



Report to the Subcommittee on Forests
and Forest Health, Committee on
Resources, House of Representatives

April 1999

WESTERN NATIONAL FORESTS

A Cohesive Strategy is Needed to Address Catastrophic Wildfire Threats



NO. 2550
PAGE 1 OF 61

EXHIBIT
33



United States
General Accounting Office
Washington, D.C. 20548

Resources, Community, and
Economic Development Division

B-281890

April 2, 1999

The Honorable Helen Chenoweth
Chairman, Subcommittee on Forests
and Forest Health
Committee on Resources
House of Representative

Dear Madam Chairman:

In response to your request and as agreed with your office, this report describes (1) the extent and seriousness of problems related to the health of national forests in the interior West, (2) the status of efforts by the Department of Agriculture's Forest Service to address the most serious of these problems, and (3) barriers to successfully addressing these problems and options for overcoming them. The report contains a recommendation to the Secretary of Agriculture for developing a more cohesive strategy to address growing threats to national forest resources and nearby communities from catastrophic wildfires.

We are sending copies of this report to the appropriate congressional committees; the Honorable Dan Glickman, the Secretary of Agriculture; and the Honorable Michael Dombeck, the Chief of the Forest Service. We will also make copies available to others upon request.

Please call me at (202) 512-9775 if you or your staff have any questions about this report. Major contributors to this report are listed in appendix II.

Sincerely yours;

Barry T. Hill,
Associate Director, Energy Resources,
and Science Issues

(1-5... 3350

2 61

Executive Summary

Purpose

National forests of the dry, interior portion of the western United States that are managed by the Department of Agriculture's Forest Service have undergone significant changes over the last century and a half, becoming much denser, with fewer large trees and many more small, tightly spaced trees and underbrush. These changes have raised concerns about the current health of these forests and their continued ability to provide for sustained levels of uses, including timber and wildlife habitat, by future generations of Americans, as required by law. In response to a request from the Subcommittee on Forests and Forest Health, House Committee on Resources, GAO examined issues related to the health of these forests. In this report, GAO discusses (1) the extent and seriousness of forest-health-related problems on national forests of the interior West, (2) the status of efforts by the Forest Service to address the most serious of these problems, and (3) barriers to successfully addressing these problems and options for overcoming them.

Background

The Forest Service manages about 155 national forests covering 192 million acres of land—nearly 9 percent of the nation's total surface area. About 70 percent of these lands are located in the dry, interior portions of the western United States. Laws guiding the management of the national forests require them to be managed under the principles of multiple use and sustained yield to meet the diverse needs of the American people. Under the multiple-use principle, the Forest Service is required to plan for six renewable surface uses—outdoor recreation, rangeland, timber, watersheds and water flows, wilderness, and wildlife and fish. Under the sustained-yield principle, the agency is required to manage its lands to provide high levels of these uses to current users while sustaining undiminished the lands' ability to produce these uses for future generations.

To carry out this mission, the Forest Service has adopted a management approach that recognizes that ensuring the long-term productivity of the land for these uses requires sustaining forest health. Although definitions of forest health vary, scientists believe a useful method for assessing it is to compare the current ecological conditions of a forest—especially the conditions of its tree stands—with the range of past ecological conditions it has exhibited. This historical range indicates the variation over time in conditions that normally occur in response to common local, natural disturbances, such as fires, floods, windstorms, or droughts, and provides a basis for identifying the forest's capacity to provide for different uses over time.

Historically, tree stands on the forests of the interior West have differed in composition and structure from those found elsewhere. These differences were largely attributable to the region's dry climate and varied elevations. In this setting, frequent low-intensity wildfires periodically removed undergrowth and smaller trees from many of the region's lower-elevation forests. In recent years, changes in the condition of these forests—including changes in tree stand density, species composition, and insect and disease infestation levels—have led some to call these forests unhealthy. The condition of these forests is of great public interest because their recreational and aesthetic values have led to population increases along their boundaries in recent years.

Results in Brief

The most extensive and serious problem related to the health of national forests in the interior West is the overaccumulation of vegetation, which has caused an increasing number of large, intense, uncontrollable, and catastrophically destructive wildfires. According to the Forest Service, 39 million acres on national forests in the interior West are at "high risk" of catastrophic wildfire. Past management practices, especially the Forest Service's decades-old policy of putting out wildfires on the national forests, disrupted the historical occurrence of frequent low-intensity fires, which had periodically removed flammable undergrowth without significantly damaging larger trees. Because this normal cycle of fire was disrupted, vegetation has accumulated, creating high levels of fuels for catastrophic wildfires and transforming much of the region into a tinderbox. The number of large wildfires, and of acres burned by them, has increased over the last decade, as have the costs of attempting to put them out. These fires not only compromise the forests' ability to provide timber, outdoor recreation, clean water, and other resources but they also pose increasingly grave risks to human health, safety, property, and infrastructure, especially along the boundaries of forests where population has grown significantly in recent years.

During the 1990s, the Forest Service began to address the unintended consequences of its policy of putting out wildfires. In 1997, it announced its goal to improve forest health by resolving the problems of uncontrollable, catastrophic wildfires on national forests by the end of fiscal year 2015. To accomplish this goal, it has (1) initiated a program to monitor forest health, (2) refocused its wildland fire management program to increase the number of acres on which it reduces the accumulated vegetation that forms excessive fuels; and (3) restructured its budget to better ensure that funds are available for reducing these fuels. The

100-335
1-4 6.1

Congress has supported the agency's efforts by increasing the funds for reducing fuels and authorizing a multiyear program to better assess problems and solutions.

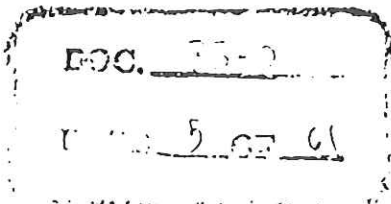
However, because it lacks adequate data, the Forest Service has not yet developed a cohesive strategy for addressing several factors that present significant barriers to improving the health of the national forests by reducing fuels. As a result, many acres of national forests in the interior West may remain at high risk of uncontrollable wildfire at the end of fiscal year 2015. Efforts to reduce accumulated fuels can adversely affect the Forest Service's achievement of other stewardship objectives. For example, controlled fires can be used to reduce fuels, but (1) such fires may get out of control, and (2) the smoke they produce can cause significant air pollution. As a result, mechanical methods, including commercial timber harvesting, will often be necessary to remove accumulated fuels. However, mechanical removals are problematic because the Forest Service's (1) incentives tend to focus efforts on areas that may not present the highest fire hazards and (2) timber sales and other contracting procedures are not designed for removing vast amounts of materials with little or no commercial value. As a result, removing accumulated fuels may cost the Forest Service hundreds of millions of dollars annually. But the problem is so extensive that even this level of effort may not be adequate to prevent many catastrophic fires over the next few decades. This report recommends the development of a cohesive strategy to reduce accumulated fuels on national forests of the interior West in an effort to limit the threat of catastrophic wildfire.

Why the Interior West?

Principal Findings

Catastrophic Wildfires Threaten Forest Resources and Communities

Tree stands on national forests of the interior West have grown much denser in recent decades, have undergone shifts in species composition, and have experienced increases in some insect and disease infestations. These conditions, often considered indicators of poor forest health, jeopardize the ability of these forests to sustain wildlife habitat as well as timber production. In addition, they pose a more immediate problem—the threat of catastrophic wildfires. After declining fairly steadily for 75 years, the average number of acres burned by wildfires annually on national forests began to rise over the last decade, nearly quadrupling to about



three-quarters of a million acres per year. Virtually all of this rise is attributable to the increasing number of very large fires.

3/4 million
Mainly large fires

\$335 FY 94

Scientists and agency officials believe that this increase in large, intense, uncontrollable, and catastrophically destructive wildfires is in large part the result of the Forest Service's decades-old policy of putting out wildfires on national forests. This policy disrupted the historical occurrence of frequent, low-intensity fires in many areas of the interior West. Such fires periodically removed smaller live and downed vegetation, preventing accumulations that could result in larger fires. But as vegetation has accumulated, fires have become larger and more difficult and expensive to put out. The average annual costs of attempting to put out these fires grew by 150 percent, from \$134 million in fiscal year 1986 to \$335 million in fiscal year 1994 (in constant 1994 dollars). The costs of preparedness, including the costs of maintaining a readiness force to fight the fires, also rose, from \$189 million in fiscal year 1992 to \$326 million in fiscal year 1997—an increase of about 70 percent.

Outside experts and Forest Service officials generally agree that increased fire suppression efforts will not be successful because such inevitable, large, intense wildfires are generally impossible for firefighters to stop and are only extinguished by rainfall or when there is no more material to burn. They are concerned that, in the future, such fires will prevent the Forest Service from meeting its mission requirement to sustain the national forests' multiple uses because the fires will likely damage soils, habitat, and watershed functioning for many generations or even permanently.

In recent years, the number of people living along the boundaries of the national forests has grown significantly. As a result, the increasing numbers of larger, more intense fires pose grave hazards to human health, safety, property, and infrastructure in these areas, which are referred to as "wildland/urban interface" areas. Not only do the fires take lives, but also, because the smoke from them contains substantial amounts of fine particulate matter and other hazardous pollutants, they can pose substantial health risks to people living in the wildland/urban interface. In addition, the fires threaten to damage infrastructure, such as the reservoirs that provide water to these nearby populations. According to the Forest Service, maintaining current funding levels for preparedness, as is now planned, will result in increased risks of injuries and loss of life to firefighters and the public. Experts believe that the "window of

1993...3350

1993...61

opportunity" for taking management action is only about 10 to 25 years before catastrophic wildfires become widespread.

Recent Actions to Address Catastrophic Wildfires Are Important but May Be Too Little, Too Late

Besides increasing preparedness and suppression efforts over the last few years, the Forest Service has taken a number of important steps to address the growing threat of wildfires. In particular, in 1995, it refocused its fire management program to reduce accumulated fuels. In 1997, the Chief of the Forest Service adopted an internal agency recommendation to increase the number of acres on which fuels are reduced from about 570,000 acres to 3 million acres annually by fiscal year 2005 and to continue this level until the year 2015. However, GAO's analysis of the agency's initial plans and data indicate that even this level of effort may leave about 10 million acres of the current 39 million acres at high risk of catastrophic wildfire.

*Other Regions
have "less serious
conditions"*

Where is this? →

The Forest Service may not be able to address all of the acres needing attention for several reasons. First, although the agency has announced its intent to give priority to threats in the wildland/urban interface, its funds for reducing fuels are currently allocated substantially to maintaining low fuel levels on forests in other regions with less serious conditions so that conditions there do not become as hazardous as in the interior West. For this same reason, a significant portion of the future funds for reducing fuels will have to be allocated to those other regions. In addition, the agency is hampered in systematically implementing its priority for reducing fuels in the wildland/urban interface because it has only recently begun to define and map these areas. Finally, the agency's fiscal year 2000 budget proposal provides the same level of funding for reducing fuels as the previous fiscal year's budget, meaning that, with rising costs, the agency will reduce fuels on fewer, rather than more, acres as initially planned.

In 1998 and 1999, the Congress authorized two efforts supporting the Forest Service's efforts—the Joint Fire Science Program and a set of "stewardship contracting demonstration projects." The Joint Fire Science Program is responsible for developing consistent information on accumulated fuels and ways to reduce them. The data being developed under the program are being used initially to map the locations of existing risks from accumulated fuels. This and other research activities of the Joint Fire Science Program may take 10 years to complete. Several more years may be required to incorporate all the lessons learned into revised forest plans. The stewardship contracting demonstration projects are

DEC 2000

DEC 2000

using alternative contracting procedures for working with nonfederal partners to demonstrate mechanical methods of removing materials (including timber harvesting) to reduce accumulated fuels. However, this program has also just begun. Lessons learned from the program can be incorporated into an agencywide strategic approach if a consistent method for evaluating the results of the demonstration projects is devised, but such an evaluation methodology has not yet been developed.

A Cohesive Strategy Is Needed for Addressing Numerous Barriers to Effective Action

Efforts to address catastrophic wildfires face several barriers, including the fact that most methods of reducing fuels can be difficult to reconcile with agencies' other responsibilities. For instance, many agency officials told GAO they do not believe it is possible to set controlled fires to reduce fuels on a scale replicating that of natural fires and still meet air quality standards under the Clean Air Act. The Forest Service and the Environmental Protection Agency are involved in a 3-year experiment to better determine whether and how it will be possible to reconcile controlled burning and these air quality standards. Moreover, because of climatic conditions and the density of tree stands, the danger of fire's escaping from such controlled burning is often too high in many areas for this method to be used. Mechanically removing fuels (through commercial timber harvesting and other means) can also have adverse effects on wildlife habitat and water quality in many areas. Officials told GAO that, because of these effects, a large-scale expansion of commercial timber harvesting alone for removing materials would not be feasible.

However, because the Forest Service relies on the timber program for funding many of its other activities, including reducing fuels, it has often used this program to address the wildfire problem. The difficulty with such an approach, however, is that the lands with commercially valuable timber are often not those with the greatest wildfire hazards. Additionally, there are problems with the incentives in the fuel reduction program. Currently, managers are rewarded for the number of acres on which they reduce fuels, not for reducing fuels on the lands with the highest fire hazards. Because reducing fuels in areas with greater hazards is often more expensive—meaning that fewer acres can be completed with the same funding level—managers have an incentive not to undertake efforts on such lands.

Moreover, the agency's current statutorily defined contracting procedures for commercial timber sales—as well as for service contracts that do not involve selling timber but are let simply for the service of removing excess

3350

61

fuels—were not designed to (1) facilitate the systematic removal of large volumes of low-value material over a number of years, (2) readily combine funds for conducting timber sales with funds for reducing accumulated fuels, or (3) allow contractors to retain this low-value material to partially offset the costs of its removal. Because of the combined (1) need to perform costly mechanical removals, (2) lack of value for the materials, and (3) lack of contracting procedures designed to facilitate their removal, GAO estimates that the cost to the Forest Service to reduce fuels on the 39 million acres at high risk could be as much as \$12 billion between now and the end of fiscal year 2015, or an average of about \$725 million annually. This is more than 10 times the current level of funding for reducing fuels, and the agency, contrary to its earlier plans, has requested no increase in this funding for fiscal year 2000.

The Forest Service has not yet devised a cohesive strategy to address these barriers to reducing excessive national forest fuel levels and associated catastrophic wildfires. It has not done so, in large part, because it lacks basic data on, for example, the (1) locations and levels of existing excessive fuel accumulations, (2) effects on other resources of different methods of reducing fuels, and (3) relative cost-effectiveness of these different methods, all of which are needed to identify quantitative measures and goals for fuels reducing fuels. Nor has the Forest Service identified a firm schedule for completing activities that will provide it with such data. The lack of such performance measures and goals, and of a cohesive strategy and schedule for developing and accomplishing them, makes it difficult for the agency to be held accountable for achieving its statutorily mandated mission of sustaining multiple uses.

Recommendation to the Secretary of Agriculture

We recommend that the Secretary of Agriculture direct the Chief of the Forest Service to develop, and formally communicate to the Congress, a cohesive strategy for reducing and maintaining accumulated fuels on national forests of the interior West at acceptable levels. We further recommend that this strategy include (1) specific steps for acquiring the data needed to establish meaningful performance measures and goals for fuel reduction, (b) identifying ways of better reconciling different fuel reduction approaches with other stewardship objectives, and (c) identifying changes in incentives and statutorily defined contracting procedures that would better facilitate the accomplishment of fuel reduction goals; (2) a schedule indicating dates for completing each of these steps; and (3) estimates of the potential and likely overall and annual

100-1350
9 08 61

costs of accomplishing this strategy based on different options identified in the strategy as being available for doing so.

Agency Comments

The Forest Service reviewed a draft of this report and generally agreed with GAO's findings, conclusions, and recommendation. In its comments, the agency stated that the report is very comprehensive, does a good job of covering the problem, and effectively portrays the conditions found on many national forest throughout the interior West. The agency agrees that it has not advanced a cohesive strategy to treat all 39 million acres of national forestlands at risk of catastrophic fire but says that it is committed to developing one in a timely manner and (1) has a general strategy for reducing wildfire threats, (2) is currently developing a more specific planning process and tools for completing this strategy, (3) will make significant progress in eliminating these threats, and (4) has realistic time frames for accomplishing these tasks. The agency also listed in its comments several initiatives that it has under way or planned to complete its more cohesive strategy. According to the agency, these initiatives will be important in reducing threats from catastrophic wildfires.

This report recognizes that the Forest Service has a general strategy and has undertaken and is planning several initiatives to develop a more cohesive strategy. However, GAO believes that the general strategy lacks cohesiveness because it does not address several barriers that the Forest Service faces in undertaking its planned fuel reduction activities. Nor is it clear from the Forest Service's comments how its current and planned initiatives, individually and collectively, will provide this cohesiveness. GAO also believes that the agency needs to be accountable for accomplishing the strategy. For these reasons, GAO believes that the agency's more cohesive strategy should include, as specific steps, those actions in its current and planned initiatives that it believes will enable it to address these barriers, as well as a schedule for completing them. GAO believes that this delineation of specific actions and a schedule will provide a practical framework and process for accomplishing the agency's intentions. The agency also provided a number of technical and clarifying comments. GAO revised the draft report where appropriate in response to the agency's comments. The agency's comments and GAO's responses to them are found in appendix I of this report.

3350
10 61

Contents

<hr/>		
Executive Summary		2
<hr/>		
Chapter 1		12
Introduction		
	The Forest Service's Mission Is Multiple Use and Sustained Yield	12
	Sustaining Ecosystems Is the Agency's Management Approach	12
	for Sustaining Multiple Uses	
	Controversies Exist Over the Health of Western National Forests	13
	Forest Health Can Be Assessed by Comparing Present to Past	14
	Forest Conditions	
	Forests of the Interior West Have Distinctive Ecological	14
	Characteristics	
	Recent Population Growth Near Interior Western National	18
	Forests Has Created a "Wildland/Urban Interface"	
	Objectives, Scope, and Methodology	19
<hr/>		
Chapter 2		22
Catastrophic Wildfires	National Forests in the Interior West Have Several Health	22
Threaten Resources	Problems	
and Communities	Catastrophic Wildfires Are a Serious Consequence of Current	27
	Tree Stand Conditions in the Interior Western National Forests	
<hr/>		
Chapter 3		36
Recent Agency	The Agency Has Recently Taken Important Steps to Address	36
Actions to Address	Catastrophic Wildfires	
Catastrophic Wildfires	The Congress Has Increasingly Supported the Agency's Efforts	37
Are Important but	Actions Planned to Date May Not Be Sufficient or Timely Enough	38
May Be Too Little, Too	to Achieve Agency Goals	
Late		
<hr/>		
Chapter 4		41
The Agency Lacks a	Several Barriers Exist to Effective Agency Action	41
Cohesive Strategy for	The Agency Lacks a Cohesive Strategy for Addressing Barriers	46
Addressing Several		
Barriers to Effective		
Action		

ENC. 33.1

PAGE 11 OF 61

<hr/>		
Chapter 5		48
Conclusions and Recommendation	Conclusions	48
	Recommendation to the Secretary of Agriculture	49
<hr/>		
Appendixes	Appendix I: Comments From the Forest Service	50
	Appendix II: Major Contributors to This Report	60
<hr/>		
Figures	Figure 1.1: The Interior West	15
	Figure 1.2: Location of Frequent Fire Forests in the Interior West	17
	Figure 1.3: Population Growth in Relation to National Forests, 1980-96	19
	Figure 2.1: 1909 Photograph of Typical Open Ponderosa Pine Stand in the Bitterroot National Forest In Idaho	23
	Figure 2.2: 1989 Photograph Taken From the Same Spot in the Bitterroot National Forest in the Same Direction	24
	Figure 2.3: Number of National Forest Acres Burned by Fire, 1910-97	28
	Figure 2.4: Number and Total Acres Burned by Large Wildfires on All National Forests, 1984-95	29
	Figure 2.5: Western Forestlands at Medium and High Risk of Catastrophic Fire	31
	Figure 2.6: Forest Service's Expenditures for Wildfire Suppression, Fiscal Years 1986-94	33
	Figure 2.7: Forest Service's Expenditures for Wildfire Preparedness, Fiscal Years 1992-97	34

Abbreviations

USDA U.S. Department of Agriculture

105-1030

105-1030 61