Chapter 1
Introduction

The 2000 fire season was the most extensive in 50 years. The scale and intensity of the 2000 fire season capped a decade that was characterized by a dramatic rise in the number of large wildfires, the costs associated with fire suppression, and the values at risk in the wildland-urban interface. In the 2000 fire season, approximately 123,000 fires burned more than 8.4 million acres. More than $2 billion from federal accounts was spent suppressing wildfires. This amount does not include state, tribal, and local firefighting suppression costs; direct and indirect economic losses to communities; loss of private, state, tribal, and federal resources; or damage to ecosystems.

In August 2000, President Clinton directed the Secretaries of Agriculture and the Interior to develop a response to severe wildfires, reduce fire impacts on rural communities, and ensure sufficient wildland firefighting capacity in the future. Congress in turn mandated implementation of a National Fire Plan (NFP) through legislation and appropriations. The NFP addresses conditions that have evolved over many decades and cannot, consequently, be reversed in a single year; these conditions will require both a multiyear period of remediation and consistent and ongoing future management efforts. The NFP is a long-term commitment based on cooperation and communication among federal agencies, states, tribes, local governments, and other interested/affected parties.

The 2002 fire season, while less extensive than the 2000 season, was nevertheless the second most extensive season in 50 years. Approximately 6.7 million acres burned in more than 68,000 fires. In August 2002, President Bush proposed the Healthy Forests Initiative (HFI) and directed federal agencies to develop administrative and legislative tools to facilitate the restoration of ecosystems to a healthy, natural condition. The HFI will also implement core components of the NFP's 10-year Comprehensive Strategy and Implementation Plan.

The Healthy Forests Restoration Act is a proposed legislative mechanism intended to implement the HFI. This act will establish procedures to expedite forest and rangeland restoration projects on USDA Forest Service and BLM lands. It focuses on lands (1) near communities in the wildland urban interface, (2) in high risk municipal watersheds, (3) that provide important habitat for threatened and endangered species where catastrophic wildfire threatens the survival of the species, and (4) where insects or disease are destroying the forest and increasing the threat of catastrophic wildfire. It also provides more timely judicial review of forest health projects and ensures that courts consider both

short and long-term effects of such projects before issuing injunctions to stop them.

Although drought has been a pivotal contributor to the recent recordbreaking fire seasons, the fuel load conditions that have developed as a result of decades of management decisions remain an issue of great concern to land managers throughout the western states.

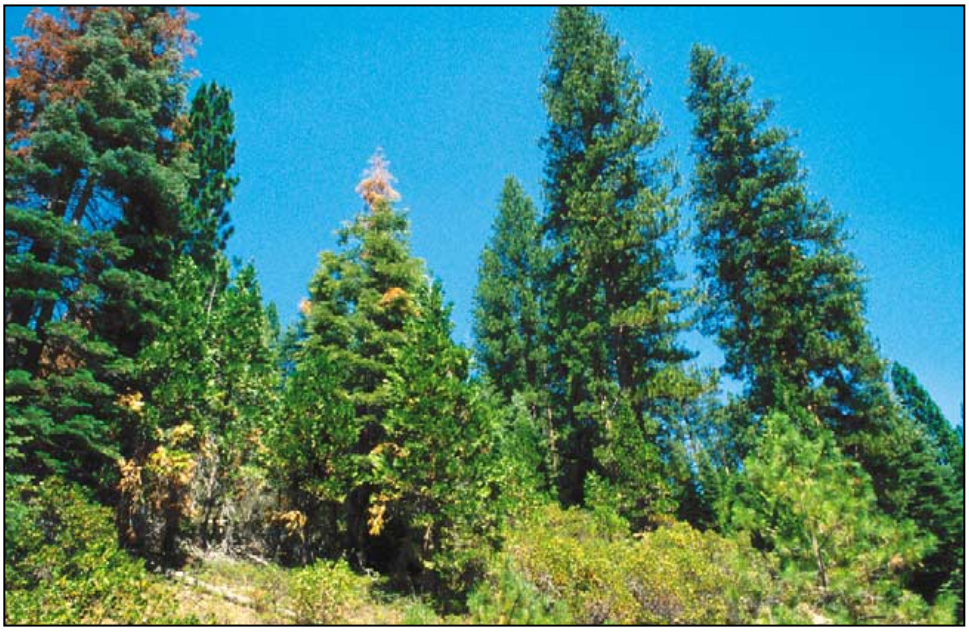
Fire in the West

For thousands of years, periodic fires ignited by lightning and volcanism shaped the ecosystems of the western United States; additionally, many groups of Native Americans traditionally used fire as a tool to manage vegetation structure. Consequently, forests and other western ecosystems evolved to support an abundance of fire-tolerant or fire-adapted species. The historical fire regimes exerted profound influence on the accumulation of fuels, nutrient cycling, patterns of vegetation growth, and distribution of natural communities. Because of the range of these influences, the fire-suppression activities of the twentieth century have had widespread effects, particularly on those systems that were most adapted to or dependent upon their historical fire regimes.

Fire suppression can lead to marked changes in stand density (Figure 1-1). The increase of small- and medium-size classes of shade-tolerant and fire-sensitive species that can result from suppression is of particular concern. This change produces an increase in the amount and continuity of live fuels near the forest floor that can act as ladder fuels (i.e., fuels that can conduct fire from ground-level or surface fuels into the forest canopy). Moreover, harvest practices of the twentieth century have typically removed the larger overstory trees, accelerating growth in the dense understory and increasing the homogeneity of the fuel structure. The lack of fire has also caused dead fuels on the forest floor to accumulate in excess of their presuppression levels.[1]

In general, the preponderance of contemporary forestlands that are in the most acute need of fuel management are those that were historically subject to periodic fire. Consequently, such stands typically are denser, contain more ladder fuels, and have higher surface fuel loads than their historical predecessors. They also support a greater abundance of species that would historically have been excluded by fire (e.g., nonclimax or invasive species). Nonforest ecosystems have been similarly modified by fire suppression and livestock grazing activities. Moreover, many of these habitat types are those most likely to characterize the wildland-urban interface (Figure 1-2).

[1] Sierra Nevada Ecosystem Project. 1996. Final report to Congress. Volume II: *Assessments and scientific basis for management options*. Davis, CA: University of California, Centers for Water and Wildland Resources.



Both photographs were taken from the same location: the top image looks downhill into an area that has recently been treated to restore a semblance of historic structure. Note the dominance in the overstory of ponderosa pine—a fire-tolerant species. The bottom image looks uphill into portions of the same stand that have not been treated; note the establishment in the understory of shade-tolerant and fire-sensitive species such as white fir.

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Jones & Stokes

Figure 1-1
Suppression and Treatment

The wildland-urban interface is of particular concern, especially as communities encroach rapidly into surrounding wildlands. In addition to the proximity of fuels to newly developed areas, the disturbance created by development activities frequently exacerbates the problem by promoting growth of dense woody vegetation. The photo shows an interface area in chaparral habitat.

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Figure 1-2
Wildland-Urban Interface

Restoring the Balance

Only in the past few decades has it become widely understood that the historical practice of fire suppression has had costly and potentially catastrophic repercussions. This new awareness has prompted a strong movement towards the use of prescribed burning, one intent of which is to reduce the risk of catastrophic wildfire and to restore wildland conditions to approximate those of a more natural fire regime. However, prescribed burning can have cumulative impacts on air quality, which is already compromised by automotive and industrial emissions, as well as by wildfire; and these air quality impacts raise serious concerns regarding public health. These impacts, as well as impacts on other environmental resources, strengthen arguments supporting the use of nonburning alternatives that have the potential to achieve many of the same results as prescribed burning but without the adverse effects. (The interviews indicated that catastrophic wildfires in stands characterized by excessive fuel loads produce significantly greater emissions than do naturally occurring or prescribed fires in healthy forests.)

Under the auspices of WRAP and FEJF, Jones & Stokes has prepared this manual to foster a greater understanding of the benefits and mechanics of nonburning alternatives. Early in the process, it became clear that a great many answers to the complex issues involved in vegetation and fuel management already exist, and that the judicious compilation of available knowledge and resources could provide a user-friendly roadmap to the arduous undertaking of developing site-appropriate strategies. Accordingly, Jones & Stokes conducted extensive interviews with a wide array of individuals involved in vegetation, fuels, and land management. Interviewees included federal land managers, state land managers, tribal land managers, researchers, timber industry representatives, and environmental interest group representatives.

How to Use This Manual

Because of the enormous complexity of the issues involved and the rather daunting variability of conditions throughout the western United States, it was not feasible to create an exhaustive "how-to" manual that would address all the contingencies that might face decision makers. Accordingly, this document has been developed to address the categories of considerations that decision makers are likely to confront, the range of options available for development of nonburning fuel management strategies, and the approaches to finding the best solutions for each management unit's particular conditions. It must be understood that every situation is unique, and that a "one-size-fits-all" approach to development of a strategy for fuel management is never appropriate. It is therefore the intent of this manual to provide decision makers—primarily resource managers and landowners—with the tools to reach an informed decision.

- Chapter 2 (*Vegetation Management: To Burn or Not To Burn*) considers the scope of variables that must be weighed in developing a vegetation or fuel management strategy.
- Chapter 3 (*Nonburning Alternatives: Variables, Criteria, and Definitions*) provides an overview of the concepts and vocabulary of vegetation and fuel management, and summarizes the options available for nonburning treatment programs.
- Chapter 4 (*Getting Started: How to Build a Nonburning Strategy*) guides the decision maker through the technical and nontechnical considerations one must navigate in designing an appropriate vegetation or fuel management program.
- Chapter 5 (*Conclusions and Recommendations*) explores means by which the increased acceptance of nonburning alternatives might be promoted.
- Chapter 6 (*List of Preparers*) lists the individuals involved in the preparation of this document.
- Appendix A is a sample checklist of considerations for evaluating fuel management options.
- Appendix B is a compendium of various types of equipment available for mechanical treatment options.
- Appendix C is a list of potential funding sources for nonburning alternatives.
- Appendix D is a list of some federal, state, and local programs to reduce fuel levels.
- Appendix E is a list of potential funding sources.
- Appendix F is a list of nonprofit organizations that were identified in the interviews.
- Appendix G is a summary of obstacles to nonburning alternatives identified by interviewees.
- Appendix H is a list of persons interviewed in the preparation of this document.
- Appendix I is a glossary of terms used in this document.