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***Forest Service Response to Changing
Public Value, Policies and Legislation
during the Twentieth Century in the
United States***

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and V. Alaric Sample*

*Paper prepared for the Subject Group "Forest Law
and Environmental Legislation" of the International
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PREFACE

Value changes from a largely resources utilization oriented to an environmentally oriented perspective have been particularly pronounced and visible with regard to management options on forest lands in the United States. This process led to serious confrontations between different user groups followed by policy changes and new legislation, as well as to an increasing influence of local groups on management decisions. The following paper presents changes in public attitudes and values toward natural resources as reflected in the conservation movement of the late 19th and early 20th centuries and again in the environmental movement that started in the 1950s and determines many fundamental issues on forest uses and preservation of today. The authors examine policies and legislation which have been adopted as the result of changes in public values, the role of the forest service in policy formulation and implementation, and the changes in forestry practices as well as their impacts on forest and range conditions.

The developments which are described and analyzed are not only of interest to an American reader but probably even more to readers in other regions of the world. They show that divergent opinions on the importance of forests and challenges to a new approach in sustainable forestry practices in order to maintain many uses and values are not isolated events. They reflect important changes in societies and cultures. In this sense the study offers a fascinating perspective to foresters and non-foresters and provides for a better understanding of forestry problems which are debated today with much passion.

The paper has been prepared as a contribution to the Subject Group "Forest Law and Environmental Legislation" of the International Union of Forestry Research Organizations, IUFRO. I wish to thank the authors that they have agreed to make available the text for presentation in the International Series of Working Papers of our Chair.

F. Schmithüsen

FOREST SERVICE RESPONSE TO CHANGING PUBLIC VALUES, POLICIES AND LEGISLATION DURING THE TWENTIETH CENTURY IN THE UNITED STATES

Dennis C. Le Master, Joseph T. O'Leary, and V. Alaric Sample*

1. VALUES, POLICIES AND LAW

Two major shifts in values of the American people toward natural resources and the environment occurred during the past one hundred years. The first of these was the conservation movement of the late 19th and early 20th centuries. It grew out of concern about the condition and trend of natural resources and the disposition of public land, and in opposition to laissez faire capitalism which was held responsible for what was regarded as wasteful exploitation of American natural resources, including forests, and the ravaging of the public domain by special interests.

The conservation movement was part of the reforms of the Progressive Era which generally were in opposition to special interests, waste, and incompetence in government. Accordingly, these reforms were characterized by government intervention in markets, broad distribution of benefits to the public, use of efficiency criteria in evaluating programs, and a fundamental belief in the efficacy of rationality and science. The progressive conservation movement was no exception, for its essential features were public land retention, a wise-use philosophy regarding the use of natural resources, self-supporting resource development programs, and scientific management of natural resources.

The public policy framework that emerged emphasized protection of forests from wildfire and their management based on scientific principles. The policy framework assumed a strong public sector role in: 1) acquisition of scientific knowledge through research and its enlightened application by resource professionals; 2) protection of forests, regardless of ownership, from wildfire, insect infestations, and disease epidemics; 3) productive management of private forest lands through technical and financial assistance and tax incentives; 4) adoption and enforcement of strong state and federal wildlife conservation laws; and 5) acquisition of public lands for stream-flow protection and timber production. A key element of the public policy framework that emerged was a strong focus on cooperative efforts among federal, state, and private sector interests to achieve common goals. A stronger more coercive federal role in the direct regulations of private forests lands was considered and debated, but ultimately rejected. The values, policies, and major laws associated with this framework are summarized in **Table 1**.

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Table 1: Values, Policies, and Major Laws of the Progressive Conservation Movement

Social Value	Policy	Law
To protect federal forest lands from destructive exploitation and to put certain cutover forest lands under federal ownership for watershed protection and prevention of flooding as well as to provide resources for future generations.	Management and acquisition of of public lands for timber production and to secure favorable conditions of water flows.	Creative Act of 1891; Organic Administration Act of 1897; Weeks Act of 1911
To protect forests from disastrous events, and in so doing, encourage forest land investment and management.	Technical and financial assistance to states for control of wildfire.	Clarke-McNary Act of 1924
To put forest land in productive condition, providing resources for future generations.	Technical and financial assistance to states for cooperative tree seed and seedling production.	Clarke-McNary Act of 1924
To preserve the natural heritage as it relates to wildlife.	Prohibition of interstate transportation wild animals or birds taken or possessed in violation of the laws of the state from which or to which they were shipped; migratory birds declared to be under the custody and protection of the U. S.	Lacey Act of 1900; Migratory Bird Treaty Act of 1918
To manage forest with predictable results.	Authorization of a comprehensive forestry research program for the Forest Service, including periodic timber surveys.	McSweeney-McNary Act of 1928

The second major shift in values began after World War II in the 1950s with growth in per capita real income, widespread use of automobiles, and a relative increase in leisure time. The result was, for that time, an unprecedented increase in demand for outdoor recreation activities. From 1950 to 1960, for example, recreational visits to the national forests increased more than 300 percent, from 26 million to 81.5 million visitor days. Noncommodity values of the national forests, specifically as sites for outdoor recreational opportunities, began to rise in their relative importance. About the same time, concern about the preservation of wilderness on public lands in the West became an important public policy issue, and the preservationist philosophy of Henry David Thoreau and John Muir again challenged the tenets of the progressive conservation movement as it did in the early 20th century. Wild places and things were valued in their own right, not as they might serve human consumption.

Rachel Carson published *Silent Spring* in 1962, condemning the wanton use of chemical pesticides and warning of their consequences upon the environment. "For the first time in history of the world," she wrote, "every human being is now subjected to dangerous chemicals, from the moment of conception until death" (Carson 1962:15). With *Silent Spring*, environmentalism - the belief that the living world is a continuous, self-renewing, and virtually closed

system that must be protected from the harmful effects of modern technology - began its way as a political movement. On April 22, 1970, the first Earth Day has held. Environmentalists, preservationists, conservationists, and outdoor recreation enthusiasts - indeed, an estimated 20 million Americans - participated (Scheffer 1991). The outpouring was unanticipated by Washington politicians. Since that time, they have viewed environmentalism as a matter of political consequence, and major environmental laws have been enacted into law.

As a result, the policy framework changed, becoming larger and more complex. In addition to the five areas listed earlier, another six were added: 1) management of the national forests for commodity and noncommodity resources, including outdoor recreation; 2) designation of portions of national forests, and other federal lands as well, as wilderness, which are to be protected from human development activities; 3) a statutory requirement for all federal agencies to use "all practicable means ... to create and maintain conditions under which man and nature can exist in productive harmony..." and to prepare environmental impact statements for "major federal actions significantly affecting the quality of the human environment;" 4) regulation of emissions of pollutants into the air, discharges of pollutants into water courses and bodies, disposal of hazardous wastes, and the use of pesticides; 5) protection of threatened and endangered species, including their critical habitat; and 6) comprehensive land management planning for the national forests. Values, policies, and selected major laws associated with the additions to the policy framework are contained in **Table 2**.

It is important to note that careful distinctions have been made by several analysts among the terms: utilitarianism, progressive conservation, environmentalism, and preservation. These distinctions turn on the relative acceptance of human consumptive use of natural resources and toleration of human disturbance of the biosphere. Culhane (1981) presents the terms with respect to a continuum of these two variables.

Utilitarianism-----Progressive Conservation-----Environmentalism-----Preservation
-----Use-oriented-----Biocentric-----

He explains:

A pure utilitarian ... is concerned solely with the human use of natural resources, irrespective of the wider consequences. The conservationist is committed to use, but attempts to reconcile it with biosphere-imposed constraints.... The environmentalist is committed to maintaining the integrity of the biosphere...; maintenance of mankind's existence is a secondary benefit,... The preservationist wishes to protect ... the biosphere from human use, irrespective of the possible benefits of that use for humans (1981:9-10).

While these distinctions are useful for systematic analysis, they tend to be blurred in everyday practice. For example, a conservation group may support wilderness designation of a particular site in a national forests, while a preservation group may be committed to wilderness preservation, but support regulation of the use of chemical pesticides as opposed to a complete ban.

Table 2: Values, Policies, and Major Laws of the Environmental Movement

Social Value	Policy	Law
To recreate in an accessible, aesthetically pleasing natural environment	National forests are to be managed for both noncommodity and commodity resources, to be administered on a sustained-yield basis.	Multiple Use-Sustained Yield Act of 1960
To preserve our natural heritage	Portions of national forests may be designated as wilderness and as such shall be protected from human development activities.	Wilderness Act of 1964
To preserve our natural heritage	Portions of rivers in national forests may be designated as wild and scenic rivers and managed accordingly.	Wild and Scenic Rivers Act of 1968
To maintain a healthy, sustainable environment	Federal agencies shall use "all practical means to create and maintain conditions under which man and nature can exist in productive harmony...;" an environmental impact statement is required for all federal actions significantly affecting the environment.	National Environmental Policy Act of 1969
To maintain a healthy, sustainable environment	Emissions of pollutants into the air, discharges of pollutants into water courses and bodies, disposal of hazardous waste, and the use of pesticides shall be regulated to minimize their harmful effects.	Clean Air Act Amendments of 1970 and 1977; Federal Water Pollution Control Act Amendments of 1972; Federal Environmental Pesticide Control Act of 1972; Resource Conservation and Recovery Act of 1976; Toxic Substances Act of 1976
To preserve our natural heritage as it relates to wildlife	Federal agencies shall conserve threatened and endangered species; furthermore, no actions taken by them shall jeopardize the continued existence of a threatened or endangered species or result in the destruction or modification of its habitat.	Endangered Species Act of 1973
To reduce societal conflict over the protection, management, and use of natural resources	A periodic strategic plan and individual national forest land management plans shall be developed, reviewed, and revised according to specified guidelines, using an interdisciplinary approach and with public participation.	Forest and Rangeland Renewable Resources Planning Act of 1974; National Forest Management Act of 1976

2. VALUE DIFFERENCES RELATED TO NATURAL RESOURCES

2.1 Identifiable Current Values

Human values are beliefs inferred on the basis of observed human behavior. The values of society concerning the protection, management, and use of natural resources have changed over the last thirty years. The changes have become so large as to suggest a movement toward a new paradigm (Catton and Dunlap 1978; Dunlap and Van Liere 1978; Albrecht et al. 1982; Lyden 1988). Lyden (1988) describes this well:

In the natural resource field, some commentators feel that even those values which nearly everyone has agreed to in the past are changing. What might be termed as the Dominant Social Paradigm (DSP) applicable to this field consists of a belief in abundance and progress, devotion to growth and prosperity, faith in science and technology, commitment to a laissez-faire economy and limited government planning, and private property rights... This perspective is now being challenged by a New Environmental Paradigm (NEP) stressing limits to growth, the balance of nature, and the finite nature of natural resources... In some parts of the country the NEP may have replaced the DSP as the dominant frame of reference in natural resource policy decision making. Whether or not this has occurred, it is clear that society no longer brings a uniform set of values to the decision-making process. As a result we not only see disagreement and conflict occurring in the public decision making, but also confusion about the sources of the disagreement. (Lyden 1988:844)

Kluckhohn and Strodtbeck (1961) noted that values that influence people's behavior stem from different ways of thinking about life and the world around them. They can be influenced by both experience and information, but tend to exist as a relatively stable foundation upon which opinions are based and be resistant to change. Potter and Norville (1981) reviewed and synthesized eight studies of social values in the United States as part of describing how they were incorporated into an energy-technology assessment project. They wrote:

(T)he consensus appears to be that values are conceptions of the desirable that help to guide decision making, and they usually contain criteria for preferences by providing codes or standards for conduct. They are believed to be general and abstract concepts, and thus they, themselves, are not directly observable but must be inferred from the behavior they elicit. They are also thought to be enduring, stable, and learned (Potter and Norville 1981:179).

An important theme in trying to understand value differences in natural resources has been comparison of groups with urban and rural backgrounds. Fortmann and Kusel (1990) note that conflicts over natural resource issues and management are frequently argued to be associated with the "environmentalism of new residents of urban origin and (that of) long standing residents." Fortmann and Kusel summarize the evidence supporting this finding and subsequently take issue with several aspects of it. Their data indicate more agreement than differences exist in values toward forests and forest resources, with greater support for pro-environmentalist positions. Similarly, Dunlap (1987; 1991) has noted a growing concern in the United States about environmental issues that appears to transcend characteristics like urban and rural. The suggestion is that many rural residents had pro-environmentalist attitudes in the

first place which were not well articulated, and that the arrival of people who had lived in urban areas, who had participated in environmental controversies, and who were willing to speak out against pro-development interests, gave rural residents the words to express their views.

Potter and Norville's (1981) examination of social values indicate there could be a broad range of values that might be identified. However, in terms of natural resources, six appear to be of the greatest interest. These social values are classified (Stankey and Clark 1991) into six categories:

- Commodity values (timber, range forage, water, minerals)
- Amenity values (nature, scenery, life style)
- Environmental quality values (air, water)
- Ecological values (biological diversity, endangered species)
- Public use values (recreation, tourism)
- Spiritual values

The foregoing values stem from different ways people think about their relationship with the natural world around them. Several of them have taken on a more prominent role in the Environmental Movement. Each is important because they expand the range of choices people consider in making choices about the protection, use, and management of natural resources.

2.2 Commodity values

Commodity values are associated with conceptions about material comfort, economic benefits, and economic progress and growth. MacCleery (1991) indicates the development of the United States was highly dependent upon products that came from the forest: fuel, timber for construction materials, and even wildlife habitat. The emphasis on the commodities that can be taken from forests is underscored by recent higher education programs in forest management that emphasized business. Davis (1966:1) quoted the Society of American Foresters' 1958 definition of forest management in his text of the same name: "The application of business methods and technical forestry principles to the operation of a forest property." While he did suggest other opportunities that could be pursued on a forest property, these often were presented as being ancillary to timber production.

Emphasis on concepts like community stability grew in the early twentieth century. Sufficient timber could be made available for local industry on a sustainable basis to be sure that an area would be able to maintain its local economy. Hence, the emphasis of timber production was viewed as a means for economic development.

The literature on Americans' views toward commodity values would not suggest that material interest has declined. In fact, the United States has gone through a recent, well documented period of materialism. However, as Machlis (1991) points out, the public's view about forests and their historical uses appears to be affected by population growth in non-metropolitan areas and proximity to forest areas, lack of support for Forest Service management objectives, shifting values within the forestry profession, the extent of interest in the quality of life, public

involvement in national forest planning, and greater scientific intervention. Although the population changes that Machlis identified were in the western United States, the same patterns are also evident in the East and South and have been described in various studies of forest land change. Following Potter and Norville's (1981) description of values that include conceptions about what is desirable, the changes noted above broaden the audience and the variety of views about desirable outcomes, thus placing more value orientations on the table for consideration.

2.3 Environmental Quality

Awareness by the public about the environment grew during the 1960s and was in its ascendancy around the 1970 Earth Day celebration. Dunlap (1987) notes that while public support for environmentalism appeared to decline somewhat, it has remained strong through energy crises, economic downturns, and tax revolts. In fact, several authors have noted that the environment has emerged as one of the persisting concerns of the American public with even some signs of growth (Anthony 1982; Mitchell 1980; Ladd 1982; Dunlap 1991). Some concern was expressed about the impacts of the Reagan administration upon environmentalism, but research indicates that: (1) its support gained strength rather than diminished, (2) that polls documenting this support could be used to support environmental legislation (e. g., Clean Water Act and Clean Air Act), and (3) that failure to provide support for the environment could be politically dangerous (Dunlap 1987).

Dunlap (1991) followed up his observations about environmental concern polls noting that the trends were consistent with the finding he reported in 1987. Indeed, the support appeared to be getting stronger. He wrote:

Used intermittently in New York Times/CBS polls since 1981, the fourth item asks respondents to agree or disagree with a very strong worded statement: "Protecting the environment is so important that the requirements and standards cannot be too high, and continuing environmental improvements must be made regardless of costs." Agreement with this statement rose steadily over the past decade, with the result that in 1990, three-fourths of the public was expressing agreement and only one-fifth was expressing disagreement (Dunlap 1991:12).

2.4 Ecological Values

The growth in concern about ecological values, on the one hand, is related to issues about environmental quality, and on the other, the changing role of science. Concerns about biological diversity, old-growth forests, and endangered species and a host of other related issues are all interconnected into a web of both public and professional values. The National Research Council (1990) called for a greater role for scientists in communicating ecological knowledge to policy makers. Machlis (1991) describes an explicit attempt by the Forest Service in its New Perspectives (now Ecosystem Management) program to include scientists in management decisions. In a recent article in *Science*, Congressman George E. Brown, Jr. stated:

U. S. government support for basic research has reflected a widespread, but weakly held sentiment that the pursuit of knowledge is a cultural activity intrinsically worthy of public support... Politicians - always on the lookout for miracle cures to sell to the public - have enthusiastically embraced research as the key to a bright future... Today ... the uneasy alliance between scientists and politicians is beginning to come unglued.

An excessive cultural reverence for the objective lessons of science has the effect of stifling political discourse, which is necessarily subjective and value laden (Brown 1992:200-201).

Dealing with biological diversity issues, Raven and Wilson (1992), also reporting in *Science*, outlined a 50-year plan in 10-year increments to conduct biological diversity surveys that aim at the ultimate identification and biogeography of all species. Placed in the context of concern for economic well being and stagnation, it is challenging to think that ecological values and science would rank higher than economic values in the political arena. This is underscored by Brown's (1992) observation that despite 50 years of increasing government support for research, the standard of living in the United States is declining. The value of science and its contribution to ecological values will continue to be under pressure as skepticism about scientific programs continues to be an issue.

2.5 Recreation Values

Outdoor recreation participation grew exponentially after World War II, at rates that far exceeded those of the pre-war period. In part, this increase was due to a change in social preferences; the mobility of the automobile, greater real income, and more leisure time combined to accentuate the trend in a substantial way. National commissions were formed to address this profound change and make recommendations on, for example, how the public land agencies might respond to the change in demand for outdoor recreation. Resources were made available to improve access and enhance the use of recreational facilities on public lands. Projections of likely future recreation participation show expected increases across all recreational activities and in all three categories: land, water, and snow and ice.

Although one of the values associated with recreational use of public lands is associated with "re-creation" and refreshment of the spirit (often linked to preparation for work), the participation levels have also reflected significant economic value. In addition, while tourist activities have always had a close interdependency with resource areas, increased attention to economic impacts and revitalization of communities and regions appears to have refocused attention on the value of recreation and travel. In fact, agencies like the Forest Service, Bureau of Land Management, and National Park Service have explicitly begun to refine their roles, not only in terms of domestic participants, but also in terms of international travelers. In addition, there are some national studies (President's Commission on Americans Outdoors 1987) that suggest the emergence of citizens that value leisure as their highest pursuit, and work is pursued essentially in support of it. Although the literature suggested 30 years ago this would happen because of an increase in leisure time and a decrease in work, other factors appear to be influencing this phenomenon like changing attitudes toward work.

2.6 Amenity Values

Perhaps one of the main effects of forest uses like recreation and tourism has been a growing interest in the amenity values of forests. As more people have had the opportunity to visit forest recreation areas, interest has also grown in making these areas more attractive by improving the scenery. Indeed, "visual resource management" is now a matter of systematic study. The early work focused on streams and road corridors, but it was soon broadened to include timber harvest areas, downhill skiing areas, valued scenic attributes of different natural settings, and landscape views. Schoeder (1992) indicates amenity values include not only quantitative aspects, but also qualitative features that involve perception, judgment, thought, emotion, imagination, and intuition. These themes appear to also have growing legal standing as environmental and aesthetic quality are receiving greater protection in the courts (Smardon and Karp 1993).

Amenity values were identified with natural, historical, wildlife, and cultural resources during a recent meeting on amenity resources and rural economic opportunities held in State College, Pennsylvania. In the context of rural areas, amenity resources were identified as those features of the environment that provide beauty and pleasure (Shafer and Siehl 1991). The results of this meeting were successful enough to influence the final version of the 1990 Farm Bill in which amenity resources and rural development were linked and included as a new economic development focus.

2.7 Spiritual Values

An emerging, increasingly prominent demand for public wildlands is defined by the spiritual values associated with the on- and off-site use of forests and other natural areas. Driver et al. observed recently:

While the spirituality-related values of natural areas might not be any more important today than they always have been, interests in and concern about these values are now being articulated more clearly and stronger and by a broader array of interest groups than in the past. It is a type of resource "use" that proactive, creative, and responsible resource managers must attend... (Driver et al. 1992:5)

The connection of spiritual values with forests emerges from a variety of sources. Schroeder (1992) identifies spiritual values showing up as one of the uses of the forest in the *Journal of Forestry* (Salwasser 1990), the National Research Council (1990) report on forestry research, and in the technical dendrology text of Harlow and Harrar (1958) in which a sense of reverence was mentioned when entering a giant sequoia grove. Schroeder also describes the challenge for the natural resource professional in dealing with spiritual values:

(T)he arguments for a land ethic are mostly abstract and intellectual, and are often justified solely in terms of material human benefits... But the educational process for natural resource professionals ignores the intuitive/feeling aspects of human experience, and focuses almost exclusively on a rational/thinking approach (Schroeder 1992:5).

This issue was highlighted in the "Workshop on Spiritual Values of Forests and Other Natural Areas" held in Santa Fe, New Mexico in 1992, where concerns were expressed both about the emergence and growth of spiritual values associated with natural resources in certain settings and contexts and the challenge of their measurement and understanding. How can managers manage or policy makers make policy when so little is understood about the interface between spiritual values and natural resource management?

3. CHANGES IN PRACTICES RESULTING FROM THE PROGRESSIVE CONSERVATION MOVEMENT

Implementation of the policy framework of the progressive conservationist movement was led by the Forest Service. And it resulted in several changes in natural resource practices documented most recently by Fedkiw (1989), MacCleery (1992), and Sedjo (1991) and summarized below.

3.1 Use of Resource Professionals

Among the first of these changes was the use of resource professionals in the practice of forestry. Scientific management was a central theme of the progressive conservationist movement, and trained forestry professionals were required for it to be carried out effectively. The Forest Service encouraged and facilitated the growth of the forestry profession in the United States. Beginning with Gifford Pinchot, its policy was to employ technically trained professional foresters. Since only two universities, Cornell and Yale, offered forestry curricula at the time, their numbers were few. By providing employment opportunities for foresters, establishment of undergraduate forestry educational programs at other colleges and universities was encouraged. By 1915, 13 schools offered forestry programs, and by World War II, the number increased by 10, a total of 23. Today, there are over 50 forestry schools in the United States.

The founding of the Society of American Foresters, the national organization representing the forestry profession, is another example of Forest Service encouragement of the forestry profession. Indeed, the initial organizational meeting of the Society was held in Gifford Pinchot's office in the Division of Forestry on November 30, 1900. Throughout its subsequent history, the agency has been a strong supporter of Society activities. In a similar way, the Forest Service played a leadership role in establishment of the range management profession and the Society for Range Management, the national organization representing the range management profession.

3.2 Establishment of Forestry and Range Research

Scientific management requires development of new knowledge to address identified problems. Forestry research was an important activity of the Forest Service from the time of formation of the Division of Forestry in the Department of Agriculture in 1876. It was enhanced by establishment of regional experiment stations beginning in 1908 and the Forest Products Laboratory in Madison, Wisconsin in 1910. It has further enhanced by the organization of the Branch of Research in the agency in 1915. The biggest stimulus to Forest Service research

was its congressional recognition through passage of the McSweeney-McNary Act in 1928 in which a comprehensive program of research in all phases of forestry and range management, including a nation-wide timber survey, was authorized. The Forest Service became the pre-eminent forestry research institution in the nation, a position it has held to this day.

The agency has augmented its research efforts through cooperative efforts with forestry schools and state agricultural experimentation stations. The result is that the forestry research establishment in the United States is unsurpassed in the world and has been so for many years. And its discoveries have led to the development and application of science-based forestry practices, increased efficiency in wood utilization, and the development of new wood products which often tend to extend timber supplies.

Range research by the Forest Service in the 1930s, 1940s, and 1950s was very productive, nearly as dramatic as they were in forestry. The range research program later became comparatively stagnant, focusing on red meat production. Recently, the focus of the program has shifted and once again is yielding important findings on rangeland ecosystems and their protection, management, and sustainable use.

3.3 Wildlife Conservation

The overexploitation of wildlife in the United States during the 19th century exposed the inability of the states to control the taking of wildlife. The Lacey Act of 1900 prohibited the transport of wildlife that had been illegally taken across state lines. The Migratory Bird Treaty Act of 1918 placed migratory birds under the custody and protection of the federal government. National wildlife refuges began to be established around the turn of the century, and additions were made in each subsequent decade. The Federal Aid in Wildlife Restoration Act, better known as the Pittman-Robertson Act, was passed in 1937. It authorized the allocation of revenues from an excise tax on firearms and ammunition for approved wildlife research and habitat acquisition, development, and maintenance.

States began to strengthen their game laws during the same time period as a better understanding of wildlife management began to emerge. Deer, elk, pronghorns, mountain goats and sheep, moose, turkey, and beaver were restocked in areas where their populations were depleted, and their numbers began to grow, often dramatically. Most of these species are now in abundant numbers. MacCleery writes: "Wildlife has been a major conservation success story" (1990:35).

3.4 Protection of Forests from Wildfire

The most important need in forest management at the turn of the century was the control of wildfire. And it continued to run unchecked for the first two decades.

In 1924, the Clarke-McNary Act authorized the Forest Service to provide technical and financial assistance to states for the prevention and suppression of wildfire. The fire control systems that were devised, covered federal, state, and private forest land in a cooperative effort both in

funding and in detection and suppression. By the end of the 1930s, these efforts began to show substantial results. Over 40 million acres were being burned annually in the 1920s. By the end of the 1930s, the number of acres burned had been reduced to about 30 million acres. The trend continued to decline until the 1960s where it has stabilized at about three to five million acres burned annually. This remarkable success was a result of improved forestry practice in terms of the detection and suppression of wildfire, the development of fire control organizations and facilities, and cooperative federal, state, and private control programs.

3.5 Cooperative Federal and State Programs

Cooperative federal and state programs were not limited to wildfire control. Section 4 of the Clarke-McNary Act also authorized financial and technical assistance to states to establish and operate nurseries to produce growing stock for windbreaks, shelterbelts, and farm woodlots. Furthermore, it authorized technical assistance to states to provide educational programs and technical assistance to farmers in establishing and improving their woodlots, shelterbelts, and windbreaks. While the initial annual appropriation limit in each case was small, \$100,000, these provisions extended federal cooperation with states into new areas. They were successful both in establishing nurseries and producing growing stock. Greeley wrote:

(S)tate forest nurseries have increased to 74 in number and a yearly production of 307 million trees. In 1949, 32 forest nurseries were also maintained by federal agencies and 13 by private forest landowners. During the five years from 1945 to 1949, 1,144,000 acres were planted, for which at least two-thirds of the stock was supplied from state production. As a 'pump primer', section 4 of the Clarke-McNary Act has been strikingly successful. (Greeley 1953: 185)

The three-point federal-state cooperative program formed in the Clarke-McNary Act - control of wildfires, production of growing stock, and educational programs for woodland owners - tended to expand and strengthen the state forestry agencies. As a result, many state forestry programs for private landowners were initiated, promoting better forest practices on private lands. Tree planting increased dramatically in the late 1950s and 1960s as part of the Soil Bank program. Nevertheless, it began to rise again and continued to grow to the present day. In the 1980s, more than 26 million acres were planted, including a record 2.3 billion seedlings planted on 3.4 million acres in 1988. While some of these increases were in response to government programs, the fact is that the increase in real prices of softwood sawtimber and lumber have improved expected financial returns of tree planting and forest management for timber growing.

3.6 Rehabilitation of Cutover Forest Land and Marginal Farm Land as National Forest Land

Often forgotten in current controversies over the protection, management, and use of the national forests in the East is that they were acquired land that had been abused, depleted, and poorly protected. Shands and Healey write:

The national forests of the East, in the main, were assembled from land that nobody wanted. In the nineteenth and early twentieth centuries, millions of acres were shorn of their most valuable timber species, sometimes burned over or badly eroded, and then left behind by a timber industry that had exhausted the resource

and moved West. Other forests, especially in the South, were created from grown-over fields of a marginal agriculture that had depleted the soil and disappeared. Most of the land purchased for first eastern national forests in the early 1900s cost the government less than five dollars an acre...

Today, this same land has been healed and rejuvenated...

The rehabilitation of the eastern national forests ranks as one of the most remarkable conservation achievements of this century. These national forests are now a treasure store of scenic, timber, wildlife, mineral, wilderness, and recreational resources. (Shands and Healey 1977:3)

4. CHANGES IN PRACTICES RESULTING FROM THE ENVIRONMENTAL MOVEMENT

Several changes in Forest Service practices occurred as a result of statutory policies enacted with increasing frequency during the post-war period as the environmental movement grew in strength. Changes in Forest Service practices brought about by laws enacted during the environmental movement include:

- increased consideration of non-market values in carrying out the policies of the Multiple Use-Sustained Yield Act;
- increased management responsibilities, programs, and activities for national forest lands reserved by statute for specific noncommodity uses;
- environmental impact analyses for agency actions that might or would have a significant impact on the environment;
- compliance with all federal, state, and local laws regulating air and water pollution;
- protection of threatened and endangered species and their critical habitat when they are located on the national forests, which is to prevail over all other conflicting uses; and
- periodic strategic and long-term land management planning.

4.1 Multiple-Use Management

Demands for all uses of the national forests grew rapidly during the 1950s. So, too, did the conflicts among the user groups, especially between outdoor recreationists and the timber industry. The Forest Service requested legislation by Congress to clarify its mission and to strengthen its position with regard to the challenges and competing pressures from different interest groups. The result was the Multiple Use-Sustained Yield Act of 1960. The wording of the act was authored by the Forest Service, and it placed into law the management policies of multiple use and sustained yield as then practiced by the agency. As a guide for decision making, the Multiple Use-Sustained Yield Act lacks rigor. As a legal performance standard, it is altogether lacking. The act is significant, however, because of the direction it provides for management of the national forests. It effectively states that the national forests are for the public as opposed to a few interest groups, that all resources of the national forest are to be given equal consideration.

Forest Service implementation of the act has been uneven. The fact is timber harvesting and related activities were and continue to be prominent features in Forest Service programs and

budgeting, and nontimber resources were neglected. Furthermore, "the (organizational) structure of the Forest Service and its reward system" have been tied to timber because "timber meant money, growth, and power for the agency" (Cubbage et al. 1993:331). On the other hand, the statutory requirement for equal consideration of all resources obligated the Forest Service, and the steady growth of the environmental movement provided a corps of careful observers intending to insure compliance with the law. The net effect was that the agency became engaged in multiple-use management, much more so than if left to its own volition.

4.2 Reservations for Specific Uses

The Wilderness Act was passed four years later (1964). Fifty-four areas totaling 9.1 million acres - all on national forest land - were designated as wilderness. Equally important, the Forest Service was directed by Congress to review all primitive and roadless areas for their suitability as wilderness. The Whiskeytown-Shasta-Trinity and the Spruce Knob-Seneca Rocks National Recreation Areas were established in 1965, and in 1968, the Wild and Scenic Rivers Act was passed, establishing a policy that certain rivers of national significance should be preserved in their free-flowing condition because of their unique scenic, recreation, geologic, fish and wildlife, historic, cultural or other similar values. The National Trails System Act was passed the same year. It preserved scenic and otherwise interesting trail routes through the United States.

With these three acts, Congress began the policy, which continues today, of reserving federal land that is unique or has some special uses, in other words, of establishing dominant use reserves on federal land, including the national forests. The result has been to reduce the area of federal land under multiple-use management and to make federal land managers more conscious of non-commodity uses of federal land. If such uses are not taken into account, Congress may reserve land exclusively for such uses.

4.3 Management and Use in Productive Harmony with Nature

The National Environmental Policy Act (NEPA) was signed into law on January 1, 1970. It established a national policy that the federal government use "all practicable means and measures ... to create and maintain conditions under which man and nature can exist in productive harmony..." To implement this policy, the act requires all agencies of the government to "include in every recommendation or report on proposals for legislation and other major federal actions significantly affecting the quality of the human environment,..." what has come to be known as an environmental impact statement.

No other environmental legislation has had greater impact on the behavior of federal land management agencies than NEPA. Agencies were compelled to take into account systematically the environmental consequences of their actions. Failure to complete an adequate environmental impact statement has resulted in delays in implementing projects and has been the basis for lawsuits, many of which were successful.

4.4 Regulation of Pollution

A number of major environmental laws were enacted subsequent to the passage of NEPA. None of them have had greater impact than the Federal Water Pollution Control Act Amendments (FWPCAA) of 1972 and its amendments of 1977 and 1987. The act authorizes a comprehensive program for regulation of water pollution administered by the Environmental Protection Agency (EPA). Among other things, EPA is directed to issue to federal and state agencies: (1) guidelines for identifying and evaluating the nature and extent of nonpoint sources of pollutants, and (2) processes, procedures and methods to control pollution resulting from nonpoint sources. Section 404 of the act also requires landowners to obtain permission from the Corps of Engineers for dredge and fill operations in the waters and wetlands of the nation. This review and permit process has evolved into an extensive wetlands protection program. The act also provides that federal agencies be subject to, and comply with, all federal, state, interstate, and local requirements for water pollution abatement and control.

The restrictions of non-point pollution from silvicultural activities has had important impacts on both public and private forest management. FWPCAA required states to prepare "208 plans" to prescribe methods for controlling non-point source pollution from agriculture, silviculture, mining, and construction. However, lack of adequate technical and financial resources at the state level led the Council on Environmental Quality to conclude in 1976 that "there has been little constructive progress in ... regulation of (non-point source pollution)" (Council on Environmental Quality 1976:23). The Water Quality Act of 1987 expanded federal assistance and direction regarding non-point source pollution, requiring each state to identify navigable waters impacted by non-point source pollution, indicate the sources of pollution, and to describe best management practices for dealing with each type of non-point source pollution.

State best management practices (BMPs) applied to runoff of pesticides as well as excessive sedimentation of watercourses, limiting the broadcast application of silvicultural herbicides. Much of the excessive sedimentation from forest management activities comes not from recently harvested forests, but from surface runoff from unpaved access roads and skid trails. Thus, FWPCAA through state BMPs has strongly influenced the extent and construction of forest road systems and their location relative to riparian areas. Where several forest landowners share a common watershed, FWPCAA has brought closer coordination and cooperation among adjacent owners in order to avoid unacceptable cumulative impacts on water quality. More importantly, it provided technical planning assistance through the Environmental Protection Agency, the Corps of Engineers, the U. S. Fish and Wildlife Service, and the Department of Agriculture, requiring these agencies to coordinate more closely with one another in assuring compliance on public lands and facilitating landowner compliance with voluntary BMPs.

Considerable controversy has developed regarding the definition and delineation of wetlands subject to Corps of Engineers permitting processes, especially in highly productive forest lands in low-lying areas such as the coastal plain of the southeastern United States. In order to reduce opposition from agricultural and forestry interests, the Clean Water Act of 1977 amended section 404 to exempt "normal farming, silvicultural, and ranching activities" from

most of the dredge and fill restrictions. Nevertheless, forestry practices commonly used on private lands in the Southeast continue to be challenged as violating the purposes of the Clean Water Act, especially those involving the draining or degradation of wetlands, and regulation of water pollution may yet have a significant impact on public and private forest management.

The Clean Air Act of 1970 regulates ambient air quality, authorizing the federal government through EPA, to impose controls if states do not satisfy national standards. The 1977 amendments provide that federal agencies be subject to, and comply with, all federal, state, interstate, and local requirements for air pollution abatement and control. They also establish standards for Class I air quality areas which include many wilderness areas located in national forests. The major impact of the Clean Air Act on forest management has been through limitations on the amount of particulates and smoke generated from prescribed burning. At first, this was an issue concerning burning after timber harvesting for slash disposal and site preparation. Increasingly, however, regulation of burning under the Clean Air Act has become a serious limitation on the use of prescribed fire to maintain the health, productivity, and biological diversity of fire-dependent ecosystems such as ponderosa pine ecosystems in the Inland West or long-leaf/wiregrass ecosystems in the southeastern United States (Agee 1993; Sampson and Adams 1994).

4.5 Protection of Threatened and Endangered Species

The Endangered Species Act of 1973 established a national policy for the conservation of endangered species and the ecosystems upon which they depend. The act was passed without political debate and only a modest amount of publicity. Subsequently, it has proven to have far-reaching effects and been the cause of several major political controversies.

The Endangered Species Act has two major processes: (1) designation of species as threatened or endangered through listing, and (2) the protection of threatened and endangered species and their critical habitat. Two federal agencies and their cabinet officers have the authority to list species: the U. S. Fish and Wildlife Service under the secretary of the interior and, in the case of anadromous fish and most marine species, the National Marine Fisheries Service under the secretary of commerce. Once a species has been listed, federal agencies are required to ensure, in consultation with the Fish and Wildlife Service or the National Marine Fisheries Service, that their actions will not jeopardize the continued existence of any threatened or endangered species or result in the destruction or adverse modification of the habitat of such species. The presence of a threatened or endangered species on federal lands drastically affects management. Indeed, their protection upon federal land that is the habitat of an endangered or threatened becomes the principal use of the land, superseding any conflicting use. The number of threatened and endangered species is significant. As of December 4, 1992, 246 species occurred on national forest system land or were likely impacted by Forest Service activities.

4.6 Comprehensive Land Management Planning with Public Participation

The Forest and Rangeland Renewable Resources Planning Act (RPA) of 1974 is an effort to resolve conflicts over the use of natural resources through comprehensive, long-term planning.

It provides for a periodic ten-year Renewable Resource Assessment for the United States as a whole, regardless of land ownership, and for a periodic five-year Renewable Resource Program, based on the Assessment, for management of the National Forest System, Forest Service Cooperative Forestry Assistance programs to states and private landowners, and Forest Service research. Two years later, the National Forest Management Act (NFMA) was passed, providing standards and guidelines for planning and management of the national forests. NFMA was passed in response to the decision by the Fourth Circuit Court of Appeals, upholding a lower court decision, that timber sales in the Monongahela National Forest violated provisions of the Organic Administration Act of 1897. It was constructed as an amendment to RPA.

RPA and NFMA are the congressional response to widespread public protest during the 1960s and 1970s over national forest management, particularly over the widespread use of even-age management and clearcutting. They are process-oriented, rather than outcome-oriented, intending to establish a framework by which the Forest Service and various public interests can reach agreement on the management of the national forests. Public participation is part of the process: first, as a result of the procedural rules implementing NEPA, and second, as a result of the wording of section 6 of NFMA, that "the secretary (of agriculture) shall provide for public participation in the development, review, and revision of land management plans."

Another feature of NFMA whose implications were not well appreciated at the time of passage was the requirement for guidelines for land management plans which "provide for diversity of plant and animal communities based on the suitability and capability of the specific land area in order to meet overall multiple-use objectives,..."

5. CHANGES IN FOREST AND RANGE CONDITION AS A RESULT OF PRACTICES OF THE PROGRESSIVE CONSERVATION MOVEMENT

5.1 Forest Condition

As mentioned earlier, Fedkiw (1989), MacCleery (1992), and Sedjo (1991) published separate studies on the condition and trend of U. S. forests. They each reached the same conclusion that the forests of the nation, in most of their major dimensions, are in significantly better condition today than they were a century ago. Major reasons for the conclusion are:

- The area annually burned by wildfire has been reduced by more than 95 percent.
- The cutover land that existed in 1900 - some 80 million acres - has long since been reforested, including the watersheds in the East whose denuding resulted in the disastrous flooding that led to the passage of the Weeks Act of 1911.
- Forest growth rates have exceeded harvest rates throughout the post-war period. Indeed, the total volume of growing stock has risen steadily through the five timber inventories taken over the period 1952 through 1988.
- Tree planting on all forest ownerships has increased dramatically since World War II and was at record levels during the 1980s.

- Wood utilization has increased in efficiency since the early 1900s, driven by steady increases in the real prices of sawtimber, enabled by the development and application of new technology.
- Conversion of forest land to cropland has stabilized. Actually, there has been no net increase of cropland for the last 70 years. Conversions have been offset by cropland abandonment.
- Some species of wildlife have experienced remarkable increases in their populations, including "wild turkey; beaver; egrets, herons, and many other wading birds; wood ducks and several other species of ducks; whistling swans; Rocky Mountain elk, pronghorn antelope; bighorn sheep; even white-tailed deer throughout most of its range" MacCleery 1991:6).

It is estimated that in 1630, the beginning of the settlement of North America by Europeans, there were 1.0 billion acres of forest land, 46.1 percent of the total land area, in what is now the United States. By 1907, there were 759 million acres of forest land, comprising 33.5 percent of the total land area; by 1992, there were 737 million acres of forest land, 32.5 percent of the total land area. Fedkiw, MacCleery, and Sedjo present substantial evidence and vigorously argue that U. S. forest lands of 1992 are in better condition than U. S. forest lands of 1907.

Nevertheless, serious questions can be asked about the comparative health of forests today as opposed to those of a hundred years ago. How resilient are they to disturbance in a comparative sense? No apparent answer is likely. What is their relative genetic diversity? Probably less because of widespread use of nursery stock in tree planting. What is their relative species diversity? Probably less because of simplification of forest ecosystems throughout the country. It is very likely that more species of plants and animals are in danger of going extinct today than they were 100 years ago. Are forests today more or less prone to disease epidemics and insect infestations? Probably more prone due to elimination of wildfire from ecosystems in which fire is an integral part. How severe are the impacts of exotic diseases, such as Dutch elm disease and the chestnut blight, and insects, such as the gypsy moth? Probably severe, at least in some regions of the country.

Simply stated, however favorable the current condition and trend of the forests of the nation, there are still important reasons for concern and caution.

5.2 Range Condition

Data on range condition are lacking in many different ways. One of the reasons is the first national assessment of rangeland was made in 1936 (U. S. Congress 1936), and the second, some thirty years later. Furthermore, there is disagreement on the term "range condition," which refers to the relative health of the range. Originally, range condition referred to range productivity in terms of livestock grazing and was based on a comparison of actual forage production with desired or potential. The concept evolved to one of actual production of vegetation of a site to an ecological norm, such as climax vegetation. It has continued to evolve to include to some ecological standard but also the desired use of the site.

The best information available is anecdotal evidence and the judgments of respected observers. Thadis W. Box is one such observer, and he recently wrote:

I believe that the American range is in the best condition that it has been in this century. This view is primarily based on my review of historical reports and our collective experience. This does not mean the job of restoring the range from the past abuses has been completed. There are still many areas in need of management. It does indicate that the range can be improved with good management and favorable climatic conditions (Box 1990:111).

Later, in the same paper he writes:

I believe that the trend, on the average, has been up for rangelands over a number of decades and that the range is in the best condition of this century. This is my professional opinion and cannot be well documented with specific surveys and reports (Box 1990:113).

It is clear that a combination of factors - overgrazing, proper management practices, and drought - caused a deterioration of range conditions in the West, particularly the Southwest. What is not clear is the extent to which conditions have improved, a matter characterized in the recent National Research Council report *Rangeland Health* (1994) as one of "sharp debate." The debate will not lessen in the foreseeable future for there is no systematic data set. The report states:

All national assessments (of rangeland condition) suffer from the lack of the lack of current, comprehensive, and statistically representative data obtained in the field. No data collected using the same methods over time or using a sampling design that enables aggregation of the data at the national level are available for assessing both federal and nonfederal rangelands (National Research Council 1994:26)

The National Research Council report makes recommendations for a national system of inventorying and monitoring rangeland health, but they are yet to be put in place. If they are, assessments can be made of the management and use of rangelands in the future. Assessments of the past, however, will continue to be made on the basis of fragmentary and anecdotal evidence.

6. CHANGES IN FOREST AND RANGE CONDITION AS A RESULT OF PRACTICES OF THE ENVIRONMENTAL MOVEMENT

Changes in forest and range condition as impacted by the values, policies, and practices of the environmental movement are more difficult to assess than those associated with the progressive conservation movement. The reason in some cases is the laws establishing the policies are simply laws of compliance, coupled with the fact that the Forest Service is not the implementing agency. In others, it is because of the extended linkage between practice and condition, like the linkage between a well conceived plan and its implementation. The reason in still other cases is uneven implementation of public policy by the Forest Service.

6.1 Multiple Use and Sustained Yield

Equal consideration of all renewable resources of the national forests "in the combination that will best meet the needs of the American people...", coupled with the relative increase in environmental values of the public, would suggest growth would occur in the relative emphasis of noncommodity resources in the management and use of the national forests vis-a-vis commodity resources.

No incontrovertible evidence exists that this is the case. Timber harvesting in the national forests increased rapidly after passage of the Multiple Use-Sustained Yield Act in 1960 (continuing a post-war trend), reaching what were considered sustainable harvest levels under then-current management plans in the late 1960s. The nondeclining even flow policy in 1973 and forest planning required by the National Forest Management Act of 1976 caused significant changes in the timber sale program resulting in a modest decline in harvest levels - with large year-to-year variations caused by economic conditions - until 1990. Subsequently, harvest levels have rapidly declined "to reflect," as the 1993 update of the RPA Assessment puts it, "changing societal values" (USDA Forest Service 1993:28) The extent of range grazing by domestic livestock on the national forests has remained fairly constant since 1953, about the same after passage of the Multiple Use-Sustained Yield Act as before (Joyce 1989:40). In contrast, recreational use of the national forests has burgeoned as have water and fish and wildlife uses.

Some of these characterizations are crass because of problems in aggregation, and the leading example is recreational use of the national forests which is much different today than it was in 1960. Not only are there many more people doing activities that were done in the 1960s, such as picnicking, backpacking, camping, boating, and downhill skiing, people are also doing things that were not done in the 1960s, such as off-road vehicle driving, mountain biking, wildlife observation, kayaking, and snowmobiling. Indeed, recreational use of the national forests is a general category under which over 30 activities can be listed (English et al. 1993:6-8).

While the relative balance may have changed in the management and use of the national forests in terms of noncommodity and commodity resources, the critical question is the timeliness and effectiveness of the Forest Service response to the corresponding social values and public policies. Did the agency respond as rapidly and as ably as it might have? The answer is an unqualified no. The last 34 years have been years of continuing conflict over the management and use of the national forests, and the sources of criticism have come from the entire range of users of the national forest. The fact that no successful lawsuit has been brought successfully against the Forest Service for violation of the multiple-use provision of the Multiple Use-Sustained Yield Act is not compelling. As one court put it, the wording of the act, including its multiple-use provision, "breathes discretion at every pore" (*Perkins v. Bergland*). The Forest Service has exercised its legal discretion in terms of the balance of commodity and noncommodity uses of the national forests, and the unfortunate result is a continuing erosion of public support. The Forest Service is where it is today by design not accident. Furthermore, it

is in its current position because its efforts and the forest conditions resulting from them, were rejected by public opinion and the courts.

A second question with regard to implementation of the Multiple Use-Sustained Yield Act is whether a "sustained yield of the several products and services" of the national forests has been ensured? As indicated above, the results are ambiguous. Substantial changes in sustainable harvest levels on national forest timber have occurred on at least three different occasions. The first was after the Douglas-fir Supply Study (1969) which concluded that if the Forest Service continued to use then current rotation management practices and utilization standards, existing harvest levels could not be sustained after the first rotation. The Forest Service issued Emergency Directive No. 16 in 1973 after public outcry and internal reaction to the study. The directive required timber planners to look beyond the first rotation and set the calculated allowable harvest at levels that would not decline, what came to be known as the nondeclining even flow policy.

Sustainable harvest levels were adjusted as a result of forest planning because: (1) substantial areas of land were removed from the allowable cut base as wilderness or as undeveloped reserves, and (2) harvest planning and practices on lands in the base were modified to minimize adverse impacts on the environment and harmful effects on noncommodity uses of the forests. Sustainable harvest levels were adjusted again in the early 1990s to meet habitat requirements of threatened and endangered species in the Pacific Northwest. These changes illustrate that sustainable levels of products and services of the national forests are not fixed. They have to be reassessed and adjusted from time-to-time as social values change. The challenge for the Forest Service is the timeliness and effectiveness of its response. To date, that response has been uneven and the subject of much public criticism.

6.2 Wilderness and Other Restricted-Use Designations

Changes in wilderness, wild and scenic river, and recreation designations during the past thirty years are shown in Table 3. They are substantial, the result of repeated affirmation by Congress of the policy of establishing restricted-use reserves to protect federal land considered unique or special in some way.

Table 3: National Wilderness, Wild and Scenic Rivers, and Recreation Areas in the National Forest System, 1965, 1970, 1980, 1990, 1992

	1965	1970	1980	1990	1992
National Wilderness Areas ^a	9.1	9.9	17.6	33.3	33.6
National Wild and Scenic Rivers ^b	n. a.	457.1	1417.2	3705.3	4604.4
National Recreation Areas ^a	.2	1.4	6.1	7.5	8.3

^aMillions of acres.

^bMiles.

Forest Service support for legislation carrying out this policy was unenthusiastic for philosophical reasons. It limited agency discretion. Furthermore, it eroded the authority of (forestry) professionals in making site-specific management decisions and was contrary to the principle of decentralization which is central to the organizational structure of the agency. Hence, while

wilderness, wild and scenic river, and recreation designations have grown over the past thirty years, the Forest Service has been considered more of an obstacle than an agent of change. The impact on the condition of the national forests was to limit their development in designated areas. The Forest Service's philosophical objections to wilderness, wild and scenic river, and recreation area designations effectively sided the agency with developmental interests.

6.3 National Environmental Policy Act

Congress considered and passed the National Environmental Policy Act with little attending public controversy. That soon changed, however. For the willingness of the court's to refine and extend NEPA procedural requirements and criteria for the adequacy of impact statements was not anticipated. The Forest Service had to amend its planning and decision-making processes to comply with NEPA, particularly those dealing with public participation. Indeed, the agency was engaged at the time in a re-examination of many of its policies and programs as a result of the growing controversy over clearcutting in the national forests and the failure of the Timber Supply Act in the House of Representatives. In October 1970, Forest Service Chief Edward P. Cliff wrote an interoffice memorandum to all employees which said in part:

Our programs are out of balance to meet public needs for the environmental 1970s, and we are receiving mounting criticism from all sides. Our direction must be and is being changed... The Forest Service is seeking a balanced program with full concern for the quality of the environment. (Cliff 1970)

The agency's compliance with NEPA was a mixed success. The Forest Service was commended for its NEPA efforts in a report of the Council on Environmental Quality in 1974 (Council on Environmental Quality 1974:378-381). At the same time, it was often in court in NEPA lawsuits, the majority of which it was losing. Forest Service litigation successes in NEPA lawsuits are summarized in Table 4. It lost more than it won during the first nine years of implementation, and it won more than it lost in the next fourteen years.

Table 4: Forest Service NEPA Litigation Successes

	Wins	Losses
1970-1988 (published cases)	20	26
1989-1992 (published and unpublished cases)	39	10
TOTAL	59	36

Source: Memorandum to F. Dale Robertson, Chief, Forest Service, from James P. Perry, Assistant General Counsel, Office of General Counsel, U. S. Department of Agriculture, February 16, 1993.

The data in Table 4 suggest Forest Service compliance with NEPA has improved over time. NEPA is a law of compliance, a law in which an agency has little discretion. It simply must comply with the statutory requirements, including their implementing regulations. Complying with something required is not what sets apart a strong government agency intent on serving the people of the nation. It is doing only what is necessary. Accomplishments become substantial, recognized, when they go beyond the minimum.

The net effect of NEPA on the condition of the national forests is arguable. NEPA has caused the Forest Service to become more sensitive to the environmental consequences of proposed actions. It would be difficult to argue, however, that the environmental condition of the national forests has improved over the past 25 years because of passage and implementation of NEPA. The causality is not that direct. Perhaps it would be more pertinent to ask what would be the condition of the national forests if NEPA were not enacted in 1970.

6.4 Water and Air Pollution

Generally, the Forest Service has complied with federal, state, and local laws regulating air and water pollution, having a positive effect on the condition of the national forests. Nevertheless, there are significant problems. Smoke management from prescribed burning has been a continuing source of difficulty for the Forest Service, state forestry agencies, and private forest managers in complying with the Clean Air Act. Federal and state air quality regulations severely limit weather conditions under which prescribed burning is permitted, often making it impossible for forest managers to complete necessary slash disposal and site preparation. Alternative mechanical and chemical methods do not have the same positive effects as fire, such as favorably modifying soil chemistry, and often have negative side effects of their own.

Environmentalists are becoming as concerned as forest managers over the potential limitations of the Clean Air Act on the use of prescribed fire. Many fire-dependent ecosystems where fire has been controlled or excluded for several decades have undergone substantial change in the composition of both plant and animal species, with possible loss of some species. Largely due to the exclusion of fire for nearly a century, forest conditions in some regions of the country are at a near crisis (Sampson and Adams 1994). Resulting changes in tree species composition and density have left forests in large areas of the Inland West in a weakened condition, no longer able to withstand normal cycles of drought and endemic insect infestations and disease epidemics. Mortality rates due to insects and diseases have been extraordinarily high in these weakened forests, creating large accumulations of heavy fuels and setting the stage for catastrophic wildfires of unprecedented size and intensity.

Forest Service accomplishments in terms of air and water pollution are modest principally because the relevant laws are laws of compliance. Further, the agency is not the lead agency. Hence, air and water pollution in and on the national forests is an important, but still a secondary priority.

6.5 Protection of Threatened and Endangered Species

Two hundred and forty-six federal threatened and endangered species occurred on national forest lands as of December 1992, approximately one-third of the total number of such species listed at that time. While several other federal agencies had similar numbers and percentages, none of them were embroiled in controversy to the extent the Forest Service was. A leading reason was protection of northern spotted owl habitat, primarily late successional stage coniferous forests, in the Pacific Northwest. An increasing body of evidence indicated that

logging of old growth forests were causing spotted owl populations to decline. Criticism of the Forest Service timber sale program mounted, and the agency was slow to respond.

On March 23, 1991, Judge William L. Dwyer ruled that nearly all sales in the 17 national forests with spotted owls be stopped until the Forest Service prepared a management plan and an environmental impact statement for the species. The essence of the injunction was agency compliance environmental law, and Judge Dwyer commented:

The records of this case and of No. C88-573Z show a remarkable series of violations of the environmental laws (Dwyer 1991:18).

He expanded on the point later in the decision:

More is involved here than a simple failure by an agency to comply with its governing statute. The most recent violation of NFMA exemplifies a deliberate and systematic refusal by the Forest Service and the FWS to comply with the laws protecting wildlife. This is not the doing of the scientists, foresters, rangers, and others at the working levels of these agencies. It reflects decision made by higher authorities in the executive branch or government (Dwyer 1991:21)

Still later, Judge Dwyer said:

The problem here has not been any shortcoming in the law, but simply a refusal of administrative agencies to comply with them (Dwyer 1991:34)

Unfortunately, the old growth-spotted owl issue is not unique. Similar, though lesser, controversies have occurred over timber harvesting in the national forests and protection of threatened and endangered species as well as other wildlife species whose populations are declining, i. e., sensitive species. Examples are clearcutting near red-cockaded woodpecker nests in national forests in Texas, logging and roadbuilding in national forests in Montana and their impacts on grizzly bear and bull trout populations, and timber harvesting in southern Appalachian national forests and its impact on black bears. In each case, the Forest Service effectively placed itself in the position of being less than fully committed to protecting threatened, endangered, or sensitive species in carrying out its national forest management activities.

The prohibition in section 7 of the Endangered Species Act is very clear. Chief Justice Warren Burger wrote the Supreme Court decision in *TVA v. Hill*, and he said:

One would be hard pressed to find a statutory provision whose terms were any plainer than those in section 7... Its very words affirmatively command all federal agencies "to insure that action authorized, funded, or carried out by them do not jeopardize the continued existence" of an endangered species or "result in the destruction or modification of habitat of such species...". This language admits of no exception (Supreme Court of the United States 1978).

Forest Service compliance with the Endangered Species Act is probably the weakest with respect to all the other laws and policies of the Environmental Movement. It puts the agency directly at odds with most of the interest groups that occupy the continuum earlier described by Culhane from progressive conservation to environmentalism and all of them from environmentalism to preservation.

6.6 Renewable Resources Planning and National Forest Management

Implementation of the Forest and Rangeland Renewable Resources Planning Act (RPA) is the responsibility of the Forest Service, and if it were successful, the agency would have a framework for developing a strategic plan for its future direction that would have broad public support and that would be of assistance to Congress in establishing budgetary priorities in the annual appropriations process. The result in terms of forest and range condition would be broad agreement on the respective roles of private and public forests and rangelands, the general outlines of Forest Service programs, and the overall management and use of the national forests. Unfortunately, no such agreement exists, in large part, because the agency's success in implementing RPA has been incomplete.

RPA implementation has been the subject of many congressional hearings and studies by various groups and individuals both inside and outside of government, and the problems identified and corresponding recommendations are fairly well recognized and agreed upon. A recent study by the Office of Technology Assessment (1990) summarizes them under three categories of problems, namely data, analysis, and direction.

- Data:
 - Incomplete and weak data in the RPA documents;
 - Poor linkage of data among the RPA documents;
- Analysis:
 - Poor foresight of impending problems for resource management;
 - Lack of evaluation of opportunities for improving yields of renewable resources;
 - Poor display of benefits and costs of (RPA) Program activities;
- Direction:
 - Weak guidance for addressing renewable resources issues;
 - Poor support for budget decisions;
 - Poor commitment (to RPA) from (executive branch and congressional) decision makers;
 - Poor evaluation of (RPA) Program implementation. (Office of Technology Assessment 1990:11)

Implementation of RPA is not without some accomplishments, and they should be recognized. The data in the documents have substantially improved over time with each successive effort. Correspondence between the principal documents - the Assessment and the Program - has improved. Roles, issues, strategies, and initiatives were systematically treated in the 1990 RPA Program, and as a result, comparatively strong guidance to Forest Service personnel was given for addressing natural resource issues, a significant improvement over the past. Finally, the Annual Report has improved, meeting more of the requirements of RPA.

Failures in implementation of RPA cannot be placed solely with the Forest Service. Congress, the Office of Management and Budget, and the Office of the President must share the blame.

Management of the national forests is probably as controversial today as it was at time of passage of the National Forest Management Act (NFMA). As of September 30, 1992, 119 forest plans were completed and guiding management of those national forests. Only four plans remained uncompleted at that time, all of which were in California - the Klamath, Shasta-Trinity,

Mendocino, and Six Rivers National Forests. These four forests were revising their previously issued draft forest plans as a result of the listing of the spotted owl as a threatened species. Has national forest planning improved the condition of the national forests? Has it been effective in setting goals and conditions for the national forests, identifying standards and guidelines for activities, and describing actions and funding necessary to achieve the goals? Anecdotal responses must be given to each of these questions, for no systematic evidence is available which allows a conclusion that the condition of the national forests have improved as a result of forest planning.

Like RPA, many congressional hearings and studies by various groups and individuals both inside and outside of government have been conducted on Forest Service implementation of NFMA, and many of the findings are critical. Two of the leading studies are ***Forest Service Planning: Accommodating Uses, Producing Outputs, and Sustaining Ecosystems*** by the Office of Technology Assessment and ***Critique of Land Management Planning*** by the Forest Service with assistance by The Conservation Foundation and the Department of Forestry and Natural Resources, Purdue University. The summary recommendations that followed from the latter study are:

- Simplify, clarify, and shorten the planning process;
- Ensure high-quality planning;
- Improve the organizational and administrative infrastructure for planning;
- Strengthen and clarify the ties between forest plans and programming, budgeting, and appropriation activities;
- Define, clarify, and explain the RPA, NFMA, and NEPA processes and their integration into the agency's framework for multilevel planning decision making, and management;
- Develop a comprehensive strategy with clearly assigned responsibilities for implementation and maintenance of forest plans;
- Refurbish the mechanisms for quality control, management review, and monitoring forest plans. (Larsen et al. 1990:ix-x)

The OTA study concluded:

Despite these problems, NFMA planning can fulfill the strategic process envisioned by Congress. Clearer legislative direction, a broader information base, targets for ecosystem health as well as for annual outputs, more effective participation, and a variety of analytical technologies could lead to technically and politically feasible national forest plans and management. Distinguishing and organizing monitoring, linking activities to results, and involving the public in monitoring can assure that forest plans are implemented. Appropriations by management activity, realistic budget assumptions in forest plans, better accounting for special accounts and trust funds, and fair compensation to counties for the tax exempt status of federal lands could lead to federal financing consistent with the forest plans and overall federal budget constraints. Finally, a more interactive RPA-NFMA planning process, with forest plans as the baseline for the national forest system and with long- and short-term direction for all resource values and all branches of the agency, can result in a national direction that can be achieved through national

forest planning and other Forest Service activities. These changes can complete the strategic planning process for the national forests that was begun with NFMA and has been evolving under Forest Service leadership. (Office of Technology Assessment 1992: 29-30)

While criticism of national forest planning has been substantial, and a significant number of lawsuits have been filed against the Forest Service for its implementation of NFMA, the agency has been quite successful in court. Twenty-one NFMA cases (published and unpublished) were adjudicated during the period 1987 through February 2, 1993. The court ruled in favor of the Forest Service in 16 cases and against it in 5. (Perry 1993)

6.7 Public Involvement

Public participation in Forest Service planning is required by statute. The Multiple Use-Sustained Yield Act requires that management of the resources of the national forests be "in the combination that will best meet the needs of the American people;..." Of course, such needs can be determined most effectively by the Forest Service interacting with the public and determining its values and wants. The implementing regulations for the National Environmental Policy Act, specifically 40 CFR 1500, require agencies among other things: (1) to examine public concerns in advance of decision making, (2) to coordinate activities with other government agencies at all levels, and (3) to solicit comments from interested individuals and organizations. Public participation is not required in RPA directly. Instead the requirement flows from the provision that the RPA program "be developed in accordance with principles set forth in ... the National Environmental Policy Act of 1969." In contrast, Congress was direct in its requirement for public participation in NFMA. Section 6(d) reads: "The secretary (of agriculture) shall provide for public participation in the development, review, and revision of land management plans..."

There have been many studies of the Forest Service's public participation efforts, and virtually all of them are critical. The Forest Service may be complying with the "letter of the law", but not its "spirit." (Russell et al. 1990:1) Much of the problem has to do with the model the Forest Service uses, which is based on due process, on receiving full and equal representation of various views and values, which tends to compell the participants into adversarial positions. The process is inherently divisive and promotes conflict and distrust among the interests and with the agency. As one study concludes: "Hardly anyone is satisfied by the current model of public participation." (Shands et al. 1990:18)

If the Forest Service's public participation efforts were successful, its understanding of the values and desires of the public would be greater. It could make its programs and activities for management of the national forests more responsive, and they would receive more public support. Unfortunately, this is not the prevailing situation, to the detriment the condition of the national forests.

7. CHANGES IN CONDITION OF PRIVATE FOREST LAND AS A RESULT OF PRACTICES OF THE ENVIRONMENTAL MOVEMENT

Many environmental laws were passed at the state level in the early 1970s as a part of the environmental movement. Several states, particularly in the West, also passed laws regulating forest practices or revised old ones to increase environmental protection and to insure forest land productivity. Specific concerns at the time were protection of water quality and riparian zones; control of the use of herbicides; regulation of timber harvesting; maintenance of soil productivity, and forest regeneration. In addition, almost all forested states that did not pass new laws regulating forest practices, developed and promoted voluntary best management practices to comply with the area-wide planning requirements of FWPCAA.

In the late 1980s-early 1990s, another wave of state regulation of forest practices occurred, driven primarily by public concern over continued degradation of water quality, wildlife habitat protection, and maintenance of biological diversity. The outstanding example is California where major revisions were made to what was already one of the most comprehensive, restrictive state forest practices laws in the country. Similar revisions were made in the state forest practices laws in Oregon and Washington. In all, seven states enacted laws regulating forest practices during the period 1986-1992 (Cubbage et al. 1993:422). Furthermore, the credible threat of state regulation of forest practices in the South compelled the forest industry to increase protection of environmental values on industrial lands.

As a result, one would expect that conditions on private forest lands in the United States have generally improved in terms of both environmental protection and timber growing. Nevertheless, public uneasiness continues over practices and the condition of private forest lands and for good reason. In the South, for example, where the extent of regulation of forest practices is comparatively small, less than expected rates of reforestation have raised both economic and environmental concern. The relative lack of reforestation and related investments following timber harvesting on many nonindustrial private forest lands results in increased pressure on industrial lands as a timber supply source at a time in which there is also mounting pressure on industrial lands to protect habitat for threatened or endangered species, such as the redcockaded woodpecker. The higher timber values that normally accompany decreased timber supply also increase the risk that landowners will liquidate their forest inventories prematurely and, with little state-level regulation, do so with little regard for environmental values.

Concern over implementation of the Endangered Species Act has resulted in some unintended and perverse consequences, specifically accelerated timber harvesting and a decline in wildlife habitat conditions on some private forest lands. In both the South and the Pacific Northwest, uncertainty over possible restrictions on timber harvesting on private forests found to host or potentially host populations of threatened and endangered species, have reportedly stimulated an increase in timber harvesting. In many cases, the harvesting is premature in terms of the age class of the timber, but owners are willing to accept lower timber values than risk, by waiting, the right to harvest at all. Furthermore, this concern works against the decision to reforest.

In areas affected by recent cutbacks in timber supply from federal forest lands, notably the Pacific Northwest, increased stumpage prices have contributed to accelerated rates of timber harvesting. This spate of harvesting on private lands may have set the stage for a sharper than anticipated reduction in future regional timber supplies with negative implications for rural, timber-dependent communities and political pressure for a return to unsustainable rates of timber harvesting on federal forest lands. Corporate takeovers and leveraged buy-outs of the 1980s are still causing negative repercussions on private forest lands. In some cases, the pressure to service high-interest bonds is resulting in the systematic liquidation of timber inventories with little regard for the subsequent condition of the forest or impacts on environmental values. In other cases, large tracts of contiguous forest land have been sold off for subdivisions or for development as vacation home sites (Harper et al. 1990). Efforts have been made by both federal and state governments to address these challenges through such mechanisms as conservation easements and outright acquisition, but insufficient funding has limited their success.

Silvicultural practices in forested wetlands, exempted under the 1978 amendments to the Clean Water Act, are under scrutiny. The continuing loss of forested wetlands throughout the United States has caused environmental challenges to practices such as "bedding" or periodic draining in areas of the southeastern coastal plain where high water tables result in temporary flooding following timber harvesting. Clearcutting, which is used extensively on private forest lands, is problematic. Increasingly, the mosaics of early-successional, even-age stands that are the rule on industry lands are regarded as incompatible with sustaining the natural diversity of plant and animal communities. In a few instances, however, private forest land owners are coordinating their efforts with management of adjacent federal lands so that, at the landscape level, early successional areas on private lands complement the management of public forest land that emphasizes the protection of ecological values, including biological diversity. Nevertheless, efforts currently exist in several states and at the federal level to outlaw clearcutting on both public and private lands.

Ironically, management of both industrial and nonindustrial private forest lands for the purpose of maximizing fiber production has resulted in some forests that are ecologically healthier than those on neighboring public lands. In both the Southeast and Inland Pacific Northwest, in areas characterized by fire-dependent forest types such as Ponderosa pine and shortleaf pine, selective harvesting has maintained a stocking density and species composition similar to what would occur under a natural regime of periodic, low-intensity ground fires. In contrast, on many public forest lands in these regions, the combination of a century of fire exclusion and a reliance on clearcutting, with few if any silvicultural treatments in between rotations, has resulted in overstocked forests with small diameter, low-vigor trees unable to withstand natural variations in climate and insect and disease pathogens. Many of these forests have experienced high levels of mortality and present a wildfire risk of a scale and intensity that is likely to result in plant and animal communities quite different from those that would naturally occur.

Changes in the condition of private forest lands as a result of the policies and practices of the environmental movement thus run in two opposing directions. The increased regulation of forest practices and protection of the forest environment through state forest practices acts and voluntary best management practices have generally served to raise the minimum standard of forestry practice on private lands in the United States. On the other hand, environmental protection tends to reduce timber inventories available for harvest on private lands which exerts upward pressure on stumpage prices. Further, reduction of the timber sale program on federal forest lands, in large part for the purpose of protecting the environment, has also tended to exert pressure on stumpage prices. The result has been accelerated harvesting on private lands, and in some cases, harvesting in trees and stands that are of young age.

Other things being equal, higher stumpage prices should encourage investment in tree planting and intensive management for timber production on private lands. Whether the recent and current level of investment in timber management is sufficient to stave off sharp increases in real stumpage prices in the future is arguable. Similarly, what is the net effect of these opposing forces in terms of the condition of private forest lands, is very difficult to assess, certainly with available data.

8. CONCLUSION: FOREST SERVICE ACCOMPLISHMENTS

The Forest Service has many significant accomplishments if measured in terms of the values and public policies of the progressive conservation movement. Such values would include belief in the efficacy of rationality and science, efficiency in government, conservation of natural resources, and public land retention. Indeed, as described earlier, the Forest Service was a leader in the use of natural resource professionals, forestry and range research, the protection of forests from wildfire, the development of cooperative programs to reforest cutover lands, the acquisition and rehabilitation of cutover forest and marginal farm land to become part of the National Forest System. Furthermore, at least until the late 1970s, the agency was often characterized as a model public agency in terms its effectiveness and the esprit de corps of its employees. All of these accomplishments are well documented by Fedkiw, Mac Cleery, and Sedjo as well as by earlier studies by Kaufman (1960), Robinson (1975), and Steen (1976).

Forest Service accomplishments if measured in terms of the values and public policies of the environmental movement are fewer. There are several reasons why. First, the Forest Service response to changing social values in implementing the Multiple Use-Sustained Yield Act was slow and often ineffectual. Second, the Forest Service is not the lead agency in the implementation of NEPA, the air and water pollution control laws, and the Endangered Species Act. Its role is to comply with these statutes, and it has had mixed success in doing so. Third, wilderness and other restricted-use federal land designations have had broad public support and have been repeatedly made by Congress over the past 30 years. Forest Service support for such designations has been unenthusiastic because they are viewed as eroding the discretion of the agency and the authority of professional forest land managers. As a result, the growth in these designations on national forest land is not looked upon as an accomplishment

of the agency, but something that was accomplished over agency opposition. Fourth, implementation of RPA and NFMA are a direct responsibility of the Forest Service, but their implementation has been attended by much public criticism of which at least some is warranted. In addition, few identifiable benchmarks exist by which progress can be measured in terms of the implementation of these laws.

Public attitudes about the environment and natural resources began to change in the 1960s and incorporate values of the environmental movement, such as preserving the natural heritage, maintaining a healthy environment, and encouraging the relative emphasis of noncommodity resources in the management and use of federal lands. The Forest Service was slow to respond to these changes. The failure to adapt agency culture and management practices to reflect changing public values and policies resulted in increasing confrontations with interest groups, administrative and legal challenges, and declining employee morale. By 1992, the agency stood alienated, with comparatively few accomplishments to its credit in terms of the policies and practices of the environmental movement.

That the Forest Service was unable to adapt to the values of the environmental movement in a timely way is curious. Their plain reading reveals them to be more extensions of the values of the progressive conservation era than their opposite. While conflicts between environmental and wise-use conservation values are very real at the individual site level, they tend to be less distinct, even blurred, at landscape and conceptual levels. Could not this have been better understood? Would not the progressive conservationists of the turn of the century, living at a latter stage of development of the United States, wanted a significant part of our natural heritage preserved; a clean, healthy, sustainable environment; and to have the opportunity to recreate in accessible, aesthetically pleasing natural environments? Surely they would!

The values, policies, and practices of the environmental movement are as important as those of the progressive conservation era, maybe even more so since they are more proximate in time. Success varies with the standards used in assessing it. If Forest Service performance is measured in terms of the standards of the progressive conservation era, the agency has many accomplishments to its credit. If Forest Service performance is measured in terms of the standards of the environmental movement, the agency's success is quite mixed, which is largely the basis for its current difficulties.

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