

November 2000

FOREST SERVICE ROADLESS AREAS

Potential Impact of Proposed Regulations on Ecological Sustainability



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GAO-01-47

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

November 8, 2000

The Honorable Larry Craig
Chairman, Subcommittee on Forests
and Public Land Management
Committee on Energy and Natural Resources
United States Senate

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

The U.S. Department of Agriculture's Forest Service manages about 192 million acres of land across the 155 national forests, 20 national grasslands, and 17 national recreation areas that make up the National Forest System. According to the agency, "the first priority for management is the maintenance and restoration of ecological sustainability, which is consistent with laws guiding use and enjoyment of National Forest System lands." The agency has proposed making ecological sustainability its top priority in order to provide a sustainable flow of products, services, and other values from the national forests and grasslands.¹ Depending on the condition of the land, the Forest Service recognizes that active management may be required to more quickly restore and maintain ecological sustainability and enable ecological systems to sustain desirable ecological conditions and human uses than would occur by allowing nature to take its course. (Contributors to ecological sustainability include fire and other ecological processes, and biological diversity—diverse animal and plant communities.)

¹64 Fed. Reg. 54103 (Oct. 5, 1999).

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Among the more contentious debates over how the Forest Service should meet its mission priority of restoring and maintaining ecological sustainability is the role of roads, particularly in areas that are now roadless. According to the Forest Service, it intends to examine policies on road construction, in both areas with and without roads, within the context of ecological sustainability. On May 10, 2000, the Forest Service proposed a roadless area conservation rule (the roadless rule).² The environmental documents accompanying the proposed rule discuss the following four alternatives: (1) no action; (2) a prohibition on road construction and reconstruction in the areas largely devoid of roads, known as "the unroaded portion of inventoried roadless areas," and hereafter referred to as "roadless areas;" (3) a prohibition on road construction, reconstruction, and timber harvest, except for stewardship purposes,³ in roadless areas; and (4) a prohibition on road construction and reconstruction and all timber harvest in roadless areas. The three action alternatives would prohibit—under most circumstances—the construction and reconstruction of roads on 43 million acres of the national forests. The agency prefers the second action alternative, which would allow commercial timber harvesting and forest health activities—such as removing brush to reduce the risk of fire—but would not allow roads to be constructed to carry them out. This is the alternative set out in the agency's proposed rule. The agency also proposed procedures for making future decisions about the management of inventoried and noninventoried roadless areas. The Forest Service has received and is considering public comments on the proposal and intends to issue a final rule by the end of 2000.

The Forest Service has developed or is developing other major national regulations and regional strategies and plans within the context of its focus on ecological sustainability. These include proposed changes to the agency's internal procedures governing road management and transportation, a current regional management plan for multiple national forests in the Pacific Northwest, and proposed regional management plans for multiple national forests in the interior Columbia River basin and the Sierra Nevada.

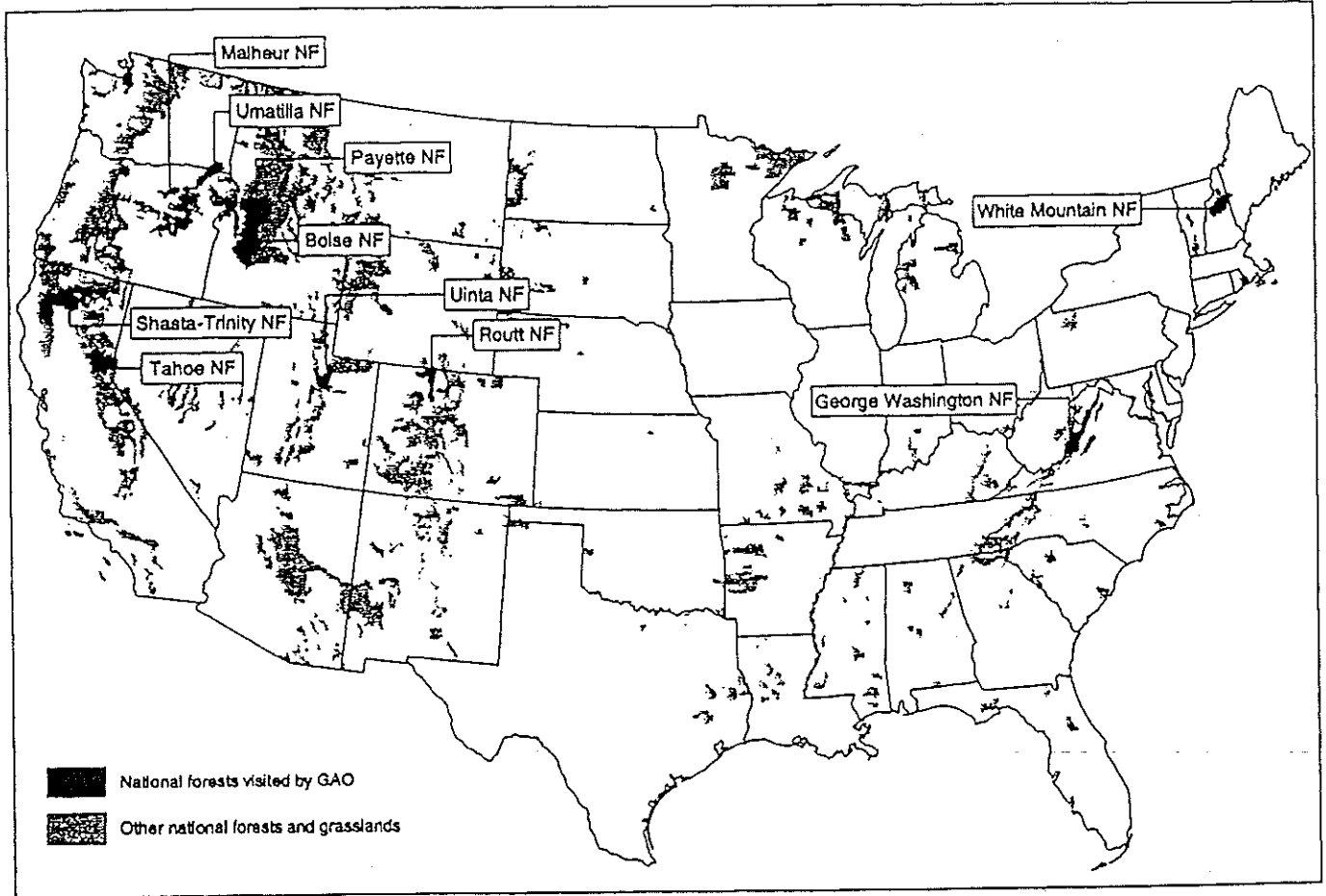
²65 Fed. Reg. 30276 (May 10, 2000).

³Stewardship purposes include improving the vigor of remaining trees to withstand insects, disease, and wind; reducing forest fuels through thinning; and creating desired wildlife habitat conditions.

You asked us to determine if the Forest Service's proposed roadless rule will affect the agency's ability to meet its mission priority of restoring and maintaining ecological sustainability. More specifically, as agreed, this report discusses (1) the role that roads play in both causing and mitigating ecological problems; (2) differences between the approach to achieve ecological sustainability under the proposed roadless rule and the approaches of other current and proposed national and regional Forest Service strategies and plans; and (3) the views of national forest managers on the proposed roadless rule's likely impact on their ability to manage their lands and resources for ecological sustainability. We did not examine the potential impact of the proposed rule on recreational use in the national forests or on the production of commodities, such as timber and forage.

In performing our work, we visited 10 national forests located in various parts of the nation that, according to Forest Service data, are experiencing ecological problems, such as buildups of hazardous fuels, outbreaks of insects or diseases, invasions of noxious weeds, degradation of water quality, and/or the loss of important ecosystems and species. These forests would likely be among those affected—both positively and negatively—by the proposed rule. We discussed the proposed rule with forest supervisors and/or natural resource specialists from the following 10 national forests: the Boise and Payette in Idaho, the Routt in Colorado, the Malheur and Umatilla in Oregon, the Uinta in Utah, the Tahoe and Shasta-Trinity in California, the White Mountain in New Hampshire and Maine, and the George Washington in Virginia and West Virginia. (See fig. 1.) The process by which we selected these forests and our overall scope and methodology are explained in more detail in appendix I.

Figure 1: Location of the 10 National Forests Included in GAO's Review



Source: The Forest Service.

Results in Brief

Roads can have lasting impacts on the national forests. When improperly constructed or maintained or when constructed along streams or on hillsides, roads can create excessive sediment that damages watersheds and degrades aquatic habitat. Moreover, in providing access into remote areas, roads can alter forest ecosystems by facilitating timber harvesting, increasing fires caused by individuals, spreading noxious weeds, and disturbing wildlife habitat. However, roads can also be used to repair environmental damage caused by other activities. For example, decades of

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fire suppression in the national forests have increased the risk of uncontrollable and often catastrophic wildfires by creating unnaturally dense forests with large amounts of accumulated hazardous fuels, such as underbrush and dead vegetation. Roads can provide a means of restoring these forests to what is considered a more natural state by providing access for thinning stands of trees and mechanically removing accumulated fuels that otherwise would have been removed by frequent but low-intensity natural fires. When fuel levels are low enough, the Forest Service can more safely reintroduce fire into an ecosystem, either by allowing natural fires to burn or by setting prescribed fires. Thinning dense forests can also improve their resistance to insects and diseases that otherwise could kill trees, thereby adding to fuel loads.

Compared with another proposed national rule on transportation management and with regional strategies and plans approved or proposed by the Forest Service that also strive to restore and maintain ecological sustainability, the proposed roadless rule takes a more restrictive approach to decision-making concerning road construction in roadless areas. The proposed roadless rule—which the agency asserts would supercede relevant portions of the proposed national transportation management rule and approved regional plans—would apply a national prohibition on road construction in roadless areas. In contrast, the transportation rule and regional plans would generally allow roads to be constructed, on a limited basis, to actively manage lands and resources to restore and maintain desired ecological conditions.

Forest Service officials on the 10 national forests included in our review provided three general observations on the proposed rule's likely impact on their ability to manage their lands and resources for ecological sustainability. First, the impact of the preferred alternative—which prohibits only road construction and reconstruction—is likely to be minimal. Although the reasons varied by forest, in sum, the forests generally did not plan to construct roads in roadless areas with or without the roadless rule. Second, although they say the need may be rare, forest officials would like to retain some discretion to construct roads in roadless areas on an exception basis to restore and maintain ecological sustainability, primarily on forests in the dry interior West with large amounts of accumulated hazardous fuels and/or large numbers of dead or dying trees. Third, officials on all 10 forests had a far greater concern with the proposed alternative that would prohibit not only road construction and reconstruction but also all timber harvesting in roadless areas. This alternative, they said, would have a far greater impact on their ability to

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manage their lands and resources for ecological sustainability and could place at risk not only ecosystems, watersheds, and species but also human property and safety.

We provided a draft of this report to the Forest Service and the Department of Agriculture for review and comment. The Forest Service provided comments that we incorporated as appropriate. The Forest Service's comments and our response are provided in appendix II.

Background

The Forest Service, created in 1905, is an organization whose management is highly decentralized and whose regional foresters and forest supervisors have considerable autonomy in interpreting and applying the agency's policies and directions, guided by a system of manuals and handbooks keyed to statutes and regulations. The Forest Service has three levels of field management—9 regional offices, 115 forest offices, and about 600 district offices. Regional offices, each managed by a regional forester, interpret policy and provide additional direction to the 115 forest offices that manage the 155 national forests, 20 national grasslands, and 17 national recreation areas. In turn, the forest offices, each managed by a forest supervisor, oversee some 600 district offices, most of which are managed by a district ranger. The forest supervisors are primarily responsible for developing and implementing forest plans for their respective forest(s) and grassland(s). The district rangers are primarily responsible for implementing project-level decisions—"on-the-ground activities," such as harvesting timber, restoring species' habitats, and constructing campsites—within their respective districts.

The Forest Service began assembling an inventory of roadless areas for further study as potential wilderness areas in the 1970s as part of a continuing effort to establish and administer the National Wilderness Preservation System. The agency's criteria allowed some areas with few roads to be inventoried as "roadless." Subsequent reviews, conducted as part of the agency's forest planning process or broader-scale assessments, have identified additional roadless areas. In all, the agency's reviews identified over 2,800 inventoried roadless areas—20 percent of which are less than 5,000 acres—totaling approximately 54.3 million acres. Over the intervening two decades, the agency has constructed roads on about 2.8 million acres in these areas, bringing the total of forest system roads to about 386,000 miles and leaving about 51.5 million acres in the unroaded portion of the inventoried roadless areas.

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On October 13, 1999, President Clinton directed the Forest Service to develop, and propose for public comment, regulations to provide appropriate long-term protection for most or all of the roadless areas and to determine whether such protection is warranted for any smaller roadless areas not yet inventoried. On May 10, 2000, the Forest Service issued its proposed alternatives, including its preferred alternative. The agency's preferred alternative, presented in the proposed rule, is to restrict road construction and reconstruction but not timber harvesting. The preferred alternative would also require land managers to consider the protection of "roadless characteristics" when revising their forest plans.

Each of the three action alternatives would include exceptions to the prohibition on road construction and reconstruction. The circumstances under which the proposed rule would allow road construction or reconstruction are: (1) to protect public health and safety in cases of an imminent threat of flood, fire, or other catastrophic event that, without intervention, would cause the loss of life or property; (2) to prevent irreparable resource damage by an existing road that is deemed essential for access, management, or public health and safety where such damage cannot be corrected by maintenance; (3) to act in accordance with reserved or outstanding rights or in accordance with statutes or treaties; and (4) to take response actions under the Comprehensive Environmental Response, Compensation, and Liability Act or to conduct a natural resource restoration action under that act, section 311 of the Clean Water Act; or the Oil Pollution Act.

As defined in the proposed roadless rule, the characteristics of roadless areas to be protected are (1) soil, water, and air; (2) sources of public drinking water; (3) diversity of plant and animal communities; (4) habitat for threatened, endangered, proposed, candidate, and sensitive species and for those species that depend on large, undisturbed areas of land; (5) primitive, semiprimitive nonmotorized, and semiprimitive motorized classes of dispersed recreation; (6) reference landscapes for research, study, or interpretation; (7) landscape character and scenic integrity; (8) traditional cultural properties and sacred sites; and (9) other locally identified unique characteristics. The preferred alternative would also delay for 5 years a determination of whether the prohibition on road construction and reconstruction should apply to the 8.5 million acres of roadless areas on the Tongass National Forest in Alaska.

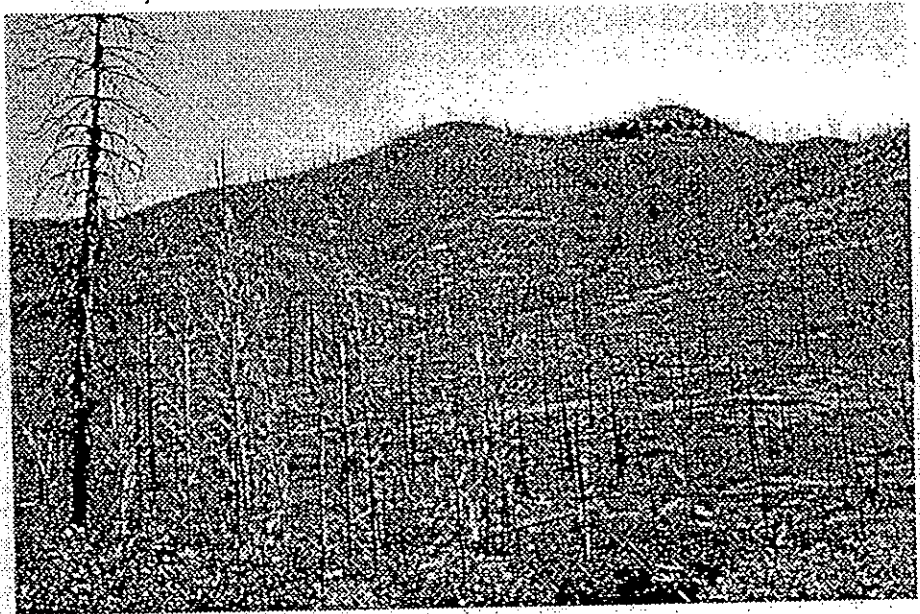
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As the Forest Service develops the proposed roadless area rule, it also faces major ecological issues. One of particular importance—as evidenced by the burning of over 6.5 million acres of public and private land this year—is the safe reintroduction of fire into the forests and grasslands.⁴ During most of the twentieth century, the Forest Service's policy was to suppress all fires. As a result of this and other policies, the health and structure of certain ecosystems that depend upon fire have been adversely affected. Fire suppression has also created unnaturally dense forests that are more susceptible to insects and disease and to catastrophic wildfire. Given the ecological damage that has resulted from fire suppression, as well as the increased risks to human development from uncontrollable wildfires, the agency's fire and management policies are coming under scrutiny. Methods of reducing fuel levels include (1) allowing natural fires to burn under certain circumstances; (2) mechanically thinning trees or removing brush; and (3) using prescribed fire—sometimes in combination with mechanical removal—cases in which forest managers deliberately set fires in an attempt to remove brush and small-diameter material.

⁴Reducing Wildfire Threats: Funds Should Be Targeted to the Highest Risk Areas (GAO/T-RCED-00-296, Sept. 13, 2000).

Figure 2: Effects of Wildfire on the Tahoe National Forest



Source: GAO.

Roads Can Have Both Positive and Negative Effects

Few human disturbances have had a more lasting legacy on the national forests than roads. For example, forest roads constructed prior to the early 1970s along streams and on hillsides used designs that were subject to erosion and failure. These roads have been found to cause significant damage to watersheds and aquatic habitat by collecting, concentrating, and directing storm runoff and the sediment that it carries into streams and rivers. Excessive sediment suffocates developing fish eggs and buries aquatic insects upon which fish depend for food. Changes in streamflows and increases in water temperatures caused by roads further impair the ability of native fish to survive and reproduce. Roads also dissect terrestrial habitat into isolated patches, thereby interfering with the ability of certain wildlife species to travel and reproduce.

By providing access into remote areas, roads have also facilitated certain human activities that have resulted in significant changes to forest ecosystems. For instance, most roads on national forests were initially constructed to harvest timber. Past timber-harvesting practices, including removing all of the trees from a timber-harvesting site at one time (clearcutting) and using heavy equipment such as tractors to haul logs

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along roads, were often not designed to protect water quality. These practices resulted in cleared and compacted areas that exposed soil to the erosive impact of rain and contributed sediment to streams, especially during large storms. Large clearcut areas and the selective removal of larger trees have also resulted in forests that differ widely from their historic conditions. In some forests, certain species of trees have declined by as much as 95 percent and have been replaced by other species that have markedly changed the forests' composition and structure. As a result, fish and wildlife species that depend on historic conditions, including old-growth forests and undisturbed watersheds, have declined in distribution and abundance. In addition, roads further push forest ecosystems away from historic conditions by increasing fires caused by individuals, poaching, and the spread of nonnative weeds that can out-compete and replace native plants.

Current road construction and timber-harvesting practices on Forest Service lands are designed to mitigate their adverse effects on ecosystems.⁵ Specifically, new forest roads are designed to be more stable and to reduce the potential for failure, and road drainage systems have been improved to reduce the amount of water and sediment delivered to streams. Additionally, newer timber-harvesting practices are less damaging to the soil than older practices and leave trees and large, woody debris in riparian buffers to trap and filter sediment before it reaches streams.

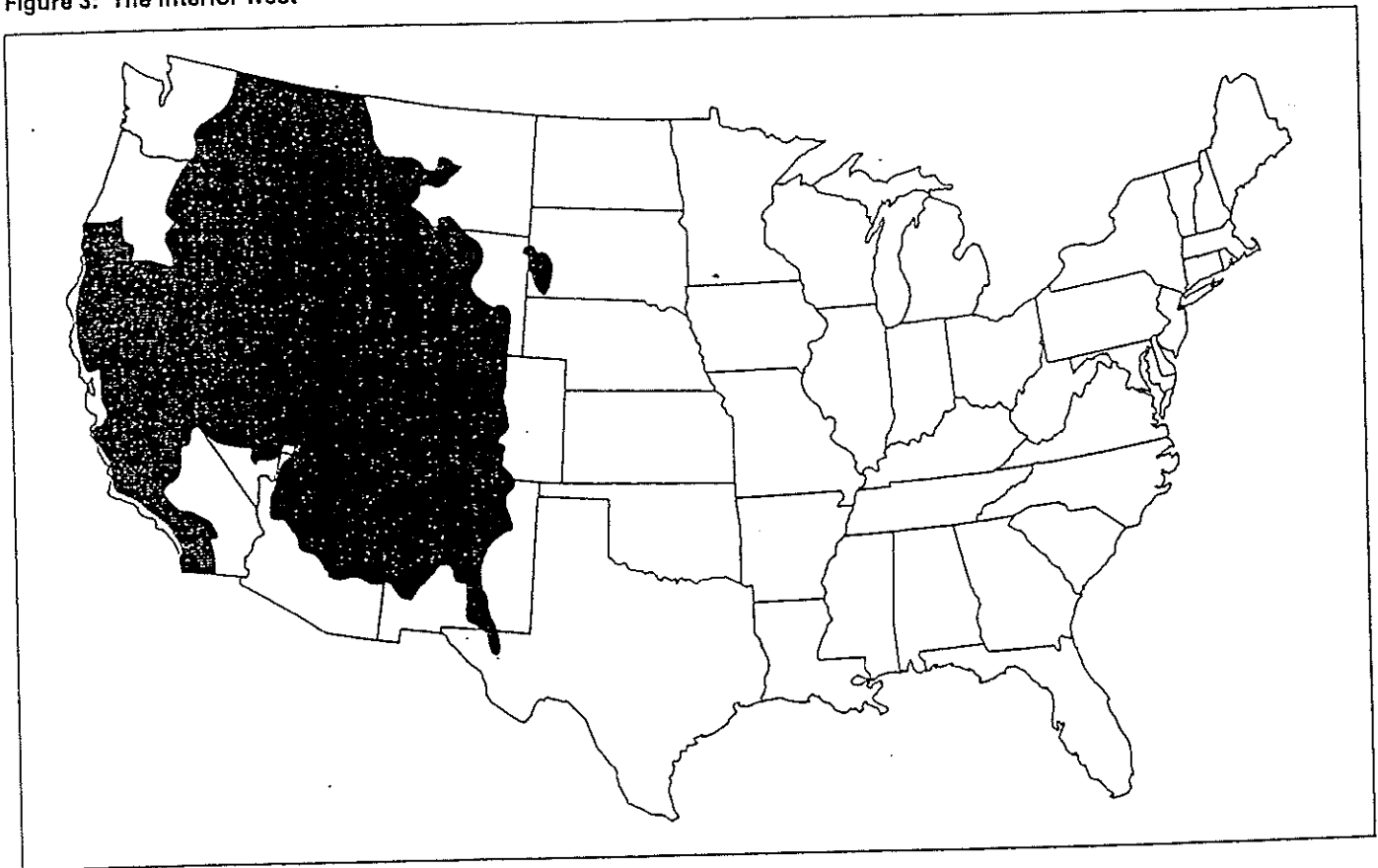
Roads can also provide access for restoring ecological disturbance processes to degraded ecosystems. Ecological disturbance processes, such as fire and insects or disease infestation, are necessary for keeping ecosystems healthy, but the size and intensity of these disturbances has exceeded historical levels in places. For example, decades of fire suppression on the national forests have increased the risk of uncontrollable and often catastrophic wildfires by creating unnaturally dense forests with large amounts of accumulated hazardous fuels, such as underbrush, small trees, dead branches, and carpets of dry needles.⁶ Unnaturally dense forests—such as many ponderosa pine forests in the dry, inland portion of the western United States (the interior West) (see fig. 3)—also cause individual trees to compete for limited quantities of water and,

⁵*Oregon Watersheds: Many Activities Contribute to Increased Turbidity During Large Storms* (GAO/RCED-98-220, July 29, 1998).

⁶*Western National Forests: A Cohesive Strategy Is Needed to Address Catastrophic Wildfire Threats* (GAO/RCED-99-65, Apr. 2, 1999).

during drought conditions, weakened trees become susceptible to insect infestations and diseases and die in unnaturally high numbers. Large stands of dead trees further contribute to accumulated hazardous fuels, increasing the risk of uncontrollable and catastrophic wildfires.

Figure 3: The Interior West



Source: The Forest Service.

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According to the Forest Service, 67 million acres on national forests across the country are at moderate to high risk from catastrophic wildfire and need to be treated over a 15-year period.⁷ Ten million of these acres are in inventoried roadless areas.⁸ Damage to forested and rangeland ecosystems caused by these fires is potentially equal to or greater than that of timber harvesting with respect to (1) exposing soil to the erosive impact of rain and contributing sediment to streams, especially during large storms, and (2) resulting in forests that differ widely from their historic conditions. Roads increase the efficiency of restoring these forests to a more natural state—by providing access to forests to thin stands of trees and mechanically removing accumulated fuels that otherwise would have been removed by frequent but low-intensity natural fires—so that fire can be safely reintroduced into an ecosystem. Roads can also (1) serve as fire breaks when applying prescribed fire and when attempting to suppress wildfires and (2) provide access to rehabilitate and restore burned areas. In addition, the Forest Service estimates that approximately 24 million acres on the national forests are at risk of excessive tree mortality from insects or diseases—7 million of which it estimates to be in roadless areas.⁹ Thinning dense forests can improve their resistance to insects and diseases that otherwise could kill trees and add to fuel loads.

⁷ *Protecting People and Sustaining Resources in Fire-Adapter Ecosystems: A Cohesive Strategy*, Forest Service (Apr. 13, 2000).

⁸ *Forest Service Roadless Area Conservation Draft Environmental Impact Statement* (May 2000).

⁹ *Forest Service Roadless Area Conservation Draft Environmental Impact Statement* (May 2000).

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The Approach to Road Construction in the Proposed Roadless Rule Is More Restrictive Than The Approach in Another Proposed National Rule and Regional Strategies and Plans

The proposed roadless rule is more restrictive than another proposed national rule and regional strategies and plans recently approved or proposed by the Forest Service. These other rules, strategies, and plans would allow roads to be constructed, on a limited basis, to actively manage lands and resources to restore and maintain desired ecological conditions. Under these other situations, decisions to construct roads would have to be supported by detailed scientific analysis.

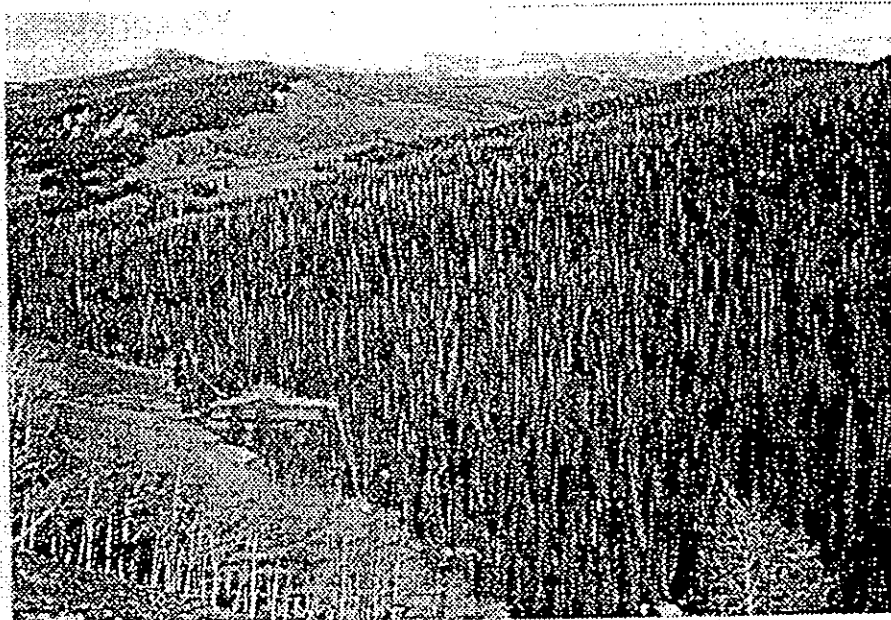
The Proposed Roadless Rule

The proposed roadless rule takes an approach to decision-making on road construction in roadless areas that is different from the approaches of other recent Forest Service proposed rules, strategies, and plans. The proposed rule—which the agency asserts would supercede relevant portions of existing plans and transportation management regulations—would apply a national prohibition on road construction in roadless areas, even if local conditions suggest that a road would help the agency to restore and maintain desired ecological conditions. Although the proposed rule includes several exceptions that would authorize road construction or reconstruction in inventoried roadless areas, the exceptions would not authorize road construction or reconstruction in inventoried roadless areas to restore and maintain ecological sustainability. Therefore, national forests could generally not construct a road to thin stands of trees and mechanically remove underbrush and dead vegetation to reduce the risk of uncontrollable and potentially catastrophic fire or to improve the forests' resistance to insects and diseases that otherwise could kill trees and add to fuel loads. (Fig. 4 shows a stand of trees damaged by spruce bark beetles in the Boise National Forest.)

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Figure 4: Trees Damaged by Spruce Bark Beetles in the Boise National Forest



Source: GAO.

The Proposed Transportation Rule

Unlike the proposed roadless rule, another proposed rule would allow more road construction and reconstruction in roadless areas if science-based analyses show benefits. In March 2000, the Forest Service proposed changes to the agency's internal procedures governing road management and transportation (the transportation rule).¹⁰ The proposed transportation rule would establish policies and procedures regarding the construction, reconstruction, maintenance, and decommissioning of roads throughout the National Forest System, including those in roadless areas. The proposed transportation rule would require national forest and grassland managers to use science-based analyses to identify the minimum road system needed to administer, use, and protect their lands and resources. The analyses would examine issues at various scales, be flexible, and be driven by road issues important to both the managers and other stakeholders. On the basis of the analyses, managers would decide which roads to keep, maintain, and close, and where to construct new roads.

¹⁰65 Fed. Reg. 11684 (Mar. 3, 2000).

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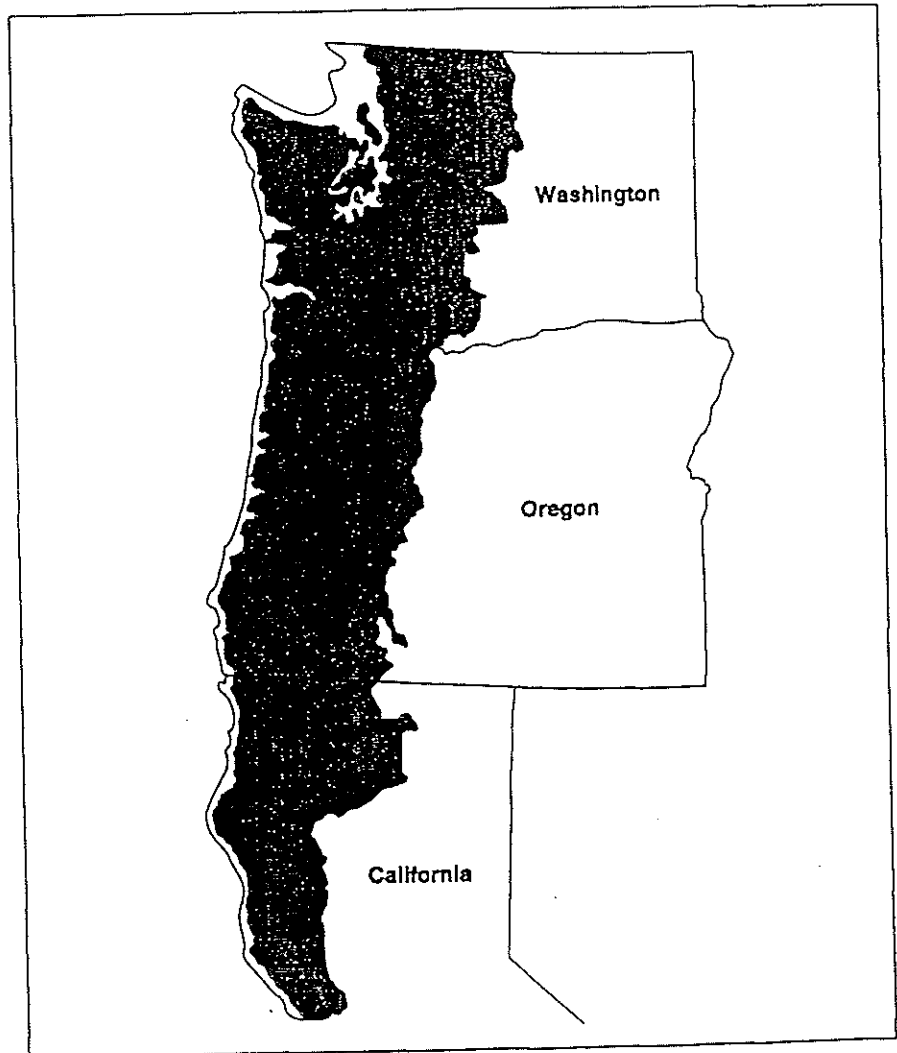
Under internal procedures that would implement the proposed transportation rule, the agency would not expect that roads would be constructed in roadless areas. However, until the relevant science-based analysis is performed, road construction could occur in roadless areas only if managers could show a "compelling need" for the road. Under the procedures, "compelling need" includes restoring and protecting critical resources. The proposed roadless rule would, if made final, supercede these procedures.

Regional Strategies and Plans

Several approved or proposed large-scale regional strategies and plans that promote the management of ecosystems would also allow for the possibility of road construction in roadless areas to restore desired ecological conditions in limited situations, after appropriate analysis and public participation. First, in 1994, the Secretaries of Agriculture and of the Interior approved the Northwest Forest Plan. The plan provides direction for the 22.3 million acres of land managed by the Forest Service or the Department of the Interior's Bureau of Land Management in the range of the northern spotted owl (northern California, western Oregon, and western Washington). (See fig. 5.)

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Figure 5: The Geographical Boundaries of the Northwest Forest Plan



Source: The Forest Service and the Bureau of Land Management.

Critical ecological issues addressed in the plan include conserving old-growth forests and protecting aquatic ecosystems. Threats to those values include human activities, such as timber harvesting and road construction, as well as wildfire. The plan prohibits new roads in "key watersheds" managed for at-risk anadromous fish, bull trout, and resident fish or where

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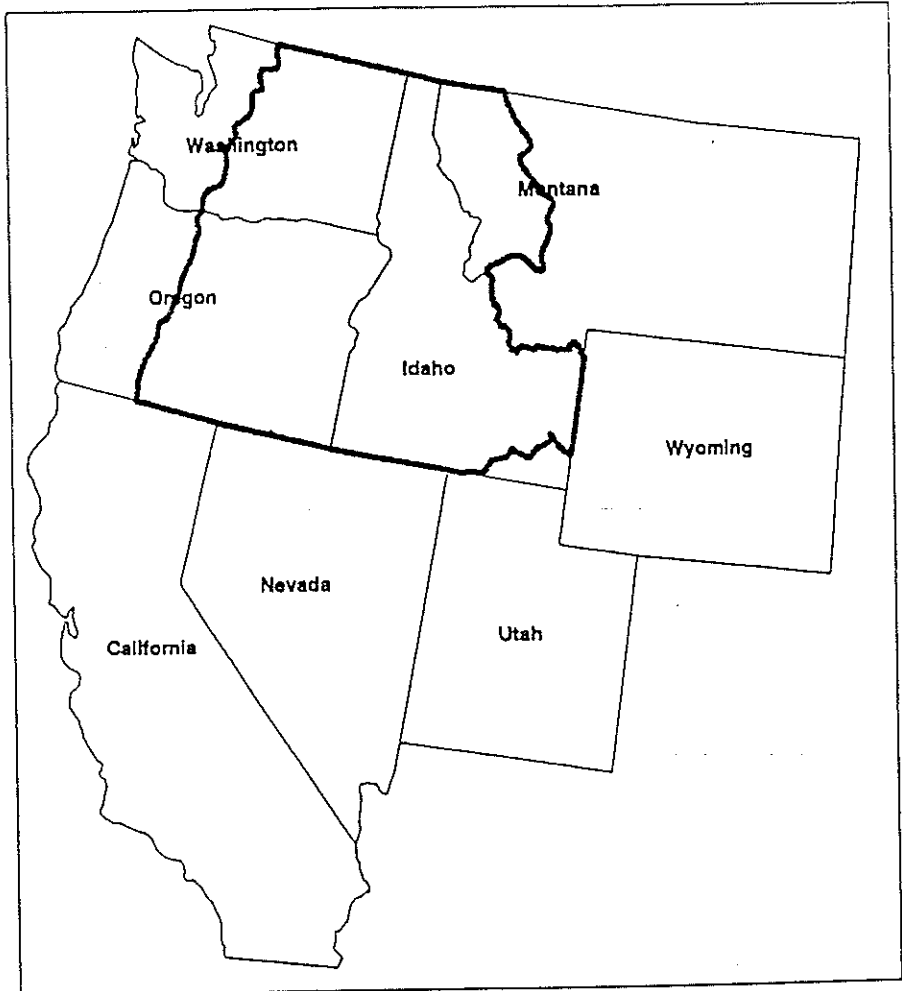
high water quality is important. However, the plan allows management activities, including road construction, in "non-key watersheds," including those with inventoried roadless areas, following a watershed analysis that focuses on collecting and compiling information within the watershed, which is essential for making sound management decisions.

Second, the Forest Service and the Bureau of Land Management are developing a broad-scale, ecosystem-based strategy for the approximately 63 million acres of land they administer in the interior Columbia River basin (eastern Oregon and Washington, much of Idaho, and western Montana). (See fig. 6.)

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Figure 6: The Geographic Boundaries of the Interior Columbia Basin Ecosystem Management Project



Source: The Forest Service and the Bureau of Land Management.

The agencies proposed a set of alternatives in 1997 and issued three supplemental alternatives in March 2000. Under their preferred alternative, science-based analyses would be used to plan and conduct restoration activities across the basin to address long-term risks associated with disturbance events, such as wildfire and disease. The preferred alternative would discourage new road construction, particularly in riparian areas.

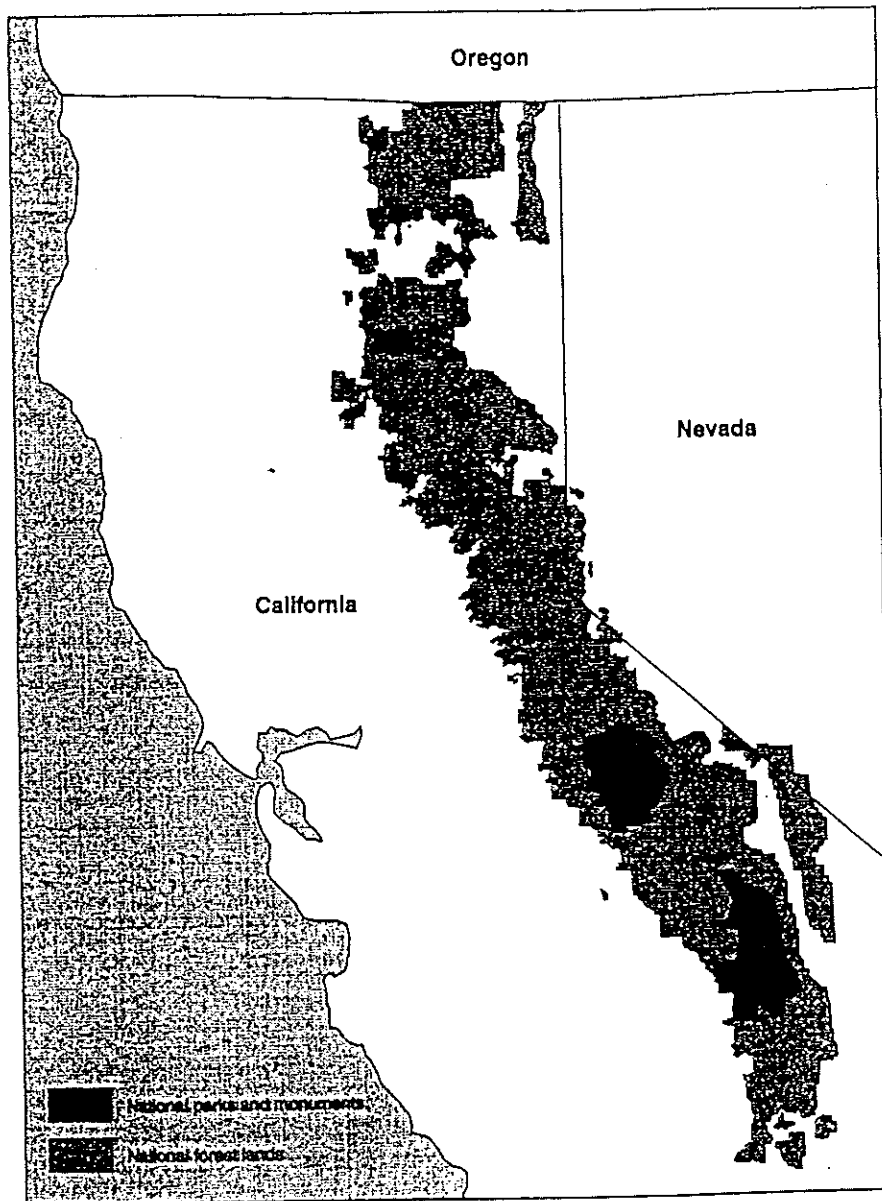
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However, the agencies stated that, although roads significantly modify landscapes and ecological processes, they also facilitate the accomplishment of many management objectives. The preferred alternative calls for science-based analyses of roads at multiple geographic scales, as appropriate, to systematically evaluate existing road system needs and to establish priorities for road restoration activities. The agencies expect that new roads into watersheds that currently have no or very few roads would be rare. However, new roads into such areas could occur following analyses that demonstrate that access is needed to prevent or address imminent environmental damage.

Finally, in April 2000, the Forest Service proposed eight alternatives for the Sierra Nevada Framework—including two preferred alternatives—for managing nine national forests in the Sierra Nevada and on the Modoc Plateau in California, the Lake Tahoe Basin Management Unit, and a portion of the Humboldt-Toiyabe National Forest in Nevada. (See fig. 7.) The planning process identified numerous issues to be addressed by the alternatives, including old-growth forest ecosystems, fire and fuels, wildlife habitat, and roads.

Figure 7: The Geographical Boundaries of the Sierra Nevada Framework



Source: The Forest Service.

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In assessing the eight alternatives' potential environmental impacts, the Forest Service stated that forest roads provide access for many uses and management activities, including research, fish and wildlife habitat management, fire protection, and insect and disease control. Under each of the proposed alternatives, an analysis of roads would be an integral part of each landscape/watershed analysis. A full range of road system management options, including new road construction, would be considered on the basis of social and environmental effects as well as administrative needs, such as access to wildfires. Neither of the two preferred alternatives for the Sierra Nevada Framework would specifically prohibit road construction in roadless areas.

National Forest Managers Believe the Preferred Alternative in the Proposed Roadless Rule Will Likely Have Minimal Impact on Their Ability to Restore or Maintain Ecological Sustainability

Forest Service officials on the 10 national forests included in our review provided three general observations on the proposed roadless rule's likely impact on their ability to manage their lands and resources for ecological sustainability. First, the impact of the preferred alternative in the proposed roadless rule is likely to have limited impact on these management responsibilities. Although the reasons varied by forest, in sum, the forests generally did not plan to construct roads in roadless areas with or without the roadless rule. Second, the officials would like to retain some discretion to construct roads in roadless areas on an exception basis. This was particularly true on forests in the dry interior West with large amounts of accumulated hazardous fuels and/or large numbers of dead or dying trees. And, third, officials on all 10 forests cautioned that one of the alternatives other than the preferred alternative—prohibiting not only road construction and reconstruction but also all timber harvesting in inventoried roadless areas—would have a far greater impact on their ability to manage their lands and resources for ecological sustainability and could place at risk ecosystems, watersheds, and species, as well as human property and safety.

Most Roadless Areas Would Remain Roadless With or Without the Roadless Rule

Few roads have been built in roadless areas in recent years, and few were likely to be built in the future, even before the roadless rule was proposed. Since 1979, the Forest Service has constructed roads on about 5 percent of the acres in roadless areas on the national forests. Current forest plans have already placed about 20.5 million of the 51.5 million acres of roadless area off-limits to road construction. Officials from several forests indicated that they expected future forest plans to prohibit road construction on additional acres even without the proposed rule or that they did not have

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plans to build roads in the roadless areas where construction is now allowed.

Officials on national forests included in our review identified several specific reasons why roadless areas would likely remain roadless with or without the rule. First, if areas inventoried in 1979 as roadless areas were accessible and had suitable commercial timber, they would have likely been entered previously, when the Forest Service emphasized timber production over other uses on the national forests. However, many roadless areas are inaccessible and/or do not have suitable commercial timber.

Second, public values about public lands changed during the 1990s, and concerns were raised about the management of the national forests, making roadless areas even more controversial and, therefore, more costly to actively manage compared with other areas on the forests. Because of these lands' status as roadless areas, any plan or project that required active management in them was almost always delayed, altered, or withdrawn. For instance, officials on the Boise National Forest in Idaho had planned, but have not implemented for nearly a decade, the Deadwood project—a project aimed at restoring historic ecological conditions on 10 percent of the forest's remaining ponderosa pine ecosystem through a combination of salvage logging, prescribed burns, and commercial thinning. Because of potential controversy, officials on the 10 forests believed that it was not usually worth the additional time, staff, and money required to construct a road in a roadless area.

Third, looking to the future, even without the rule, these officials will construct far fewer roads in roadless areas than in the past. They noted that the Forest Service—consistent with its existing legislative framework—has shifted its priorities away from producing timber and other commodities toward restoring and maintaining land health and forest resources.¹¹ In this context, approved and proposed national rules and regional plans, including those discussed above, make clear that constructing a new road anywhere and for any reason on a national forest will be rare and must be scientifically credible, legally defensible, and developed with public participation. Moreover, although roads may facilitate management activities to address certain ecological problems, such as hazardous fuels

¹¹See *Forest Service Priorities: Evolving Mission Favors Resource Protection Over Production* (GAO/RCED-99-166, June 17, 1999).

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and insects and diseases, officials pointed out that these activities can often be accomplished in roadless areas without having to construct new roads, although sometimes at increased cost.

Forest Officials Would Like to Retain Some Discretion to Construct Roads in Roadless Areas on an Exception Basis

Even though officials on the 10 national forests included in our review believe that they will need to construct few roads in roadless areas in the future, some wanted to retain the discretion to construct or reconstruct roads in roadless areas on an exception basis to help restore and maintain ecological sustainability. Officials on three national forests in the interior West also identified several projects that they believe may require road construction to restore ecosystems to the ecological conditions that existed prior to the advent of fire suppression. This restoration would involve mechanically removing and thinning accumulated fuels; setting prescribed fires; and allowing less severe, naturally occurring fires to return to the ecosystem; and reducing the threat of unnaturally occurring attacks from insects and disease. Other projects would protect human property and safety on private lands immediately adjacent to roadless areas that are at risk of insect infestation and subsequent wildfire.

For example, officials on the Payette National Forest in Idaho said that, under the preferred alternative in the proposed rule, they would not undertake projects in certain roadless areas that are designed to help restore a healthy ponderosa pine forest. This is the ecosystem most at risk in Idaho and on the forest as a result of decades of fire suppression, livestock grazing, and timber harvesting. Most of the ponderosa pine forest at risk is in roaded areas. However, significant portions in roadless areas are also at risk. The forest has developed a forestwide plan that includes projects in roadless areas to help restore the ponderosa pine forest to a more natural condition. However, according to forest officials, they would not treat at least half of the acreage of six projects because treatment would require new road construction; helicopter logging is not economically feasible as an alternative. These projects would combine prescribed burns and mechanical thinning in an attempt to restore the ponderosa forest to historic conditions.

According to officials on the Shasta-Trinity National Forest in California, the preferred alternative would limit their ability to use mechanical thinning and prescribed fire to reduce hazardous fuels and thus reduce the risk of uncontrollable and potentially catastrophic wildfires in a key watershed—the Lower McCloud River watershed. This watershed also contains old-growth forest habitat critical to the survival of the threatened

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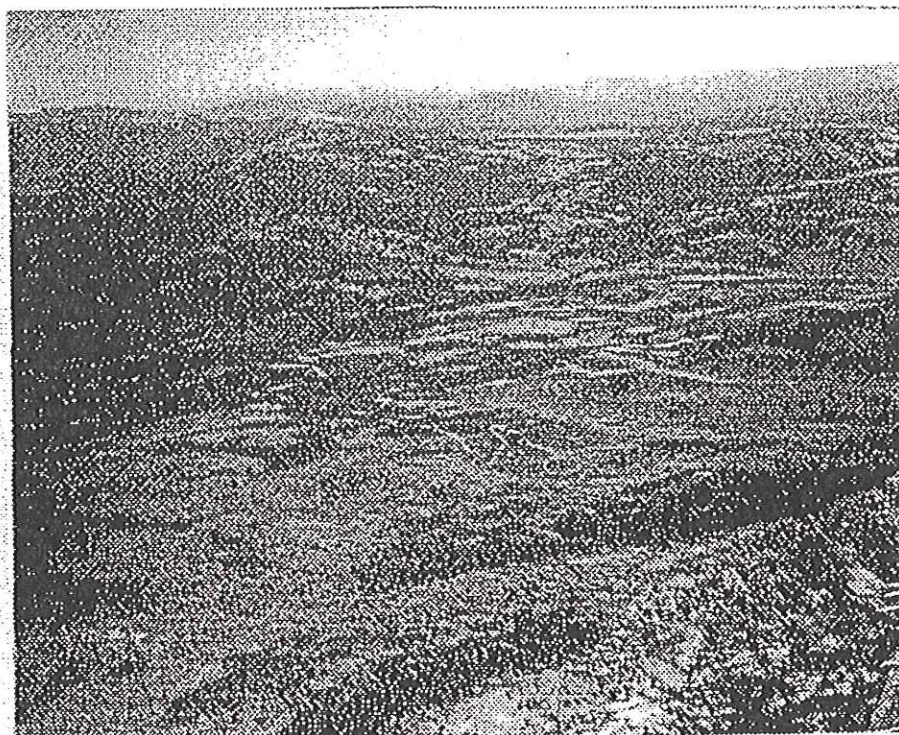
northern spotted owl and other species that depend on old-growth forest. Officials had planned to reconstruct and maintain old jeep trails to provide short-term access for mechanical thinning. They had also planned to maintain the trails as firebreaks for controlling prescribed fires and as access points for suppressing potential wildfires. However, sections of the trails are in a roadless area, and forest officials believe that the preferred alternative in the proposed roadless rule could prevent them from reconstructing and maintaining these trails.

In Colorado, on the Routt National Forest, forest officials had planned to construct temporary roads into several roadless areas immediately adjacent to private property and homes to thin dense lodgepole pine forests that are currently at risk of insect infestation and subsequent stand-replacing wildfire. Although this is a natural ecological process in lodgepole pine forests, it is not desirable in such close proximity to residential development on private lands. According to forest officials, the preferred alternative in the proposed roadless rule would prevent them from treating these areas because they could not construct even temporary roads, and other harvesting methods are not economically feasible. These officials also expressed concern that residential development adjacent to or intermingled with roadless areas is increasing, making it likely that this problem will be greater in the future.

Officials on several national forests included in our review voiced concerns about the long-term impacts of the roadless rule. For instance, officials on the Boise and Payette national forests said that the encroachment of fir trees into ponderosa pine stands—a phenomenon caused by fire suppression—will increase over time and makes the use of prescribed fire more dangerous unless these fir trees are mechanically removed, which is most efficiently and economically accomplished with the aid of roads.

Officials on the Routt National Forest anticipate an outbreak of spruce beetles resulting from a catastrophic windstorm in 1997 that felled 13,000 acres of mostly spruce and fir trees in or adjacent to roadless areas on the forest. (Fig. 8 shows an area affected by the storm, with dead trees appearing in light gray.) They believe that the preferred alternative would not allow them to construct the roads necessary to remove trees in roadless areas that in the future may become infected by beetles currently living within this deadfall. Therefore, they would be unable to protect highly valued resources, such as scenic areas and adjacent campgrounds and ski slopes.

Figure 8: Trees Killed in Routt National Forest by 1997 Windstorm



Source: GAO.

In the impact analysis that accompanied the proposed roadless rule, the Forest Service stated that it considered exemptions to permit road construction for fire suppression, insect and disease treatment, and forest health management but did not consider such an alternative in detail because "road construction is not necessary for the maintenance and protection of roadless area characteristics." However, the impact analysis also acknowledges that there are situations where road construction in roadless areas may be warranted, but the agency considered the cost associated with not being able to do so—such as a decrease in the acreage treated for fuel management—to be an "unavoidable adverse effect."¹²

¹²Forest Service Roadless Area Conservation Draft Environmental Impact Statement (May 2000).

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In elaborating on the impact analysis, Forest Service officials charged with developing the roadless rule stated that they are aware of the concerns raised by forest officials. They also believe that national ecological and social values associated with keeping roadless areas roadless outweigh local adverse impacts associated with not constructing a road in a roadless area. Therefore, these Forest Service officials believe that national direction on roadless areas is appropriate and that the rule should supercede all other approved national rules and regional strategies and plans and apply uniformly across the agency. Accordingly, the proposed rule concludes that, with respect to roadless areas, local discretion to build or reconstruct a road should be replaced by a national policy that would apply to all the national forests.

One Other Alternative in the Proposed Rule Could Further Limit the Ability of the National Forests to Manage Their Lands and Resources

Officials on all 10 forests included in our review expressed concern that one of the other alternatives in the proposed roadless rule would have a far greater impact on their ability to manage their lands and resources for ecological sustainability. This alternative would prohibit not only road construction and reconstruction but also all timber harvesting in roadless areas. This alternative could place not only ecosystems, watersheds, and species at risk but also human property and safety. The officials viewed this alternative as inconsistent with both the Forest Service's stated priority of restoring and maintaining ecological sustainability and its goal of protecting roadless characteristics.

In the impact analysis accompanying the proposed rule, the Forest Service stated that it assumed that most forests in roadless areas at a moderate to high risk from insects, disease, or catastrophic wildfire would be given a low priority for treatment unless there was an imminent threat to public safety, private property, water quality, or threatened and endangered species. However, the Forest Service officials charged with developing the impact analysis and the proposed rule told us that they recognize the importance of providing the national forests with flexibility to manage their lands and resources—including the use of timber harvesting—to restore and maintain desired ecological conditions. The preferred alternative would allow more flexibility by not placing direct restrictions on timber harvesting.

Agency Comments and Our Evaluation

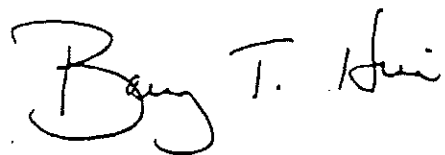
We provided copies of a draft of this report to the Forest Service and the U.S. Department of Agriculture for review and comment. The Forest Service provided a number of technical comments that we incorporated as

appropriate. As part of its comments, the Forest Service stressed that reducing fuel and risks from fire will not be a top priority in roadless areas. The agency also stated that, if needed, fuel reduction work could be done in roadless areas without constructing new roads. We agree that the agency's priorities are likely to be in areas with roads that are near communities. On the other hand, in our report we cite the agency's report—*Protecting People and Sustaining Resources in Fire-Adapted Ecosystem: A Cohesive Strategy*—as support for the statement that there is a need for treatment in roadless areas over the next 15 years. We also cite the views of national forest managers that such work is needed and that some of it cannot feasibly be done without new road construction. The agency's written comments and our detailed response to them are found in appendix II.

We conducted our work from April 2000 through October 2000 in accordance with generally accepted government auditing standards. Appendix I provides information on our scope and methodology.

As arranged with your offices, unless you publicly announce its contents earlier, we plan no further distribution of this report until 7 days after the date of this letter. At that time, we will send copies of this report to the Honorable Frank Murkowski, Chairman, and the Honorable Jeff Bingaman, Ranking Minority Member, Senate Committee on Energy and Natural Resources; the Honorable Don Young, Chairman, and the Honorable George Miller, Ranking Minority Member, House Committee on Resources; the Honorable Ron Wyden, Ranking Minority Member, Subcommittee on Forests and Public Lands Management, Senate Committee on Energy and Natural Resources; the Honorable Adam Smith, Ranking Minority Member, Subcommittee on Forests and Forest Health, House Committee on Resources; the Honorable Dan Glickman, Secretary of Agriculture; the Honorable Mike Dombeck, Chief of the Forest Service; and other interested parties. We will also make copies available to others on request.

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



Barry T. Hill
Director, Natural Resources
and Environment

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Objectives, Scope, and Methodology

To determine the role that roads play in both causing and mitigating ecological problems—including catastrophic wildfire, insect infestations and diseases, noxious weeds, degraded watersheds, loss of critical fish and wildlife habitat, and loss of important ecosystems—we examined documents prepared by the Forest Service, the World Wildlife Fund, the Wilderness Society, the National Audubon Society, and the Boise Cascade Corporation. We also interviewed resource managers with these agencies and organizations to clarify these studies when necessary, and we interviewed state governmental agencies in Colorado, Idaho, and Virginia.

To determine the differences between the approach to achieving ecological sustainability taken by the proposed roadless area conservation rule and other national and regional Forest Service strategies and plans, we examined and analyzed the following documents: the proposed regulations for the National Forest System road management and transportation system; the proposed regulations for National Forest System land and resource management planning; the Standards and Guidelines for Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl; the Interior Columbia Basin Supplemental Draft Environmental Impact Statement; and the Sierra Nevada Forest Plan Amendment Draft Environmental Impact Statement. Our particular interest was in how these strategies and plans would, or do, make decisions about building new roads in roadless areas. We also relied on our previous reports on the Forest Service's planning process and use of regional ecosystem management plans.

To determine the proposed roadless area conservation rule's likely impact on the agency's ability to manage its land and resources for ecological sustainability, we took both a local and a national approach. To assess the potential impact of the proposed rule on local national forests, we selected and visited 10 national forests. We did not select the forests randomly, and they are not intended to be representative of all national forests in any way. Indeed, we used a subjective process that was intended to select national forests that may have significant ecological management issues within their roadless areas. The forests we chose met the following criteria:

- had a substantial amount of their land in roadless areas (the range was from 12 percent to 66 percent, and the average for the 10 forests was about 30 percent);
- appeared, on the basis of national Forest Service data, to have varying amounts of roadless areas at significant risk from either catastrophic wildfire or insects and disease;

- had other ecological management issues, such as species of concern, watershed restoration, or invasive species; and
- were in the midst of revising their forest plans or had revised their plans in recent years.

Our rationale for the criteria regarding the status of forest plan revisions was that the managers of those forests would be more likely to have accurate information on the condition of the forests and on planned management activities. Furthermore, although the overall selection of forests was not intended to be representative of all national forests, we did strive for some geographic dispersion among the 10 that we selected. The 10 forests represent six of the nine Forest Service regions.

Once we selected the 10 forests, we visited each and interviewed numerous natural resource staff, district rangers, fire management officials, and 9 of the 10 forest supervisors. In each case, our primary line of questioning regarded the potential impact of the proposed rule on managing the forests to maintain and restore ecological sustainability. At each forest, we were shown roadless areas, with an emphasis on those areas that need active management to address a particular ecological problem. In addition to meeting with Forest Service staff, we spoke with representatives from nonfederal entities, including state and local governments, environmental groups, and private timber industry. Our emphasis with these groups was, again, to determine the potential impact of the proposed rule on the management of ecological problems at particular national forests in roadless areas. We did not attempt to determine the potential impact of the proposed rule on the production of goods and services, such as timber, forage, or recreational opportunities. Nor did we focus on the public participation process that has been implemented by the national forests as part of the rulemaking.

On the basis of our review of conditions and potential impacts at the 10 national forests, we determined that the most likely impact of the proposed rule on ecological management would relate to fuel reduction and insect and disease control. Therefore, we focused our effort to gauge the potential national impact of the rule on those two issues. We reviewed and analyzed information on these two issues presented in the draft environmental impact statement that accompanied the proposed rule and in "specialist reports" prepared by the Forest Service's roadless area project team. With respect to the issue of fuel reduction, we also analyzed the Forest Service's April 13, 2000, document entitled *Protecting People and Sustaining Resources in Fire-Adapted Ecosystems: A Cohesive Strategy*, and the

Appendix I
Objectives, Scope, and Methodology

departments of Agriculture and Interior's September 8, 2000, report to the President entitled *Managing the Impact of Wildfires on Communities and the Environment*. We also relied on our previous reports and testimonies on the issue of fuel reduction and fire management.

Our review was conducted from March 2000 through October 2000 in accordance with generally accepted government accounting standards.

Comments From the Forest Service

Note: GAO's comments supplementing those in the report text appear at the end of this appendix.



United States
Department of
Agriculture

Forest
Service

Washington Office

14th & Independence SW
P.O. Box 96090
Washington, DC 20090-6090

File Code: 1420

Date:

OCT 23 2000

Mr. Robert Robinson, Managing Director
Natural Resources and Environment
U. S. General Accounting Office
441 G Street, NW
Washington, D. C. 20548

Dear Mr. Robinson:

Thank you for the opportunity to review and comment on the draft report "Forest Service Roadless Areas: Potential Impact of Proposed Regulation on Ecological Sustainability" (GAO/RCED-01-47, code 141412).

Enclosed are comments to the draft report. These comments include those of a general nature pertinent to the draft report as a whole, such as proposed policies (roadless, roads, and planning), as well as specific comments addressing factual errors and/or misinterpretations.

If you have additional questions, please contact the Agency's External Audit Liaison, Linda Washington at (202) 205-3761.

Sincerely,

HILDA DIAZ-SOLTERO
Associate Chief for Natural Resources

Enclosure(s)



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General Comments

The GAO reviewed Forest Service documents and visited 10 national forests¹ to find out their views on the implications of the proposed roadless rule for managing for ecological sustainability. GAO also examined documents and interviewed officials from States and other organizations.²

The forests' discussions with GAO were in part based on assumptions made about proposed policies (roadless, roads, and planning) or, in the case of the cohesive fire strategy, a draft policy that has not been released. In general, the forests concluded that most roadless areas would remain roadless with or without the roadless rule, and that the impact of the proposed rule on their ability to restore or maintain ecological sustainability would be minimal.

Some forests expressed the desire to retain the discretion to construct or reconstruct roads in roadless areas for ecological restoration purposes on an exception basis. Three forests (Payette, Shasta-Trinity, and Rout) described specific projects that would not be undertaken under the proposed rule. The goal of these projects is to reduce the risk of catastrophic fires by reducing hazardous fuels or returning fire adapted ecosystems to historic conditions.

The Rout National Forest was concerned about their ability to construct temporary roads into several roadless areas immediately adjacent to private property and homes to thin dense lodgepole pine forests that are currently at risk of insect infestation and subsequent stand replacing wildfire.

Additional Comments

1. Page 6, 2nd full paragraph - Lists only two of the four exceptions in the proposed rule for road construction. The two exceptions not listed are (1) reserved or outstanding rights or as provided by statute or treaty and (2) response actions under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) or to conduct a natural resource restoration action under CERCLA, section 3112 of the Clean Water Act, or the Oil Pollution Act. Although it could be argued that these two exceptions are not for ecological sustainability, their omission gives an incomplete view of the rule's application.
2. Page 9, 1st full paragraph - Discusses acres on national forests and inventoried roadless areas at moderate to high risk of catastrophic wildfire and need to be treated [emphasis added]. The Cohesive Strategy identifies acres at risk "from" catastrophic

¹ Boise, Payette, Rout, Malheur, Umatilla, Uinkai, Tahoe, Shasta-Trinity, White Mountain, George Washington

² World Wildlife Fund, Watershed Society, National Audubon Society, Boise Cascade Corporation, Idaho, Colorado, and Virginia

See comment 1.

Now on p. 9.
See comment 2.

Now on p. 14.
See comment 3.

Now on p. 8.
See comment 4.

fire, not at risk "of" catastrophic fire. This is an important distinction. This is not a risk of occurrence of catastrophic fire, but rather a risk of damage to ecosystem components should a catastrophic fire occur.

3. Page 5, the sentence "The Forest Service began assembling an inventory of roadless areas throughout the National Forest System in the 1970s, partly in response to a provision of the Wilderness Act requiring the agency to recommend to Congress areas that should be added to the wilderness system." is inaccurate. The FS's review of primitive areas pursuant to the Wilderness Act's was expressly excluded from the 1974 RARE I effort. See 1974 RARE I EIS, p. 9. I suggest replacing that sentence with a paraphrasing of the text on p. 3 of the 1974 EIS as follows:

"The Forest Service began assembling an inventory of roadless areas for further study as potential wilderness area in the 1970s as part of a continuing effort relating to the establishment and administration of the National Wilderness Preservation System."

The distinction being that neither RARE I nor RARE II were mandated by the wilderness Act, instead both reviews were undertaken at the discretion of the Secretary.

Now on pp. 14 and 28.
See comment 5.

4. Page 9, 1st full paragraph and page 17, 1st full paragraph - GAO's discussion of risk from fire and risk of insects and disease on page 9 does not include a discussion of Forest Service priorities for treatment. This is a critical omission because, without an understanding of Agency treatment priorities, it implies that without the roadless rule the Agency would enter these areas immediately. On page 17 the report briefly mentions but dismisses this issue.

In inventoried roadless areas, very little fire hazard work has occurred in the past and little work is planned for the future. Regardless of whether there is a prohibition on road construction and reconstruction or a prohibition on timber harvest in inventoried roadless areas, the highest priorities for fuel treatment work will continue to be on NFS lands outside of roadless areas where natural resource values or potential threats to human communities are the highest. This priority has been validated in two recent government reports. The first document, a Report to the President titled *Managing the Impact of Wildfires on Communities and the Environment*, notes that a top priority for reducing wildland fire risk is to reduce fuels in forests and rangelands adjacent to, and within communities. The second report, *Protecting People and Sustaining Resources in Fire-Adapted Ecosystems: A Cohesive Strategy*, addresses the need to restore roaded and managed landscapes in close proximity to communities.

For the roadless rule analysis, it is assumed that fire hazard reduction work would not begin in inventoried roadless areas for at least 20 years, the estimated time it would take to address the extremely hazardous fuel situations outside roadless areas. Even though the majority of fuel management work is expected to occur outside inventoried roadless areas, if there were a threat to human life or property, threatened or endangered species, or community or domestic watershed from a hazardous fuel

Appendix II
Comments From the Forest Service

situation in inventoried roadless areas, then agency personnel, working at the local level, could choose to work in these areas without the construction or reconstruction of roads.

Now on p. 15.
See comment 6.

5. Page 10, paragraph 1 – The GAO report states that the rule would prevent the Forest Service from constructing roads to thin stands of trees and mechanically remove underbrush and dead vegetation to reduce the risk of uncontrollable and potentially catastrophic fire or to improve the forests' resistance to insects and diseases that otherwise could kill trees and add to fuel loads.

Historically the Agency has not constructed roads solely in support of fuel management projects. Roads are constructed for other purposes and subsequently used to access fuel-treatment areas. If the cost of road construction and maintenance were added to the fuel treatment cost, the increased cost would likely be higher than the commodity value of the resources protected.

Now on p. 15.
See comment 7.

6. Page 10, paragraph 1 – The report states, "*Therefore, national forests could generally not construct a road, even on a temporary basis, to thin stands of trees...*" This statement implies that temporary roads are somehow less impactful than permanent roads. Temporary road construction has most of the same effects as permanent road construction, but generally for a shorter term and for a more limited physical extent. Many of these roads are designed to lower standards than permanent roads, are typically not maintained to the same standards, and are associated with additional ground disturbance during their removal. Generation of sediment within timber harvest units is most strongly related to logging and associated facilities (skid roads and trails, log landings, etc.) that are needed to remove logs, as opposed to tree cutting. Skid roads and trails, log landings, and similar disturbances within the sale area are the main cause of soil erosion and can contribute up to 90% of the sediment generated by timber sale activity. Long-term effects can occur if temporary roads receive extended use, and they are not decommissioned. Use of temporary roads in a watershed to support timber harvest or other activities often involves construction of multiple roads over time, providing more continuous disturbance to the watershed than a single, well-designed, maintained, and use-regulated road.

Now on p. 17.
See comment 8.

7. Page 14, last paragraph, the sentence at the bottom of the page that begins "However, road construction could occur in roadless areas if managers could show a "compelling need for the road."" lacks the necessary context or caveat that the compelling need & associated provisions are only "interim requirements" that apply until completion of a forest scale analysis.

The following are GAO's comments on the Forest Service's letter dated October 23, 2000.

GAO's Comments

1. We agree with this characterization but note that the cohesive fire strategy, while not released to the public, was signed by the Chief of the Forest Service.
2. We added the other two exemptions to the report.
3. We changed "of" to "from." In our view, the key to the sentence is the number of acres of national forest and inventoried roadless area that, according to the cohesive strategy, "need to be treated."
4. We made this change.
5. We recognize that the Forest Service has different priorities for treating areas at risk from fire, insects, and disease and that roadless areas may be a lower priority than areas with roads. The Forest Service cites two documents—a report to the President from the Secretaries of Agriculture and of the Interior and the Forest Service's cohesive fire strategy—that emphasize that reducing fire risk outside of roadless areas and near communities will be a top priority. The report to the President states, "given current funding levels and the scope of the fuels issue, the Forest Service would do fuels reduction work for 15 years in roaded areas." However, in the cohesive strategy, the Chief of the Forest Service recommended that funding be substantially increased to treat 67 million acres, including an estimated 10 million acres of inventoried roadless area, over a 15-year period. The agency also commented that fire hazard reduction work could be done in roadless areas without constructing or reconstructing roads if there were a threat to specific resources and values. We agree that such work could be done under the proposed regulation, and that in many situations new roads are not needed. However, national forest managers with whom we spoke did not believe that all such work could feasibly be done without new road construction.
6. We recognize that constructing roads would add to the cost of mechanical treatment and prescribed fire. Nevertheless, in the view of some forest managers, there are situations where this work is needed but cannot feasibly be done without roads. The Forest Service will have to weigh the potential effect of not treating these areas against the cost

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of treating them with a method that does not rely on roads, such as helicopters.

7. We deleted the phrase "even on a temporary basis."
8. We changed this section to reflect that the proposed transportation rule procedures would apply to inventoried roadless areas until the proposed roadless rule is made final.

GAO Contacts and Staff Acknowledgments

GAO Contacts

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Acknowledgments

In addition to those named above, Ronald Belak, Ross Campbell, Richard Johnson, and Angela Sanders made key contributions to this report.

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