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Report to Congressional Requesters

August 2003

WILDLAND FIRE MANAGEMENT

Additional Actions Required to Better Identify and Prioritize Lands Needing Fuels Reduction

GAO-03-805

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Highlights

Highlights of GAO-03-805, a report to congressional requesters

Why GAO Did This Study

The density of the nation's forests, along with drought and other weather conditions, has fueled wildland fires that have required billions of dollars to suppress and has forced thousands of people to evacuate their homes. The Department of Agriculture's (USDA) Forest Service and the Department of the Interior (Interior) are collaborating on a long-term effort to reduce the risk these fires pose. GAO was asked, among other things, to (1) assess the agencies' efforts to determine which federal lands require fuels reduction treatments, (2) determine how lands are prioritized for treatment, and (3) assess how progress is measured and reported.

What GAO Recommends

To enhance fuels reduction efforts, GAO recommends, among other things, that the Forest Service and Interior (1) collect detailed nationwide data to identify and prioritize which federal lands need fuels reduction and (2) report acres treated to reduce wildfire risk, acres requiring multiyear treatments to reduce wildfire risk, and maintenance acres separately in annual performance reports.

Commenting on the draft report, Interior and USDA agreed that prioritization is essential to program effectiveness, but had concerns about our recommendations on identifying lands and reporting accomplishments.

www.gao.gov/cgi-bin/getrpt?GAO-03-805.

To view the full product, including the scope and methodology, click on the link above. For more information, contact Barry T. Hill at (202) 512-3841 or hillbt@gao.gov.

What GAO Found

The Forest Service and Interior have identified three categories of land for fuels reduction: (1) lands with excess fuels buildup, (2) lands in the wildland-urban interface where federal lands surround or are adjacent to urban development and communities, and (3) lands where vegetation grows rapidly and requires regular maintenance treatments to prevent excess fuels buildup. However, the agencies have not yet reliably estimated the amount or identified the location of these lands. Without identifying these lands there is no baseline against which to assess progress under the fuels reduction program.

Local land management units prioritize lands for fuels reduction using a variety of methods, including professional judgment and ranking systems. Prioritization methods vary, in part, because the Forest Service and Interior have not issued specific national guidance on prioritization. Without specific national guidance on prioritization, it is difficult for the Forest Service and Interior to ensure that the highest priority fuels reduction projects nationwide are being implemented.

A number of factors, including weather and diversion of resources to fire suppression have hindered the Forest Service's and Interior's ability to complete their annual fuels reduction workloads. While agency officials are addressing some of these factors, others, such as weather, are beyond human control. As a result, agency officials are uncertain whether increased funding would necessarily result in a proportional increase in acres treated.

The Forest Service and Interior are developing results-oriented performance measures to assess the effectiveness of treatments in reducing the risk of catastrophic wildfires. However, since the agencies have not identified the amount or location of lands with excess fuels buildup, there is currently no baseline from which to assess program performance. In addition, annual performance reports provide misleading information on the overall progress being achieved under the fuels reduction program because the agencies are reporting all acres treated annually without separately reporting on acres that are treated to maintain a low level of wildfire risk and other acres that require several years of treatments to reduce risk.

Fuels Reduction on Forest Service and Interior Lands

Source: NIFC Image Portal (http://www.nifc.gov).

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BLM	Bureau of Land Management
USDA	U.S. Department of Agriculture

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G A O
Accountability * Integrity * Reliability

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

August 15, 2003

The Honorable Charles Taylor
Chairman
The Honorable Norman Dicks
Ranking Minority Member
Subcommittee on Interior and Related Agencies
Committee on Appropriations
House of Representatives

The Honorable Scott McInnis
Chairman
Subcommittee on Forests and Forest Health
Committee on Resources
House of Representatives

Nearly 100 years of fire suppression have left the nation's forests dense with small, tightly spaced trees and thick brush. This density, along with weather conditions, such as wind, high temperatures and drought, has fueled wildland fires that in certain cases have spread rapidly and become catastrophic. These fires and the resulting damage not only compromise the forests' ability to provide timber, outdoor recreation, clean water, and other resources, but also pose increasingly grave risks to health, safety, and property. Two of the more devastating fire seasons on record have occurred in the last 3 years. In 2000, wildland fires burned more than 8 million acres; and in 2002, almost 7 million acres were burned—about twice the 10-year annual average. These fires required billions of dollars to suppress and forced thousands of people to evacuate their homes.

In the aftermath of the wildland fires of 2000, the federal agencies responsible for wildland fire management—the Forest Service in the U.S. Department of Agriculture (USDA) and the Bureau of Indian Affairs, Bureau of Land Management (BLM), Fish and Wildlife Service and National Park Service in the Department of the Interior (Interior)—developed the National Fire Plan, a long-term multibillion-dollar plan to address the nation's risk of such fires. A major component of the plan is a hazardous fuels reduction program that requires the agencies to thin forests and rangelands, thereby reducing the risk of catastrophic fires caused by excessive buildup of vegetation. Local land management units, such as national forests and parks, are generally responsible for carrying out projects to reduce the buildup of vegetation that fuels catastrophic fires. Techniques used for managing vegetation generally include setting fires

under controlled conditions (prescribed burns) and mechanical thinning. Another important component of the plan is for the agencies to establish effective performance measures to assess the results of their fuels reduction treatments. Beginning in fiscal year 2001, the agencies have received approximately $400 million annually for fuels reduction under the plan.

According to the Forest Service and Interior, about 650 million acres, or over 85 percent of the approximately 750 million acres of federal land that they manage, are susceptible to wildland fire. These susceptible lands, according to a recent government estimate, include (1) millions of acres in the dense forests of the West that have excess buildup of fuels and are at risk of catastrophic fires, (2) millions of acres nationwide that either surround or are adjacent to urban development and communities (commonly referred to as the wildland-urban interface) that are at risk to wildland fire, and (3) still other acres that need regular and frequent treatments to prevent rapid fuels buildup. While fire plays a role in maintaining the health of certain ecosystems, the overall growth of vegetation in the nation's forests and rangelands has created unnatural hazardous fire conditions. Under the National Fire Plan, the Forest Service and Interior are attempting to identify and prioritize the lands most in need of fuels reduction while dealing with a number of challenges that hinder the agencies' implementation of fuels reduction efforts. The House of Representatives has recently passed legislation intended to, among other things, reduce the risk of damage to communities, municipal watersheds, and certain federal lands from catastrophic wildfires. However, there is controversy over whether conducting fuels reduction treatments outside the wildland urban interface—as the House bill would authorize—is appropriate, especially if the treatments involve clear cutting trees in remote forest areas.

In this context, you asked us to (1) assess the Forest Service's and Interior's efforts to determine which federal lands require fuels reduction treatments, (2) determine how local land units within the Forest Service and Interior prioritize land for fuels reduction treatments, (3) identify factors that have hindered fuels reduction efforts, and (4) assess how the Forest Service and Interior measure and report progress under the fuels reduction program.

In conducting our review, we met with Forest Service and Interior officials in headquarters, and visited five states, where we met with officials in selected regional and state offices, as well as 17 Forest Service and BLM local land units, such as national forests and BLM field offices. While the

results of our visits cannot be projected nationwide, the visits represent a mix of local fuels reduction efforts based on geographic diversity and level of funding. (See app. I for details on the scope and methodology of our review.)

Results in Brief

The Forest Service and Interior have identified three categories of federal lands that require fuels reduction, but they have not yet reliably estimated the amount and identified the location of these lands. Given the potentially vast amounts of federal land at risk of catastrophic wildfire, the agencies have stressed the importance of treating lands that have excess fuels buildup and lands in the wildland-urban interface. In addition, the agencies acknowledge a third category—lands that require regular maintenance to prevent excess fuels buildup because vegetation grows rapidly—but they have not decided whether these lands are as important to treat as are lands in the first two categories. Government scientists have collected nationwide data on lands with excess fuels buildup, but because the data were not detailed, there was a large margin of error in the resulting estimates. Recognizing the need for more accurate estimates, the agencies are currently considering whether to fund a project to assess in more detail the fuels buildup on federal land nationwide. If funded, they do not expect to complete the effort until 2008 at the earliest. For the second category—lands in the wildland-urban interface—the agencies have not specifically defined the wildland-urban interface so they have been unable to collect data that are relevant nationwide. For example, the agencies have not decided if it includes only land near residences and commercial development or also land near public resources, such as power lines and watersheds. Without a clear national definition, there is no basis for a consistent determination about which lands are part of the wildland-urban interface. Finally, for the third category—lands that require regular maintenance treatments because the vegetation grows rapidly—the agencies have not estimated the total amount and location of such lands, although they have been reducing fuels on such lands in the Southeast for decades. Without a nationwide estimate of the amount and location of land in each category of land that is important to treat, it will be difficult for the agencies to assess their progress in reducing the total amount of federal land that requires fuels reduction.

Local land units prioritize lands within the three categories for fuels reduction using a variety of methods including professional judgment and ranking systems. For example, at one local unit an agency official uses his professional judgment, local knowledge, and field observations of

vegetative conditions to prioritize projects. At another unit, officials collect detailed data on factors such as vegetative condition, proximity to recent fires, and proximity to communities; then they assign points to potential fuels reduction projects, based on the factors, and rank the projects in priority order. Still other units—particularly in the Southeast—select lands for fuels reduction according to a recurring schedule. Moreover, even units that use the same prioritization method may not emphasis the same criteria in prioritization decisions. For example, among units that rely on professional judgment, some place far greater weight on community preferences than others. This variation in prioritization methods occurs, in part, because the Forest Service and Interior have not issued specific national guidance on how to prioritize projects; rather, they have issued broad guidance allowing local units wide discretion. Without specific guidance on how to prioritize locations for fuels reduction within the three categories of federal land identified nationally, it is difficult for the Forest Service and Interior to ensure that there is any consistent, systematic rigor to how projects are being prioritized or that the highest priority fuels reduction projects nationwide are being implemented.

Several factors including weather and diversion of resources to fire suppression have hindered the Forest Service's and Interior's ability to complete their annual fuels reduction workloads. Given these factors, in 2002, the Forest Service and Interior reduced fuels on 56 percent of the approximately 4 million acres they could have treated. In discussions with officials from 17 Forest Service and Interior local land units we visited, they stated that the most prominent factor was the weather, which accounted for 40 percent of all fuels reduction project delays at these units in 2002. In some cases, land managers could not ignite prescribed burns because weather conditions, such as wind, temperature, and drought, made doing so unsafe; and they could not use mechanical thinning equipment because of the risk that a spark would accidentally ignite a wildfire. For example, at one local unit, over 34,000 acres, or 72 percent of the approximately 47,000 acres planned for fuels reduction, were not treated because of drought conditions. A related factor hindering agencies' completion of fuels reduction projects in 2002 was the diversion of agency resources from fuels reduction to fire suppression efforts during the severe fire season. This factor accounted for about 30 percent of all project delays at the local units we visited. For example, one national forest shifted about 22 percent of its approximately $570,000 fuels reduction budget to support fire suppression efforts. Even in the Southeast, where the drought and the fire season were less severe, nationwide policy restrictions prohibited local units from implementing fuels reduction projects because the units' staff

were required to be immediately available for suppression efforts elsewhere. In addition, local land unit officials cited other factors, such as administrative regulatory requirements and public resistance, that affected fuels reduction projects. Although local land units are working to address some of these factors, others, such as weather, are beyond human control. Given these factors, some local officials were uncertain whether increased funding would result in a proportional increase in acres treated under the fuels reduction program.

To measure progress under the fuels reduction program, the Forest Service and Interior are currently tracking and reporting the total number of acres treated nationwide. This practice, however, measures only the number of acres that receive fuels reduction treatments—not necessarily whether progress is being made in reducing the overall risk of wildfire. Recognizing this shortcoming, the Forest Service and Interior are currently developing results-oriented performance measures that assess the effect of these treatments in reducing the risk of wildfires. However, because the Forest Service and Interior have not yet established baseline data by identifying the acres that are at different levels of risk to wildfire, any assessment of the change in wildfire risk level will be subjective, and it will be difficult to determine the actual progress being made in reducing the risk of catastrophic wildfire nationwide. In addition, the current method of reporting annual performance is resulting in misleading information on what is actually being accomplished with respect to reducing the total amount of land at risk nationwide. Currently, the data give the indication that all the acres treated are reducing the risk of catastrophic wildfire. This is not the situation. In some cases, acres are being treated that will not change the risk and in other cases multiple treatments need to be made over several years to reduce the risk. Unless treatments in these cases are reported separately in annual performance reports, it is, and likely will continue to be, difficult to assess the progress being made under the fuels reduction program in terms of reducing the overall risk of wildfires nationwide.

In the context of vast, yet unknown acres of federal land at risk to wildfire and major factors hindering fuels reduction on that land, mitigating the risk of catastrophic wildfires through fuels reduction will require a sustained, long-term effort. However, without a nationwide estimate of the amount and location of lands that need fuels reduction, it will be difficult to ensure that the highest priority fuels reduction projects nationwide are being implemented and to assess progress in reducing fuels buildup in forests and rangelands across the nation. Accordingly, we are recommending that

the Forest Service and Interior identify which federal lands need fuels reduction so that detailed, comparable data can be collected on the amount and location of these lands, to facilitate prioritization decisions. In addition, we are recommending that in annual performance reports the Forest Service and Interior report acres treated that reduce the level of wildfire risk separately from other acres treated, to better reflect the long-term progress of the fuels reduction program. In commenting on a draft of this report, the Forest Service and Interior stated that the report aptly described the nature of the fuels problem on public lands in both its scope and severity. They agreed that prioritization is essential to program effectiveness, but they had some concerns about our recommendations related to identifying lands that need fuels reduction and reporting accomplishments in separate categories.

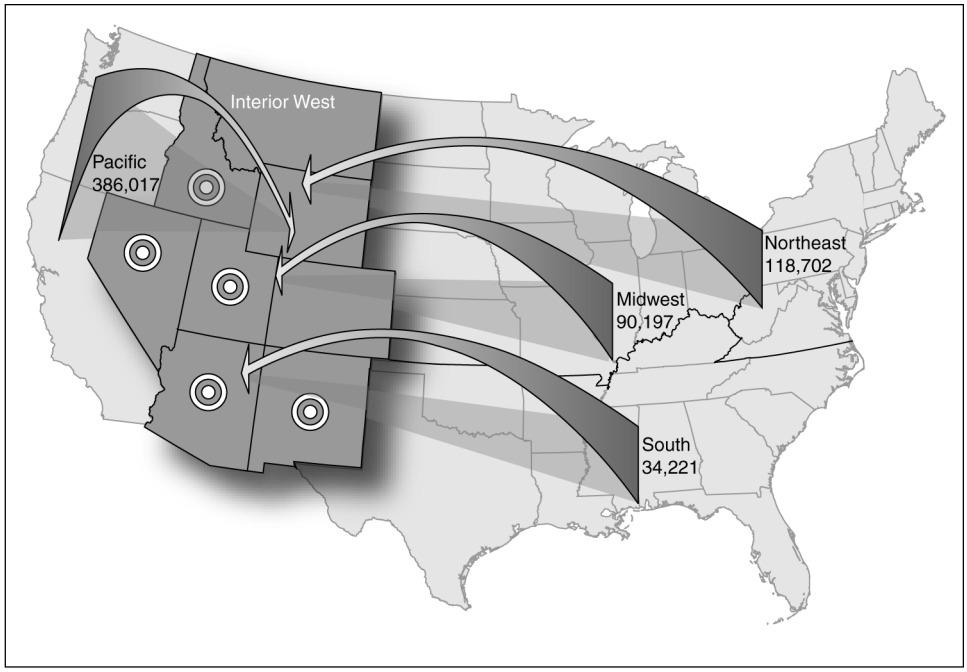
Background

Nearly all forests and grasslands in North America evolved with fire as a natural part of the ecosystem. Fire contributes to ecological health in forests and rangelands by maintaining plant species diversity, preventing the spread of invasive species, limiting the spread of insects and disease, and promoting new growth. Historically, fires occurred at a variety of frequencies ranging from 1- to 2-year cycles in some southeastern forests, to 200- to 500-year cycles in northwestern rain forests. These historical cycles changed in part because the federal government began a policy of suppressing all wildland fires as quickly as possible. Over the years, brush, small trees, and other vegetation accumulated that can fuel fires and cause them to spread more rapidly with catastrophic results. Weather phenomena have also contributed to dangerous fire conditions. The weather phenomenon known as La Niña, characterized by unusually cold Pacific Ocean temperatures, changed weather patterns when it formed in 1998. It caused severe, long-lasting drought across much of the country, drying out forests and rangelands.

The Forest Service, BLM, Bureau of Indian Affairs, National Park Service, and Fish and Wildlife Service manage about 750 million acres of federal land across the United States. Most federal lands in the 48 contiguous states are located in 11 western states, which have seen a dramatic surge in population over the last 2 decades, complicating the management of wildland fires. As shown in figure 1, the population is moving toward the Interior West, contributing to new development in fire-prone areas, often adjacent to federal land, and creating a wildland-urban interface. This relatively new phenomenon means that more communities and structures

are at risk of wildland fire and of potential post-fire effects, including increased erosion and flooding.

Figure 1: Movement of U.S. Population Toward the Interior West



Fastest growing states, 1990–1999[a]

Net migration, 1990–1994[b]

Source: Adapted from Atlas of the New West (W. W. Norton, 1997) - © Regents of the Colorado University.

[a]The five fastest growing states through 1999 include Arizona, Colorado, Idaho, Nevada, and Utah.

[b]People moving to the Interior West minus people leaving.

Following the 2000 fire season, which was one of the most challenging on record, the Bush Administration asked USDA and Interior to recommend how best to respond and how to reduce the impacts of such fires in the future. Their report, called the National Fire Plan, recommended increased funding for several key activities, such as suppressing wildland fires and reducing the buildup of unwanted hazardous fuels. To fund the activities recommended in the National Fire Plan, Congress appropriated $2.9 billion to the Forest Service and the Interior agencies for their fiscal year 2001 wildland fire needs—an increase of over $1 billion from the prior year

funding of $1.5 billion. Of the $2.9 billion, $400 million was for reducing hazardous fuels. For fiscal year 2002 wildland fire needs, Congress authorized $2.3 billion for the Forest Service and Interior agencies of which $395 million was for reducing hazardous fuels. Of the agencies involved with the fuels reduction program, the Forest Service and Interior's BLM spend the most money to reduce hazardous fuels.

A key component of the National Fire Plan is the development and implementation of a cohesive strategy aimed at lowering the risks from catastrophic wildfires by reducing the excess buildup of hazardous fuels in the nation's forests and rangelands.[1] Since beginning implementation of the National Fire Plan, the Forest Service and Interior have treated hazardous fuels on about 4.4 million acres of federal land in 2001 and 2002. Most of the treatments to date have been in the southeastern region of the United States, where the vegetation in the forests tends to grow rapidly, causing fuels to accumulate over a short period. (See app. II and III for detailed information on program results for fiscal years 2001 and 2002, and planned work for fiscal year 2003.)

Local land units within the Forest Service and Interior's wildland fire management agencies largely carry out fuels reduction treatments. The Forest Service's local land units consist of national forests and grasslands. These local land units are overseen by the Forest Service's regional offices. Within Interior, the Bureau of Indian Affairs' local land units consist of agencies; BLM's local land units consist of districts, field offices, or resource areas; and the Fish and Wildlife Service's and the National Park Service's local land units consist of facilities, refuges, or parks. BLM's state offices oversee its local land units, while the regional offices of the Bureau of Indian Affairs, Fish and Wildlife Service, and National Park Service oversee their local land units.

These agencies plan and implement fuels reduction projects that are required to conform to agency specific land management statutes as well as requirements under legislation such as the National Environmental Policy Act, the Endangered Species Act, and the Clean Air Act, and often involve other federal and nonfederal regulatory agencies. In addition, as directed by the community assistance goal of the National Fire Plan, the agencies work with and grant funds to local communities for fuels reduction.

[1]At the time of our review, the Forest Service and Interior had not finalized the cohesive strategy. As a result, local land units are continuing to operate under draft guidance.

At the national level, the Forest Service and Interior agencies are directed to allocate fuels reduction funding to their regional or state offices that have the greatest fire management workload, risk to communities, and fuels buildup. However, because it has been difficult for the agencies to allocate funding according to these criteria, in practice, funding allocations are primarily influenced by historical workload and funding levels, and proportional allocations tend to be similar from year to year. Consequently, it is left to the local land units to identify the highest priority locations for fuels reduction treatments.

To reduce hazardous fuels, agencies rely principally on mechanical or hand thinning of trees and brush, prescribed burning, or a combination of the two. Mechanical thinning includes the use of chainsaws, traditional timber extraction machinery, and hydromowers and slashbusters—machines that grind up small trees and shrubs into mulch—or other mechanized equipment. Figure 2 depicts a mechanical thinning project. Prescribed burns are fires set deliberately by land managers under weather, fuel, and temperature conditions that enable the fire to be controlled at a relatively low intensity level. Figure 3 depicts a prescribed burn project. In some cases, it is necessary to mechanically thin an area before igniting a prescribed fire, in order to achieve fuel conditions that prevent the fire from burning so rapidly and intensely that it becomes uncontrollable.

Figure 2: A Mechanical Thinning Project Being Used for Fuels Reduction on a Western National Forest

Source: NIFC Image Portal (http://www.nifc.gov).

Figure 3: Prescribed Fire Being Used for Fuels Reduction on a Western National Forest

Source: NIFC Image Portal (http://www.nifc.gov).

Agencies Are Focusing Fuels Reduction on Lands in Three Categories, but More Efforts Are Needed to Estimate the Amount and Location of These Lands

The Forest Service and Interior have determined that three categories of federal lands require fuels reduction treatment, but they have not yet reliably estimated the amount or identified the location of these lands. The agencies' draft cohesive strategy emphasizes the importance of treating lands that have excess fuels buildup and lands in the wildland-urban interface with fuels reduction. In addition, the draft cohesive strategy mentions that a third category should be considered as well—lands that require regular maintenance to prevent excess fuels buildup because vegetation grows rapidly—but the strategy is unclear about whether lands in this category are as important to treat as lands in the first two categories. Forest Service scientists have collected nationwide data on lands with excess fuels buildup, but because the data were not detailed, scientists could make only rough estimates of the amount; and they could not identify

the specific locations of these lands.[2] Recognizing the need for more accurate estimates, the agencies are currently deciding whether to fund a project that would collect more detailed data on land with excess fuels buildup nationwide. They have not yet clearly defined the parameters of the wildland-urban interface, and consequently have been unable to collect data that is relevant at the national level. In addition, the agencies have not decided whether lands requiring regular maintenance treatments are among the lands most at risk nationally and therefore most in need of fuels reduction treatments. As a result, they have neither estimated the total amount nor identified the location of such lands.

More Data Needed to Identify Land with Excess Fuels Buildup

Although one of the categories of land targeted for fuels reduction in the draft cohesive strategy is land with excess fuels buildup, the agencies have not yet accurately estimated the amount or identified the location of these lands. In an attempt to gather nationwide data on these lands, in April 2001, Forest Service scientists completed a national assessment of fuels buildup, resulting in a map that classified all land in the contiguous 48 states as high, moderate, or low risk for catastrophic wildfires. As figure 4 shows, the risk depends on how much the vegetation has changed relative to historical conditions, with the highest levels of fuels buildup corresponding to the highest wildfire risk ranking.

[2]The Forest Service and Interior jointly funded the initial assessment, and subsequent studies were funded by the Forest Service.

Figure 4: Wildfire Risk Levels

High Risk. The risk of damage to soil, vegetation, and water quality from fire is high. In forests, there are excess levels of fuels buildup, and on rangelands, nonnative species are predominate. Vegetation composition, structure and diversity have been significantly altered. Consequently, these lands are at the greatest risk of catastrophic, destructive wildland fires. To restore their historical fire patterns-before prescribed fire can be utilized-these lands may require multiple mechanical thinning projects, or reseeding.	
Moderate Risk. The role of fire in the ecosystem has been altered, allowing fires to occur less frequently than they did historically. In forests, there are moderate levels of fuels buildup; and on rangelands, nonnative species have replaced some native species. A moderate risk of damage to soil, vegetation, and water quality has been identified on these lands. To restore their historical fire patterns, these lands may require some prescribed burns, mechanical thinning, and the subsequent reintroduction of native plants.	
Low Risk. For the most part, fires occur at frequencies and severities similar to historical patterns. In forests, vegetation has not accumulated beyond historic levels, and on rangelands, native species are predominate. Thus, the risk of damage to soil, vegetation, and water quality from fire remains relatively low. Maintenance such as prescribed burns, mechanical thinning, or preventing the invasion of nonnative weeds is required to prevent these lands from becoming degraded.	

Source: GAO analysis of Forest Service and Interior data.

While the initial assessment provided a rough approximation of national risk level, it could not be used to accurately discern the total amount of land at high risk, or to identify specific locations of such land because it was based on data that were not detailed and therefore was subject to a considerable margin of error. The scientists estimated that about 75 million acres of federal land were at high risk of wildfire, but because of the lack of detail, the estimate was rough. The lack of detail was particularly limiting on rangelands, where flammable nonnative weeds such as cheatgrass have

replaced native plants in many areas, leaving the land vulnerable to fast-moving, high-intensity fires. According to Forest Service scientists, the initial data did not sufficiently depict nonforested lands including rangelands. In many cases, nonnative and native plants grow in a scattered patchwork pattern, and it is difficult to distinguish small patches of nonnative plants without detailed data. To partially address this limitation, in 2002 scientists studied vegetative conditions on some rangelands and found that they had underestimated the amount of rangeland at high risk. Adding this land to the 75 million acres in the initial assessment, they concluded that about 90 million acres of federal land were at high risk to wildfire. Aware that the lack of detail in the initial assessment also affected forests, in 2003 scientists collected samples of more detailed data in several forests in the West. The detailed data revealed that the initial assessment had also underestimated the amount of land with excess fuels buildup in forests, and consequently, the amount of land at high risk. Extrapolating their findings to adjust the nationwide estimate, the scientists concluded that about 190 million acres of federal land were at high risk, but they acknowledged that the correct number could be anywhere from 90 to 200 million acres, considering the margin of error.

Recognizing the need for more accurate nationwide data about land with excess fuels buildup, and aware of the limitations of existing assessments, the Forest Service and Interior are taking actions to more accurately estimate the amount and identify the location of such land with excess fuels buildup. Over the long term, the agencies are considering a proposal to collect more detailed nationwide data through a project called LANDFIRE, but they have not yet decided whether to fund the project. They have, however, begun to test a prototype in two areas, which will serve as a model for applying the same methods nationwide.[3] If implemented, LANDFIRE is expected to provide accurate maps showing specific locations of lands with excess fuels buildup and computer models that can predict which areas are at highest risk of wildfire based on vegetation type and condition, historical fire frequency, weather, and other factors. Nevertheless, while the agencies have been considering the project for years, they still have not fully funded it. We first examined LANDFIRE in 1998, at which time agency officials initially showed us one of the

[3]Although the initial assessment covered only the 48 contiguous states, the new efforts will cover all 50 states.

prototype areas.[4] We later reported on LANDFIRE in 2002, and found that it had the potential to provide data critical for use in project prioritization, but we had concerns that the project was no closer to being funded than it was in 1998.[5] Now, according to agency officials, data collection efforts in the test areas has provided sufficient information to make a decision about whether to fund and implement LANDFIRE, which is estimated to cost $33 million. Currently the agencies are contemplating funding the project as soon as 2003, but they have not yet made a decision; and if it is implemented, it is not scheduled to be complete until 2008 at the earliest.

In an effort to provide usable data in the interim, the Forest Service and Interior have proposed completing by 2005 a nationwide rapid assessment which would use information from a variety of sources, such as expert opinion, statistical analysis, and data previously collected by state agencies, local governments, and federal agencies. However, the agencies have not funded this effort either. Furthermore, because the data used in the rapid assessment would come from a mixture of sources, they would vary in accuracy, reliability, and level of detail, among other things. Consequently, the results of the rapid assessment would not be as accurate as what is expected from LANDFIRE, bringing into question the value of funding the rapid assessment in addition to LANDFIRE.

Consistent Definition Needed before Land in the Wildland-Urban Interface Can Be Identified

The President and Congress, as well as the Forest Service and Interior have stressed the importance of reducing fuels in the wildland-urban interface, but the agencies have not developed a specific definition of wildland-urban interface and therefore are unable to identify the amount and location of lands in the interface nationwide. In January 2001, a definition of wildland-urban interface was published in the *Federal Register*, but it is very general and consequently, it has been interpreted inconsistently.[6] The definition classifies wildland-urban interface into two primary categories: (1) lands where structures are directly adjacent to wildlands and (2) lands where

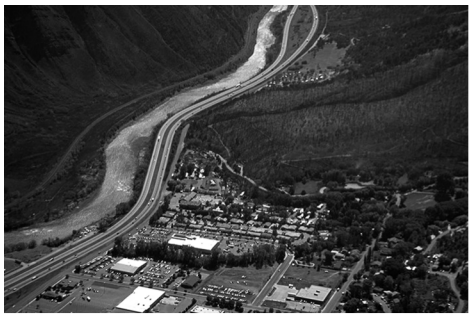
[4]See U.S. General Accounting Office, *Western National Forests: A Cohesive Strategy Is Needed to Address Catastrophic Wildfire Threats*, GAO/RCED-99-65 (Washington, D.C.: Apr. 2, 1999).

[5]See U.S. General Accounting Office, *Severe Wildland Fires: Leadership and Accountability Needed to Reduce Risks to Communities and Resources*, GAO-02-259 (Washington, D.C.: Jan. 31, 2002).

[6]66 *Fed. Reg.* 753 (2001).

structures are scattered throughout a wildland area.[7] The definition further specifies that wildland-urban interface includes communities ranging from suburban and urban neighborhoods (3 or more structures per acre) to widely dispersed rural dwellings (1 structure per 40 acres). The breadth of this definition allows for diverse interpretations—including, for example, subdivisions lining forest boundaries, remote summer cabins in the wilderness, or land surrounding powerlines crossing federal lands. On the basis of this definition of wildland-urban interface, the Forest Service and Interior allowed each state to identify a list of communities at risk from wildfire to be published in the *Federal Register* in August 2001. However, given the lack of specificity in the published definition of wildland-urban interface, each state used criteria it believed appropriate for selecting communities at risk. For example, figure 5 shows diverse types of land that states could include based on different definitions of wildland-urban interface.

Figure 5: Various Types of Wildland-Urban Interface



Source: NIFC Image Portal (http://www.nifc.gov).

Large community | Watershed | Power generation equipment

As a result, some states provided much longer lists of communities at risk than other states, and there was no consistent standard for inclusion on the list. To resolve this inconsistency, the draft cohesive strategy calls for the states to develop a common definition of communities at risk by June

[7]A third category included the less-common situation when structures, often within a city, abut an island of wildland fuels (e.g., a park or open space).

2003.[8] Toward this end, the Forest Service and Interior have tasked the National Association of State Foresters—an organization representing state forestry departments—with developing uniform guidance for states to use in identifying wildland-urban interface communities at risk, but this process is no more likely to result in a consistently-applied definition of wildland-urban interface than the former one. The guidance, now in draft, sets out four criteria and recommends that states assign an adjective rating such as high, medium, or low risk to each community or wildland-urban interface area identified. If implemented, the guidance would provide a methodology for states to generally assess relative risk; but because each state would interpret and apply high, medium, and low risk independently, the risk rankings would not be comparable on a nationwide basis. In addition, the guidance does not define wildland-urban interface, instead allowing each state to develop its own definition. For example, some states may develop a very narrow definition that includes only land immediately surrounding housing subdivisions, while other states may develop a definition that includes remote ranches and cabins used only seasonally, as well as land surrounding public resources, such as power lines or communications equipment. The Forest Service and Interior will again be left with multiple, inconsistent definitions developed independently by each state, and because of this inconsistency the lands identified through the process will not be comparable. As a result, the process will not enable national decision-makers to accurately determine how much land is in the wildland-urban interface nationwide, or where it is located. While the task of developing a specific, consistently used definition of wildland-urban interface is a challenging one requiring difficult decisions to be made, if the Forest Service and Interior do not develop such a definition, not only will they be unable to accurately identify which lands are in the wildland-urban interface nationwide, but they will also be unable to identify the highest priority lands for fuels reduction treatments.

Agencies Unclear About Importance of Maintenance Treatments in Fuels Reduction Program

Although the agencies have been using regular maintenance treatments as part of their risk prevention strategy in the Southeast for decades, and almost half of the annual acres treated under the fuels reduction program have been in this category, the Forest Service and Interior have not clarified whether the treatment of these acres is as important as the treatment of lands with excess fuels buildup and lands in the wildland-

[8]As of August 2003, a common definition of communities at risk had not been developed.

urban interface. Rather, the draft cohesive strategy separately acknowledges the value of continuing maintenance treatments in some areas to prevent them from becoming quickly overloaded with fuels, especially in the Southeast where vegetation grows rapidly. Because the agencies have not determined whether the maintenance acres are as important as lands with excess fuels buildup and lands in the wildland-urban interface, they do not plan to assess the total amount of maintenance acres that need to be treated nationwide.

The vegetation in southeastern forests builds up more quickly than it does in the West because it grows rapidly. Consequently, agency officials in the Southeast conduct fuels reduction treatments frequently in an attempt to prevent the forests from developing excess fuels buildup and increasing the risk that a wildfire there would grow into a catastrophic one. For example, on some national forests in the Southeast, fuels reduction treatments are scheduled on various acres of the forest annually, such that the entire forest is treated every 3 to 5 years. According to agency officials, this approach maintains forests at the low wildfire risk level, and prevents them from growing into a condition that would put them at a higher wildfire risk level. The agencies have been reducing fuels in the Southeast this way for decades. In contrast, fuels reduction in most of the West has increased significantly since the beginning of the National Fire Plan in 2001. With these increased efforts—and needs— in other parts of the country, the agencies must now determine whether maintenance efforts in the Southeast should have the same priority as fuels reduction efforts elsewhere, and if so, assess the total amount and location of lands in need of maintenance treatments nationwide.

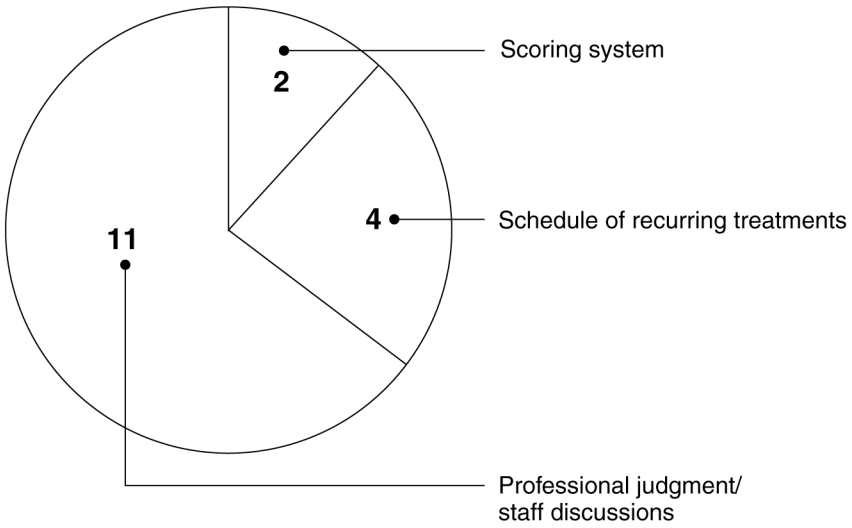
Local Land Units Prioritize Projects Using a Variety of Methods Because of a Lack of Specific National Guidance

Local land units use a variety of methods to prioritize lands within the three categories identified by the Forest Service and Interior as needing fuels reduction. In large part, local units use different methods because the Forest Service and Interior give them wide latitude to do so through broad national guidance. Prioritization decisions are particularly significant given that the three categories of land identified by the agencies—land with excess fuels buildup, land in the wildland-urban interface, and land that requires maintenance to prevent excess fuels buildup—could collectively include nearly all federal land. Nevertheless, prioritization decisions are deferred to the local level because there is not sufficient data at the national level to guide prioritization decisions.

At the national level, the Forest Service and Interior are directed to allocate fuels reduction funding to regional and state offices that have the greatest fire management workload, risk to communities, and fuels buildup. However, given the lack of consistent nationwide data on risk to communities and fuels buildup, it is difficult for the agencies to allocate funding according to these criteria. In practice, funding allocations are primarily influenced by historical workload and funding levels, and proportional allocations tend to be similar from year to year. Consequently, it is left to the local land units to identify the highest priority locations for fuels reduction treatments.

The national guidance in the draft cohesive strategy sets out a long list of criteria to be considered by local units in prioritizing projects, including selecting projects that protect wildlife habitat, contracting for work outside of federal agencies, and offsetting costs through the sale of firewood. Furthermore, the guidance also offers local officials the discretion to make exceptions to the national criteria. The result is that nearly any method of project selection—and nearly any project—is allowable. As shown in figure 6, we grouped the various prioritization methods used by the local land units that we visited into three general types: (1) professional judgment and staff discussions, (2) scoring systems, and (3) schedules of recurring treatments. In addition to these three methods, local units consider a wide variety of criteria when prioritizing projects; and as discussed below, even units that use the same method may not emphasize the same criteria in prioritization decisions. A complete record of the methods used and the criteria considered at all 17 units is shown in figure 16, in appendix IV.

Figure 6: Methods Used to Prioritize Projects at 17 Local Units



Source: GAO analysis of Forest Service and Interior data.

The most common method used by the local units we visited to prioritize projects for 2002 is professional judgment or staff discussions. Specifically, under this method, agency officials make decisions either individually or in groups through discussions among staff members, but they do not assign numeric scores to potential projects or use a quantitative process. In some cases, however, they consider scientific data and other systematically documented criteria, while in other cases, the process is informal and undocumented. For example, at BLM's San Juan Field Office in Colorado, the fuels manager identifies and prioritizes projects based on his knowledge of fuels buildup, location of nearby communities, and accessibility to the project area. He also consults with county fire chiefs and reviews community fire plans to identify additional projects, and he aims to distribute projects evenly across various counties. He does not, however, refer to scientific data, or follow a formal process of ranking potential projects. At the Klamath National Forest in northern California, the staff rely on informal discussions to prioritize projects, in part, because they do not have accurate, recent data to use in assessing vegetative type or condition and scoring projects. According to an agency official, the most recent vegetation data for this forest were collected during the 1970s. In contrast, at the Deschutes and the Ochoco National Forests in Oregon staff discussions to determine prioritization are guided by a documented list of prioritization criteria. They consider local data on type of vegetation,

amount of fuels buildup, and predicted fire behavior, as well as other criteria—including but not limited to the number of acres the potential project will cover and whether the project is (1) coordinated with other agencies, (2) will benefit other resources, (3) will cost less than $50 per acre, and (4) has completed planning documents. Agency officials at these forests said they want to retain the subjective quality of the process and have therefore not put the criteria in order or developed a numeric scoring system.

Among local units that prioritize projects through professional judgment or staff discussions, there is considerable diversity in the extent to which they involve nearby communities. For example, at the San Juan National Forest in southwestern Colorado, agency officials rely on a list of potential projects identified in local community planning documents to initially select all mechanical fuels reduction projects. Forest Service officials then conduct on-the-ground surveys to verify that the projects are feasible and suitable. Typically, however, they do not consult additional data on vegetative type and condition, fire history, or other characteristics. Instead, they choose to give priority to community preferences. Most other local land units we visited do not emphasize community involvement in the project prioritization process to this extent; but some consider community acceptance as one of several factors when selecting projects. For example, at the Stanislaus National Forest in California, projects are given higher priority when adjacent landowners are willing to coordinate implementation of fuels reduction projects and given lower priority when agency officials believe it is likely that informal resistance or formal legal challenges from the community will impede the project.

Some local units we visited use a scoring system to prioritize projects. For example, at the Los Padres National Forest in California, agency officials have developed a detailed scheme for assigning points to potential projects based on a set of weighted criteria. Each project is assigned points for, among other factors, type and age of vegetation proximity to recent fires and proximity to communities. Managers refer to detailed Geographic Information System maps with data on vegetation type and age, and locations of historical fires to determine the number of points to assign. Once potential projects have been assigned points, they are ranked; and those with the most points are selected for implementation.

Some local units in the Southeast rely on schedules of recurring treatments to select projects for maintenance treatments. Under such a schedule, each year fuels reduction projects are implemented in areas where more time

has elapsed since the last treatment because these areas generally have the greatest fuels buildup. For example, at the Bienville National Forest in Mississippi, agency officials schedule prescribed burns on each parcel of land in the forest every 3 to 5 years. To schedule specific parcels for treatment, agency officials rely on two primary resources. First, they use a prescribed burn atlas, in which local officials have documented the location of every prescribed burn completed each year. Second, agency officials also record the locations of wildfires because fuels reduction may be unnecessary in areas where wildfires have recently occurred.

In addition to the variation among local units in the methods used and criteria considered for prioritizing projects, there is variation in how they apply the criteria. For example, all of the local land units that we visited attempt to give priority to projects in the wildland-urban interface, but they do so to varying degrees. Specifically, some units implement only projects that are in the interface, others complete projects both inside and outside of the interface; and two units that we visited did not implement any projects in the interface in 2002, but planned to do so in 2003. Further, because there is no specific national definition of wildland-urban interface and states have not yet developed their own definitions, it is left to local units to define it; and they do so differently. For example, the Apalachicola National Forest in Florida defines wildland-urban interface to include all land within 5 miles of a populated area, while several units include land within 1.5 miles of a populated area; and some units do not use a uniform definition, instead relying on case-by-case determinations. At the White River National Forest near Vail, Colorado, much of the wildland-urban interface is in areas where the views are critical to the economic health of the resort town according to an agency official. Consequently, land managers use an expansive definition of wildland-urban interface that includes land that is part of the view from the town, as well as the populated areas. BLM's Surprise Field Office in rural California classifies scattered ranches as wildland-urban interface. Also, some local units consider land around features such as municipal watersheds or power lines to be wildland-urban interface, while others include only land surrounding residential and commercial buildings.

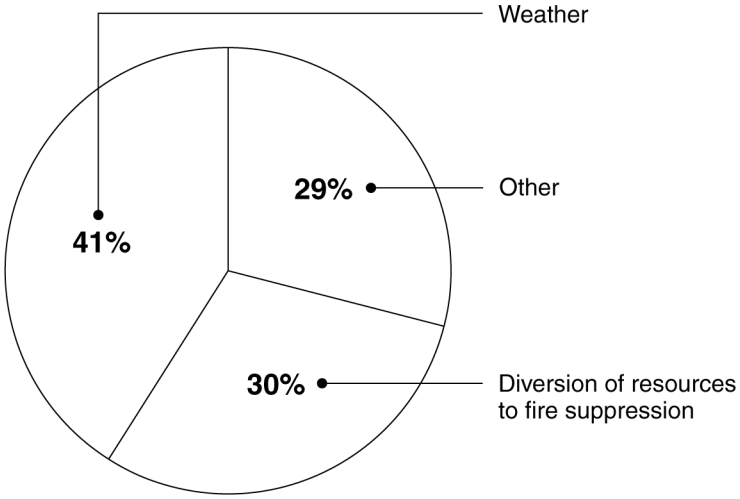
Although we did not find that local units had implemented projects that were unimportant according to agency guidance, this guidance is so broad that nearly any project could be considered a priority. In addition, as more projects are completed, there will be fewer priority projects left in some localities, and it will become increasingly difficult to ensure that fuels reduction efforts are focused in areas that are a priority nationwide. To

provide such assurance, in the future the agencies may need to redistribute funding according to where the highest concentrations of priority projects are located nationwide. However, without more specific national guidance on systematically prioritizing projects, and more consistent application of the guidance at local units, nearly any project may continue to qualify as a priority. In this context, it is difficult for the Forest Service and Interior to ensure that the highest priority projects nationwide are being implemented.

Fuels Reduction Efforts Hindered by a Number of Factors

Several factors have hindered local land units in completing their annual fuels reduction workloads. As shown in figure 7, weather was the predominant factor in preventing fuels reduction projects from being implemented at the 17 local land units we visited, according to agency officials. This factor was followed by diversion of resources from fuels reduction efforts to fire suppression, then by other factors related to planning and funding issues. (See app. III for additional details.) In 2002, largely as a result of these factors, the agencies treated only about 2.3 million acres, or 56 percent of the approximately 4 million acres they were ready to treat. Given these factors, some local officials were uncertain whether increased funding would result in a proportional increase in acres treated under the fuels reduction program.

Figure 7: Reasons Why Fuels Reduction Treatments Were Not Implemented by 17 Local Units, FY 2002



Source: GAO analysis of Forest Service and Interior data.

Weather Was the Most Prominent Factor Hindering Fuels Reduction Program

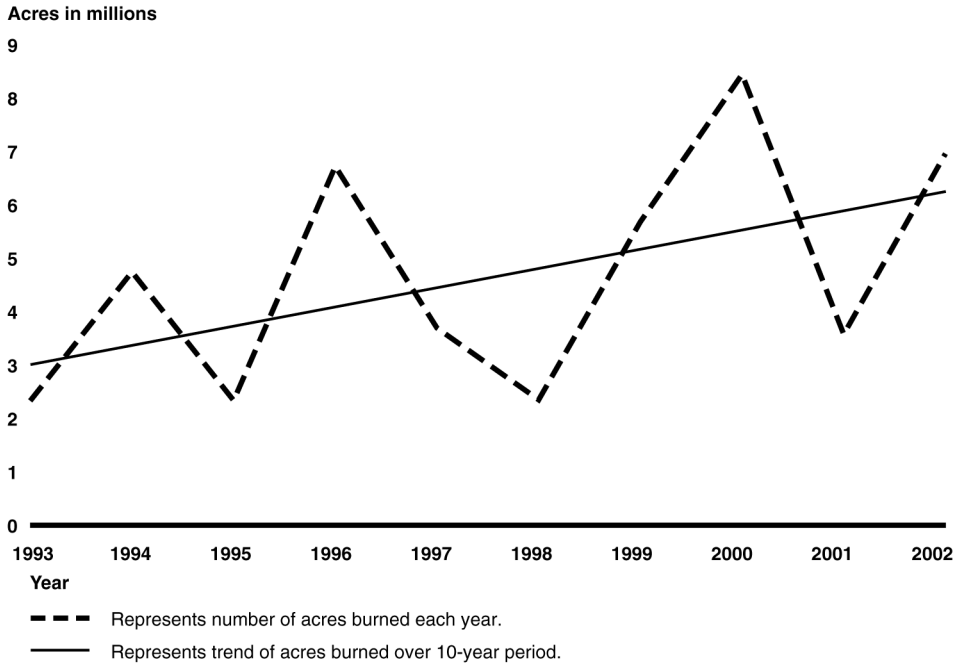
Based on our discussions with officials at the 17 local land units we visited, weather was the most prominent factor that hindered the implementation of fuels reduction projects in 2002, which accounted for over 40 percent of all fuels reduction project delays at these units. For example, of the 10,259 acres planned for treatment in 2002 at the San Juan National Forest in Colorado, 6,757 acres, or 66 percent were not treated because of severe drought conditions. In addition, of the 2,248 acres planned for treatment at the BLM Alturas Field Office in California, consisting of primarily rangelands and juniper trees, 1,195 acres, or 53 percent, were not treated because of a variety of weather-related factors. According to local land unit officials, very specific weather conditions are required for every prescribed burn, which often leaves a small window of opportunity to complete fuels reduction treatments. The officials explained that it is dangerous to ignite prescribed burns under high temperatures, drought conditions, high winds, or unfavorable wind directions, because these conditions can cause a prescribed fire to spread out of control or emit excessive smoke over nearby urban areas and thoroughfares. It can also be dangerous to thin vegetation using mechanical means during drought conditions because many of the machines used for thinning can cause sparks that officials fear could ignite excessively dry vegetation. On the other hand, it can be difficult to ignite prescribed burns if the vegetation is too wet, which makes treatments difficult to complete in the fall and winter months in some areas. For these reasons, the number of days per year when the weather will allow local units to administer fuels reduction treatments can be quite small. For example, in 2002, officials at the Osceola National Forest in Florida said that because of weather-related factors they had about 60 days to conduct fuels reduction treatments. As a result, out of the 47,000 acres planned for treatment in 2002 at the Osceola National Forest, 34,000 acres, or 72 percent, were not treated because a prescribed burn within the forest's swamplands during drought conditions could have emitted heavy smoke onto a major interstate. If acres are not treated within a specific window of opportunity, their treatments are generally delayed until the next fiscal year or later.

Fuels Reduction Was Hindered by Diversion of Resources to Fire Suppression

Another factor that hindered the agencies' completion of fuels reduction projects in 2002 was the diversion of agency resources—funding and staff—from fuels reduction to fire suppression during the severe fire

season.[9] This factor accounted for 30 percent of all project delays at the local units we visited. In 2002, the nation endured the second most severe fire season in half a century. In all, wildland fires burned 6.9 million acres, far above the 10-year annual average of 4.2 million acres; Colorado, Arizona, and Oregon recorded their largest timber fires in the last century. In fact, in the last 10-year period (1993-2002) the number of years with severe fire seasons has been extremely high, as shown in figure 8. Over this period, the number of federal acres burned by wildfires has steadily increased.

Figure 8: Number of Acres Burned by Wildfires, 1993-2002



Source: GAO analysis of Forest Service and Interior data.

Because suppression costs are budgeted based on the 10-year average of actual suppression costs and have not been fully funded in recent years, the

[9]In 2002, the fire season was particularly severe. Agencies may not experience the same resource diversions in years when the fire season is less severe. However, recent history suggests that agencies will continue to face severe fire seasons in the future. (See fig. 8.)

Forest Service and Interior have, in some cases, diverted funds from the fuels reduction program to cover the costs of fire suppression. According to Forest Service regional officials, although the fuels reduction program generally gets reimbursed the next fiscal year, the uncertainty and the timing of the reimbursement makes planning projects difficult, especially given the sometimes small window of opportunity for conducting treatments. As such, diverting funds from fuels reduction can delay fuels reduction projects. For example, in 2002, the Klamath National Forest in California shifted about 22 percent of its approximately $570,000 fuels reduction budget to support national fire suppression efforts. As a result, the forest was unable to treat over 500 acres or about 15 percent of its annual target.

In addition to funds, staff were also diverted from the fuels reduction program to fire suppression. In some cases, fuels reduction staff were deployed locally or nationally to fight wildfires. In other cases, local units had the staff available to complete the fuels reduction work but were prevented from doing so because of national fire fighting preparedness restrictions put into place by the Forest Service and Interior. These restrictions, dictated by burning conditions, fire activity, and resource availability, limit or cancel fuels reduction work to ensure that the necessary personnel are prepared and immediately available for local or national fire suppression duties. During 2002, the national preparedness restrictions rose to the highest level possible, 5 weeks earlier than ever before; and they remained at that level for a record-setting 62 days. According to local officials, at the highest preparedness level, the Forest Service and Interior generally cancel all fuels reduction work across the country, no matter what the local weather conditions are or the number of staff on hand to do the work. As a result, some local units were not able to complete their 2002 fuels reduction workloads. For example, the BLM Prineville District in Oregon, which primarily consists of juniper trees and rangelands, was unable to treat over 3,500 acres because of the national restrictions. Staffing obligations for fire suppression even affected the fuels reduction efforts of the local units in the Southeast. For example, out of the 145,208 acres scheduled for treatment in 2002 at the Apalachicola National Forest in Florida, 31,518 acres, or 22 percent were not treated owing, in part, to the national fire restrictions. In addition, nearly 20 percent of the 54,634 acres planned at the Bienville National Forest in Mississippi were not treated because local staff were deployed to fight western wildfires. If the trend illustrated in figure 8 continues, more instances of funds and staff being diverted to fire suppression could take place in the future.

Agency Officials Cited Additional Factors That Affected Fuels Reduction

In addition to the weather and the diversion of resources, local land unit officials also cited, to a lesser degree, other factors that affected the fuels reduction program. These factors included such things as public resistance to fuels reduction projects, administrative work to fulfill regulatory requirements, and the uncertainty of annual funding. Citizens may generally challenge a local unit's decision to proceed with a fuels reduction project. This allows greater citizen involvement in the fuels reduction program. While the issue of formal public resistance, such as appeals and litigation, has recently been contentious, only a few local land unit officials we visited indicated that this type of resistance had delayed particular fuels reduction treatments. Local unit officials noted that more informal methods of public resistance to fuels reduction have prevented them from completing treatments and can even dissuade them from planning projects in some areas. For example, agency officials from a national forest in Oregon told us that they terminated a prescribed burning project that was in progress because they received numerous complaints from local residents about the smoke. Since that incident, officials have been hesitant to initiate prescribed burns in the area, they said. Other local unit officials stated that, because of the possibility of public resistance over fuels reduction work and the necessity to comply with regulatory requirements, their staff has to spend more time researching and analyzing the possible impacts of fuels reduction treatments. For example, according to officials at the Los Padres National Forest in California, many of their projects are delayed for months while waiting for the mandatory external consultations to comply with the Endangered Species Act. In another example, a recent Forest Service report noted that to avert legal challenges at the Santa Fe watershed project, Forest Service officials spent almost 5 years and $1 million on planning and public involvement.[10]

Another factor that affects fuels reduction projects at the local level is the uncertainty of annual funding. Some local officials stated that it is difficult to plan projects, especially multiyear projects, without consistent and sustained funding over a period of years. Officials also said that the timing of the budget cycle makes planning difficult because the annual budget process and fuels reduction planning cycle often overlap with the fire season. According to one local unit, officials often do not know how much funding they will receive until April—well past the fall and winter months,

[10]U.S. Forest Service, *The Process Predicament: How Statutory, Regulatory and Administrative Factors Affect National Forest Management*, (Washington, D.C.; June 2002).

which are ideal for planning. Other officials explained that it is difficult to hire people, identify targets, and write contracts when they do not know the amount of funding they will receive. Because of this uncertainty, officials pointed out, it is often necessary to fund fuels reduction projects piece by piece. When projects are funded piecemeal and the following years' funding is not guaranteed, projects may remain incomplete for several years. Under these circumstances, costly and time-consuming regulatory paperwork may have to be redone, because much of the necessary environmental analysis needs to be updated after 3 to 5 years. In addition, projects that are only partially complete can leave areas more susceptible to wildfire risk than they were before their initial treatments because vegetation that is cut but left on the ground or stacked in piles creates a dry, dense concentration of fuels that can be highly flammable. While local units were generally more concerned about the timing of the budget cycle, officials at five of the local land units we visited indicated that inadequate funding itself was a factor that hindered the implementation of fuels reduction treatments. The most notable example was the Los Padres National Forest, where officials claimed that they were not able to complete over 44,000 acres, or approximately 96 percent, of their fuels reduction workload in part because of limited funding. In addition to these factors, local officials also mentioned staffing and contractor shortages as sometimes limiting their ability to plan and implement fuels reduction projects.

The Forest Service and Interior acknowledge these factors that hinder the fuels reduction program, and some local land units have made efforts to address them.

- The BLM San Juan District in Colorado and other local land units sponsor public education programs and citizen meetings to help curb public resistance to fuels reduction work.

- Officials at the Bienville National Forest in Mississippi said they regularly have more acres ready for treatment than they expect to treat, as part of their annual workload. This gives them the flexibility to treat other acres if adverse factors prevent them from treating the acres originally scheduled.

- Officials at the Osceola National Forest in Florida said that they borrow resources from other local area forests and adjust workforce schedules to take advantage of ideal weather conditions.

- To help streamline the planning process, officials at the Klamath National Forest in California prepare a "programmatic biological assessment" which can accommodate the necessary regulatory compliance paperwork for several fuels reduction projects.

While these efforts are encouraging, some factors hindering the fuels reduction program, such as the weather, are beyond human control; and it is uncertain whether increased funding would result in a proportional increase in acres treated under the fuels reduction program.

Agencies Recognize Need to Better Measure the Effect of Fuels Reduction Treatments, but Annual Reporting Practices Need Improvement

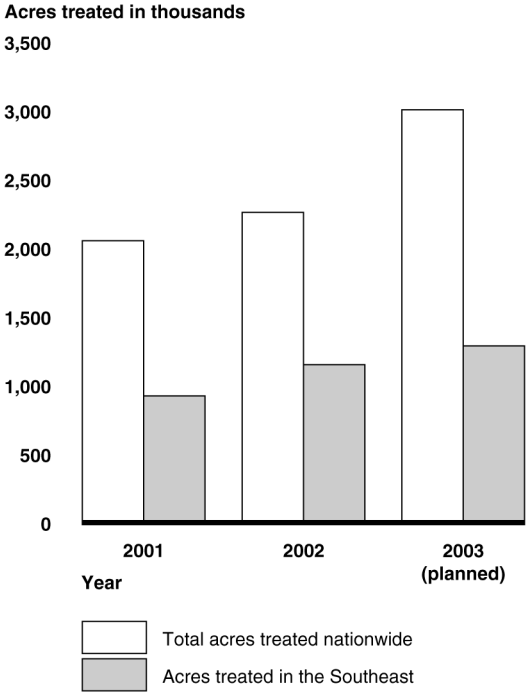
The Forest Service and Interior currently measure the performance of the fuels reduction program by counting the actual number of acres treated. Assessing the performance of the fuels reduction program by counting the number of acres treated is problematic, however, because it does not provide information on how or if the level of risk to catastrophic wildfire has been reduced. To address this weakness, the Forest Service and Interior are currently developing results-oriented performance measures to better assess the effects of fuels reduction treatments. The new performance measures are intended to assess how well the treatments are reducing the risk of wildfire by counting the number of acres where the vegetative condition of the land has been converted to a lower level of wildfire risk. However, because the Forest Service and Interior do not currently have detailed nationwide baseline data on wildfire risk and vegetative condition, the assessment of risk level is generally left up to the judgment of local land officials. As such, it will be difficult to ensure that any change in wildfire risk as reported in annual performance reports is consistent and accurate.

The current method of reporting annual performance under the fuels reduction program is resulting in misleading data on what is actually being accomplished. For example, reporting on the total number of acres actually treated during the year provides an inaccurate assessment on what is being accomplished to reduce the overall risk of catastrophic wildfire because maintenance acres are being reported together with other acres that are treated primarily to reduce the level of wildfire risk. Maintenance acres, currently located primarily in the Southeast, receive regular and frequent treatments to control their rapid vegetation growth and maintain them at a low risk to wildfire. According to agency officials, failure to regularly treat these acres could quickly result in a higher risk to catastrophic wildfire. All four local land units we visited in the Southeast treat the same acres at each of their units about every 3 to 5 years to keep the vegetation from

growing and maintain them at a low level of wildfire risk. While the treatment of these types of acres is important to maintain a low risk of wildfire, reporting the treatment of these acres annually together with nonmaintenance acres—those acres treated primarily to reduce the overall risk of catastrophic wildfire—in annual performance reports is misleading the Congress and the public over exactly what the agencies are accomplishing with the fuels reduction program.

For example, if the Forest Service and Interior were to treat a total of 2 million acres per year for the next 10 years, of which 1 million acres per year were maintenance acres, and the other 1 million acres per year were treated to reduce the level of wildfire risk, the performance reports as currently structured would indicate that the agencies had treated 20 million acres toward the total number of acres nationwide that are at risk to wildfire. However, this assessment would be incorrect in two ways. First, the 1 million maintenance acres treated and reported were most likely treated 2 to 3 times, thus reported 2 to 3 times during the 10-year period, making the number of new acres actually treated one third or one half of the 20 million reported. Second, because maintenance acres will continue to require additional treatments beyond the 10-year period, it is misleading to link these treatments to any long-term progress in further reducing the total lands at risk to wildfire. This reporting practice can be especially misleading under the fuels reduction program because of the large proportion of maintenance acres treated each year, compared with the other acres treated. For example, as shown in figure 9, for the 3-year period for which the agencies have been counting the number of acres treated for fuels reduction under the National Fire Plan (2001-2003), between 40 to 50 percent of the total acres treated, or were planned to be treated, each year have been maintenance acres in the Southeast.

Figure 9: Percentage of Acres Treated or Planned for Treatment in the Southeast by the Forest Service and Interior, FY 2001-2003



Source: GAO analysis of Forest Service and Interior data.

Furthermore, as the fuels reduction program progresses in the future and an increasing amount of acres are reduced to a low level of catastrophic wildfire risk, treatments to maintain these acres may become an even greater proportion of the agencies' annual fuels reduction nationwide workload. For example, the BLM Medford District in Oregon stated that most of their lands would require maintenance treatments in 7 or 8 years. As a result, because maintenance acres are counted together with nonmaintenance acres, it will continue to be difficult to accurately assess how annual fuels reduction accomplishments are reducing the total number of acres at risk to wildfire over time.

Also under the current reporting system, the way acres are reported when multiple treatments are necessary to reduce the risk of wildfire is also resulting in misleading data on what is actually being accomplished for that year. By reporting multiple treatments on the same acres as separate accomplishments, the agencies are creating the impression that more acres

are receiving treatments than what is actually occurring. Specifically, not all of the acres reported as treated in annual performance reports reflect "new" accomplishments—some of the same acres may have been reported as treated in the previous fiscal year. For example, on one national forest in Oregon, 13,000 acres were treated in 2002 and reported as accomplishments. However, about 5,600 acres of the 13,000 acres, or 43 percent, were also treated in 2001 and reported as accomplishments in 2001. As such, only about 7,400 "new" acres were actually treated in fiscal year 2002. In addition, over 500 of the 5,600 acres treated in 2001 were also treated and reported a third time in 2002. While reporting acres in this manner is an appropriate workload measure, it is nonetheless difficult to assess the progress of the fuels reduction program beyond a single fiscal year if some of the same acres are reported year after year in annual performance reports.

Conclusions

The Forest Service and Interior are working collaboratively to reduce the buildup of underbrush and other vegetative fuels that has accumulated to dangerous levels over the past several decades. Because this task is an enormous undertaking, it will be nearly impossible for the agencies to treat all of this land. Instead, they must first treat the areas where the threat of wildfire presents the greatest risk. As such, the agencies will have to make difficult decisions about which locations should be treated first, and allocate funding accordingly. Before the Forest Service and Interior can accurately identify which lands need fuels reduction, they will have to collect detailed data on lands with excess fuels buildup. Recognizing this need, they are considering funding the LANDFIRE project as well as an interim rapid assessment to collect these data. However, given that the rapid assessment is unlikely to provide results that are as accurate and consistent nationwide as those from LANDFIRE, we believe the agencies should concentrate their efforts on LANDFIRE. In addition, the agencies will have to define which lands are part of the wildland-urban interface and determine whether lands that require regular maintenance are as important to treat as other lands. Without doing so, they will be constrained in their ability to prioritize locations for fuels reduction treatments and allocate funding accordingly. In the future, as more projects are completed, it will be increasingly important to ensure that high-risk areas are identified systematically so the agencies can identify the highest priority locations nationwide and allocate funding accordingly. Also, because fuels reduction will require a long-term sustained effort, it will be essential to report accurate data concerning what is actually being accomplished so that the progress made each year through these efforts may be monitored. To this

end, the agencies need to report accomplishments so that the number of acres on which the level of wildfire risk is reduced in a given year can be distinguished from other acres on which fuels reduction work was accomplished.

Recommendations for Executive Action

To better ensure that federal lands most in need of fuels reduction are treated, and provide the Congress and the relevant agencies with better information for making fuels reduction funding decisions, we recommend that the Secretaries of Agriculture and of the Interior direct the agencies to

- fund and implement LANDFIRE so they can more accurately identify the amount and location of lands with excess fuels buildup and facilitate the prioritization of fuels reduction treatments;
- develop a consistent, specific definition of the wildland-urban interface so that detailed, comparable nationwide data can be collected to identify the amount and location of lands in the wildland-urban interface which will facilitate the prioritization of fuels reduction treatments;
- decide whether lands that require regular maintenance treatments are an important area needing continuous fuels reduction treatments and, if so, identify the amount and location of these lands nationwide to facilitate the prioritization of fuels reduction treatments; and
- distinguish in annual performance reports (1) acres that are treated to reduce the level of risk of wildfire from high or moderate to low; (2) acres that require multiple treatments over several years to reduce their risk of wildfire; and (3) acres being treated to maintain their low risk to wildfire, to more accurately reflect the actual progress being made under the fuels reduction program.

Agency Comments and Our Evaluation

We provided a draft of this report to the Secretaries of Agriculture and of the Interior for review and comment. The departments provided a consolidated, written response to our report, which is included in appendix V of this report. The departments stated that the report aptly described the nature of the fuels problem on public lands in both its scope and severity. The departments agreed that prioritization is essential to program effectiveness and acknowledged that it may be possible to create broad categories of high, medium, and low priority for fuel treatments. They

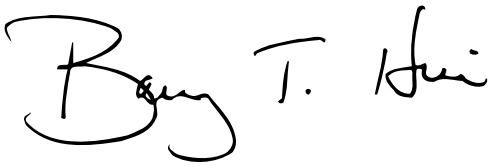
further indicated that they are nearing a decision on whether to fund and implement LANDFIRE. Regarding our recommendation that they decide whether lands requiring regular maintenance are an important part of the fuels reduction program, the departments said they had decided that these lands are an integral part of the program. However, they expressed concerns related to our recommendations that they develop a specific definition of the wildland-urban interface and that they distinguish among categories of fuels treatments when reporting accomplishments.

The departments commented that it has been difficult to reach consensus on a specific definition of the wildland-urban interface and they believe that (1) landscape differences preclude the application of a single geographic definition and (2) a too-detailed definition would compromise the effectiveness of local collaboration and community participation in this process. We recognize that reaching consensus on a specific definition is difficult. We are not advocating an inflexible geographic definition such as one based on a uniform radius around communities. On the contrary, we agree that landscape differences should be considered when defining the wildland-urban interface. We do, however, believe that a more specific definition than currently exists is needed to provide greater consistency among local units when selecting projects in the wildland-urban interface; and we believe that such a definition could be compatible with landscape differences. We also continue to believe that without narrowing the definition of what constitutes wildland-urban interface, a wide variety and large quantity of land will continue to fit within the broad definition; and it will be difficult for the departments to identify the highest priority areas for fuels reduction nationwide.

In commenting on our recommendation that the agencies distinguish among the types of acres treated in annual performance reports for the fuels reduction program, the departments expressed concerns that our report apparently assumes maintenance treatments and the first of multiple treatments on the same acreage do not lower fire risk. We agree that maintenance treatments do lower fire risk, but as noted in the report, we believe that without separately reporting these treatments, it will be difficult to accurately measure the progress that fuels reduction treatments are having in reducing the total number of acres at the highest level of risk to wildfire. To clarify this point, we have changed our recommendation to more specifically focus on distinguishing treatments done in high or moderate risk areas from treatments done in low-risk areas.

As arranged with your offices, unless you publicly announce the contents earlier, we plan no further distribution of this report until 30 days after the date of this letter. At that time, we will send copies of this report to the Chairman and Ranking Minority Member, Subcommittee on Public Lands and Forests, Senate Committee on Energy and Natural Resources; the Chairman and Ranking Minority Member, House Committee on Resources; the Ranking Minority Member, Subcommittee on Forests and Forest Health, House Committee on Resources; and other interested congressional committees. We will also send copies of this report to the Secretary of Agriculture; the Secretary of the Interior; the Chief of the Forest Service; the Directors of BLM, the National Park Service, and the Fish and Wildlife Service; the Deputy Commissioner, Bureau of Indian Affairs; the Director, Office of Management and Budget; and other interested parties. We will make copies available to others upon request. In addition, this report will be available at no charge on GAO's web site at http://www.gao.gov/.

If you or your staff have any questions about this report, please contact me at (202) 512-3841. Key contributors to this report are listed in app. VI.



Barry T. Hill
Director, Natural Resources and Environment

Scope and Methodology

To assess the Forest Service's and the Department of the Interior's (Interior) efforts to determine which federal lands require fuels reduction treatments, we obtained interagency strategy and planning documents that described the mission of the fuels reduction program and an approach for achieving that mission. We interviewed department and agency officials in national, regional, and state offices, as well as at local land units. We obtained scientific studies about nationwide fuels buildup in forests and other vegetated areas from the Rocky Mountain Research Station and the Washington Office of Fire and Aviation Management, and we interviewed some of the authors. We reviewed a Forest Service proposal for a rapid assessment that will collect data on nationwide fuels buildup in the near-term and interviewed officials about LANDFIRE, a long-term plan to collect more detailed data on nationwide fuels buildup. We also interviewed regional and local unit officials from the Forest Service, Bureau of Land Management (BLM), the Bureau of Indian Affairs, the Fish and Wildlife Service, and the National Park Service, as well as officials representing state departments of forestry, nonprofit organizations, and research institutions.

To determine how local land units within the Forest Service and Interior prioritize land for fuels reduction treatments, we obtained interagency strategy documents and memorandums describing prioritization criteria and process requirements. We also obtained guidance from regional, state, and local offices where available. We interviewed Forest Service and BLM officials representing state and regional offices. We visited Forest Service and BLM fire and fuels specialists representing 11 national forests and 6 BLM field offices located in California, Colorado, Florida, Mississippi, and Oregon. (See table 1.) We selected these two agencies because they received the largest funding allocations for fuels reduction and treated the most acres. We selected these states because they received the largest funding allocations and treated the most acres under the fuels reduction program. We included states in the Southeast as well as in the West to ensure that diverse vegetation, climate, and treatment strategies were represented. Through consultation with regional and state agency officials we selected local land units to visit that received the largest funding allocations, treated the most acres, and represented diversity, with respect to predominant vegetative type, treatment strategies used, and proximity to communities and urban development. In addition, we verified that some of the units we selected had faced challenges that prevented them from completing all of the fuels reduction projects they had planned to implement in 2002. Finally, we considered cost-effective logistics and travel for our staff in selecting the 17 local land units to visit. At each local land

unit, we collected fiscal year 2002 and 2003 data about implemented and planned fuels reduction projects; and in some cases, we observed field locations where projects were proposed, had begun implementation, or had been completed. While the results of our visits cannot be projected nationwide, the locations represent a mix of local fuels reduction efforts based on geographic diversity and level of funding.

Table 1: Local Land Units Visited by GAO

Agency and local land unit	State
Forest Service	
Apalachicola National Forest	Florida
Bienville National Forest	Mississippi
Deschutes National Forest	Oregon
DeSoto National Forest	Mississippi
Klamath National Forest	California
Los Padres National Forest	California
Ochoco National Forest	Oregon
Osceola National Forest	Florida
San Juan National Forest	Colorado
Stanislaus National Forest	California
White River National Forest	Colorado
BLM	
Alturas Field Office	California
Grand Junction Resource Area	Colorado
Medford District, Ashland Resource Area	Oregon
Prineville District	Oregon
San Juan Field Office	Colorado
Surprise Field Office	California

Source: GAO.

To identify factors that have hindered recent fuels reduction efforts, we interviewed Forest Service and Interior officials in headquarters, regional, and state offices, and collected data about the percentage of federal land ready for fuels reduction treatments in 2002 that was treated. We interviewed agency officials from the 17 Forest Service and BLM local land units we visited and collected information about fuels reduction treatments planned and completed for fiscal year 2002, and treatments planned for

fiscal year 2003. Specifically, for each treatment, officials provided the number of acres covered, whether the treatment was in the wildland-urban interface, the type of treatment used (e.g., prescribed burn or mechanical treatment), whether the same area had been treated the previous year, whether the treatment was completed as scheduled, and if not, the reasons why the treatment was not completed.

To assess how the Forest Service and Interior measure progress under the fuels reduction program, we reviewed interagency strategy and planning documents that specified performance measures for the fuels reduction program. We also collected nationwide accomplishment data for the fuels reduction program in fiscal years 2001 and 2002 from the Forest Service, BLM, Bureau of Indian Affairs, Fish and Wildlife Service, and National Park Service, and analyzed the data to detect patterns across fuels reduction projects. These data were obtained from annual performance reports from the Forest Service and Interior for fiscal years 2001 and 2002 that summarized annual performance and provided quantitative data about fuels reduction accomplishments and program costs nationwide. In addition, we received planned accomplishment and projected cost data for fiscal year 2003 directly from the agencies. We also reviewed the agency files we received to ensure the accuracy and completeness of the data required for our assessment. Finally, we interviewed agency officials in headquarters, in the National Interagency Fire Center, and at local units to obtain information about reporting systems and databases currently in use and those planned for future use.

We conducted our work from June 2002 through May 2003 in accordance with generally accepted government auditing standards.

Summary of Fuels Treatment Accomplishments for the Forest Service and Interior, FY 2001-2003

The following tables summarize the hazardous fuels reduction accomplishments of the Forest Service and Interior for fiscal years 2001 and 2002 and planned accomplishments for 2003. The 2001 and 2002 tables summarize the number of acres treated and total obligated costs for lands both in and outside of the wildland-urban interface (WUI). The 2003 table summarizes the number of acres the agencies plan to treat and the projected costs of those treatments. Except where noted, the information was taken from the annual National Fire Plan performance reports and was further analyzed by GAO.

Table 2: Summary of FY 2001 Goals and Accomplishments

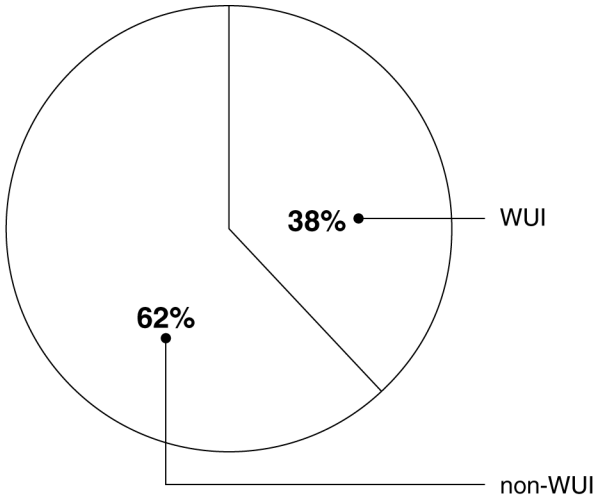
Agency	Acre targets	Treated acres	Percentage treated of planned acres	Total costs	WUI acres	WUI costs	Non-WUI acres	Non-WUI costs	Non-WUI cost/ acre	WUI cost/ acre
Forest Service	1,800,000	1,323,705	74%	**$145,473,000**	611,551	$87,967,000	712,154	$57,506,000	$81	$144
Bureau of Land Management	unavailable	313,978		**58,784,000**	98,590	40,823,000	215,388	17,961,000	83	414
Bureau of Indian Affairs	unavailable	74,010		**25,544,000**	8,415	18,212,000	65,595	7,332,000	112	2,164
National Park Service	unavailable	97,691		**12,204,000**	2,843	1,640,000	94,848	10,564,000	111	577
Fish and Wildlife Service	unavailable	242,433		**18,263,000**	54,489	8,795,000	187,944	9,468,000	50	161
Department of Interior	1,400,000	728,112	52%	**114,795,000**	164,337	69,470,000	563,775	45,325,000	80	423
Total for FS and Interior	**3,200,000**	**2,051,817**	**64%**	**$260,268,000**	**775,888**	**$157,437,000**	**1,275,929**	**102,831,000**		
Averages for FS and Interior	1,600,000	410,363	63%	**52,053,600**	155,178	31,487,400	255,186	20,566,200	81	203

Source: GAO analysis of Forest Service and Interior data.

Notes: Totals do not include 197,148 acres of Wildland Fire Use including 37,992 acres for Forest Service and 159,156 acres for Interior. Wildland Fire Use is the management of naturally ignited wildland fires to accomplish specific resource management objectives.

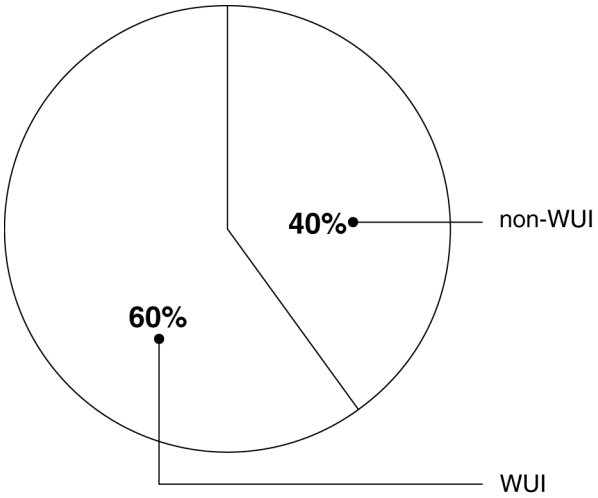
Forest Service cost data are project totals and do not reflect administrative costs.

Figure 10: Fiscal Year 2001 Fuels Reduction WUI and Non-WUI Acre Distribution



Source: GAO analysis of Forest Service and Interior data.

Figure 11: Fiscal Year 2001 Fuels Reduction WUI and Non-WUI Cost Distribution



Source: GAO analysis of Forest Service and Interior data.

Table 3: Summary of FY 2002 Goals and Accomplishments

Agency	Planned acres	Treated acres	Percentage treated of planned acres	Total costs	WUI acres	WUI costs	Non-WUI acres	Non-WUI costs	Non-WUI costs/ acre	WUI cost/ acre
Forest Service	2,101,234	1,198,518	57%	**$127,379,000**	764,367	$73,524,000	434,151	$53,855,000	$124	$96
Bureau of Land Management	862,321	321,087	37%	**80,850,000**	118,275	54,979,000	202,812	25,871,000	128	465
Bureau of Indian Affairs	246,634	120,761	49%	**25,731,000**	24,501	14,911,000	96,260	10,820,000	112	609
National Park Service	212,166	163,511	77%	**27,485,000**	15,030	10,559,000	148,481	16,926,000	114	703
Fish and Wildlife Service	578,694	453,605	78%	**25,314,000**	51,514	10,210,000	402,091	15,104,000	38	198
Department of Interior	1,899,815	1,058,964	56%	**159,380,000**	209,320	90,659,000	849,644	68,721,000	81	433
Total for FS and Interior	**4,001,049**	**2,257,482**	**56%**	**$286,759,000**	**973,687**	**164,183,000**	**1,283,795**	**$122,576,000**		
Averages for FS and Interior	800,210	451,496	60%	**57,351,800**	194,737	32,836,600	256,759	24,515,200	95	169

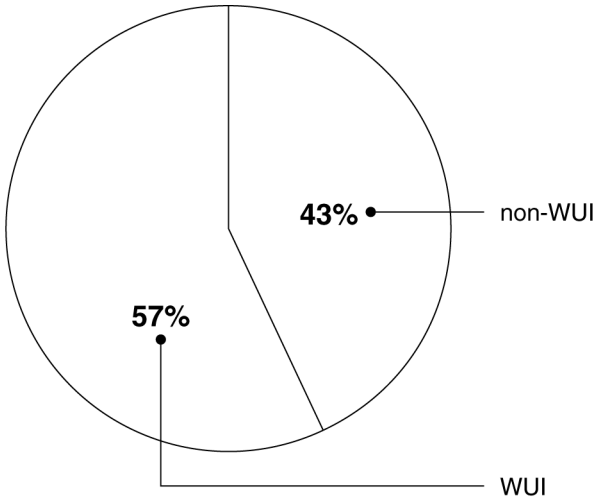
Source: GAO analysis of Forest Service and Interior data.

Notes: Planned acres refer to the total amount of land that the agency would like to treat in the fiscal year. These acres do not refer to formal targets or goals, and agencies do not use them for accountability purposes. Formal targets are established when the agencies receive their final appropriations and are further adjusted as additional challenges arise.

Forest Service dollar amounts are project totals and do not reflect administrative costs.

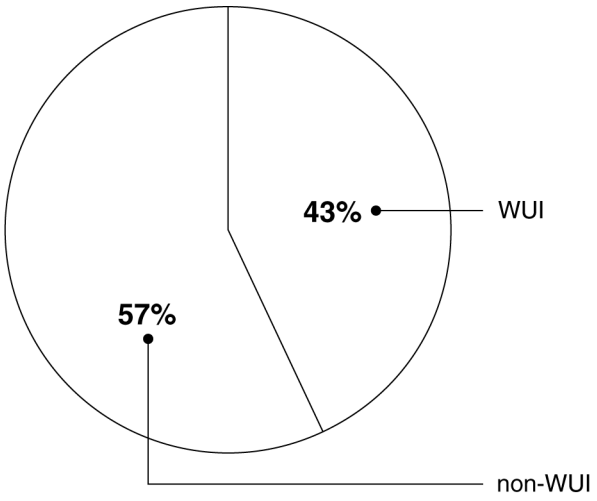
In addition to above accomplishments, 1,024,846 acres (59,385 for Forest Service and 965,441 for Interior) were "treated" through Wildland Fire Use. Also, an additional 458,456 acres were treated through the Forest Service's Forest Health Program. The total for all of these acres is 1,483,300.

Figure 12: Fiscal Year 2002 Fuels Reduction WUI and Non-WUI Acre Distribution



Source: GAO analysis of Forest Service and Interior data.

Figure 13: Fiscal Year 2002 Fuels Reduction WUI and Non-WUI Cost Distribution



Source: GAO analysis of Forest Service and Interior data.

Table 4: Summary of FY 2003 Planned Accomplishments

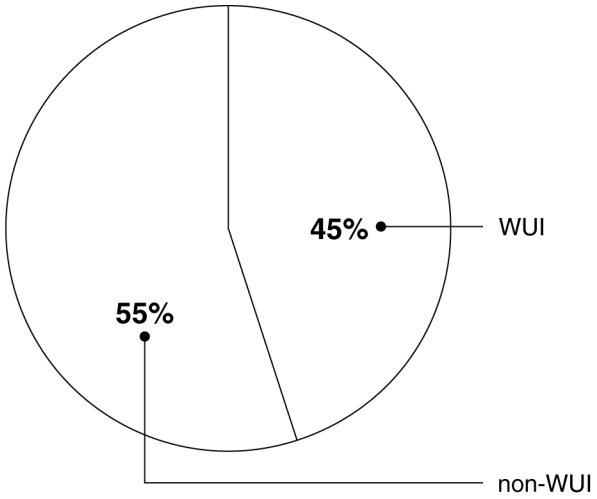
Agency	Planned acres	Total costs	WUI acres	WUI costs	Non-WUI acres	Non-WUI costs	Non-WUI cost/acre	WUI cost/acre
Forest Service	1,944,453	**$205,008,413**	1,047,200	$104,575,084	897,253	$100,433,328	$112	$100
Bureau of Land Management	415,861	**65,185,014**	153,292	37,601,168	262,569	27,583,846	105	245
Bureau of Indian Affairs	188,114	**16,416,775**	14,425	8,446,191	155,170	7,970,584	51	586
National Park Service	131,010	**8,779,231**	18,935	5,154,304	112,075	3,624,927	32	272
Fish and Wildlife Service	325,440	**15,851,449**	99,541	10,387,148	225,899	5,464,301	24	104
Department of Interior	1,060,425	**106,232,469**	286,193	61,588,811	755,713	44,643,658	59	215
Total for FS and Interior	**3,004,878**	**$311,240,882**	**1,333,393**	**$166,163,895**	**1,652,966**	**145,076,986**		
Averages for FS and Interior	600,976	**62,248,176**	266,679	$ 33,232,779	330,593	29,015,397	88	125

Source: GAO analysis of Forest Service and Interior data.

Notes: Planned acres refer to the total amount of land that the agency would like to treat in the fiscal year. These acres do not refer to formal targets or goals, and the agencies do not use them for accountability purposes. Formal targets are established when the agencies receive their final appropriations and are further adjusted as additional challenges arise.

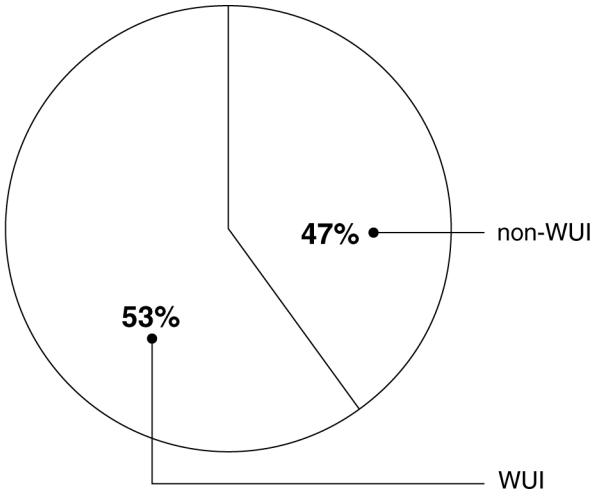
Planned acres and projected cost data received directly from the Forest Service and Interior.

Figure 14: Fiscal Year 2003 Fuels Reduction WUI and Non-WUI Acre Distribution



Source: GAO analysis of Forest Service and Interior data.

Figure 15: Fiscal Year 2003 Fuels Reduction WUI and Non-WUI Cost Distribution



Source: GAO analysis of Forest Service and Interior data.

Summary of Fuels Treatment Accomplishments in the Southeast for the Forest Service and Interior, FY 2001-2003

These tables summarize the hazardous fuels reduction accomplishments in the southeastern portion of the United States for the Forest Service and Interior for fiscal years 2001 and 2002 and planned accomplishments for 2003. The 2001 and 2002 tables summarize the number of acres treated and total obligated costs of the hazardous fuels program in the Southeast. The 2003 table summarizes the number of acres the agencies plan to treat and the projected costs of those treatments. Except where noted, the information was taken from the annual National Fire Plan performance reports and further analyzed by GAO. To ensure consistency among agencies, states were selected based on their inclusion in the Forest Service's Southeastern Region.

Table 5: Southeast Accomplishments for FY 2001

	Acres treated							
State	Forest Service	National Park Service	Fish and Wildlife Service	Bureau of Land Management	Bureau of Indian Affairs	Total	Total costs	Cost/acre
AL	83,232	548				**$83,780**	**$1,710,000**	$ 20
AR	55,044	2,521	1,940			**59,505**	**3,174,000**	53
FL	108,282	72,172	19,589	5	3,430	**203,478**	**5,110,000**	25
GA	25,863		2,293			**28,156**	**933,000**	33
KY	7,065					**7,065**	**1,018,000**	144
LA	116,397		8,672			**125,069**	**2,836,000**	23
MS	177,794		5,335			**183,129**	**3,907,000**	21
NC	25,702		8,962		16	**34,680**	**1,826,000**	53
OK	14,550		378		7,739	**22,667**	**747,000**	33
SC	52,676	463	7,195			**60,334**	**2,414,000**	40
TN	17,275	1,707				**18,982**	**1,036,000**	55
TX	60,426	3,854	27,029		300	**91,609**	**3,727,000**	41
VA	3,623	139	88			**3,850**	**318,000**	83
Total	**747,929**	**81,404**	**81,481**	**5**	**11,485**	**$922,304**	**$28,756,000**	
Averages	57,533	6,262	6,268	0	883	**70,946**	**2,212,000**	31
Percent of treated acres	55%	83%	34%	0%	16%			

Source: GAO analysis of Forest Service and Interior data.

Table 6: Southeast Accomplishments for FY 2002

	Acres treated							
State	Forest Service	National Park Service	Fish and Wildlife Service	Bureau of Land Management	Bureau of Indian Affairs	Total	Total costs	Cost/acre
AL	64,688	863	89			**$65,640**	**$1,085,000**	$17
AR	84,558	6,501	1,467			**92,526**	**2,725,000**	29
FL	148,922	100,005	46,572		6,667	**302,166**	**4,746,000**	16
GA	17,167	22	64,865			**82,054**	**4,899,000**	60
KY	9,191	130				**9,321**	**572,000**	61
LA	88,384		29,384			**117,768**	**2,100,000**	18
MS	214,326	1,056	13,271			**228,653**	**4,060,000**	18
NC	14,268	48	17,865			**32,181**	**1,693,000**	53
OK	14,348	722	5,042		10,521	**30,633**	**1,672,000**	55
SC	44,324	1,739	16,205			**62,268**	**371,000**	6
TN	10,053	1,553				**11,606**	**1,259,000**	108
TX	50,950	3,711	55,066			**109,727**	**3,184,000**	29
VA	4,463	348	193			**5,004**	**528,000**	106
Total	**765,642**	**116,698**	**250,019**		**17,188**	**$1,149,547**	**$28,894,000**	
Averages	58,896	8,977	19,232		1,322	**88,427**	**2,222,615**	44
Percent of treated acres	62%	71%	55%		16%			

Source: GAO analysis of Forest Service and Interior data.

Table 7: Southeast Accomplishments Planned for FY 2003

	Acres planned					
State	**Forest Service**	**National Park Service**	**Fish and Wildlife Service**	**Bureau of Land Management**	**Bureau of Indian Affairs**	**Total**
AL	60,702	1,083	1,098			**$62,883**
AR	137,188	15,658	2,180			**155,026**
FL	214,236	52,260	27,716		34,367	**328,579**
GA	17,604	4	8,430			**26,038**
KY	8,580	424				**9,004**
LA	134,583		19,700			**154,283**
MS	218,733	562	6,160		1,850	**227,305**
NC	54,971	45	10,048		51	**65,115**
OK	27,264	833	2,230		5,887	**36,214**
SC	38,550	841	14,461			**53,852**
TN	20,132	2,100	220			**22,452**
TX	88,427	11,897	29,608	91		**130,023**
VA	14,387	47	317			**14,751**
Total	**1,035,357**	**85,754**	**122,168**	**91**	**42,155**	**$1,285,525**
Averages	79,643	6,596	9,398	7	3,243	**98,887**
Percent of treated acres	53%	65%	38%	0%	0%	

Source: GAO analysis of Forest Service and Interior data.

Note: Planned acres and projected cost data received directly from the Forest Service and Interior.

Summary of Information Related to the 17 Forest Service and BLM Local Units Visited by GAO

Tables 8 through 12 and figure 16 summarize the hazardous fuels reduction accomplishments, reasons for incomplete treatments, and prioritization methods for the local Forest Service and BLM units that we visited. Table 8 summarizes the number of acres actually treated and total obligated costs of the hazardous fuels program for the local units. Table 9 summarizes the number of acres the agencies plan to treat. Except where noted, the information was taken from data provided by the local units.

Table 8: 2002 Fuels Reduction Acres and Costs for 17 Local Land Units

Local land units	2002 planned acres[a]	Acres completed	Percentage of planned acres completed	Estimated total costs[b]	Estimated cost per acre[b]	Estimated WUI cost per acre[b]
California						
Alturas BLM	2,248	653	29%	**$190,000**	$291	$2,069
Klamath NF	5,642	3,348	59%	**539,760**	161	184
Los Padres NF	46,124	6,704	15%	**269,000**	40	40
Stanislaus NF	11,321	4,892	43%	**445,570**	91	114
Surprise BLM	753	448	59%	**165,178**	369	440
Colorado						
Grand Junction BLM	8,186	3,073	38%	**150,951**	49	56
San Juan BLM	2,013	1,573	78%	**216,435**	138	138
San Juan NF	10,259	3,113	30%	**167,139**	54	101
White River NF	4,470	520	12%	**34,000**	65	
Florida						
Apalachicola NF	145,208	94,661	65%	**1,893,220**	20	20
Osceola NF	46,935	12,960	28%	**233,280**	18	
Mississippi						
Bienville NF	54,694	43,497	80%	**483,604**	11	11
DeSoto NF	96,392	80,407	83%	**1,179,405**	15	15
Oregon						
Deschutes NF	13,655	13,470	99%	**2,365,562**	176	281
Ashland Resource Area, Medford BLM[c]	8,888	8,113	91%	**3,475,132**	428	428
Ochoco NF	12,847	4,701	37%	**380,443**	81	98
Prineville BLM[d]	28,221	18,749	66%	**451,963**	24	35
Total	**497,856**	**300,882**	**60%**	**$12,640,642**		
Average Per Unit	29,286	17,699	60%	**$743,567**	$119	$269

Source: GAO analysis of Forest Service and Interior data.

[a]Planned acres refers to acres for which officials at local units have completed preliminary documentation. It does not refer to local units' formal acreage targets that they expect to complete in a given year.

[b]Because we were unable to estimate costs for a small number of fuels projects that were not fully completed, their costs are not included in these calculations.

[c]A portion of Medford District, Ashland Resource Area's fuels reduction work was paid for by funds outside of the fuels program, but all acres were reported as accomplishments under the fuels reduction program.

[d]BLM's Prineville District reduced fuels on 1,200 acres of Park Service land as a joint effort between the two agencies. These 1,200 acres and BLM costs associated with them are included here in order to more accurately measure accomplishments and unit costs.

Table 9: 2003 Planned Fuels Reduction Acres and Costs for 17 Local Land Units

Local land units	2003 acres planned[a]	Estimated cost	Estimated cost per acre	Estimated WUI cost per acre
California				
Alturas BLM	746	$200,000	$268	$268
Klamath NF	5,903	875,560	148	149
Los Padres NF	10,192	809,625	79	79
Stanislaus NF	14,134	2,767,584	196	175
Surprise BLM	540	212,000	393	947
Colorado				
Grand Junction BLM	11,395	760,661	67	86
San Juan BLM	2,280	386,000	169	169
San Juan NF	16,900	2,137,200	126	163
White River NF	3,960	447,500	113	347
Florida				
Apalachicola NF	155,027	3,410,594	22	22
Osceola NF	27,890	502,020	18	18
Mississippi				
Bienville NF	55,370	595,529	11	11
DeSoto NF	101,656	1,524,840	15	15
Oregon				
Deschutes NF	44,469	2,601,882	59	48
Ashland Resource Area, Medford BLM	7,856	3,223,784	410	410
Ochoco NF	17,000	1,268,000	75	116
Prineville BLM	17,810	540,500	30	42
Total	**493,128**	**$22,263,279**	**$45**	**$42**

Source: GAO analysis of Forest Service and Interior data.

[a]Planned acres refers to acres for which officials at local units have completed preliminary documentation. It does not refer to local units' formal acreage targets that they expect to complete in a given year.

Table 10: Cost and Accomplishments by Fuels Reduction Treatment Methods Used by 17 Local Land Units, 2002

	Prescribed burning		Mechanical thinning		Total	
Local land units	**Acres treated**	**Estimated average cost per acre[a]**	**Acres treated**	**Estimated average cost per acre[a]**	**Acres treated**	**Estimated average cost per acre[a]**
California						
Alturas BLM	460	$86	193	$780	**653**	**$291**
Klamath NF	2,403	119	945	269	**3,348**	**161**
Los Padres NF	6,343	38	361	82	**6,704**	**40**
Stanislaus NF	1,029	44	3,863	104	**4,892**	**91**
Surprise BLM			448	369	**448**	**369**
Colorado						
Grand Junction BLM	532	7	2,541	58	**3,073**	**49**
San Juan BLM			1,573	138	**1,573**	**138**
San Juan NF	2,556	36	557	136	**3,113**	**54**
White River NF	520	65			**520**	**65**
Florida						
Apalachicola NF	94,661	20			**94,661**	**20**
Osceola NF	12,960	18			**12,960**	**18**
Mississippi						
Bienville NF	43,497	11			**43,497**	**11**
DeSoto NF	80,407	15			**80,407**	**15**
Oregon						
Deschutes NF	4,615	93	8,855	219	**13,470**	**176**
Ashland Resource Area, Medford BLM[b]	3,936	115	4,177	723	**8,113**	**428**
Ochoco NF	4,201	79	500	100	**4,701**	**81**
Prineville BLM[c]	14,294	17	4,455	46	**18,749**	**24**
Total	**272,414**	**$51**	**28,468**	**$252**	**300,882**	**$119**
Percentage of treated acres	91%		9%		**100%**	

Source: GAO analysis of Forest Service and Interior data.

[a]Because we were unable to estimate costs for a small number of fuels projects that were not fully completed, their costs are not included in these calculations.

[b]A portion of Medford District, Ashland Resource Area's fuels reduction work was paid for by funds outside of the fuels program, but all acres were reported as accomplishments under the fuels reduction program.

[c]BLM's Prineville District reduced fuels on 1,200 acres of Park Service land as a joint effort between the two agencies. These 1,200 acres and BLM costs associated with them are included here in order to more accurately measure accomplishments and unit costs.

Table 11: Reasons Cited for Incomplete Fuels Reduction Work by 17 Local Land Units, 2002

					Reasons cited for incomplete projects				
Local land units	Projects planned	Projects not completed	Percentage projects not completed	2002 planned acres[a]	Weather	Fire season	Funding	Administrative requirements	All other reasons
California									
Alturas BLM	8	4	50%	2,248	3			1	1
Klamath NF	19	8	42%	5,642	2	2	4		
Los Padres NF	15	8	53%	46,124	2		8	2	
Stanislaus NF	41	19	46%	11,321	4	1	11	1	2
Surprise BLM	11	7	64%	753	3	2		1	5
Colorado									
Grand Junction BLM	14	11	79%	8,186	4	3		1	4
San Juan BLM	7	2	29%	2,013		2			
San Juan NF	16	11	69%	10,259	9				2
White River NF	10	9	90%	4,470	2	7			
Florida									
Apalachicola NF	117	42	36%	145,208	42	24			
Osceola NF	47	35	74%	46,935	35				
Mississippi									
Bienville NF	29	5	17%	54,694	4	4			1
DeSoto NF	61	12	20%	96,392	11	11			1
Oregon									
Deschutes NF	369	6	2%	13,655	6				
Ashland Resource Area, Medford BLM	222	18	8%	8,888		18			
Ochoco NF	23	20	87%	12,847	2	18	18		18
Prineville BLM	35	16	46%	28,221	2	4	1	3	8
Total	**1,044**	**233**	**22%**	**497,856**	**131**	**96**	**42**	**9**	**42**

Source: GAO analysis of Forest Service and Interior data.

[a]Planned acres refers to acres for which officials at local units have completed preliminary documentation. It does not refer to local units' formal acreage targets that they expect to complete in a given year.

Note: Because several factors can delay fuels work, some local units cited more than one reason for incomplete fuels reduction projects. The 17 local units visited during our review cited 320 reasons to explain 233 incomplete projects.

Table 12: Acres Treated in FY 2002 or Planned in FY 2003 That Were Treated in the Previous Fiscal Year

Local land units	FY 2002 acres completed	FY 2002 acres previously treated in 2001	Percentage of FY 2002 acres previously treated in 2001	Planned FY 2003 acres	Planned FY 2003 acres previously treated in 2002	Percentage of Planned FY 2003 acres previously treated in 2002
California						
Alturas BLM	653			746		
Klamath NF	3,348			5,903		
Los Padres NF	6,704	82	1%	10,192		
Stanislaus NF	4,892	1,264	26%	14,134	420	3%
Surprise BLM	448	5	1%	540		
Colorado						
Grand Junction BLM	3,073			11,395		
San Juan BLM	1,573	37	2%	2,280		
San Juan NF	3,113			16,900	600	4%
White River NF	520			3,960		
Florida						
Apalachicola NF	94,661			155,027		
Osceola NF	12,960			27,890	2,200	8%
Mississippi						
Bienville NF	43,497			55,370		
DeSoto NF	80,407			101,656		
Oregon						
Deschutes NF	13,470	5,592	42%	44,469	33,968	76%
Ashland Resource Area, Medford BLM	8,113	2,662	33%	7,856	3,363	43%
Ochoco NF	4,701			17,000		
Prineville BLM	18,749			17,810		
Total	**300,882**	**9,642**	**3%**	**493,128**	**40,551**	**8%**

Source: GAO analysis of Forest Service and Interior data.

Note: In 6 of the 17 local land units that we visited, some acres of land that were treated for fuels reduction and counted as acres accomplished during fiscal year 2001 were treated and counted again as acres accomplished in 2002. Treating an acre of land more than once is sometimes necessary. For example, some areas with hazardous fuels buildup are too dense to be treated with a prescribed burn because fire would possibly burn too intensely and destroy valued resources, defeating the original

objective. In these cases, a series of treatments, such as hand chopping and piling of fuels and small prescribed burns, are performed on the same land over a period of time, ranging from several months to several years. Forest Service and Interior's internal reporting guidelines direct local land units to report accomplishments on the same acres in separate fiscal years as a workload measure showing the results from their annual funding allotments. Overall, we found that, for the 17 local land units, 3 percent of the acres treated and counted as accomplishment for fiscal year 2002 had been treated and counted in fiscal year 2001.

Figure 16: Elements of Local Land Units' Project Prioritization Methods

	Methods			Criteria considered												
Local land units	Scoring system	Professional judgment/ staff discussions	Schedule of recurring treatments	WUI	Data on fuels buildup/ vegetative condition	Data on fire occurrence history	Community acceptance/ willing partners	Resource specialist opinions	Benefits to other resources/ multiprogram funding	Cost	Feasibility	Multiagency collaboration	Access[a]	NEPA documents complete	Consistent with other planning documents	Total acres
Alturas BLM		○		○				○							○	
Klamath NF		○		○				○								
Los Padres NF	○			○	○	○	○	○	○			○		○	○	
Stanislaus NF		○		○			○		○	○	○	○		○	○	
Surprise BLM		○		○		○		○					○		○	
Grand Junction BLM	○			○		○	○	○	○	○	○	○	○	○	○	
San Juan BLM		○		○			○					○	○	○		
San Juan NF		○		○			○	○			○		○			
White River NF		○		○			○								○	○
Apalachicola NF			○[b]	○					○			○				
Osceola NF			○	○	○	○		○	○							
Bienville NF			○	○				○	○							
DeSoto NF			○	○		○		○	○							
Deschutes NF		○		○	○				○	○		○		○	○	○
Medford/Ashland BLM		○		○	○		○				○			○	○	
Ochoco NF		○		○	○				○	○		○		○	○	○
Prineville BLM		○		○			○	○								

Source: GAO analysis of Forest Service and Interior data.

[a]Access includes physical as well as legal access to potential locations for fuels reduction projects. For example, in some cases, the terrain is too steep for fuels reduction equipment to operate, and in other cases snowy or muddy conditions can make a road impassable. Also, in cases where private or other nonfederal land must be traversed in order to reach a parcel of federal land, legal access becomes relevant and agency officials must obtain formal permission to cross the nonfederal land.

[b]In addition to a schedule of recurring treatments, the Apalachicola National Forest uses a scoring system to prioritize projects.

Comments from the Departments of Agriculture and of the Interior

WASHINGTON

THE DEPARTMENT OF AGRICULTURE

THE DEPARTMENT OF THE INTERIOR

June 26, 2003

Barry T. Hill, Director
Natural Resources and Environment
United States General Accounting Office
441 G Street, N.W.
Washington, DC 20548

Dear Director Hill:

Thank you for giving us the opportunity to review the draft report, *Wildland Fire Management: Additional Actions Required to Better Identify and Prioritize Lands Needing Fuels Reduction (GAO-03-805)*. The report is a well-prepared document that appropriately focuses on strategic issues.

The report aptly describes the nature of the fuel problem on public lands in both its scope and severity. Likewise, it accurately portrays the range of issues that may have impacts on hazardous fuels reduction treatments as they are actually accomplished on the landscape.

We agree with the fundamental premise that prioritization is essential to program effectiveness. We note, however, that the nation's enormous diversity in settlement patterns, land use, topography, vegetation, and other geographic factors all influence wildland fire risk. These same factors also impact how people in various parts of the country view the landscape, identify and evaluate features at risk, and thus prioritize fuels reduction treatments.

The Congress recognized the importance of regional differences when it instructed the Secretaries of Agriculture and Interior to engage in a collaborative process in the fuels program. It declared that State and local governments were to be full partners and that "key decisions be made at local levels."

Regional differences impact the fuel program in two areas of concern to GAO. First, these differences frustrate efforts to devise a systematic method to rank order the thousands of annual individual treatments. It may be possible, however, to develop techniques that create broad landscape categories of high, medium, and low priority for fuel treatments. Second, landscape differences preclude the application of any single geographically useful definition of the wildland urban interface (WUI).

The House of Representatives recently passed the Healthy Forests Restoration Act (H.R. 1904) that adopted a flexible January 4, 2001 *Federal Register* WUI definition cited by GAO. The States, charged with the responsibility of developing a definition of the WUI for the Wildland Fire Leadership Council (WFLC) created at Congressional behest, also endorse the *Federal Register* definition. Likewise, the Secretaries of Agriculture and Interior, Western Governors Association, National Association of Counties, National Association of State Foresters, Intertribal Timber Council, and other stakeholders adopted a pliant definition of the WUI in *A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment: A 10-Year Comprehensive Strategy.*

Prioritization based on a too detailed and prescriptive national definition for the WUI, combined with overly rigid prioritization guidelines, would severely limit the effectiveness of local collaboration and community participation that lies at the heart of the fuels treatment program.

Nonetheless, we are sensitive to GAO's concern for the need for national guidelines in order to reach national goals of reducing the risks abnormal wildland fire poses to people, communities, and natural resources and doing so in an effective and efficient manner. Hence, we agree that local collaboration should operate within nationally determined guidelines. We are persuaded, however, that such guidance is exemplified by the January 14, 2003 FY 2004 project prioritization letter from the Secretary of the Interior and a similar letter from Chief of the Forest Service (copies attached). The nearly completed "Protecting People and Natural Resources: A Cohesive Fuel Treatment Strategy," amplifies on that direction.

We offer the following comments regarding GAO's four specific recommendations for executive action to ensure that federal lands most in need of fuels reduction are treated.

- *Fund and implement LANDFIRE so they can more accurately identify the amount and location of lands with excess fuels buildup and facilitate the prioritization of fuels reduction treatments.*

  The Departments are nearing a decision on the funding of LANDFIRE. The first prototype will be completed in the spring of 2004 and the second in the fall of 2004. Since development of LANDFIRE began, other methods for identifying and prioritizing fuel treatments have emerged (e.g. those adopted by the State of Florida and since expanded to include thirteen southern States). We are considering these alternatives as part of our LANDFIRE evaluation process.

- *Develop a consistent, specific definition of the wildland-urban interface so that detailed, comparable nationwide data can be collected to identify the amount and location of lands in the wildland-urban interface which will facilitate the prioritization of fuels reduction treatments.*

  Since the development and implementation of the National Fire Plan, a marked increase in attention to fuels treatment in the WUI has occurred. In fiscal year 2001, for example, the agencies treated 775,000 WUI acres while they expect to treat 1,075,000 acres in FY 2004, an increase of nearly 40 percent.

While we understand the desire for geographic specificity, for the reasons noted previously, it has been difficult to reach consensus on a precise definition that adequately reflects the spatial complexity of human settlement across diverse landscapes.

However, we are working to resolve this and have made significant progress. As part of the collaborative process in identifying fuel treatments projects, the States, through the National Association of State Foresters (NASF), have the lead in developing a more nationally consistent WUI definition for the WFLC. On June 20th, NASF proposed, and the WFLC approved, using the January 4, 2001 *Federal Register* definition of the wildland urban interface. Through the collaborative process we will continue to refine this WUI definition and its application as we prioritize fuels reduction treatments.

- *Decide whether lands that require regular maintenance treatments are an important area needing continuous fuels reduction treatments and, if so, identify the amount and location of these lands nationwide to facilitate the prioritization of fuels reduction treatments.*

What GAO refers to as maintenance treatments remove fuel from lands that are in fire regime condition class 1, meaning they have not missed normally occurring fire return intervals. Such treatments most often occur in the Southeast where vegetation grows quickly and are required to prevent increased risk of wildland fire in such heavily vegetated areas.

We have already determined that maintenance treatments (perhaps better thought of as prevention treatments) are an integral part of the fuels treatment program. In FY 2003 we expect to treat some 700,000 condition class 1 acres. Without these treatments fuels conditions in the Southeast could quickly spiral into dangerous situations that would require much more costly treatments as it is more cost effective to keep lands in condition class 1 than it is to return them to that status after allowing them to slip into condition classes 2 or 3.

- *Distinguish in annual performance reports (1) acres that are treated to reduce the risk of wildfire, (2) acres that require multiple treatments over several years to reduce their risk to wildfires, and (3) acres being treated to maintain their low risk to wildfire, to more accurately reflect the actual progress being made under the fuels reduction program.*

The report argues that maintenance acres and non-maintenance acres are fundamentally different (e.g., treatments done to maintain land in fire condition class 1 -- maintenance acres or maintenance treatments -- do not lower risk, while treatments done in areas within fire condition classes 2 and 3 do lower risk). Consequently, it recommends that these acres should be reported separately to give Congress and the public a more accurate description of program accomplishments. GAO also argues that annual reporting of these incremental treatments is misleading when a series of treatments to complete risk reduction are needed on the same area over several years, and that reporting multiple treatments on the same area exaggerates the total risk reduction accomplished.

We can report treatments by condition class.

Starting this fiscal year, we are requiring field units to report acres treated by condition class, indeed one performance measure in the FY 2004 budget justification calls for the agencies to treat a specified number of condition class 2 and 3 acres. To support this requirement, we have developed a standard field procedure to evaluate changes in condition class resulting from treatments. These procedures are new to field practitioners. As the field offices become more experienced in applying them, more complete information on risk reduction will become available at a finer scale of resolution.

We are concerned, however, about the apparent assumptions that maintenance treatments or the first of multiple treatments on the same acreage do not lower fire risk. Removal of fuel means risk reduction irrespective of the fire condition class of the land at the time of removal and irrespective of the fact that multiple treatments may have to be applied to the same acreage to lower its fire regime condition class. In the Southeast, where maintenance treatments are most common, fuel reduction in priority condition class 1 areas not only immediately lessens the ever-increasing risk of fire, but also keeps these areas from deteriorating into condition class 2 and 3 lands that would require multiple, expensive treatments over a period of years in order to reduce risk back to acceptable levels. Similarly, when the full prescription for lowering the fire regime condition class of an area includes thinning and slash removal followed by prescribed burning, carrying out the first part of the program will lower risk independent of subsequent actions.

We appreciate the opportunity to review the draft Wildland Fire Management: Additional Actions Required to Better Identify and Prioritize Lands Needing Fuels Reduction report (GAO-03-805) and look forward to working with GAO on future reports.

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In addition to those named above, Paul Bollea, Ridge Bowman, Lee Carroll, Christine Colburn, Richard Johnson, and Cynthia Norris made key contributions to this report.

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