergoes a transformation as it shifts from an output focus under multiple use to a process or condition focus under ecosystem management. Thus, the objective of ecosystem management is not the output of the forest factory, but rather the condition of the forest factory itself, something that is inherently difficult to measure. The various multiple-use outputs of the forest, including those mandated by Congress, become merely incidental, with little if any attention being given to the costs and trade-offs required.

It is widely recognized that one cannot manage what one cannot measure. Therefore, how do we measure the success of ecosystem management? How is the achievement of the desired forest condition to be objectively assessed? Kirkland (1987) has argued that in the absence of meaningful measures, the achievement of the best balance becomes a matter of judgment.

However, the question of whose judgment should be used to determine which set of forest attributes provide the ideal condition remains elusive. In a political setting where various interest groups vie to achieve their objectives, someone will almost always be left unhappy. Although science is often offered as the means to choose objectives, science cannot choose objectives. It can simply assist people in managing for those objectives once they have been determined (Botkin 1991, 2000).

ALTERNATIVE MANAGEMENT OBJECTIVES

The existing management systems evolved at a time when the main outputs from forests were timber, water quality, grazing, and, to a certain extent, wildlife and recreation. Today, however, there are new demands on the forests related to environmental amenities, but the institutions are ill suited to meet those demands. Short of revolutionary change, we must ask whether existing institutions can be reformed to accommodate the new demands. Even if ecosystem management is selected as the management approach, there will be dissension about what is being sought and how to achieve it.

Protective Custodial Management

One approach can be characterized as a protective custodial approach. It would focus on the protection of biodiversity and its habitat. Some, including former Forest Service chief Jack Ward Thomas (1996), maintain that this has been the focus of management in recent years. The protective custodial approach would consist largely of passive means such as minimizing human contacts and disturbances. Major environmental groups, particularly at the national level, have advocated such an approach, emphasizing the "hands-off" aspect and arguing for establishing large areas as set-asides or de facto set-asides.[5] In its extreme, this approach would preclude activities in the forests to modify habitat, even to achieve nontimber management objectives such as creating habitat for wildlife or controlling wildfires, disease, and infestation. Supporters of this approach argue that the impact of humans should be minimized, allowing the forests to return to a "natural state."

The custodial approach may well be a relatively low-cost way of preserving much of the forest's biodiversity. The notion behind it is that the basic natural processes will continue to operate without human intervention. Forests are inherently a dynamic system. Modern ecology recognizes that some of the earlier ecological concepts, such as that of a climax forest, i.e., a forest approaching a

stable steady state, are problematical at best (Botkin 1991). Rather, the dynamics of forest change may lead to a somewhat different forest than in the past, in some cases markedly different.

The custodial alternative, however, is vulnerable to sharp criticism. The forest has been affected by human activity for thousands of years and reflects its history. The reduction of natural fire occurrences over the last century, due to human actions, has resulted in large areas of forests with different characteristics than were found in earlier periods. Many forests are now overstocked and suffer from disease, pests, and overmaturity. Many are increasingly susceptible to catastrophic fire that may spill over, creating injury, death, and the destruction of property. This approach also has implications for recreational use of the forest. The absence of roads has implications for both commodities and for recreational use.

Active Ecosystem Maintenance and Restoration

An alternative to custodial ecosystem management is an activist approach devoted to ecosystem maintenance, protection of biodiversity habitat, and ecological restoration. This was the position of many of the members of the Committee of Scientists (COS), a group of scientists appointed to advise the Forest Service on its planning process, and strong elements of this view are found in its report (COS 1999). The COS saw the role of the Forest Service as maintenance and monitoring to ensure ecosystem sustainability (a term that has no definition that reflects a consensus of opinion). They recommended that management actions, including restoration, be taken to ensure the maintenance of ecosystems, biodiversity, and diverse habitats.

In its more extreme form, this active ecosystem maintenance view argues that the forests should be managed so they can return to their pre-Columbian condition. This would involve extensive inventories of the condition and viability of the ecosystem, utilizing concepts of focal species, which are selected species that are believed to be indicators of forest condition. In this view, if there would be any role for timber harvests, it would be to achieve restoration ecology and protect biodiversity.

An argument against the active maintenance of biodiversity and ecological systems through techniques including forest restoration is that it is likely to be very costly, and budgets are likely to have very little public support. Complicating such a policy is the fact that the field of ecological restoration is still in a major state of flux. Between 1991 and 1997 the Society of Ecological Restoration modified its definition of ecological restoration five times (Palmer, Ambrose, and Poff 1997).

Additionally, there is no compelling scientific logic for the choice of any earlier forest condition, such as pre-European settlement, as the ideal. The notion of a unique pre-European condition is more ambiguous than it first appears (Wagner et al. 2000). It is now known that native populations had fallen dramatically in the decades before European settlement through exposure to diseases that reached native populations before Europeans themselves did. Thus, the forests at settlement reflected both the earlier native pressures on the forest, and then the reduced impacts as native populations declined. So what forest conditions are truly pre-settlement?

Furthermore, it is clear that today's forests are to a large extent an accident of history. Suppose, for example, that humans never migrated into the Western Hemisphere as the last ice age was ending about 10,000 years ago. The absence of native peoples would have resulted in a very different forest from the one the Europeans found at the beginning of the 16th century. Would that forest be any less (or any more) "natural"?

Finally, there is the question of how technically feasible in the long term is any approach to return the forest to some earlier condition. The widespread introduction of exotic species into North America is probably as large a threat to the current composition of biodiversity as is the loss of habitat. Exotic species may have forever modified the landscape of America, in which case a return to any "pre-settlement" condition is unrealistic if not effectively impossible.

Even if forest scientists could return the forests to one of the earlier pre-Columbian conditions, a small change in climate would likely undo this reconstruction. The evidence indicates that the tree and plant composition of forests can change readily in response to

modest variations in climate, which many scientists believe is happening or about to happen (Intergovernmental Panel on Climate Change 1996). Shugart, Sedjo, and Sohngen (N.d.) note that in the period since the last ice age, significant changes in the forest vegetation took place that are associated with the approximately 2-degree C climatic warming over that period. Paleoecological reconstructions of the changes in the components of the world's boreal (northern) forests, for example, show that the relative abundances of species that make up the forest have changed greatly (Webb 1988). One finds in these reconstructions unique mixtures of trees and other plants, different from what we experience today.

Management for Forest Health

Another management approach focuses on maintaining the health of the forest, although the definition of forest health is somewhat problematic.[6]

Many have argued that the Forest Service has a major responsibility for forest health (perhaps better termed condition), and that major sections of the system may be currently threatened. Well before the fires of the summer of 2000 a number of observers (Clark and Sampson 1995; Sampson et al. 1994) argued that large portions of the national forests were in poor condition. In fact, the dramatic reduction of fire in the forest system as well as the misuse of fire are leading to many of the current concerns about forest condition (Nelson 2000).

Clark and Sampson (1995, 5) have characterized the situation as follows: "The concern for forests today is not simply that trees will die from bugs and disease—it is that entire forest systems are so far out of normal ecological range that virtually every element in the system is affected, and may be at risk."

This view is substantiated by the General Accounting Office (1998, 1–2), which has argued that past management practices, especially the suppression of low-intensity fires in the forest, have given rise to an "increasing number of large, intense, uncontrollable, and catastrophically destructive wildfires. . . . " The GAO goes on to characterize this wildfire as "the most extensive and

serious national forest health-related problem in the interior West." Some argue that at least a minimum degree of human intervention—that is, management—is desirable to address the problems created over the past several centuries. Some intervention is now being recognized within our national park system, which previously had prohibited it.

Forest health advocates call for management activities such as prescription burning and logging to remedy the problem of deteriorating forests caused by excessive fire suppression. Some argue that for forests that have reached very high densities it is already too late to rely on prescription burns alone. An illustration is the now famous Los Alamos fire of 2000, which started as a controlled burn but quickly got out of control. Thomas Bonnicksen, a forest ecologist at Texas A&M University, stated before Congress that America's public forests are deteriorating because of neglect, mismanagement, and misguided attempts at preservation. He says that "prescribed fires cost $75–$200 per acre. The Forest Service estimates that treating 40 million acres over 15 years could cost nearly $15 billion. These costs will never end because forests continue to grow." He adds that "the only viable alternatives to prescribed fire are mechanical thinning and timber harvesting. Prescribed fire can supplement, but it cannot replace, these tools" (Bonnicksen 2000, 6).

The forest condition approach would also maintain habitat for biodiversity by correcting some of the distortions in the forest created by earlier management. Bonnicksen (2000, 5), accepting the view of the active ecological reconstructionists, notes optimistically, "We can sculpt a forest into a near perfect replica of the original."

CHANGING CONSTITUENCIES

These management alternatives reflect a major change in the political forces affecting the Forest Service. Until the mid-1970s, the Forest Service was relatively successful in balancing the demands and interests of its major constituencies (Culhane

1981). These were the environmental community, the timber industry, recreationists, and local people close to the forests. In this world of special interests, the Forest Service could play one interest against another to preserve this balance. In return for providing its major constituents with the outputs they desired, the Forest Service was rewarded by the support of these constituents in its budget negotiations with Congress.

The legislation of the 1970s was consistent with this vision. The "problem" was viewed as maintaining a balance of the various interests. The expectation was that new legislation would help the interest groups more effectively coordinate and articulate their different objectives for Forest Service management. They expected to induce Congress to provide the Forest Service a larger budget to meet these increasingly diverse and higher-output goals. The concept was that with proper management the forests could provide a little more for everybody in the form of higher outputs for all. More outputs financed by the taxpayer would "buy" cooperation from the various important constituencies.

In the first half of the 1980s these hopes appeared to be realized. The planning process was beginning, and there was no litigation during this period. However, the lack of litigation simply reflected the moratorium on litigation that was part of the understanding. After 1985 lawsuits occurred in droves. By the end of the 1980s the system was in chaos, and any semblance of the previous balance was lost.

What destroyed the balance among the constituencies? First, the period after 1960 saw a gradual growth in the role and general acceptance of many of the objectives of the environmental movement. In 1988, Republican George H. W. Bush ran for president with the theme of becoming "the environmental president." With its goals widely accepted, the environmental movement grew in political power. The country became greener. The relative balance among the various constituencies that had existed at the end of the 1970s was largely lost by the end of the 1980s. Individuals who before the beginning of the decade had approved of timber harvesting often found themselves opposed to those practices by the end. The first Bush administration was followed by eight years

of the Clinton-Gore administration, which had as one of its major constituencies the environmental lobby.

Second, the increased strength of the environmentalists was accentuated by a relative decline in the political strength of the timber industry. The timber industry gradually came to recognize that its long-term future would depend more on high-yielding intensively managed planted forests on private lands than on continuing harvests from the national forests. The industry's focus shifted from the West, where public lands dominate, to the South, where public lands are scarce. By the 1980s some of the largest forest products companies were relocating their central offices from the Pacific Northwest to the South. This trend toward relocation from the west to the South has continued, as has the trend of firms toward more intensive management on the very best sites (Sedjo 1991), most of which are on private land.

The timber industry is not a monolith, of course. The public forests remained important to local mills, which were usually owned by small forest industry firms. But the larger companies, with significant areas of private forestlands, were no longer dependent on harvests from national forests and had little direct interest in maintaining timber harvests from these forests. In fact, they benefited financially from the reduction of logging on the national forests, since this placed strong upward pressure on timber prices. Wood prices rose very sharply after it became clear that federal timber harvests would be declining,[7] and the large companies with private land were beneficiaries.

Loggers and small mills dependent upon national forests bore the brunt of reduced federal harvests. Bidding for the reduced supplies of federal timber drove prices higher. While the larger companies did not actively promote the reduction of timber harvests from the national forests, neither did they find it in their interest to strongly oppose federal harvest reductions. They were relatively uninvolved in the discussions of the time.

Perhaps the single most important achievement of the major environmental groups was to "nationalize" public forest issues during the 1980s. In earlier periods harvests and environmental concerns had been treated as largely local problems; now they were

viewed with interest across the nation. Biological diversity and ecosystem sustainability had become an issue of concern to Americans everywhere.

In the far West these issues were encapsulated in the battle fought over the northern spotted owl, a small bird listed as threatened under the Endangered Species Act and residing in the old-growth forest of the Pacific Northwest. When the dust cleared, an estimated 17 million acres of old-growth forests in the Pacific Northwest had been taken out of the national forests' timber harvest base. In the process local forest issues had become nationalized. Voters in New England could feel just as passionately about a forest environment issue in Montana as would voters in Montana

The environmentalists had won. From the late 1980s to the late 1990s, harvests from national forests fell by almost 80 percent, from over 12 billion board feet to about 3 billion (USDA Forest Service 1998). Never again in our lifetimes will we see harvest levels in the national forests approaching those of the peak periods of the 1970s and 1980s.

GOING LOCAL

What then for the national forests in this new century? As the federal timber harvests decline, we are beginning to see the shadow of the coming conflicts of the twenty-first century emerging out of the ashes of the forest fires of the summer of 2000. The issues are several.

A critical one is what the Forest Service objectives of management will be in the future. Which among the models discussed above will the Forest Service choose to follow? Will these objectives change with each new administration as the outputs of the national forests, both marketed and nonmarketed, become political gifts to supporters?

Decisions exclusively from the top will almost surely give low weights to many local problems over which national officials have control but about which they have only limited interest and knowledge. Local decision makers, for their part, will focus on the

issues nearest to them while tending to overlook national environmental concerns. As before, we are faced with a balancing act between national and local objectives with the distribution of outputs determined primarily by political considerations.

The dichotomy between national and local control is not surprising in a country that has grappled with the respective roles of the states and the federal government since its inception. However, in recent years the balance of power appears to have shifted markedly to the national and away from local choices. This shift appears to have been facilitated through the increasing politicization of the Forest Service.

An example of how the process has been functioning in the most recent decade can be found in the experience of the Quincy Library Group (QLG) in California. The QLG is a coalition of local environmentalists, civic organizations, teachers, community residents, and timber industry representatives which began meeting on a regular basis during the early 1990s in the library in Quincy, California. Their meetings were the outgrowth of earlier meetings during which they had argued over the allocation of land uses in the nearby Plumas National Forest as part of the Forest Service's forest planning process. The common view within the QLG was that it was folly to leave the forest's ecological fate to Washington-based agencies and national interest groups (Quincy Library Group 2000).

QLG members were united by concern that the interests of the local areas were being sacrificed. They viewed the nearby forests as excessively prone to fire. Old forests with high proportions of dead and dying trees created a large build-up of fuels on the forest floor. Dense stands could easily result in "crown" fires, and those fires would not be confined to the national forests only. Members of the Quincy Library Group feared that they had a serious environmental problem that could threaten their personal health and safety as well as their property. They felt that the national environmental groups were unwilling to acknowledge the local problem for fear of compromising their national issue, which was commitment to a hands-off policy.

Resisting pressures from many national environmental groups,

many local environmentalists joined with loggers, recreationists, business executives, and other local interests to form the QLG. The group demanded that the Forest Service manage the local national forests in a manner that allowed for mechanical removal of excess material in the forest.

The dispute arose over whether the Forest Service should actively work to reduce the potential for catastrophic fire, even when it might involve "sanitary" logging, which would remove excess materials and create open spaces called "fuel breaks." Much of the costs of sanitary logging would be paid for by allowing loggers to supply the material to local sawmills, but the overall management costs would rise substantially.

The QLG developed a forest management plan based on an earlier version of a forest plan. Sanitary logging and strategic fuel breaks were important components of the plan. The group failed to persuade the Forest Service to adopt critical aspects of the plan, however, and the QLG turned to the national political arena.

In 1994, forty QLG members went to Washington and lobbied Congress to promote their proposal as a more community-centered approach to the management of national forests. After substantial opposition, the 1999 Herger-Feinstein Quincy Library Group Forest Recovery Act was passed as a rider attached to another bill. This act authorizes the Forest Service to manage 2.25 million acres of land on all or part of three national forests in northeastern California for a five-year trial period and to evaluate the usefulness of an approach to community-based forest management.

How successful the QLG will be ultimately remains to be seen. The QLG was appealing the Forest Service's local forest plan. The major issue concerns the construction of fuel breaks, which the Forest Service is reluctant to institute and did not include in the plan. However, some of the Forest Service pilot projects involving fire breaks have shown encouraging results in limiting the spread of wildfires. The Quincy Library Group is not alone in wanting to have a role in addressing forest problems. For example, the Federal Lands Task Force Working Group in Idaho has suggested five pilot projects that could address problems of forest condition (Kemmis 2001).

The experience of the QLG points out the great differences between the interests of people at the local levels and members of national special interest groups. The degree to which they will be successful in customizing management plans to local conditions, even given special accommodating legislation, in the face of political resistance at the national level remains to be determined.

In the early years of the National Forest System a large amount of management discretion remained at the local level. This approach is generally viewed as sensible because regulatory costs—information costs, agency costs, and monopoly distortion—tend to grow with centralization (Haddock 1997). Thus, the optimal situation for a heterogeneous and widely dispersed system such as the national forests would generally involve a substantial amount of local manageme0nt and decision making.

To the extent that market prices are used to guide output mix decisions, the advantages of local decision making, as directed by local relative prices of forest outputs, would be enhanced. A national forest near a large urban population would probably focus on large-scale recreation and water values, both of which would be reflected in local market prices of recreation. Additionally, where fire is a significant risk, there may be an emphasis on reducing fire hazards. A national forest away from large populated centers would likely generate a different mix of outputs when responding to market information.

Over the years, however, the management decisions in the Forest Service have become increasingly centralized. Although the local population can be involved in the planning process, the experience of the Quincy Library Group shows that these preferences are often ignored. Centralized bureaucrats routinely make important decisions without good information and without knowing the true costs and benefits of their decisions, while also lacking strong motivation to gather relevant information. Even where employees of the agency are stationed locally, a common practice in the Forest Service, dissatisfaction with their decisions must be registered through an unwieldy chain of command that stretches through a multitude of bureaucratic levels.

Another problem stemming from the centralized management

of the national forests today is the disparity between those bearing the costs and those receiving the benefits. The costs borne by certain local groups can be huge. An example would be an attempt, not uncommon today, to use a largely hands-off approach to achieve a desired forest condition. If this is in an area with a forest-urban interface, the probability of large catastrophic fires can be great, with their attendant costs, both economic and noneconomic. The risks and often the actual costs to health, safety, and property would fall disproportionately on local people living in such a forest-urban interface areas. Furthermore, the environmental benefits that are gained by all are paid for by a disproportionate few. This situation, experienced by the Quincy Library Group, currently exists in many places, particularly in the West.

SUMMARY AND CONCLUSIONS

The future management of the national forests has become increasingly intractable as the alternative management objectives become more philosophical and increasingly politicized. Exacerbating the problem is today's deeper understanding of the role of fire in the forest and the ways in which the forest has changed over a period of many decades when fire eradication was a major objective.

Furthermore, the nation is coming to recognize, ever so haltingly, that the forest today is not the same one Europeans found when they first set foot on this land 500 years ago. At least two important influences have changed radically. First, the influence of the native peoples on the forest, which we now know was considerable in the pre-settlement period, largely ceased more than 100 years ago. Second, as the result of overzealous fire suppression, the nature of the forest disturbance regime has been altered for almost a century. Our forest today is very different from what it was 100 years ago.

With this backdrop of a changed forest, the nation finds itself struggling with forest management systems that do not work. Both multiple-use and ecosystem management appear attractive

but lack operational content because of information and incentive problems or unwillingness to share the use of the public lands.

Resolving the management dilemmas of the Forest Service will require asking whether the information and incentives can be improved at the national level by more regulations and planning laws or whether devolution to more local management levels is necessary to take advantage of locally valuable information and of greater ease in monitoring agency actions. The Quincy Library Group seems to offer a potential model, but political, bureaucratic, environmental, and timber lobbying groups in Washington, D.C., are unlikely to surrender control. Perhaps the acrimony associated with Forest Service management will have to get worse and forest health will have to decline more before policy makers will seriously consider reforming the Forest Service. If and when that happens, we can only hope that local control will be part of the equation.

NOTES

1. Today, more than 25 years later, it is still available from Resources for the Future.

2. Letter to Mike Dombeck, Chief U.S. Forest Service, from Frank Murkowski and members of the U.S. Senate, Committee on Energy and Natural Resources, February 20, Washington, D.C.

3. The usefulness of characterizing production functions as a prerequisite to valuation has been raised more recently in the context of ecosystems (Daily et al. 2000).

4. For a strong critique of the operational concepts of ecosystems and ecosystem management see Fitzsimmons (1999).

5. The proposal by the Clinton administration to designate as roadless areas almost 60 million acres of Forest Service lands, a proposal that the Bush administration appears to have accepted with modifications, is an example of a de facto set-aside. The absence of roads affects recreation as well as timber harvesting.

6. Although it is sensible to talk about the health of individual organisms, it does not make much sense to characterize a group as

healthy or unhealthy. The concept of ecosystem health implies that a piece of land with all the organisms is an organism itself that is healthy or unhealthy. If this were so, ecosystems missing a critical component such as a species would perish. In fact, nothing like this happens.

7. This price rise was exacerbated by restrictions that were placed on the import of softwood lumber from some Canadian provinces.

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