2. RE-INVENTING THE UNITED STATES FOREST SERVICE: EVOLUTION FROM CUSTODIAL MANAGEMENT, TO PRODUCTION FORESTRY, TO ECOSYSTEM MANAGEMENT

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(Note: The views and perspectives expressed in this paper are those of the author and do not necessarily reflect the policy positions of the USDA/Forest Service or the United States Government.)

Forest policy and institutional frameworks in all countries are fashioned according to their larger sociopolitical context, traditions and history. A major factor in shaping the historical sociopolitical context in the United States has been decentralization. At the time of their independence from England, the 13 original colonies entered the union as largely autonomous entities or "states" — and over time they have guarded this status jealously.[2] In spite of this, over more recent decades, many policy and institutional functions have been centralized at national or federal levels. This trend has been slow at times — and has often been resisted by the states — with occasional attempts to reverse such centralization.

HISTORICAL CONTEXT LEADING TO THE ESTABLISHMENT OF THE NATIONAL CONSERVATION FRAMEWORK AND THE FOREST SERVICE

Throughout the nineteenth century, United States policy encouraged rapid settlement and economic development of its western territory. To accomplish this, a variety of approaches were developed, including transfer of federal (public domain) lands to individual farmers, ranchers and corporations, especially railroad companies that built transportation infrastructure.

After 1850, the population grew rapidly (20 to 25 percent per decade) and settlement of the western territories accelerated. Concerns began to be voiced over some of the environmental and economic implications of rapid development, including: (1) accelerated deforestation (forests were being cleared for agriculture at the rate of almost 3 500 hectares per day); (2) massive wildfires due to logging and land clearing (wildfires annually razed 8 to 20 million hectares); (3) extensive areas of "cut-over" land or "stump lands" remained unstocked or poorly stocked with trees for decades (estimated at 32.5 million hectares in 1920); (4) significant soil erosion by wind and water in some places; and (5) major wildlife depletion due to commercial hunting and subsistence use (Trefethen 1975; Williams 1989; MacCleery 1992). It was gradually recognized that these conditions were jeopardizing future economic development, as well as being concerns in their own right.

Early 1900s: conservation policy framework

A number of policy and institutional changes were put in place during the early decades of the twentieth century (MacCleery 1992). This conservation policy framework included:

- Closing the public domain to further private land disposal and reserving the remaining public lands (most of which were in the western part of the country) for protection and management, as national forests, national parks

and national wildlife refuges.
- Promoting and encouraging the protection of forests and grasslands — across all ownership categories — from wildfire, insects and disease.
- Improving natural resource management by acquiring scientific knowledge on the management of forests and wildlife and on the more efficient utilization of raw materials.
- Improving the management and productivity of both agricultural lands and forests through technical and financial assistance to farmers and landowners.
- Adopting and enforcing federal and state wildlife conservation laws.

The rationale for public land reservation in 1900 was watershed protection and timber production. There were major concerns at the time that forest depletion would lead to timber shortages, even a "timber famine" (Williams 1989). In 1900, wood was considered an essential raw material for both industrial and domestic use.

Given the long time frames associated with tree growth, plus the relatively low timber prices at the time, it was assumed widely that once the original forest capital was removed private landowners would not make the forest management investments that would be needed to assure adequate long-term supplies of timber for the nation.[3] Therefore national forests were reserved to secure "favorable conditions of water flows, and to furnish a continuous supply of timber…" (1897 Organic Administration Act). By 1900, however, about 70 percent of the total national area of productive forests had already been transferred to private ownership and a decision was made not to transfer the remaining forest lands.

Rather than transferring the remaining 30 percent of forest lands to private ownership or giving administrative responsibility to the states or local authorities, the United States opted for direct federal administration of much of the remaining public domain lands. This decision was a significant one which has, over the years, substantially affected the political dynamics under which these lands have been administered.

The Forest Service, established under the United States Department of Agriculture, became the primary government agency for administering the national forests and supporting collaborative forest management across the country.

Federally administered lands are concentrated in the western United States and make up about 261 million hectares. These lands contain approximately 100 million hectares of forest land — or about a third of all forests in the United States. The Forest Service administers 78 million hectares of land, or about 8 percent of the total area of the United States (Table 1).

Table 1. Land area and ownership in the United States

Ownership category	Land area(millions of ha)	Percent of all lands
Private lands	551	60
Public lands		
National Forest System	78	8
Bureau of Land Management	106	12
National Park Service	34	4
National Wildlife Refuges	38	4
DOD/Energy/other agencies	6	1
Total Federal	262	29
Indian Trust lands	22	2
State and local	79	9
Total public	363	40
All lands	916	100

Sources: Based on USDA/ERS (2001) and USDA and USDI statistics.

FOREST SERVICE: ORGANIZATIONAL PHILOSOPHY AND

STRUCTURE

One of the most significant structural re-organizations in the early years of forest management in the United States occurred when the Forest Service was created in 1905. At that time, management responsibility for the forest reserves was transferred from the Department of the Interior's General Land Office to the Department of Agriculture.[4] This signified a major change in organizational culture from the land disposal philosophy of the Department of the Interior to the production and scientific management philosophy of the Department of Agriculture.[5]

At the time it was established, the Forest Service was crafted on European models of forest administration and was characterized by:

- A professional line and staff cadre that was required to pass proficiency exams as a condition of hiring (Roth and Williams 2003).
- A set of core values and a common approach to problem-solving. These values were reenforced by the curricula and cultural values taught in forestry schools.
- A decentralized decision-making structure with considerable discretion given to field managers. This reflected purposeful design, as well as the practicalities of the remote locations and poor communications that existed in forest areas at the time and the high variability of resources and local conditions. Previous requirements for upward reporting and approval that had existed under the Department of the Interior were reduced or eliminated (Roth and Williams 2003).
- The Forest Service becoming the central identity and organizing structure in professional employees' lives. Employees were required to move frequently if they wanted to advance professionally. This both expanded professional experience and reduced the risk of employees becoming "captured" by local economic interests.[6]
- A "promotion from within" policy, under which the agency prided itself that any professional employee with enough talent (and luck) could aspire to become the Chief of the Forest Service.

For decades the Forest Service was characterized by a management philosophy established early on in its history. Until the 1970s, most Forest Service professional employees were foresters with rural American values who had graduated from forestry schools that taught curricula that re-enforced these values. While the agency had a highly decentralized decision-making structure, what emerged was a remarkably consistent approach to solving problems and viewing the world.

In addition to the management of the national forests, the Forest Service was delegated responsibilities for forest management and wood technology research, and for providing assistance to private forest landowners. In cooperation with emerging state-level public forestry agencies, the Forest Service geared up to improve wildfire suppression and to provide technical and financial assistance to small forest landowners.

By the 1920s, the Forest Service's organizational framework was largely in place. This included three operational divisions: (1) the National Forest System (NFS); (2) Research and Development (R&D); and (3) State and Private Forestry (S&PF). This organizational structure remains today (Figure 1).

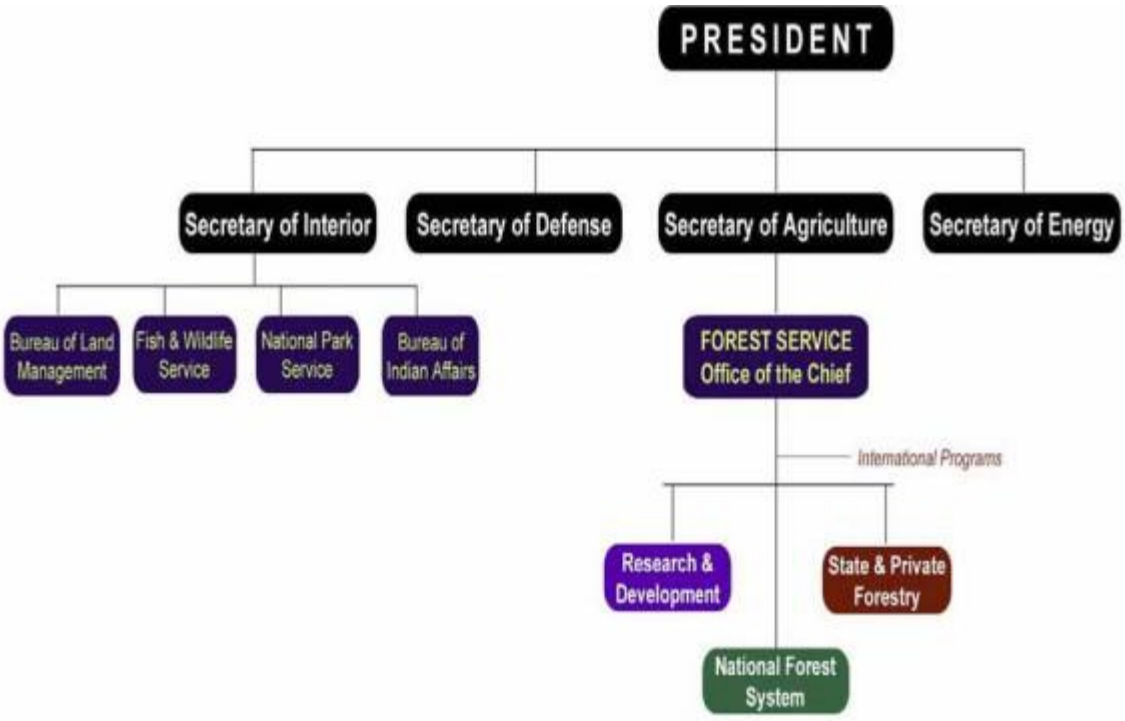

Figure 1. Organizational relationship of federal land management agencies

The National Forest System has always been the largest of the divisions by far. From inception, it has had four hierarchical levels:

- Ranger districts, subdivisions of national forests, where most fieldwork is carried out.
- Supervisor's Offices — the administrative offices for each individual national forest.[7]
- Regional Offices, providing an intermediate administrative level below the headquarters (there are nine regional offices in existence today).
- National Headquarters, located in Washington, DC.

THE EVOLVING USE AND MANAGEMENT OF NATIONAL FOREST SYSTEM LANDS (1905–1970)

National forest lands traditionally and statutorily have been managed for multiple objectives such as timber, recreation, wildlife, water, grazing, mining and wilderness. The advantages of multiple use are that: (1) it provides administrative flexibility to shift management over time in response to changing public demands and preferences on public lands; and (2) it sets the stage for significant debates over preferred use, especially as competing demands become intense.

In the 1970s, Forest Service Chief John McGuire remarked that the management of millions of acres of federal lands for multiple objectives in a modern, pluralistic democracy was a "grand experiment" and that "the jury is still out" with regard to the success or failure of the experiment. These words still hold true today. The management of the national forest lands — established in the midst of controversy — remains controversial to this day.

The early history of national forests

National forest management from 1900 up to the Second World War was mostly custodial in nature. An early focus was to establish the boundaries of the national forests and to prevent, or respond to, unauthorized uses (such as illegal timber felling, unauthorized mining, agricultural encroachment).

Another main focus of Forest Service efforts was reducing uncontrolled wildfires that were common prior to the 1930s. Curtailing the 8 to 20 million hectares that consistently burned annually, mostly on private lands, was considered a

prerequisite for the long-term management of forests and grasslands — both public and private.

The focus of these efforts was on protecting all lands from wildfire, regardless of their ownership; but systematic control became effective only during the 1930s, when large public employment programmes were established. By the 1960s, the area burned by wildfire had declined by 90 percent compared to the 1930s (Figure 2). This was accomplished through highly successful federal, state and private landowner cooperation.[8] Within the Forest Service, the State and Private Forestry Division was responsible for this coordination.

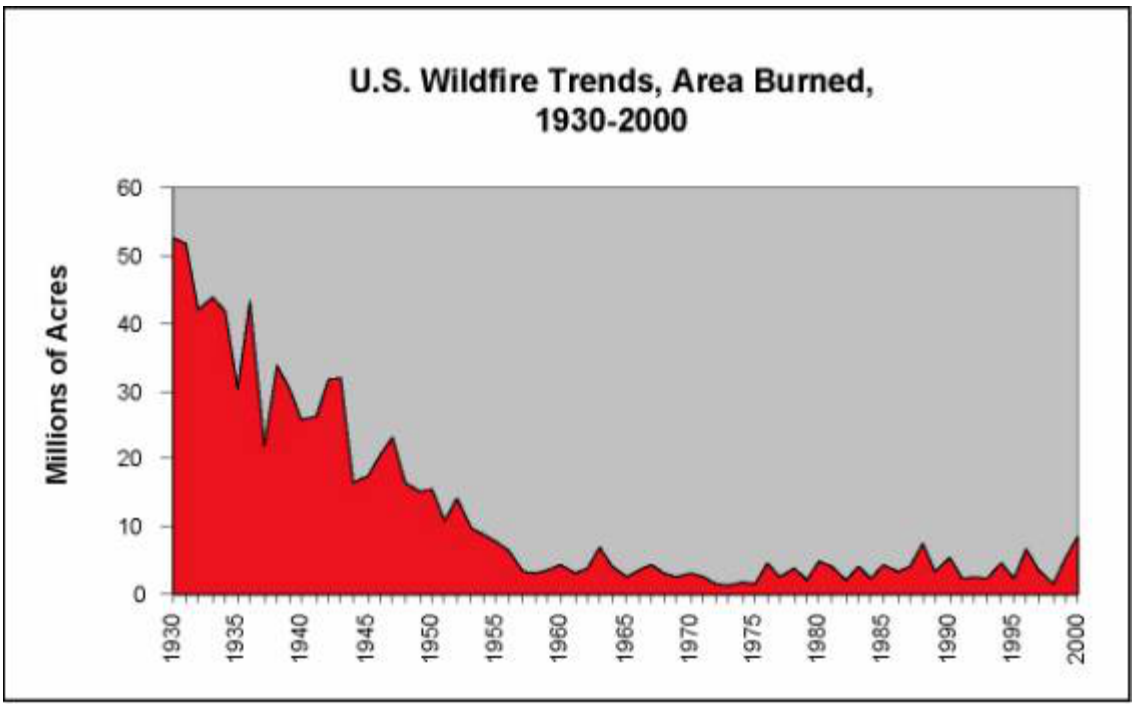

Figure 2. Area burned by wildfire (1930–2000)

Source: U.S. Wildfire Statistics, USDA/Forest Service.

Increased demands on national forests after the Second World War

After the Second World War, there was substantial expansion in the demands placed on federal lands for a variety of products and uses. After the war, as millions of service men and women returned home and started families, demand for timber for housing rose dramatically. The nation increasingly looked to the national forests in the western United States to meet this demand (Steen 1976).

National forest timber sale levels increased from a range of 9 to 13.5 million m^3 in the late 1940s to 45 to 50 million m^3 in the 1960s. By the 1970s, national forests were meeting about 14 percent of the nation's total wood needs, and over 30 percent of softwood sawtimber — the primary source of lumber and plywood for housing (USDA/Forest Service 2004; Howard 2003).

This substantial increase not only served to meet a critical national need for timber, it also took pressure off private forest lands, many of which had been heavily logged to meet war-effort demands (Fedkiw 1989).

The Forest Service's response to increased timber demands

In order to gear up to expand national forest timber sales, the late 1950s and 1960s witnessed a major increase in Forest Service employees (Figure 3). From 1955 to 1975, the number of Forest Service employees more than doubled, from 9 100 to over 19 500 (Williams 2004a; OPM 2006). Most were foresters, with an increasing number of civil engineers after 1965, who were hired to prepare and administer timber sales and build roads.

Figure 3. Changes in permanent full-time Forest Service employees

Sources: Williams (2004a); OPM (2006); HRM (2006).

By the 1960s, each individual national forest had developed a management plan that specified the maximum annual allowable timber harvest. Commercial harvest of timber from national forest lands has subsequently been carried out primarily using short-term (one to five years duration) contracts for logging and road building only. Among other tasks, Forest Service managers designate the timber to be harvested, locate and design forest roads and specify the logging systems to be used. Timber sale contracts specifying the requirements for harvest of timber and construction of roads (if needed) are also prepared by Forest Service employees. Such contracts are advertised, competitively bid and awarded to the qualified private contractor submitting the highest bid (often a wood processing mill or logging contractor). Administration of these contracts is overseen by Forest Service employees.[9]

The Forest Service seen as a model public agency

After its first 50 years, the Forest Service generally was looked upon as a stunning success — an agency known for high morale, a strong sense of purpose and administrative excellence. A 1952 *Newsweek* magazine article stated, amongst other factors, that due to its sterling reputation, "The Forest Service is one Washington agency that doesn't have to worry about next fall's election. Nor will the next administration have to worry about the Forest Service. In 47 years, the foresters have been untouched by scandal". Because of this, "Most Congressmen would as soon abuse their own mothers as be unkind to the Forest Service".[10]

A 1960 book on public administration, *The forest ranger*, documented the Forest Service as a case study example of an efficient and effective public institution (Kaufman 1960). Kaufman attributed the Forest Service's success to a sense of shared purpose, values and a common culture. Ironically, however, two decades later, the reputation of the Forest Service would be in tatters.

Congressional endorsement of managing NFS lands for multiple objectives

The 1950s witnessed a substantial increase in demand for non-timber uses, outputs and values from national forests and other federal lands. Per capita personal incomes rose rapidly after 1940, rising from about US$2 000 annually in 1940 to US$26 000 in 2000 (adjusted for inflation) (U.S. Department of Commerce 2001). An increasingly mobile and affluent

population began to look to national forests for outdoor recreation. Visits to national forests had increased from about 5 million in the early 1920s to 18 million in 1946, but surged to 93 million visits in 1960 and 233 million in 1975 (Census 1975 and 1994).

The increased demands on national forests led to an interest in legislatively expanding their authorized uses from watershed protection and timber production as elaborated in the 1897 Organic Act. The Multiple Use-Sustained Yield Act of 1960 (MUSYA), which was hailed by the Forest Service as a significant accomplishment, gave the agency permissive and discretionary authority to administer national forests "for outdoor recreation, range, timber, watershed, and wildlife and fish purposes".

The passage of MUSYA created the impetus for multiple-use planning and the hiring of new specialists, such as soil scientists, to assist in integrating uses on the ground (Fedkiw 1999; Williams 2002). These multiple-use plans often zoned national forests into general administrative emphasis areas, but still required considerable on-the-ground coordination with regard to where specific uses (timber, recreation, wildlife, mining, grazing) were to occur and how conflicts were to be resolved (Fedkiw 1999).

1960s recreation and wilderness legislation

In the 1960s, a growing segment of the public began seeking statutory protection for maintaining federal lands in their "natural" condition. The Wilderness Act, passed in 1964 after much debate, provided for the designation of significant areas of federal land in their natural and "untrammeled" condition.[11] Most commodity uses were prohibited from these areas. The Wilderness Act set the stage for much of the controversy and antagonism over the use and management of national forests that remains today.[12]

In 1968, the Wild and Scenic Rivers Act and the National Trails System Act were passed. These acts created separate systems within which rivers and trails with outstanding scenic, recreational, geological, cultural, historical, or other values could be designated by Congress into national systems, often after being proposed for such designations by federal land-managing agencies (DPC 1988). A Land and Water Conservation Fund was established, financed by oil revenues, to help finance the purchase of land in nationally designated areas.

The environmental movement of the 1970s — a new agenda

The growing environmental awareness of the 1960s continued to evolve into a general concern over the deterioration of air and water quality and the negative environmental and health effects of industrialization. Industrial air and water pollution were significant in and around most cities. Rachael Carson's *Silent spring* galvanized public concern over pesticide use (Carson 1962). The first Earth Day (1970) successfully raised public awareness on environmental issues. Congress responded to these concerns by passing a variety of laws that addressed air and water quality as well as toxic control and endangered species.

A primary focus of the environmental legislation of the 1970s was to reform the way federal agencies made decisions affecting the environment. The National Environmental Policy Act of 1970 (NEPA) required federal agencies proposing actions that could have a significant effect on the environment to evaluate a range of alternatives to the proposed action and come to a reasoned choice after providing the public with an opportunity for comment. Although only a procedural law, NEPA has had a profound impact on federal decision-making.

The Endangered Species Act of 1973 (ESA) provided a statutory mandate for protecting species in jeopardy. It prohibited federal agencies from carrying out actions that might adversely affect a species listed as threatened or endangered. The ESA became a powerful tool that mandated that primacy in federal decision-making be given to endangered species protection, and, by extension, to biodiversity. More than any other law, the ESA was the genesis of the move toward "ecosystem management" on lands managed by the federal government.

In 1974, the Forest and Rangelands Renewable Resources Planning Act (RPA) required the Forest Service periodically to assess the national long-term demand and supply situation for all renewable resources, and to plan how agency programmes would address projected resource demands and needs. In 1976, the National Forest Management Act

(NFMA) provided detailed guidelines for the management of national forest lands and for increased participation of the public in national forest decision-making. Both the RPA and NFMA were intended to encourage planning and stakeholder involvement (Fedkiw 1999). It was hoped that the process could help to resolve the differences between environmentalists and timber, mining and livestock-grazing communities. This did not transpire.

Many environmental laws in the 1970s authorized and encouraged individual citizens and NGOs to bring lawsuits to require federal agencies to enforce the laws. This encouragement included federal financing of citizen and NGO lawsuits against federal agencies.[13] These statutory provisions substantially increased the role of NGOs as an element of environmental law enforcement and of United States courts in interpreting the "intent of Congress" in passing these laws. As many of these laws contain vague goals and standards, this has sometimes put the courts in the de facto position of setting environmental policy through judicial interpretation.

The 1960s–1970s environmental movement had other subtle effects. One was generating interest among affluent young urban people in careers in conservation and natural resources. These "Earth Day graduates" have subsequently moved into influential positions in most federal and state land-managing agencies.

Another major shift since the 1960s has been the movement of urban people to many rural areas adjacent to national forests. These former "urbanites" have caused a significant change in the preferences expressed by local people for how national forests should be managed.

EFFECT OF THE 1970s ENVIRONMENTAL AGENDA ON NATIONAL FORESTS

Hiring of resource specialists

One of the responses of the Forest Service to the environmental laws enacted in the 1970s was to rapidly increase the hiring of resource specialists — wildlife biologists, soil scientists, hydrologists, archeologists and other experts. Such specialists were required to prepare environmental analyses under NEPA and forest plans under NFMA, as well as to carry out soil and watershed evaluations, archeological investigations and related activities to enable timber sales to progress in compliance with the new environmental legislation (Fedkiw 1999). Between 1980 and 1985, Forest Service permanent full-time employment rose from about 21 400 to 29 200 employees (Williams 2004a; OPM 2006; HRM 2006).[14]

Many of these specialists were Earth Day graduates; although they were hired to assist in assuring compliance with applicable environmental laws, they also helped change the culture and values of the agency itself. These new employees eventually had a profound impact on the Forest Service.

Concerns over land management practices and resulting expansion of protected areas

The use of clear-cutting timber harvest practices increased dramatically in national forests after the Second World War. By the 1970s, an increasingly vocal and well-organized public disliked the visual and other effects of prevailing timber-harvesting activities and sought political remedies to reduce them. Concerns over clear-cutting led to Congress recommending guidelines for the application of clear-cutting on federal lands, and eventually to the passage of the NFMA.[15] Later, as clear-cutting greatly diminished after 1990, the focus of many environmental groups shifted to oppose commercial timber harvesting more generally.

In addition to clear-cutting concerns, a second major public thrust was aimed at designating significant areas of national forest land as statutory "wilderness" or similar statutory categories emphasizing protection of natural values, recreation and other uses, and limiting or prohibiting commodity production. Between 1980 and 1985, Congress passed omnibus state-wide wilderness acts for 25 states (including most of the states containing national forest lands).

The 1980s and the "War in the Woods"

The 1980s saw a merging of focus and linkage between concerns over national forest land management practices and wilderness designation generated by language in virtually all omnibus state-wide wilderness acts. This language prevented the Forest Service from considering any more additions to the National Wilderness Preservation System after completion of the first round of land management planning under the NFMA, but required such consideration when forest plans were revised ten to 15 years later. This dramatically shifted the focus of many environmental groups from "wilderness" designation *per se* to seeking to protect as much undeveloped and unroaded land as possible for potential designation as wilderness in the future.

Issues emerging strongly in the 1980s that reflected this changed focus included concerns that the Forest Service was selling timber in some areas below its cost of production and the old-growth/ northern spotted owl issue in the Pacific Northwest (Fedkiw 1999). While both of these issues reflected important public policy issues, they also acted as wilderness "proxies" designed to protect the inventory of undeveloped and roadless areas.

The late 1980s and early 1990s were characterized by increasing administrative appeals and lawsuits charging that the Forest Service was violating the NFMA, the ESA and other environmental laws. Such legal challenges became common and were successful often enough to delay several proposed timber sales and other projects and create uncertainty over national forest timber and other commodity programme outputs (Fedkiw 1999).

Dissent from within the ranks of the Forest Service

In addition to public conflict, debate over the use and management of national forest lands was growing within the ranks of agency employees. In the mid-1980s, the Forest Service installed a new electronic communication system that linked its various field offices and line organizations. The electronic communications system, which was very innovative for the time, allowed for greatly improved internal communication vertically between organizational levels as well as horizontally among Forest Service employees. Soon several informal networks were established that allowed like-minded employees to share information and ideas on national forest activities and policies.

These network dialogues became fora for internal debate and fostered a growing sense of solidarity and democracy within the ranks of Forest Service employees who disagreed with official policy and trends (and also among employees willing to debate the dissenters). Several of these fora became institutionalized such as the so-called "Eco-Watch" dialogues.[16] To its credit, Forest Service leadership, although it may not have liked how official communications equipment was being used, did not systematically seek to stifle such dialogue.

Other dissent was growing within the ranks, especially among forest supervisors. In 1989, at what was to become known as the "Sunbird" conference, 14 forest supervisors from the Northern Region (Montana and northern Idaho) provided an "open letter" to Chief Dale Robertson stating their view that existing national forest timber harvest levels were jeopardizing important resource values such as water quality, and were out of step with many national forest stakeholders. The letter was leaked to the press and created considerable attention in the media and in the environmental community.

Additional internal dissent came from lower-level employees. For example, Jeff DeBonis, a Forest Service timber sale planner and an Earth Day graduate, broke ranks with the agency in 1989 by sending a seven-page letter directly to Chief Robertson (copied to several members of Congress) raising concerns over Forest Service timber-harvesting policies in the Pacific Northwest. DeBonis later resigned from the Forest Service, but before doing so he established the Association of Forest Service Employees for Environmental Ethics (or AFSEEE), with a self-proclaimed role as "environmental conscience" on Forest Service policies and practices.[17]

Dissent from within the ranks of the research community and its culmination in the northern spotted owl controversy

By the mid-1970s, research studies began to reveal that late-successional and old-growth forests provided essential habitats for a suite of wildlife and plant species. In 1981, a summary of this research by eight Forest Service scientists was published in *Ecological characteristics of old-growth Douglas-fir forests* (Franklin *et al.* 1981).[18]

Scientists such as Jerry Franklin and Chris Maser began to promote a "new" style of forestry (or "New Forestry") that

would reflect the concepts behind this emerging research (Franklin and Forman 1987; Franklin 1989). This new forestry approach involved, among other concepts, leaving downed logs, standing dead trees, clumps of trees and other "biological legacies" within cutting areas. Franklin and Maser developed a broad media and environmental group following as they began to speak out publicly against the existing national forest timber-harvesting policies.

By the mid-1980s the northern spotted owl took centre stage as the "poster child" for species thought to need large areas of old-growth and late-successional forest. As conservation biologists estimated that 1 000 or more nesting spotted owl pairs would likely be required to maintain a viable species population, protection of millions of hectares of old-growth forests was potentially needed to accomplish this objective.

In March 1989, federal district court judge William Dwyer issued an injunction on the harvest of virtually all national forest timber within the range of the northern spotted owl (i.e. western Washington and western Oregon and northern California), and subsequently ordered the Forest Service to revise its standards and guidelines by March 1992 "to ensure the northern spotted owl's viability". This created an economic and political crisis.

In October 1989, the Forest Service, the Bureau of Land Management and the U.S. Fish and Wildlife Service formed the Interagency Scientific Committee (ISC), chaired by Forest Service research biologist Jack Ward Thomas. The resulting ISC report, which was issued in May 1990, provided a framework for federal agencies to determine how much federal forest might need to be preserved as owl habitat given various ratings of risk to owl viability (Thomas *et al.* 1990).[19]

In June 1990, the U.S. Fish and Wildlife Service listed the northern spotted owl as "threatened" under the ESA, which required federal agencies to avoid any action that might jeopardize the species regardless of the opportunity costs or economic effects associated with not taking that action.

In April 1991, the House Agriculture Committee convened its own panel, the Scientific Panel on Late Successional Forests, also chaired by Jack Ward Thomas, which issued its report in October 1991 (Johnson *et al.* 1991).[20] The Scientific Panel report provided a number of management options with estimated timber sale levels and risk to the northern spotted owl and several other species associated with mature forests.

The news from these reports was not good for stakeholders who wanted to maintain a high level of jobs in rural, timber-producing communities while also protecting the viability of the owl and other species. The earlier presumption of a high degree of compatibility between production forestry and the viability of all forest-dependent species was being unraveled by these panels.

The political response to the scientists' findings

In April 1993, shortly after he assumed office, President Clinton convened a Forest Conference in Portland, Oregon, to consider ways to address the impasse that had existed in the Pacific Northwest for four years. The result was to commission yet another scientific team headed by Forest Service research scientist Jack Ward Thomas. In May 1994, a final proposal was submitted by the Forest Ecosystem Management Team (FEMAT) to Judge Dwyer who lifted his injunction in June 1994. In December 1994, Judge Dwyer affirmed that the plan met the requirements of the ESA, NFMA and other laws.[21]

Under the final decision flowing from FEMAT, now called the Northwest Forest Plan (NWFP), of the 9.9 million hectares of Forest Service and BLM land covered by the plan, only 16 percent would be available for sustained timber harvesting (another 6 percent would potentially be available in so-called "Adaptive Management Areas"). Timber sale levels in the Forest Service's Pacific Northwest Region, which had averaged about 62.5 million m^3 of timber annually between 1977 and 1989, dropped to an average of just 1.5 million m^3 annually between 1999 and 2004 — a 93 percent reduction.[22]

The adoption of the NWFP affirmed a process that had been ongoing for at least a decade, the gradual transfer of significant amounts of power in the Forest Service from line officers and foresters to scientists and agency resource specialists — and from the Forest Service itself to federal regulatory agencies and the courts.

The "Perfect Storm"

The 1980s and 1990s were particularly difficult for the Forest Service. Strong dissent came from external sources and from within its own ranks, both on national forests and within its research community. In the Pacific Northwest, protests became particularly strident, with vocal public demonstrations and acts of civil disobedience (such as tree sittings and vandalism of logging equipment and tree spiking). Between 1985 and 1993, environmental NGOs were successful in nationalizing (and even globalizing) the spotted owl/old-growth issue (Fedkiw 1999).

On the other hand, the Reagan and the George H.W. Bush administrations resisted reductions in timber sales levels, as did the Congressional Appropriations Committee and other committees to which the Forest Service reported.

But even without this political resistance in Washington, Forest Service leadership knew only too well the economic and social pain being suffered by scores of rural communities whose economies depended on national forest timber. Such economic pain was real and, in many cases devastating to the same communities that the Forest Service had encouraged to locate and grow next to national forests in the late 1950s and early 1960s, based on Forest Service promises of reliable supplies of timber for harvesting and processing. Tens of thousands of jobs in small rural communities were at risk.

It can be claimed that the Forest Service's sensors and early warning systems were not functioning well during this period — that they were not properly picking up signals from the urban public, environmental groups, internal agency sources and its own research community that substantial management changes were needed. Or if such signals were being received, perhaps the Forest Service was simply too inflexible to respond effectively to them. In reality, a cacophony of mixed and often conflicting signals was being heard — not just from those seeking change, but also from timber-dependent communities, the timber industry, ranchers, members of Congress and their staff, scientists and the duly appointed officials of the Executive Branch of which the Forest Service is a part. The challenge for Forest Service leadership in sorting through these signals — the "fog of war" — was indeed daunting.

Forest Service re-invention under Chief Dale Robertson — setting the stage for major change

When Dale Robertson became Chief in January 1987 during the second term of the Reagan Administration, he expressed more interest in meaningful organizational re-invention than previous Forest Service Chiefs. He recognized that the Forest Service was under siege and needed to change.

Chief Robertson began to openly encourage experiments in innovation and elimination of institutional hurdles by establishing re-invention pilots to reduce red tape and improve customer service.[23] He allowed field units — if they adopted efficiencies that saved the agency money — to keep those savings to advance their own local priorities, even if those activities fell outside the budget line items where the savings had occurred (Kennedy School 1994). He often said that, "there are no failures, only learning experiences".

Dale Robertson further saw "New Forestry" ideas being advocated by Franklin, Maser and other scientists as a way to shift the course of the agency. He sought to institutionalize applicable parts of this evolving science and make it part of a Forest Service initiative. This came to be called "New Perspectives" (Salwasser *et al.* 1993; Kessler *et al.* 1992). Under "New Perspectives," Robertson encouraged field managers to work with scientists to put practical shape and substance in field applications to the somewhat amorphous New Forestry concepts.

Robertson was also concerned about the level of clear-cutting in national forests and the consequent erosion of public support. In early 1991, he made commitments to Congressional leaders to curtail the amount of clear-cutting in national forests.

New Perspectives and limits to clear-cutting, became linked in 1992 on the eve of the United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro. The Bush Administration wanted to announce initiatives related to domestic forests prior to the president's arrival at the conference. Dale Robertson saw in this a major opportunity to obtain an official sanction for both New Perspectives and limits on clear-cutting (Steen 2000). Thus, in coordination with the Administration, on 4 June 1992 Chief Robertson announced that an "ecological approach" would

subsequently govern management of the national forests (Robertson 1992). He indicated:

... that we must blend the needs of people and environmental values in such a way that the National Forests and Grasslands represent diverse, healthy, productive, and sustainable ecosystems.

The details on what this implied were to be drawn from the ongoing work on New Perspectives and also included a commitment to eliminate clear-cutting as a "standard practice" for all national forests

After 1990: National forest timber sales drop precipitously

National forest timber sales had been relatively consistent between 1960 and 1989. After 1989, however, as a result of court decisions, public pressure and management plans imposed to protect the northern spotted owl and other endangered species, national forest timber sale levels went into free fall. Between 1989 and 2004, they dropped by more than 80 percent, from about 50 million m^3 annually to between 9 million and 13.5 million m^3 annually[24] (Figure 4).

Figure 4. National forest timber sales (1960–2004)

Source: U.S. Wildfire Statistics, USDA/Forest Service.

Between 1988 and 2004, the area harvested by clear-cutting dropped by 91 percent, from 283 000 to 19 000 acres, and clear-cutting as a percentage of all harvesting in national forests declined by about 80 percent, from 38 percent to 7 percent annually (Annual National Forest System Reforestation and Timber Stand Improvement Reports; Table 20).[25]

In addition to the reduced use of clear-cutting, smaller sized trees and dead and dying timber began to make up a greater percentage of harvests from national forests than in the past. Between 1990 and 1996, the percentage of sawlog-sized logs harvested from national forests dropped from 77 percent to 56 percent of total harvest volume and harvest of dead and dying timber increased from 26 percent to 47 percent of national forest timber harvest volume.[26]

INSTITUTIONALIZING THE SHIFT TO ECOSYSTEM MANAGEMENT — A NEW MISSION FOCUS FOR NATIONAL FOREST SYSTEM LANDS

In December 1993, Jack Ward Thomas, the charismatic scientist who had become famous for his work on the spotted owl issue, replaced Dale Robertson as Chief of the Forest Service. [27] Jack Thomas worked under a Clinton Administration that wanted to advance its environmental agenda on national forests and other public lands. But he was also faced with a Congress whose Republican leadership (in both Houses) was hostile to that agenda.[28]

When Thomas became Chief, he inherited an agency under siege. Many agency employees who had chosen careers in natural resources out of a sense of mission and conviction to conservation were feeling unfairly vilified by environmental groups and their sympathetic press. Thomas set about working to restore the agency's self-esteem. Among others issues, he sought to institutionalize the meaning and content of the emerging "ecological approach" to national forest management. "New Perspectives" was renamed "ecosystem management" and various efforts were made to institutionalize it and distinguish it from the multiple-use sustained-yield management approaches of the past.

The move to ecosystem management by the Forest Service and other federal land-managing agencies occurred in the absence of explicit statutory authority. Rather, it was an administrative response to a variety of factors, the most important being the requirements of the ESA and court cases brought to enforce it.

Thomas repeatedly asked political leaders in Congress to legislatively affirm or deny if it was their intent that the national forests be managed primarily for biodiversity, and if so (or if not), prescribe the sideboards. Such clarification never came.

THE DEVELOPMENT OF "PROCESS GRIDLOCK"

Due to the lack of social consensus as to how national forests should be managed, a tendency developed for the Forest Service, other federal agencies (such as the U.S. Fish and Wildlife Service), Congress and the courts to add process and procedure to national forest planning and decision-making. Consequently, national forest management became increasingly costly and time-consuming, while providing considerable opportunity for individuals and interest groups to delay or block proposed actions. The term "process gridlock" thus came into use.

Many Forest Service employees, who previously had prepared projects in the field, had to be shifted to conduct environmental analyses, respond to administrative appeals and support related work.[29] This led to an increase in the number of staff in forest supervisors' offices, regional offices and the Washington Office at the expense of district field offices. It also extended the time needed to arrive at final management decisions.

Chief Thomas often expressed his view that environmental laws and regulations were substituting process for needed action. He frequently spoke on the gridlock issue and on the tendency toward a short-term perspective by the regulatory agencies that oversaw national forest management (Thomas 2001b):

Regulatory agencies, given their missions, will always opt to accept as little short-term risk as possible and be relatively indifferent to long-term dynamic changes in the ecosystem in question. Multiple-use oriented agencies, given their missions, will usually opt for greater short-term risk with a longer-term view. The regulatory agencies' cards trump those of the land management agencies.

"From my perspective, it seems that each time there was a decision to be made, it was made on the conservative (low immediate risk) side. These cautious decisions, piled one on top of the other, finally accumulated to slow management to a crawl headed for a stop.[30]

Chief Mike Dombeck, who replaced Thomas as Chief in January 1997, was generally less vocal about conflicting laws and gridlock issues. But the concerns re-emerged when Dale Bosworth, a former regional forester, became Chief in 2001. Bosworth oversaw an agency review of the gridlock issue, culminating in a 2002 report, "The Process Predicament: How Statutory, Regulatory, and Administrative Factors Affect National Forest Management". The review noted that, while the statutory requirements of environmental laws were not necessarily directly in conflict, over the years overlapping procedural requirements, procedural redundancy, court decisions and multiple layers of interagency

coordination had created major inefficiencies in decision-making.[31] The review report concluded that:

Too often, the Forest Service is so busy meeting procedural requirements, such as preparing voluminous plans, studies, and associated documentation, that it has trouble fulfilling its historic mission: to sustain the health, diversity, and productivity of the nation's forests and grasslands to meet the needs of present and future generations. Too often the paralysis results in catastrophe.

CHANGED ROLE OF THE FOREST SERVICE IN PUBLIC PARTICIPATION

The role of public participation in federal land management planning evolved considerably over the decades. In the 1950s and 1960s, district rangers or forest supervisors (usually after informally sensing acceptance in the local community) would typically announce decisions that they had determined to be in the best interest of the national forests, its customers and stakeholders. The 1970s environmental laws, particularly NEPA and NFMA, directed federal land-managing agencies to increase formalized public participation substantially and mandated more open and "transparent" consideration and evaluation of a full range of management alternatives. These laws also increased the legal standing available to stakeholders to sue federal managers in court to enforce compliance with both the procedural and the substantive requirements of these laws.

In response, a "rational planning model" evolved, based on an objective of seeking to optimize the various multiple uses and objectives using estimated values for market and non-market uses (Bowes and Krutilla 1989). The approach was also premised on a rather optimistic assumption that federal agency decisions arising from it would lead to a working consensus among diverse stakeholders and that such stakeholders would consent to share the land and resources under a politically acceptable social contract. In retrospect, the premise was overly optimistic.

In recent years, a new agency role has emerged in which the Forest Service has shifted from being a "mediator" (receiving public input and deciding how best to weigh it in decision-making) to encouraging competing interests to sit down and "reason together" to find ways to accommodate their diverse objectives. This sometimes even includes stakeholders assisting in the design of vegetation management projects. The agency's role in this case is similar to a "facilitator," rather than mediator. While the decision still rests with the agency, the theory behind this approach is that it will lead to more informed decisions having broader public support than in the past. Experience suggests that this approach works best at the local level where the effect of alternative management approaches on specific areas of land can more easily be visualized.

This new role places greater emphasis on effective collaborative skills in dealing with the public and other public agencies. It also relies heavily on forging partnerships to carry out some of the tasks traditionally done directly by the agency itself. It has resulted in an increasing focus on community-based efforts in national forest public involvement.

Barriers and questions still remain regarding this emerging approach. For one thing, active engagement in collaborative decision-making is often discouraged as a result of subsequent administrative appeals and litigation. A second issue arises because federal lands are involved. How to address and balance local versus national interests in the use and management of federal lands is a particularly intractable issue with no easily applied solutions. This conflict is sometimes described as the problem of balancing the interests of "communities of place" with "communities of interest". As local communities become more economically and socially diverse, this can become less of a problem.

FROM MODEL FEDERAL AGENCY TO ADMINISTRATIVE PARALYSIS — WHAT HAPPENED AND WHAT OPTIONS ARE AVAILABLE?

Thirty years after Kaufman (1960) described the Forest Service as a model federal agency, the reputation of the Forest Service was in disarray. Kaufman, in revisiting his 1960 treatment of the Forest Service in *The forest ranger*, reflected

that the same characteristics that had made the agency effective when demands on it were relatively modest and rural-based, made it rigid and difficult for it to change when those demands became more intense, diverse and complex (Kaufman 1994).[32]

Living and working in rural areas, many Forest Service staff failed to read or understand the signals coming from urban areas. In addition, the demands of urbanites were often perceived to conflict with the interests of rural communities whose economies were tied to commodity use. Another major factor that worked against change was the Congressional budgeting process, which encouraged and directed the agency to maintain high levels of commodity outputs.

Various opinions have been expressed about what should be done to reduce the polarization related to management of federal multiple-use lands. Some observers feel that the key to improving public agreement lies in effectively managing the transition to vegetation management practices specifically designed to maintain healthy forests and watersheds. Others feel that the key is to improve and make more inclusive and transparent public involvement and participation processes in federal planning decisions. Still others call for more incentives for interest groups to get involved during the planning process by reducing administrative and legal opportunities for such groups to intervene outside the process.

Finally, there are some people who believe that entirely new administrative arrangements are called for, such as transferring all federal forest lands to the states, the private sector, national parks, or some combination thereof. Few concrete proposals have arisen in response to these ideas, however.

BUILDUP OF FOREST FUELS AND CONCERNS OVER ECOSYSTEM HEALTH — MAJOR ISSUES IN SOME AREAS

The shift in focus and mission within the Forest Service in recent years has occurred at the same time as concerns have grown over the ecological health of significant areas of the national forests (Sampson and Adams 1993; USDA/Forest Service 1993; GAO 1999). A multiyear drought in the western United States, coupled with a multidecade buildup in forest density and forest fuels, has led to a significant increase in unusually severe wildfires (with consequent damage to sensitive watersheds, ecological values and adjacent communities).

The increased incidence of severe fires is entirely coincidental to the recent mission shifts within the Forest Service, but it has created a strong sense of new direction and urgency for the agency as a replacement for its previous focus.

Many observers believe that the twin problems of fuel buildup and declining forest health, and their effects on ecosystem diversity and sustainability, will be the most significant environmental challenges facing national forest managers in the early twenty-first century (Sampson and Adams 1993; Clark and Sampson 1995). Federal land managers estimate that over 40 million hectares of federal forest lands are at unnaturally high risk of catastrophic wildfires and large-scale insect and disease outbreaks because of unhealthy forest conditions (Senate Agriculture 2003).

An additional risk factor is the major expansion of residential development into rural areas, often adjacent to national forest lands. This has created a new and growing local and community constituency that supports thinning and restoration of forests to reduce the risk of severe wildfires. Many areas in western states that were subject to frequent, low intensity non-lethal fires in the nineteenth century are now at risk from uncharacteristically intense and destructive wildfires (Figure 5) (Arno and Allison-Bunnell 2002; Sampson and Adams 1993; Pyne 1984).

The buildup of forest fuels is often attributed to the success of modern fire control. The reality is that a significant reduction in ecosystem fires in many parts of the western United States already occurred in the 1870s and 1880s, predating modern fire control by more than 50 years. This reduction in the number and extent of ecosystem fires was associated with the elimination of burning by indigenous peoples and the introduction of large numbers of livestock, which changed fuel dynamics and often prepared a mineral seed bed for forest regeneration (Arno 1985; Gruell 1985; Pyne 1984). Modern fire control, which became increasingly effective after 1930, exacerbated the problem.

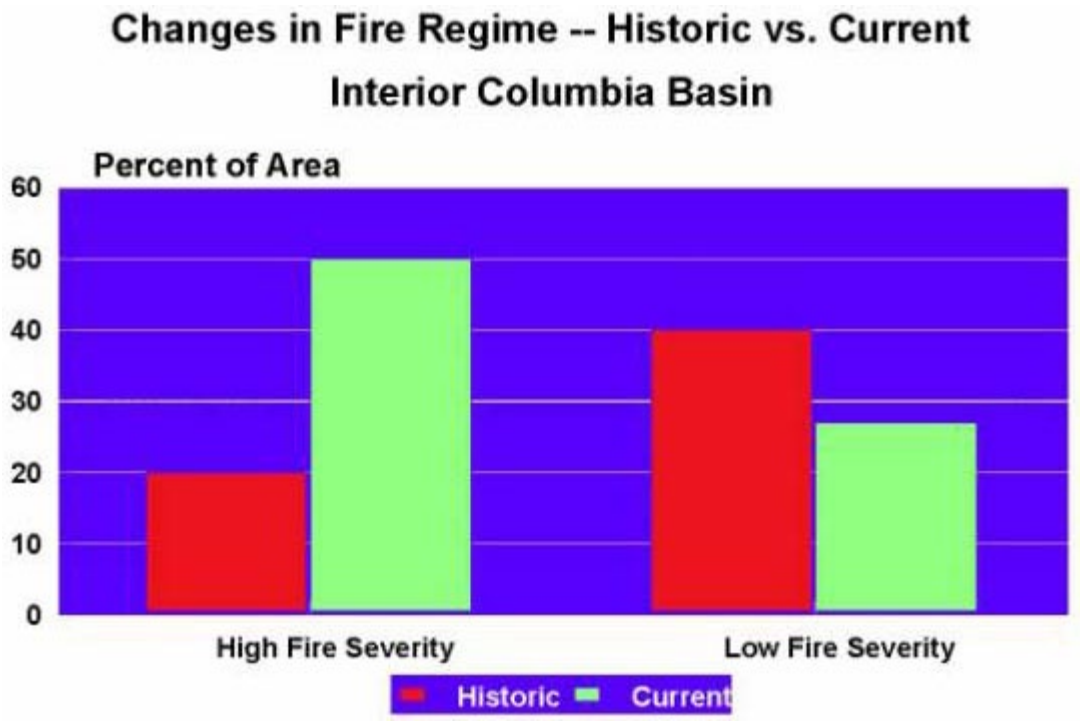

Figure 5. Changes in fire regime condition class

Source: ICBEMB (1996)

Efforts to streamline efforts to reduce forest fuels and restore ecosystems on national forest lands

In 2002, President George W. Bush announced the "Healthy Forest Initiative" (HFI), which was designed to reduce administrative, regulatory and statutory barriers to reducing forest fuel levels on federally administered lands.[33]

In late 2003, Congress passed the Healthy Forest Restoration Act (HFRA), which reduced some statutory process requirements associated with treatment and reduction of forest fuels and efforts to restore forests (including the relaxation and expedited processing of some NEPA requirements). As a result of these process reforms, the area of forest lands where fuel reduction and restoration activities have been carried out has increased substantially in the past five years.

SEEKING TO RE-EMPOWER LOCAL COMMUNITIES

The shift in power from local communities (whose economies were heavily dependent on national forest commodity resources in the past) to national and regional special interest groups, that progressively took place from the 1970s through the 1990s, left many local communities feeling they had little voice in determining their own future (Lee 1994).

Under President George W. Bush, various efforts have been made to re-empower local communities and increase their influence over national forest management decisions. These efforts are referred to as "collaborative conservation" or "collaborative governance".

Two caveats should be noted with respect to these efforts to re-empower local communities. The first is that these efforts are based almost entirely on administrative action, which could be reversed by a future Administration. Whether or not this happens may depend on whether broad bipartisan support for local community re-empowerment emerges. The second is that these efforts leave unresolved the issue of effectively balancing national and local interests in managing federal lands, with the possibility of national interests again reasserting a dominant position.

THE CHEQUERED HISTORY OF EFFORTS TO RE-ORGANIZE THE

FOREST SERVICE

Over the years, many proposals have been made to change to the Forest Service's organizational structure, but very few have been adopted and the organizational structure of the agency remains much the same as it was 50 years ago (Figure 1). The most frequently proposed changes have been to move the responsibility for administration of the national forests back under the DOI or, alternatively, to combine the Forest Service, DOI land-managing agencies and other federal land-managing agencies (such as the Corps of Engineers) under a new federal Department of Natural Resources (DNR) (Williams 2004).

The first proposal to move the national forests back to the DOI came in 1911 only six years after the forest reserves were moved to the USDA and subsequent proposals have been advanced regularly since that time. Opposition by Forest Service stakeholders and resistance from within the ranks of the agency has always been sufficient to block the implementation of these proposals.

Those organizational changes or "re-inventions" that have been implemented have come largely in response to shifting demands and have occurred in an incremental fashion, rather than the result of major strategically directed changes in the Forest Service organization chart. Many changes have come about in response to increasing or decreasing funding and Congressional appropriations and mandates.

The field organization of the Forest Service — especially ranger districts and forest supervisors' offices — has often successfully re-organized itself to become more integrated, and various field offices have been consolidated to improve efficiencies. In the western United States, many adjacent national forests have been combined under a single forest supervisor's office. In the eastern part of the country, it is not uncommon for all national forests in one state to be administered by a single administrative office.

Such efforts have often been initiated locally or in regional offices in response to shifts in funding or public demands (most often with headquarters' encouragement and concurrence), rather than being directly orchestrated nationally.

Downsizing and re-invention under the Clinton Administration

The sharp decline in timber sales resulting from implementation of the Northwest Forest Plan caused a major downsizing of Forest Service programme offices and employees in the Pacific Northwest. Within the area covered by the plan, Forest Service permanent full-time employee equivalents (FTEs) declined by 36 percent between 1993 and 2002, from 8 431 to 5 365 (Figure 6). Several individual national forests saw declines in FTEs of more than 50 percent during this period.

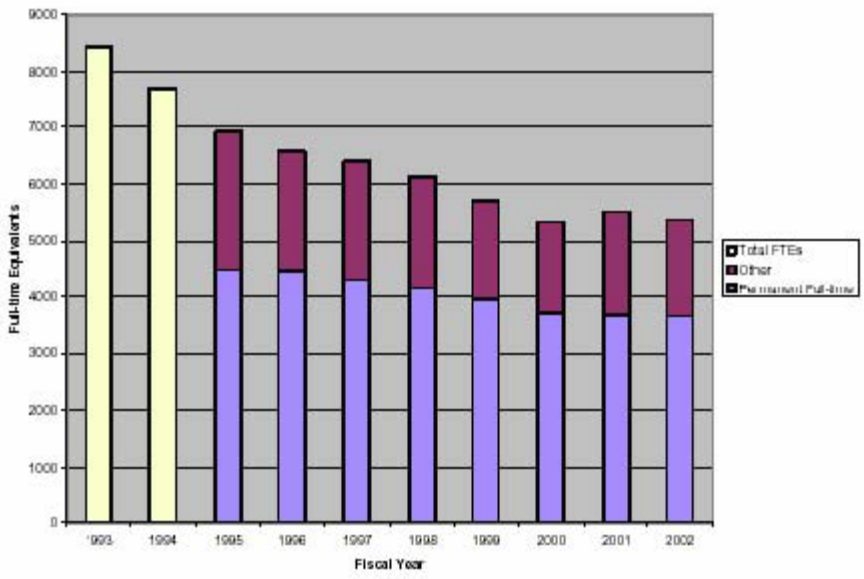

Figure 6. Changes in FTEs in California and the Pacific Northwest (1992–2002)

Source: USDA/Forest Service (2005).

In addition to downsizing in the Pacific Northwest, various other re-invention ideas were developed and formally proposed by the Clinton Administration. During President Clinton's first term, a major "re-inventing government" effort led by Vice-President Al Gore (called the "National Performance Review") sought to streamline and reform federal agencies, including the Forest Service.

The National Performance Review re-invention proposal for the Forest Service included several elements (USDA/Forest Service 1994a), but the only one that was eventually adopted was the "enterprise team" concept.[34] With a Republican-controlled Congress, the government-wide reinventing programme became politicized and no proposals that required Congressional concurrence were implemented.

Recent efforts to re-invent the Forest Service

The George W. Bush Administration has put forward few formal federal agency re-organization proposals. Instead, the focus has been to seek to improve the management efficiency of federal agencies generally. The strategy is to evaluate how many of the services that federal agencies currently provide could be carried out more cost efficiently through contracts with the private sector or other entities. A major component of this strategy is to require every federal agency to go through a formal process to assess each of its units and activities for potential savings through outsourcing or "competitive sourcing" (White House 2002).[35]

Studies are currently evaluating outsourcing options for many Forest Service activities. These include communications, aviation management, training, engineering design, environmental data collection and analysis, safety and occupational health, and many others. About 21 180 full-time employees, or more than two-thirds of the Forest Service's total FTE positions, are now being analysed for possible outsourcing (Wilent 2006).

Like past government re-invention efforts, only time will tell how effective the current efforts will be. In the meantime and not surprisingly, the current competitive sourcing evaluations have created considerable anxiety within the agency workforce (Wilent 2006).

Current Forest Service employment and funding

Since the 1980s, in spite of a precipitous drop in national forest timber sale levels, the total number of permanent full-time employees in the Forest Service has remained relatively stable, at around 30000.

Appropriated levels of funding for the three branches of the Forest Service have also remained relatively stable since 1990 (but have declined in inflation-adjusted terms). A major exception has been a major increase in funding for fire and treatment of forest fuels (Figure 7).

THE UNREALIZED PROMISE OF ADAPTIVE MANAGEMENT

One of the main ideas emerging from the movement toward ecosystem management in the 1980s was the concept of "adaptive management". The concept of adaptive management is based on the realization that ecosystems and the processes that influence them are so complex that it is difficult or impossible to predict in advance the full implications of proposed management actions. Therefore land managers must proceed with a heavy dose of humility, the application of the best science available and a strong commitment to monitoring the environmental, social and economic effects of management decisions — and to adapt or change decisions based on systematic monitoring. Adaptive management ideally also involves the purposeful design of management practices as experiments to assist in the learning experience (Walters 1986).[36]

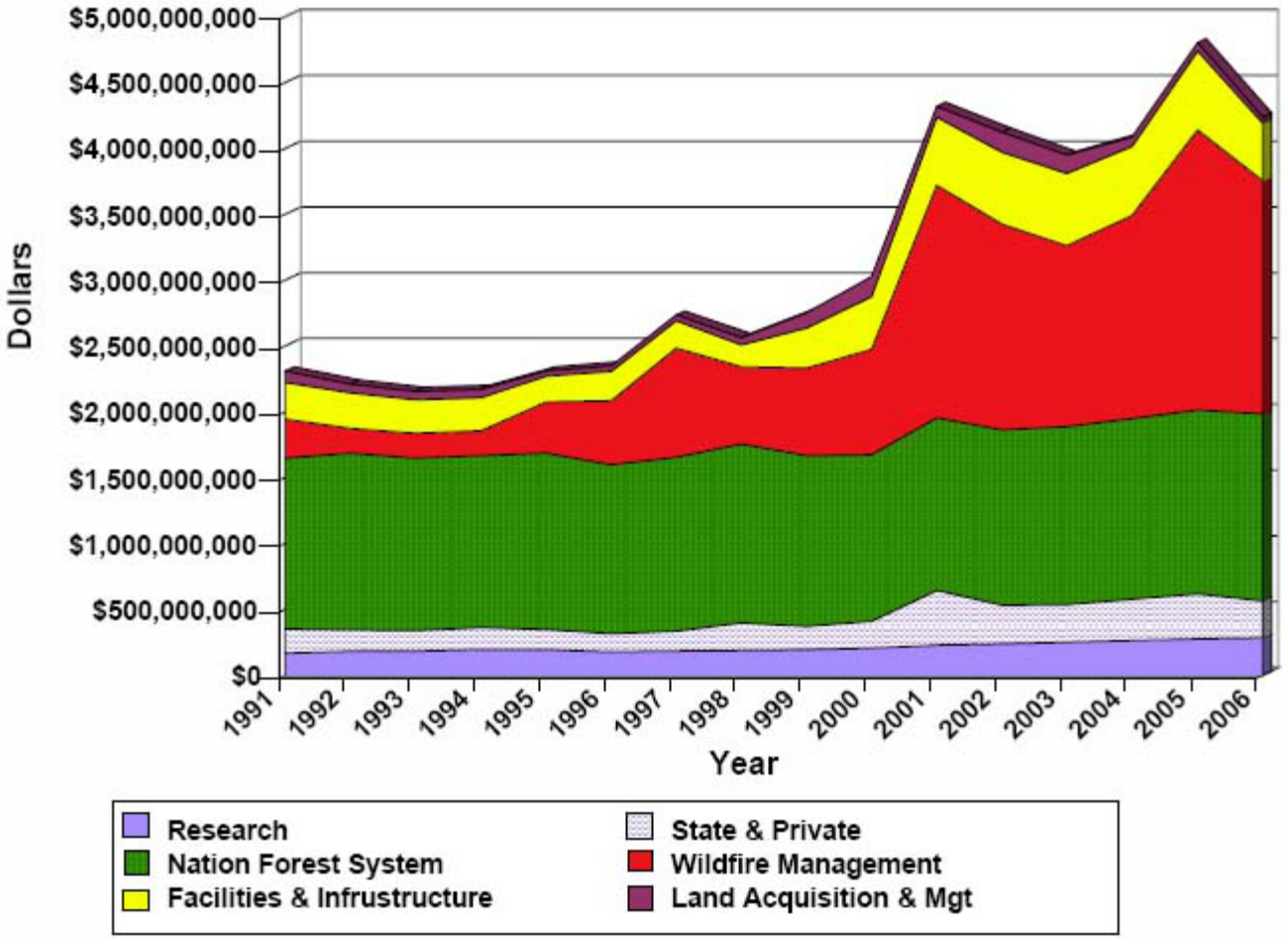

Figure 7. Changes in Forest Service discretionary budget by activity

Source: Forest Service Budget Summary (1991–2006), USDA/Forest Service.

The systematic application of adaptive management has not occurred for a variety of reasons, including a lack of commitment to and funding of needed inventories and monitoring. But there are also inherent cultural and institutional barriers, as well, both within land management and regulatory agencies, including the Council on Environmental Quality (CEQ). As an example, the Northwest Forest Plan established ten so-called "Adaptive Management Areas" (AMAs), covering about 600 000 hectares, which were intended to be laboratories for testing innovative management practices. In spite of the opportunity to showcase the application and utility of the concept of adaptive management, most observers feel that this effort has failed miserably (Thomas 2003, Stankey *et al.* 2003).

The short-term risk intolerance common to federal regulatory agencies, which has been discussed previously, remains a major barrier to adaptive management. In addition, the courts have been unwilling to reduce what they consider to be the legal obligations of land management agencies to carry out detailed predecision analysis.

Since the late 1970s, the NEPA has been strongly criticized for requiring volumes of upfront analysis and paperwork to "bullet-proof" documents against possible court challenges, while at the same time providing only limited knowledge for improved decision-making (Fairfax 1978). In a major critique of NEPA in the *Columbia Law Journal*, Bradley C. Karkkainen (2002) stated that:

…agencies have an incentive to overstuff the EIS with information from every available source, regardless of its quality, so as to achieve a protective layer of redundancy or "overkill" while at the same time inoculating themselves against the charge that they overlooked relevant information…NEPA ambitiously, and naively, demands the impossible: comprehensive, synoptic rationality, in the form of an exhaustive, one-shot set of ex ante predictions of expected environmental results. In the normal course of events, that task proves insuperable.

In addition to discouraging adaptive management, current NEPA procedures can also discourage constructive and effective stakeholder collaboration. Collaboration is most effective if the Forest Service effectively engages all interested stakeholders in seeking to craft decisions that maximize joint objectives and interests. But NEPA procedures require that, even after the Forest Service has gone through this collaborative process, it must: (1) spend a year or more preparing voluminous documents evaluating in detail the environmental implications of a full range of alternatives; and (2) then ask for formal public comment on this range of alternatives, even after the collaborative process has successfully narrowed or eliminated many, if not most of them from active consideration. Not surprisingly, the stakeholder community often feels confused, betrayed and abandoned by this required NEPA process.

In spite of the apparent conflict with the evolving science and application of ecosystem management, adaptive management and collaboration, the CEQ continues to staunchly defend its 1970s-era regulations implementing NEPA.

CHALLENGES FACING THE FOREST SERVICE

A variety of challenges face the Forest Service in the early twenty-first century. Some of these are briefly summarized hereunder.

Loss of technical skills. Since the Forest Service has not hired significant numbers of new employees for two decades, the agency is faced with an ageing workforce. Many employees are within five years of retirement (Figure 8).

Percent Permanent Forest Service Employees by Age Class - 1992 and 2005

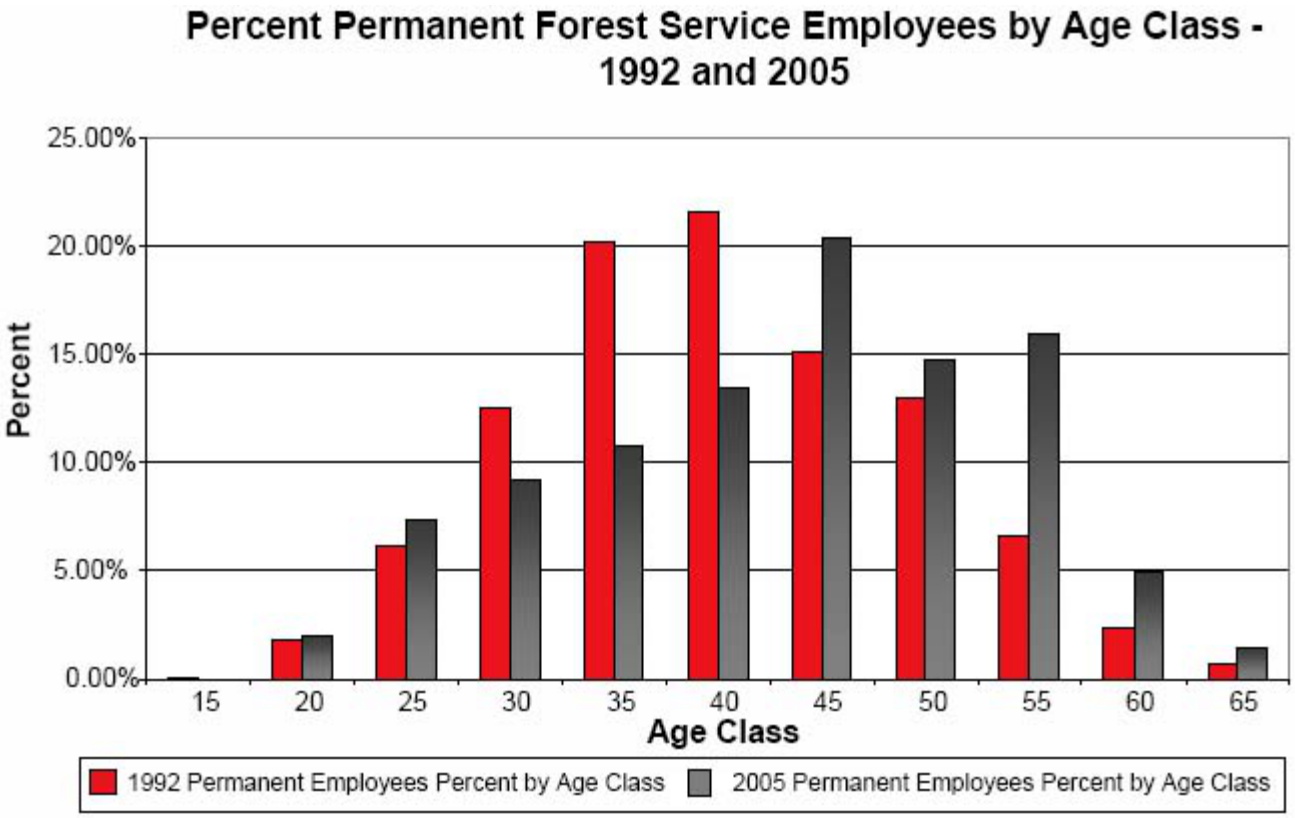

Figure 8. Percent of permanent full-time employees by age class

Source: HRM (2006).

Reduced resources at the field level. Increased process demands have resulted in increased staff numbers at the upper levels of the Forest Service. As the agency's budget has declined in real terms, its field offices working on the ground have been disproportionately affected (Figure 9). National forest field units are consequently stressed and stretched to meet the demands being placed on them.

Lack of integration and turf wars. Agency turf wars are hindering integration. In the past, the roles of traditional functional areas in the Forest Service were relatively well-defined. They corresponded to each of the traditional multiple uses. Thus, the timber staff prepared and administered commercial timber sales, the fire staff prepared for and fought forest fires, the watershed and wildlife staff reviewed and commented on proposed projects, helped prepare environmental documentation and carried out watershed and wildlife restoration projects. With the agency focus on forest restoration and treatment of forest fuels, traditional lines of responsibility have become blurred. A timber sale, formally the responsibility of the timber staff (and funded by a timber sale budget line item), may now be the mechanism to reduce forest fuels — a task which was previously the responsibility of the fire staff (funded by the fire budget line item). The same activity may also advance the objectives of restoring watershed conditions or enhancing wildlife habitat (under the purview of the watershed and wildlife staffs, respectively). It has sometimes been difficult for the existing functional disciplines — with their traditional budget line funding from Congress — to rationalize and clarify their roles under the new mission focus. Considerable integration has occurred at the field level, but the turf battles and responsibility issues remain contentious at regional offices, and especially at the Washington Office level.

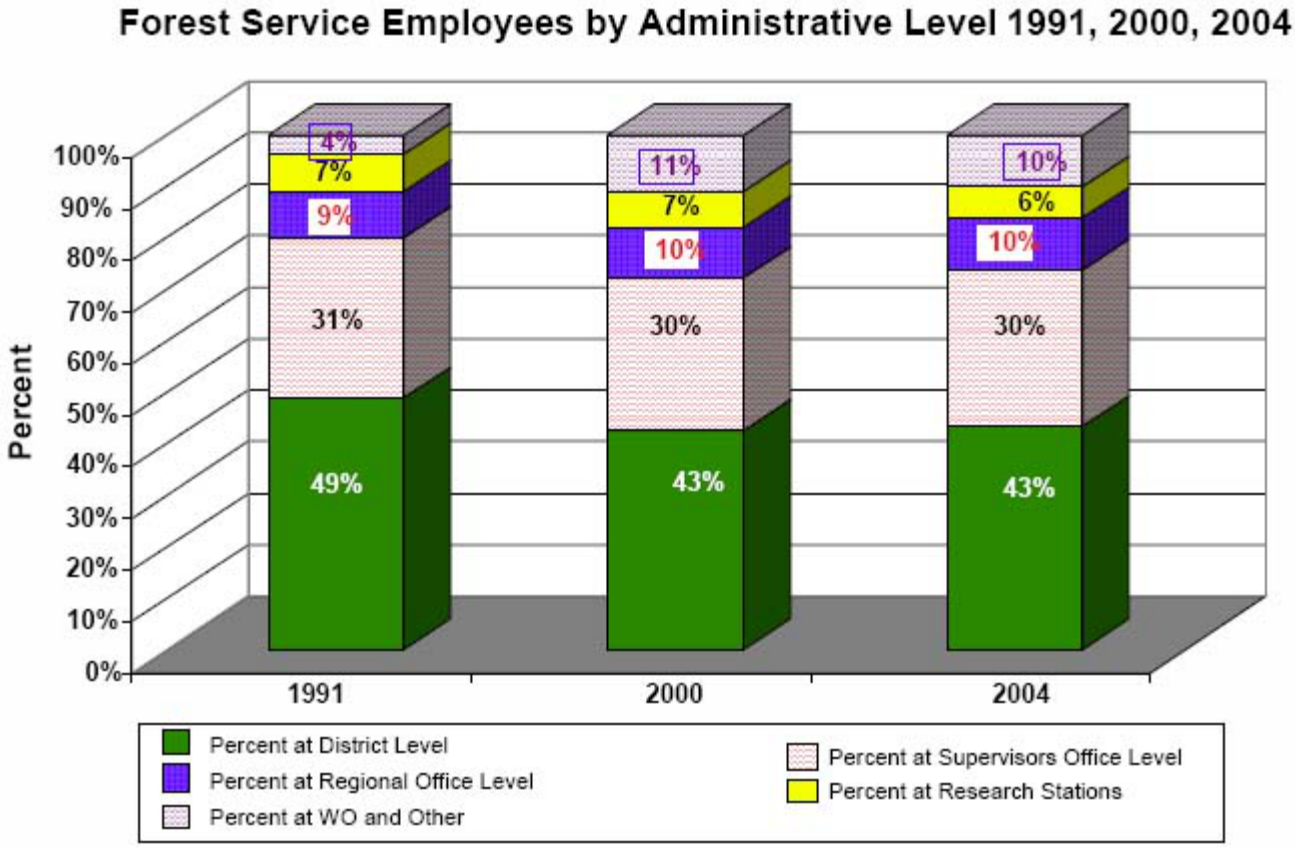

Figure 9. Forest Service employees by administrative level

Source: HRM (2006).

Undefined social constituency for ecosystem restoration and fuels' treatment. At present, there is no well-organized national constituency for forest restoration and treatment of forest fuels. Some of the current national forest constituencies, such as the timber industry and wilderness interests, are cool to this new mission focus, or even opposed. For others, such as recreation stakeholders, the issue is considered peripheral to their primary interests. A constituency for restoration and fuels' treatment may now be emerging at local community levels, but it has yet to emerge as a national political force.

LESSONS TO BE LEARNED FROM EXPERIENCE WITH NATIONAL FORESTS

Lessons on organizational re-invention

Since 1905, the management of national forest lands has shifted from custodial management (1905– 1945), to production of wood products (1945–1985), and most recently to a still evolving form of ecosystem management that emphasizes restoration and maintenance of forest health, reduction of hazardous fuels, biodiversity and recreation. The most recent shift was rapid, although it was often resisted both within and outside the Forest Service.

The Forest Service has made these significant changes in its mission focus within an overall organizational structure that has remained largely unchanged since the 1930s. In addition, the substantial changes in mission focus since 1985 have occurred without an explicit change in the statutory mandate governing the purposes for which the national forests are to be managed. While numerous formal proposals to re-organize and restructure the Forest Service have been made over the years, few have been implemented. Those restructurings that have occurred have mainly involved consolidation of management units, largely initiated by field offices in response to shifts in funding and budgets.

The Forest Service as an organization has demonstrated both rigidity and flexibility over the years. In response to changing legal requirements and public demands, the Forest Service has been able to "re-invent" itself by making substantial changes in its mission focus. Such changes have not always been easy for the agency, especially when they ran counter to the organizational culture or adversely affected key Forest Service stakeholder groups. Strong leadership of the agency by career employees who worked their way up through the organization has been a major positive factor in formulating workable responses to shifting demands on the agency. The decentralized decision-making culture of the agency has also been a strength, allowing the agency to adapt to changing needs at local levels.

A major barrier that remains to the Forest Service becoming a true learning organization is that the regulatory agencies that oversee it, and the courts that review legal challenges against it, have yet to embrace the concept of adaptive management. This has prevented the Forest Service from adjusting management approaches and strategies as quickly as hoped in response to lessons learned on the ground.

Lessons on multiple use of public lands

The performance and evolution of multiple use in any specific context depends on a variety of factors, not the least of which is: (1) the nature and intensity of the demands being placed on the land; (2) the nature and scope of the stakeholders or constituencies interested in that management; and (3) the "rules of engagement" that apply to public input and intervention into the decision-making process.

The experiences in managing the national forests suggests strongly that key land allocation decisions, especially between protected lands, such as wilderness, and land used to produce a broader range of goods and services (e.g. timber), should be recognized as essentially political decisions and, therefore, should not be left to professional land management agencies to resolve. The unwillingness of Congress to make these decisions, or, alternatively, to set clear limits or parameters on the area of protected and/or production lands, has often left the Forest Service in an untenable situation.

Lessons on the need for public lands to secure reliable supplies of timber

In the early twentieth century it was widely assumed that public ownership and management of forest lands was needed to assure that they would be managed effectively for watershed protection and sustained timber production. Today 92 percent of the timber produced in the United States is harvested from private land (USDA/Forest Service 2004). In fact, it can be argued that the existence of public forests designated for multiple-purpose use is contrary to the objective of timber production because it encourages the kinds of public debates and controversy described in this study. As demands for non-timber uses and values on these lands increased, timber production shifted to other forests and to other countries.

Factors contributing to expanded private investment in forestry in the United States include: (1) stable and well-defined institutional frameworks and land tenure and land rights systems, backed by the rule of law; (2) strong and relatively consistent markets for forest products; (3) strong agricultural and forestry institutions and support and delivery systems at national, state and local levels; and (4) increasing per capita income and other measures of economic strength and

diversity that encourage investment in the forest sector and result in citizens who cherish forests for their non-timber and environmental values (MacCleery 2001).

Effects of national versus state management of public lands

The decision to establish a federal system of forest reserves in the United States was fateful. It created a perceived right and interest among all citizens on how these lands should be managed. If federal forest lands in the United States had been transferred to the jurisdiction of individual states, the changed political dynamics would have resulted in a substantially different policy evolution. Whether it might have been better or worse depends on one's viewpoint.

There is no question that the existence of a large federal land estate has led to a sizeable body of federal laws governing their management, as well as the requisite federal land management agencies to administer them. Together, these elements created a public forest policy-making structure heavily concentrated in Washington. As the demands being placed on these lands increased over time, diverse constituencies emerged with a stake in how these lands were to be managed; they organized themselves to influence Congress and federal agencies in Washington to achieve their particular objectives. As a significant portion of this constituency is disconnected from the economic impacts of reduced federal commodity production, it should be no surprise that such a shift has occurred in recent years.

A VIEW TO THE FUTURE

A key consideration for the future is whether the public concerned with the management of the national forests can come together and forge a working consensus as to how these precious lands are to be managed. There appears to be a growing consensus in favour of a forest restoration/fuels treatment mission for the Forest Service. But a strong constituency for such a mission focus has yet to develop. Former Chief Jack Ward Thomas wrote that national forest stakeholders currently seem to be too engaged in fighting the battles of the past to look to the future (Thomas 2001a):

Fierce in battle, many of the eco-warriors have been unable to come to grips with the consequences of victory and are now reduced to wandering about the old battlefields bayoneting the wounded. Their counterparts from the resource extraction community, likewise, cannot come to terms with defeat and hold "ghost dances" to bring back the good old days when they were undisputed Kings of the West.

Some emerging signs are promising. In a recent opinion piece in *Grist* magazine, Mitch Friedman, one of Jack Thomas' "eco-warriors" on the Pacific Coast suggested that it is time for the environmental community to reconsider the newly re-invented Forest Service and change from confrontation to cooperation and collaboration.[37] Friedman writes that the environmental community should "…push to thin overgrown stands before it gets charred. We need to get better at advocating restoration logging before fires occur".

Friedman also acknowledges that the Forest Service has been "critically hampered by process". He argues that:

If we want our forest ecosystems restored, we must now disabuse the Forest Service of the inefficiencies we helped impose. We must rescue the Forest Service by becoming its friend, its ally and its core constituency…. We have at hand an opportunity…to build a new conservation movement and a new Forest Service to advance a new central idea of restoration.

Only time will tell how well Friedman's challenge will be taken up by other national forest stakeholders. It still remains to be seen whether Chief McGuire's "grand experiment" wherein diverse interests consent to "share the land" is a viable approach for multipurpose public land in an era of representative democracy characterized by diverse and fiercely competing special interest groups.

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[2] The United States Civil War (1861–1865), the bloodiest conflict in the country's history, was fought, in part, over whether individual states had the right to withdraw from the Union into which they had voluntarily entered at the conclusion of the Revolutionary War of 1776 to 1782. The outcome of the war determined that the answer was "no".

[3] Although reasonable at the time, this assumption has since proven invalid. Owing to rising real prices for wood products and a favourable tax and related institutional climate that encourages investments in timber-growing practices, private forests now account for 92 percent of national timber harvest, while also providing high levels of watershed protection (USDA/Forest Service 2004).

[4] In 1907 the forest reserves were renamed "national forests".

[5] Over time, one of the largest federal land-managing agencies has been located in the Department of Agriculture, while almost all other land-managing agencies are located in the Department of the Interior (DOI); this led to many proposals to either shift the Forest Service back to the DOI or to create a Department of Natural Resources within which all federal land-managing agencies would reside. None of these proposals has been implemented successfully.

[6] Until the mid- to late 1970s, professional employees working for the national forests generally did not apply for job openings. Such promotions or transfers were offered with a strong expectation that they would be accepted. These usually required the employee and his or her family to move, often to remote locations. It was widely understood that if a particular employee turned down two such offers, the next one would be very long in coming, if ever.

[7] Over the last several decades many adjacent national forests have combined administrative offices.

[8] For example, today firefighters of the various federal and state agencies are trained to use standardized firefighting equipment and techniques. Federal, state and local agency firefighters from anywhere in the country can be mobilized, sent to emergency situations elsewhere in the country and operate effectively with standardized radio frequencies, equipment, terminology and training.

[9] Required reforestation of logged areas is generally done by the Forest Service, usually using funds deposited into a special fund by the logging contactor. Federal agencies generally use private planting contractors and planting stock raised in federal nurseries.

[10] *Newsweek*, 2 June 1952.

[11] The Forest Service had advanced the primitive area and wilderness concepts by establishing several "primitive areas" in the 1920s and 1930s. A summary of this history is available online at: http://www.fs.fed.us/global/wsnew/fs_history/issue19.doc

[12] In 1975, legislation was passed to allow designation of wilderness areas in the eastern United States (DPC 1988).

[13] Under the Equal Access to Justice Act, citizens and NGOs can be reimbursed for the costs of bringing litigation against the federal government if certain requirements are met. In contrast to many other countries, citizens and NGOs are not required to cover the government's legal costs if the litigation brought by them is unsuccessful.

[14] Some of the increase in permanent full-time employment during this period was due to conversion of temporary, wage grade employees to permanent full-time status.

[15] In response to the national forest clear-cutting controversy, in March 1972, the Senate Subcommittee on Public Lands published a set of guidelines for clear-cutting on public lands (U.S. Senate 1972). These guidelines, called the "Church Guidelines" after Subcommittee Chair Frank Church of Idaho, were later incorporated into the statutory requirements of the NFMA of 1976 (Fedkiw 1999).

[16] Current and old archived Eco-Watch dialogues can be viewed online at: http://www.fs.fed.us/eco/eco-watch/ecowatch.html

[17] The AFSEEE's Web site can be viewed at: http://www.fseee.org/

[18] Available online at: http://216.48.37.142/pubs/viewpub.jsp?index=5546

[19] The ISC report can be viewed at: http://pnwin.nbii.gov/nwfp/ConservationStrategyOwl/part_1.pdf

[20] The Scientific Panel report can be viewed at: http://pnwin.nbii.org/nwfp/alternatives.pdf

[21] The FEMAT report can be viewed at: http://pnwin.nbii.gov/nwfp/FEMAT/

[22] Information on the NWFP is available at: http://www.reo.gov/

[23] Dale Robertson had begun the process of agency re-invention even before he became Chief (in his position as Associate Chief under Chief Max Peterson).

[24] *Cut and sold* and other timber-related reports can be viewed online at: http://www.fs.fed.us/forestmanagement/reports/index.shtml

[25] Annual National Forest System Reforestation and Timber Stand Improvement reports can be viewed at: http://www.fs.fed.us/forestmanagement/reports/reforest-tsi/index.shtml

[26] A detailed discussion of how the national forest timber programme has changed since 1990 can be viewed at: http://www.fs.fed.us/forestmanagement/reports/tspirs/1997/index.shtml#fig4

[27] Although a career Forest Service employee, Thomas did not undergo the senior executive training required of top career civil service positions. Therefore, he accepted his appointment as the first political appointee to be Chief since Gifford Pinchot and Henry Graves, based on the promise that he would later be converted to career civil service status. This never occurred.

[28] For his account of the pressures he faced in responding to the demands of Congress and the Clinton Administration see *The journals of a forest service chief* (Thomas 2004).

[29] Planning and environmental analysis was estimated to consume 40 percent of total direct work at the national forest level (USDA/Forest Service 2002).

[30] The focus on short-term effects on forest resources, e.g. water quality and fisheries, is illustrated by the adverse ruling in Pacific Coast Federation of Fisherman's Association V. NMFS, 253 F.3d 1137 (9th Cir. 2001).

[31] Testimony by Dale Bosworth before the House Subcommittee on Forests (6/12/2002) describing the implications of this report can be viewed at: http://www.usda.gov/agency/ocr/download/FS-Bosworth-6.12.02.pdf

[32] This essay, "The Paradox of Excellence", is online at: http://fs.jorge.com/archives/History_National/Kaufman_1994.htm

[33] The background and descriptions of the administrative reforms under HFI and related topics can be viewed at: http://www.healthyforests.gov/initiative/admin_actions.html

[34] The enterprise team concept was developed to encourage innovative and entrepreneurial activities within government. These units are self-supporting and enter into contracts with agency offices needing specialized services. More information and a list of teams are available at: http://www.fs.fed.us/reinvention/enterprise/about/enterprise_units.shtml

[35] The process for carrying out competitive sourcing is laid out in the Office of Management and Budget's Circular A-76, which can be viewed online at: http://www.whitehouse.gov/omb/circulars/a076/a76_incl_tech_correction.pdf

[36] More information on the practical application of adaptive management is available online at: http://www.worldwildlife.org/bsp/publications/aam/112/titlepage.htm

[37] The article, "*The Forest Service is dead; long live the Forest Service!: It's time for conservationists to collaborate with an agency they've long demonized",* can be viewed at:
http://www.grist.org/comments/soapbox/2006/02/28/friedman/