

**FEDERAL WILDLAND
FIRE MANAGEMENT**

POLICY & PROGRAM REVIEW

FINAL REPORT • DECEMBER 18, 1995

**U.S. DEPARTMENT OF THE INTERIOR
U.S. DEPARTMENT OF AGRICULTURE**



Additional copies of this report may be obtained from
the Bureau of Land Management's Office of Fire and Aviation

at the

National Interagency Fire Center

Attn: External Affairs Office

3833 South Development Avenue

Boise, Idaho 83705-5354

(208) 387-5150

or

(208) 387-5457



THE SECRETARY OF AGRICULTURE

WASHINGTON



THE SECRETARY OF THE INTERIOR

February 14, 1996

Dear Interested Citizen:

We are pleased to provide you with a copy of the final report of the Federal Wildland Fire Management Policy and Program Review. The report and memorandum of acceptance from Secretary of the Interior Bruce Babbitt and Secretary of Agriculture Dan Glickman culminate nearly a year of intensive internal and external review of Federal fire management policies and programs.

This review was chartered by the two Secretaries for the purpose of ensuring that Federal fire management policies are uniform and that agencies work together efficiently and effectively to carry out fire management programs across administrative boundaries. It was prompted by the recognition that wildland fire management is increasing in complexity and magnitude, that our collective ability to respond is becoming overextended, and that it is more important than ever to strengthen cooperative partnerships.

We are pleased that this review has resulted in the development of unified Federal principles and policies that meet the objectives of the Secretaries' charter. This will greatly improve our capability of responding to the challenges posed by current wildland fire conditions.

The review would not have been possible without the constructive input we received from many citizens and organizations. These comments helped us develop uniform Federal policies that truly address nationwide wildland fire management concerns.

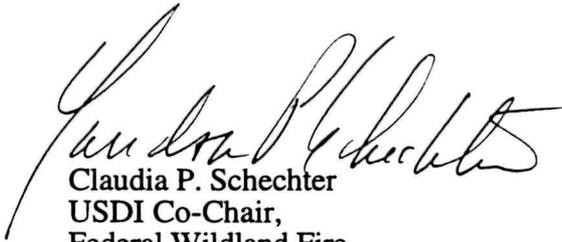
Several consistent messages emerged from the public comment we received. In response, you will see these principal themes reflected throughout the final report: safety of firefighters and the public as the first priority in wildland fire management; the need to achieve efficiency through consistency of Federal policies and procedures; the importance of incorporating decisions about the use of wildland fire into land and resource management plans; recognition that wildland fire is not only a potentially destructive force but also a vital part of nature that may be managed for positive purposes; and the importance of partnerships in increasing our success and effectiveness in managing wildland fire.

Although the final report has been completed, much work remains to be done. The Secretaries have directed the land and resource management agencies within the Departments of the Interior and Agriculture to give high priority to implementing the principles, policies, and recommendations contained in the final report. Consultation and coordination will be inherent in the implementation process. Emphasis will be placed on involving employees and the public in implementation and incorporating wildland fire management considerations into land and resource management plans. Toward this end we look forward to your participation.

Additional copies of the report are available from the Office of External Affairs, National Interagency Fire Center, 3833 S. Development Avenue, Boise, Idaho 83705-5354, or by calling (208) 387-5150 or 5457. The full text of the report is also available on Internet at: <http://www.fs.fed.us/land/wdfire.htm>.

Thank you for your interest in this important endeavor. We look forward to your continued involvement as we begin to implement this new policy.

Sincerely,



Claudia P. Schechter
USDI Co-Chair,
Federal Wildland Fire
Management Policy &
Program Review



Dr. Charles Philpot
USDA Forest Service Co-Chair,
Federal Wildland Fire
Management Policy &
Program Review

Enclosure: Final Report, Federal Wildland Fire Management Policy & Program Review



WASHINGTON



THE SECRETARY OF AGRICULTURE

THE SECRETARY OF THE INTERIOR

MEMORANDUM

To: Acting Director, Bureau of Land Management
Chief, USDA Forest Service
Director, National Park Service
Director, U.S. Fish and Wildlife Service
Deputy Commissioner, Bureau of Indian Affairs
Director, National Biological Service

Subject: Federal Wildland Fire Policy

We are pleased to accept and endorse the principles, policies, and recommendations in the attached Federal Wildland Fire Management Policy and Program Review Report. These principles and policies provide a common approach to wildland fire by our two Departments. We look forward to the endorsement of these principles and policies by our Federal partner agencies, including the Federal Emergency Management Agency, the Environmental Protection Agency, the National Oceanic and Atmospheric Administration, and the Department of Defense, so that we have a truly Federal approach to wildland fire. We invite our partners in Tribal, State, and local governments to endorse these principles and policies in order to promote an integrated, intergovernmental approach to the management of wildland fire.

The principles and policies of the Report reiterate the commitment all of us have made to firefighter and public safety. No resource or property value is worth endangering people; all of our actions and our plans must reflect this commitment. Our second priority is to protect resources and property, based on the relative values to be protected. We must be realistic about our abilities to fight severe wildfire. As natural resource managers we must make prudent decisions based on sound assessments of all the risks. Good management reduces the likelihood of catastrophic fire by investing in risk-reduction measures; good management also recognizes when nature must take its course. The principles and policies of the Report, along with the recommended actions, will improve our collective ability to be better wildland fire risk managers.

The philosophy, as well as the specific policies and recommendations, of the Report continues to move our approach to wildland fire management beyond the traditional realms of fire suppression by further integrating fire into the management of our lands and resources in an ongoing and systematic manner, consistent with public health and environmental quality considerations. We strongly support the integration of wildland fire into our land management planning and implementation activities. Managers must learn to use fire as one of the basic tools for accomplishing their resource management objectives.

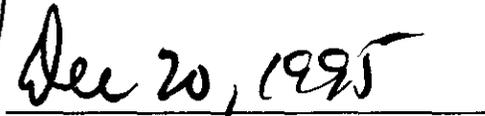
By this memorandum we are directing that you assume the responsibility for the implementation of the principles, policies, and recommendations in the Report. Implementation should be a matter of high priority within your bureaus and should:

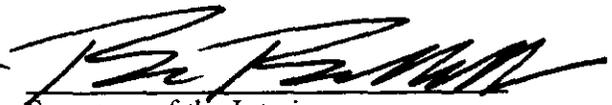
- Be consistent with the nine Guiding Principles contained in the Report.
- Occur on a joint, interagency basis wherever possible to ensure the consistent application of policy.
- Involve a broad spectrum of program areas, including resource managers, agency administrators, scientists, and planners, as well as the wildland fire management staffs.
- Address local, interagency, integrated planning as a critical means of ensuring that on-the-ground implementation is as effective as possible.
- Coordinate with other Federal agencies, including the Federal Emergency Management Agency, the Environmental Protection Agency, the National Oceanic and Atmospheric Administration, and the Department of Defense.
- Ensure coordination with Tribal, State, and local partners.
- Recognize the results of the wildland-urban interface project sponsored by the Western Governors Association.

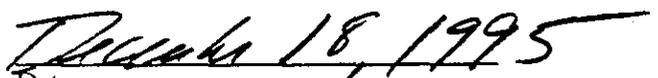
We request that you prepare a joint, integrated strategy for implementing the Report by no later than March 1, 1996. At a minimum this strategy should describe the priorities, timeframes, responsibilities, leadership, and the participation of other Federal agencies and non-Federal partners and cooperators. Each of you should designate a senior official, with the authority to ensure implementation, to work in concert with the two Departments to guide overall implementation of the Report.

We recognize that complete implementation of all of the recommendations will take some time. Priority should be placed on educating and informing employees of the philosophy, principles, and policies of the Report and on examining how quickly and efficiently we can update resource and land management plans to incorporate wildland fire considerations.


Secretary of Agriculture


Date

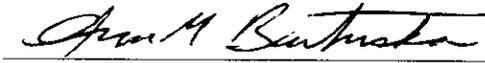

Secretary of the Interior


Date

REPORT RECOMMENDED FOR ACCEPTANCE BY THE SECRETARIES:



Dr. Charles Philpot, Co-Chair
Director, Pacific Northwest Research Station
USDA Forest Service



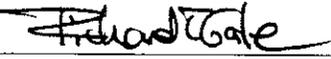
Dr. Ann Bartuska
Director, Forest Pest Management
USDA Forest Service



Dale Bosworth
Regional Forester, Intermountain Region
USDA Forest Service



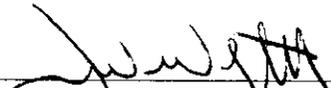
Jim Douglas
Director, Office of Hazard & Fire Programs Coord.
DOI / Office of the Secretary



Rick Gale
Deputy Chief Ranger
DOI / National Park Service



Lester K. Rosenkrance
Director, National Office of Fire & Aviation
DOI / Bureau of Land Management



Dr. Jan van Wagtenonk
Station Leader, Yosemite Field Station
DOI / National Biological Service



Claudia Schechter, Co-Chair
Director, Operations - Policy, Management & Budget
DOI / Office of the Secretary



Keith Beartusk
Assistant Area Director, Billings Area Office
DOI / Bureau of Indian Affairs



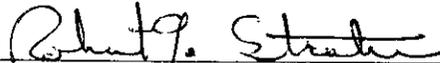
Stan Coloff
Physical Scientist
DOI / National Biological Service



Miké Edrington
Director, Aviation & Fire Management
Pacific Northwest Region
USDA Forest Service

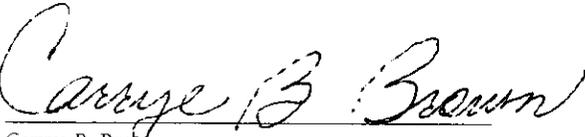


Dr. Mary Jo Lavin
Director, Fire & Aviation Management
USDA Forest Service



Dr. Robert Street
Assistant Director, Refuges & Wildlife
DOI / U. S. Fish & Wildlife Service

CONCURRENCE WITH RECOMMENDATION FOR ACCEPTANCE:



Carrye B. Brown
Administrator
U. S. Fire Administration



Richard Krimm
Assistant Director, Response & Recovery
Federal Emergency Management Agency



Rich Przywarty
Chief, Operations Division, Office of Meteorology
Department of Commerce / National Weather Service



Sally Shaver
Director, Air Quality Strategies & Standards Division
U. S. Environmental Protection Agency



FEDERAL WILDLAND FIRE MANAGEMENT

POLICY & PROGRAM REVIEW

FINAL REPORT

TABLE OF CONTENTS



Executive Summary	iii
Introduction	1
Guiding Principles and Policies	4
Topic Area Discussions	
Role of Wildland Fire in Resource Management	7
Use of Wildland Fire	13
Preparedness and Suppression	17
Wildland/Urban Interface Protection	21
Coordinated Program Management	29
Appendix I: References	35
Appendix II: Work Groups	39

EXECUTIVE SUMMARY

The challenge of managing wildland fire in the United States is increasing in complexity and magnitude. Catastrophic wildfire now threatens millions of wildland acres, particularly where vegetation patterns have been altered by past land-use practices and a century of fire suppression. Serious and potentially permanent ecological deterioration is possible where fuel loads exceed historical conditions. Enormous public and private values are at high risk, and our nation's capability to respond to this threat is becoming overextended. The goals and actions presented in this report encourage a more proactive approach to wildland fire to reduce this threat.

The Departments of the Interior and Agriculture, together with Tribal governments, States, and other jurisdictions, are responsible for the protection and management of natural resources on lands they administer. Because wildland fire respects no boundaries, uniform Federal policies and programs are essential. And, as firefighting resources become increasingly scarce, it is more important than ever to strengthen cooperative relationships.

The Federal Wildland Fire Management Policy and Program Review was chartered by the Secretaries of the Interior and Agriculture to ensure that Federal policies are uniform and programs are cooperative and cohesive. This report addresses five major topic areas, presents nine guiding principles that are fundamental to wildland fire management, and recommends a set of thirteen Federal wildland fire policies. While unique agency missions may result in minor operational differences, having, for the first time, one set of "umbrella" Federal fire policies will enhance effective and efficient operations across administrative boundaries and improve our capability to meet the challenges posed by current wildland fire conditions.

Public input and employee review have provided the foundation upon which many of the policy and program goals and actions contained in this report are based. Initially, broad policy and program issues were presented for comment. These initial comments sharpened the focus and were used in preparing a draft report. The draft was then made available for both internal and external comment. More than 300 comments were received and used in preparing these final policy and program conclusions.

Following are some of the key points made in this report:

- Protection of human life is reaffirmed as the first priority in wildland fire management. Property and natural/cultural resources jointly become the second priority, with protection decisions based on values to be protected and other considerations.
- Wildland fire, as a critical natural process, must be reintroduced into the ecosystem. This will be accomplished across agency boundaries and will be based upon the best available science.
- Agencies will create an organizational climate that supports employees who implement a properly planned program to reintroduce wildland fire.
- Where wildland fire cannot be safely reintroduced because of hazardous fuel build-ups, some form of pretreatment must be considered, particularly in wildland/urban interface areas.
- Every area with burnable vegetation will have an approved Fire Management Plan.
- Wildland fire management decisions and resource management decisions go hand in hand and are based on approved Fire Management and land and resource management plans. At the same time, agency administrators must have the ability to choose from the full spectrum of fire management actions — from prompt suppression to allowing fire to function in its natural ecological role.
- All aspects of wildland fire management will be conducted with the involvement of all partners; programs, activities, and processes will be compatible.
- The role of Federal agencies in the wildland/urban interface includes wildland firefighting, hazard fuels reduction, cooperative prevention and education, and technical assistance. No one entity can resolve and manage all interface issues; it must be a cooperative effort. Ultimately, however, the primary responsibility rests at the State and local levels.
- Structural fire protection in the wildland/urban interface is the responsibility of Tribal, State, and local governments.

- The Western Governors' Association will serve as a catalyst to involve State and local agencies and private stakeholders in achieving a cooperative approach to fire prevention and protection in the wildland/urban interface.
- Federal agencies must place more emphasis on educating internal and external audiences about how and why we use and manage wildland fire.
- Trained and certified employees will participate in the wildland fire program; others will support the program as needed. Administrators are responsible and will be accountable for making employees available.
- Good data and statistics are needed to support fire management decisions. Agencies must jointly establish an accurate, compatible, and accessible database of fire- and ecosystem-related data.

The success of the actions recommended in this report depends upon four things: Every agency administrator must ensure that these policies are incorporated into all actions. Fire professionals must work with agency administrators to make the policies work on the ground. Managers and staffs must actively implement the recommendations and work with their constituents to ensure success. And every employee of every agency must be committed to follow through on the ground.

Finally, agencies and the public must change their expectation that all wildfires can be controlled or suppressed. No organization, technology, or equipment can provide absolute protection when unusual fuel build-ups, extreme weather conditions, multiple ignitions, and extreme fire behavior come together to form a catastrophic event.

To effect the recommended changes and to achieve the consistent Federal policies reflected in this report, the Steering Group recommends that all agencies be directed to develop implementation plans that include actions, assignments, and time frames.

INTRODUCTION

The Federal wildland fire management community has, for many years, been a leader in interagency communication and cooperation to achieve mutual objectives. While many policies and procedures are similar among the agencies, some significant differences may hinder efficient interagency cooperation. Because it is prudent to manage consistently across agency boundaries, uniform cooperative programs and policies are critical to efficient and effective fire management. Policies and programs must incorporate the wisdom and experience of the past, reflect today's values, and be able to adapt to the challenges of the future. They must be based on science and sound ecological and economic principles and, above all, must form the basis for suppressing and using fire safely.

While continual improvements are inherent in the fire program, the events of the 1994 wildfire season created a renewed awareness and concern among the Federal land management agencies and our constituents about the impacts of wildfire. As a result of those concerns and in response to specific recommendations in the report of the South Canyon Fire Interagency Management Review Team (IMRT), the Federal Wildland Fire Management Policy and Program Review was chartered to ensure that uniform Federal policies and cohesive interagency and intergovernmental fire management programs exist. The review process was directed by an interagency Steering Group whose members represented the Departments of Agriculture and the Interior, the U.S. Fire Administration, the National Weather Service, the Federal Emergency Management Agency, and the Environmental Protection Agency. The Steering Group received staff support from a core team representing the Departments of Agriculture and the Interior. During the review process, the core team gathered input from teams of internal and external subject-matter experts (see Appendix II).

The Federal agencies referenced throughout this report are the five principal fire/land management agencies, including the Forest Service (FS) under the Department of Agriculture and the Bureau of Land Management (BLM), National Park Service (NPS), Fish and Wildlife Service (FWS), and Bureau of Indian Affairs (BIA) under the Department of the Interior. The term "Federal wildland" as used in this report

recognizes that Indian trust lands are private lands held in trust by the government and that Tribes possess a Nationhood status and retain inherent powers of self government. It is also recognized that, in addition to the five principal Federal land management agencies that have participated in this review, the Department of Defense and other Federal entities also manage a significant amount of wildland and may choose to adopt the fire management strategies and policies contained in this report.

Early in this review process, internal and external ideas were sought and broad program management issues were identified. The review was announced and input was requested in the Federal Register on January 3, 1995. At the same time, letters were sent to approximately 300 individuals and organizations across the nation and employee input was sought through internal communications within the Departments of the Interior and Agriculture. Subsequently, Steering Group members met with national stakeholders, the Western Governors' Association, and employees to get additional, more focused input; they incorporated input resulting from the Environmental Regulation and Prescribed Fire conference held in Tampa, Florida, in March 1995; and they individually continued to network with their constituents.

The draft report was published in its entirety in the *Federal Register* on June 22, 1995, and a 30-day public comment period was announced. Copies of the report were mailed to a greatly expanded audience, including those who commented early in the review process. The full report was also available on Internet. At the end of the 30-day comment period, the Steering Group had received a significant number of requests to allow additional time for comments. In response to those requests, the comment period was reopened, closing for a second time on September 25, 1995. In total, 308 comments were received on the draft report. An independent contractor completed a content analysis of the comments; the resulting report and individual responses were used in the preparation of this report.

A number of related reviews and studies form a broad foundation of technical, professional, and scientific assessment upon which the recommended policies, goals, and actions contained in this report are founded, including:

- Final Report on Fire Management Policy; USDA/USDI – May 1989.
- Rural Fire Protection in America: A Challenge for the Future; National Association of State Foresters – 1991.
- Oversight Hearing: Fire Suppression, Fire Prevention, and Forest Health Issues and Programs; Committee on Agriculture and the Committee on Natural Resources, House of Representatives – October 4, 1994.
- Report of the National Commission on Wildfire Disasters; Sampson, Chair – 1994.
- Western Forest Health Initiative Report; USDA Forest Service – 1994.
- Fire Management Strategic Assessment Report; USDA Forest Service – 1994.
- Fire Management and Ecosystem Health in the National Park System; USDI National Park Service – September 1994.
- Report of the Interagency Management Review Team, South Canyon Fire; USDI/USDA – October 1994.
- Bureau of Land Management Fire and Aviation Programwide Management Review Report; USDI BLM – April 1995.

Communication and collaboration are highlighted throughout this report. The planning, implementation, and monitoring of wildland fire management actions will be done on an interagency basis with the involvement of all partners. The term “partners,” as used in this report, is all encompassing, including the Federal land management and regulatory agencies; Tribal governments; Department of Defense; State, county, and local governments; the private sector; and the public. We believe there is no option to this renewed emphasis on public participation. Although initially time consuming, this approach will lead to a long-term payoff, including an increase in public safety, reduced costs and losses, and a wider acceptance of the important role that wildland fire plays in the management of our public lands.



Wildland fire at Warm Lake, Idaho. (Photo courtesy of National Interagency Fire Center.)

GUIDING PRINCIPLES & POLICIES

The following guiding principles are fundamental to the success of the Federal wildland fire management program and the implementation of review recommendations. The proposed Federal policies shown on the following pages were developed as a part of this review. These "umbrella" Federal policies do not replace existing agency-specific policies but will compel each agency to review its policies to ensure compatibility. Individual agency policies will be reflected through the land and fire management planning processes.

GUIDING PRINCIPLES

- A. *Firefighter and public safety is the first priority in every fire management activity.*
- B. *The role of wildland fire as an essential ecological process and natural change agent will be incorporated into the planning process. Federal agency land and resource management plans set the objectives for the use and desired future condition of the various public lands.*
- C. *Fire management plans, programs, and activities support land and resource management plans and their implementation.*
- D. *Sound risk management is a foundation for all fire management activities. Risks and uncertainties relating to fire management activities must be understood, analyzed, communicated, and managed as they relate to the cost of either doing or not doing an activity. Net gains to the public benefit will be an important component of decisions.*
- E. *Fire management programs and activities are economically viable, based upon values to be protected, costs, and land and resource management objectives. Federal agency administrators are adjusting and reorganizing programs to reduce costs and increase efficiencies. As part of this process, investments in fire management activities must be evaluated against other agency programs in order to effectively accomplish the overall mission, set short- and long-term priorities, and clarify management accountability.*
- F. *Fire management plans and activities are based upon the best available science. Knowledge and experience are developed among all wildland fire management agencies. An active fire research program combined with interagency collaboration provides the means to make this available to all fire managers.*
- G. *Fire management plans and activities incorporate public health and environmental quality considerations.*
- H. *Federal, State, Tribal, and local interagency coordination and cooperation are essential. Increasing costs and smaller work forces require that public agencies pool their human resources to successfully deal with the ever-increasing and more complex fire management tasks. Full collaboration among Federal agencies and between the Federal agencies and State, local, and private entities results in a mobile fire management work force available to the full range of public needs.*
- I. *Standardization of policies and procedures among Federal agencies is an ongoing objective. Consistency of plans and operations provides the fundamental platform upon which Federal agencies can cooperate and integrate fire activities across agency boundaries and provide leadership for cooperation with State and local fire management organizations.*

F E D E R A L W I L D L A N D F I R E P O L I C I E S

	DEPARTMENT OF THE INTERIOR	USDA FOREST SERVICE	PROPOSED FEDERAL
SAFETY	No wildfire situation, with the possible exception of threat to human survival, requires the exposure of firefighters to life-threatening situations.	Conduct fire suppression in a timely, effective, and efficient manner with a high regard for public and firefighter safety. Forest officers responsible for planning and implementing suppression action shall not knowingly or carelessly subordinate human lives to other values.	Firefighter and public safety is the first priority. All Fire Management Plans and activities must reflect this commitment.
PLANNING	Fire will be used to achieve responsible and definable land-use benefits through the integration of fire suppression and prescribed fire as a management tool.	Integrate consideration of fire protection and use into the formulation and evaluation of land and resource management objectives, prescriptions, and practices.	Every area with burnable vegetation must have an approved Fire Management Plan. Fire Management Plans must be consistent with firefighter and public safety, values to be protected, and land and resource management plans and must address public health issues. Fire Management Plans must also address all potential wildland fire occurrences and include the full range of fire management actions.
WILDLAND FIRE			
WILDFIRE	Fires are classified as either wildfire or prescribed fire. All wildfires will be suppressed. Wildfire may not be used to accomplish land-use and resource-management objectives. Only prescribed fire may be used for this purpose.	Wildland fires are defined as either a wildfire or a prescribed fire. Respond to a fire burning on National Forest System land based on whether it is a wildfire or a prescribed fire; implement an appropriate suppression response to a wildfire.	Fire, as a critical natural process, will be integrated into land and resource management plans and activities on a landscape scale, across agency boundaries, and will be based upon best available science. All use of fire for resource management requires a formal prescription. Management actions taken on wildland fires will be consistent with approved Fire Management Plans.
USE OF FIRE			
PRESCRIBED FIRE	Prescribed fire may be utilized to accomplish land-use or resource-management objectives only when defined in prescribed fire plans.	Use prescribed fires, from either management ignitions or natural ignitions, in a safe, carefully controlled, cost-effective manner as a means of achieving management objectives defined in Forest Plans. Prepare a burn plan for all prescribed fire projects.	Wildland fire will be used to protect, maintain, and enhance resources and, as nearly as possible, be allowed to function in its natural ecological role.
PRESCRIBED NATURAL FIRE	Prescribed fire, designed to accomplish the management objective of allowing naturally occurring fire to play its role in the ecosystem, will be allowed to burn if provided for in a Fire Management Plan, a valid prescription exists, and the fire is monitored.	Allow lightning-caused fires to play, as nearly as possible, their natural ecological role in Wilderness.	
PREPAREDNESS	Bureaus will maintain an adequate state of preparedness and adequate resources for wildland fire suppression. Preparedness plans will include considerations for cost-effective training and equipping of suppression forces, maintenance of facilities and equipment, positioning of resources, and criteria for analyzing, prioritizing, and responding to various levels of fire situations.	Plan, train, equip, and make available an organization that ensures cost-efficient wildfire protection in support of land and resource management direction as stated in Fire Management Action Plans. Base presuppression planning on the National Fire Management Analysis System.	Agencies will ensure their capability to provide safe, cost-effective fire management programs in support of land and resource management plans through appropriate planning, staffing, training, and equipment.
SUPPRESSION	Wildfire losses will be held to the minimum possible through timely and effective suppression action consistent with values at risk and within the framework of land-use objectives and plans.	Conduct fire suppression in a timely, effective, and efficient manner with a high regard for public and firefighter safety.	Fires are suppressed at minimum cost, considering firefighter and public safety, benefits, and values to be protected, consistent with resource objectives.
PREVENTION	Wildfire prevention is an integral part of the total suppression program and ranges from public education to hazard reduction activities. Bureaus will develop and participate in interagency fire prevention cooperatives.	The objective of wildfire prevention is the cost-efficient reduction of fire suppression expenditures and damages from human-caused fires to levels commensurate with resource management objectives and fire management direction.	Agencies will work together and with other affected groups and individuals to prevent unauthorized ignition of wildland fires.

F E D E R A L W I L D L A N D F I R E P O L I C I E S

	DEPARTMENT OF THE INTERIOR	USDA FOREST SERVICE	PROPOSED FEDERAL
PROTECTION PRIORITIES	The standard criterion to be used in establishing protection priorities is the potential to destroy: (1) human life, (2) property, and (3) resource values. (National Interagency Mobilization Guide, March 1995, NFES 2092.)	The standard criterion to be used in establishing protection priorities is the potential to destroy: (1) human life, (2) property, and (3) resource values. (National Interagency Mobilization Guide, March 1995, NFES 2092.)	Protection priorities are (1) human life and (2) property and natural/cultural resources. If it becomes necessary to prioritize between property and natural/cultural resources, this is done based on relative values to be protected, commensurate with fire management costs. Once people have been committed to an incident, these resources become the highest value to be protected.
INTERAGENCY COOPERATION	Bureaus will coordinate and cooperate with each other and with other protection agencies for greater efficiency and effectiveness.	Develop and implement mutually beneficial fire management agreements with other Federal agencies and adjoining countries. Cooperate, participate, and consult with the States on fire protection for non-Federal wildlands.	Fire management planning, preparedness, suppression, fire use, monitoring, and research will be conducted on an interagency basis with the involvement of all partners.
STANDARDIZATION	The National Wildfire Coordinating Group (NWCG) provides a formalized system to agree upon standards of training, equipment, aircraft, suppression priorities, and other operational areas. (Memorandum of Understanding, NWCG; II, Function and Purpose.)	The National Wildfire Coordinating Group (NWCG) provides a formalized system to agree upon standards of training, equipment, aircraft, suppression priorities, and other operational areas. (Memorandum of Understanding, NWCG; II, Function and Purpose.)	Agencies will use compatible planning processes, funding mechanisms, training and qualification requirements, operational procedures, values-to-be-protected methodologies, and public education programs for all fire management activities.
ECONOMIC EFFICIENCY	Bureaus will ensure that all fire management activities are planned and based upon sound considerations, including economic concerns. Bureaus will coordinate and cooperate with each other and with other protection agencies for greater efficiency and effectiveness. Wildfire damage will be held to the minimum possible, giving full consideration to minimizing expenditure of public funds for effective suppression.	Provide a cost-efficient level of wildfire protection on National Forest lands commensurate with the threat to life and property and commensurate with the potential for resource and environmental damage based on hazard, risk, values, and management objectives.	Fire management programs and activities will be based on economic analyses that incorporate commodity, non-commodity, and social values.
WILDLAND/URBAN INTERFACE	Emergency assistance may be provided to properties in the vicinity of public and Indian lands so long as Departmental lands or the public's interest is not jeopardized. Bureaus will develop and participate in interagency fire prevention cooperatives.	Structural fire suppression, which includes exterior and interior actions on burning structures, is the responsibility of State and local government. Structural fire protection from advancing wildfire within the National Forest protection boundary is the responsibility of State and local fire departments and the Forest Service.	The operational role of Federal agencies as a partner in the wildland/urban interface is wildland firefighting, hazard fuels reduction, cooperative prevention and education, and technical assistance. Structural fire protection is the responsibility of Tribal, State, and local governments. Federal agencies may assist with exterior structural suppression activities under formal Fire Protection Agreements that specify the mutual responsibilities of the partners, including funding. (Some Federal agencies have full structural protection authority for their facilities on lands they administer and may also enter into formal agreements to assist State and local governments with full structural protection.)
ADMINISTRATOR AND EMPLOYEE ROLES	Wildfires are considered emergencies, and their suppression will be given priority over normal Departmental programs.	Every Forest Service employee has the responsibility to support and participate in wildfire suppression activities as the situation demands.	Employees who are trained and certified will participate in the wildland fire program as the situation demands; employees with operational, administrative, or other skills will support the wildland fire program as needed. Administrators are responsible and will be accountable for making employees available.

ROLE OF WILDLAND FIRE IN RESOURCE MANAGEMENT



Understory burning in ponderosa pine on the Malheur National Forest in Oregon reduces competition from grass, brush, and small trees, allowing ponderosa pine to prosper. Wildland fire plays an important role in maintaining healthy forests. (Photo courtesy of Mike Apicello, Forest Service, NIFC.)

SITUATION

HISTORICAL PERSPECTIVE

Long before humans arrived in North America, there was fire. It came with the first lightning strike and will remain forever. Unlike earthquakes, tornados, and wind, fire is a disturbance that depends upon complex physical, chemical, and biological relationships. Wildland fire is inherently neither good nor bad, but it is the most powerful natural force that people have learned to use. As an inevitable natural force, it is sometimes unpredictable and potentially destructive and, along with human activities, has shaped ecosystems throughout time.

Early ecologists recognized the presence of disturbance but focused on the principle that the land continued to move toward a stable or equilibrium condition.

Through the years, however, scientists have acknowledged that equilibrium conditions are largely the exception and disturbance is generally the rule. Natural forces have affected and defined landscapes throughout time. Inasmuch as humans cannot completely control or eliminate these disturbances, ecosystems will continue to change.

Human activities also influence ecosystem change. American Indian Tribes actively used fire in prehistoric and historic times to alter vegetation patterns. In short, people and ecosystems evolved with the presence of fire. This human influence shifted after European settlement in North America, when it was believed that fire, unlike other natural disturbance phenomena, could and should be controlled. For many years fire was aggressively excluded to protect both public and private investments and to prevent what was considered the destruction of forests, savannahs, shrublands, and grasslands. While the destructive, potentially deadly side of fire was obvious and immediate, changes and risks resulting from these fire exclusion efforts were difficult to recognize and mounted slowly and inconspicuously over many decades.

CURRENT PERSPECTIVE

There is growing recognition that past land-use practices, combined with the effects of fire exclusion, can result in heavy accumulations of dead vegetation, altered fuel arrangement, and changes in vegetative structure and composition. When dead fallen material (including tree boles, tree and shrub branches, leaves, and decaying organic matter) accumulates on the ground, it increases fuel quantity and creates a continuous arrangement of fuel. When this occurs, surface fires may ignite more quickly, burn with greater intensity, and spread more rapidly and extensively than in the past. On the other hand, uses such as grazing can sometimes reduce fine fuels, precluding periodic surface fires that would typically burn in these areas. Without fire, encroachment of woody species may occur in some savannah and grassland ecosystems.

The arrangement of live vegetation also affects the way fires burn. For example, an increase in the density of small trees creates a multi-storied forest structure with a continuous vertical fuel arrangement. This

arrangement may allow a fire normally restricted to the surface to spread into the trees and become a crown fire. In addition to structural changes, vegetation modification resulting from fire exclusion can cause a shift toward species that are not adapted to fire (some of which are not native) and are therefore more susceptible to damage from fire. Fire exclusion sometimes favors non-native species in some fire-dependent areas, while in other areas fires may encourage non-native species. Fires in areas of altered vegetation and fuels can adversely affect other important forces within the ecosystem, such as insects and diseases, wildlife populations, hydrologic processes, soil structure and mineralogy, and nutrient cycling. Any of these components, if altered greatly by unusually severe fire, can seriously diminish the long-term sustainability of the land. In addition, effective protection from, and control of, these large fire events will likely be much more difficult.

Paradoxically, rather than eliminating fire, exclusion efforts, combined with other land-use practices, have in many places dramatically altered fire regimes (circumstances of fires, including frequency, intensity, and spatial extent) so that today's fires tend to be larger and more severe. No longer a matter of slow accumulation of fuels, today's conditions confront us with the likelihood of more rapid, extensive ecological changes beyond any we have experienced in the past. To address these changes and the challenge they present, we must first understand and accept the role of wildland fire and adopt land management practices that integrate fire as an essential ecosystem process.

While other techniques, such as mechanical removal, may be used to reduce heavy fuels, they cannot always replace the ecological role that fire plays. Fire not only reduces the build-up of dead and downed fuel, it performs many other critical ecosystem functions. Fire can recycle nutrients that might otherwise be trapped for long periods of time in the dead organic matter that exists in many environments with slow rates of decay. It can also stimulate the production of nutrients and provide the specific conditions, including seed release, soil, light, and nutrients, that are critical for the reproduction of fire-dependent species. For more extensive information about the ecological role of fire and current ecosystem conditions, refer to the documents listed in Appendix I.

PLANNING

Although ecological knowledge and theories have evolved relatively quickly, the scope and process of land management have had difficulty keeping pace. Ecological processes, including fire and other disturbance, and changing landscape conditions are often not integrated into land management planning and decisions. With few exceptions, existing land management planning is confined within individual agency boundaries and is based on single-program goals that are driven by agency missions and policies. Separate, incompatible planning systems can also preclude the ecosystem perspective in land management planning. This type of planning can result in an inefficient, fragmented, short-term approach to management that tends to ignore broad, interdisciplinary-based, long-term resource issues that cross agency boundaries. Land management agencies now recognize the need to break down these barriers and seek cooperative, ecologically sound approaches to land management on a landscape scale. One way to break down these barriers is to involve all interests, including the public, scientists, resource specialists, and regulators, throughout the planning process. Another is to establish a clear link for communication and information transfer between scientists and managers. These measures will help to ensure that management needs are met and that current science is used in land management planning at all levels.

Planning must also consider the risks, probabilities, and consequences of various management strategies, e.g., fire use versus fire exclusion. In a responsive planning process, management decisions must be monitored, integrated, and supported at each step. In order to carry out critical and effective "adaptive management" (a feedback approach to management that uses monitoring results to plan future actions), planners and managers need a nationwide baseline measure of ecological condition and a compatible method of assessing long-term ecological health by ecosystem type.

We must understand and accept the need to integrate wildland fire into land management plans and activities, and this integration must be reconciled with other societal goals, e.g., maintaining species habitat, producing commodities, and protecting air quality, water quality, and human health. Laws and regulations must consistently address long-term ecosystem processes and must guide agencies toward a common

goal. Information about the consequences of various management strategies is not currently available to assist in working toward and prioritizing simultaneous goals. Land management and regulatory agencies must interact and collaborate and must rely upon a continuous process of public involvement and feedback to achieve a balance of ecosystem and other societal goals.

REINTRODUCTION OF FIRE

Several factors hinder the reintroduction of wildland fire on an ecologically significant scale. Even now it sometimes takes years to reach agreement about appropriate treatments and to take action. Land managers often feel the need to wait for scientific certainty before acting. This favors the status quo, impedes progress, and deters investigation of new techniques. In some ecosystems, little or no information is available about disturbance regimes, historical fire patterns, response to past management actions, and likely future responses. Information needed to reintroduce fire includes a well-planned, large-scale scientific assessment of current ecosystem conditions and the consequences of various management strategies.

Another constraint is that Fire Management Plans are not in place in all areas, thus precluding managers from taking advantage of the management options presented by wildland fires. Planning should consider all wildland fires, regardless of ignition source, as opportunities to meet management objectives. In areas where planning has determined a range of appropriate management actions for the use of wildland fire, there will be more opportunities to safely and cost-effectively reintroduce fire. This approach will also make suppression resources available for the highest-priority situations. All wildland fire management actions will continue to be based on values to be protected, fire and land management objectives, and environmental conditions. In many situations, such as fires occurring in highly developed areas or during particularly severe weather, immediate initial attack and prompt suppression will still be required.

An additional contributing factor is the increasing human settlement that encroaches upon wildlands (wildland/urban interface). Such development divides and fragments wildlands, making it difficult to apply ecosystem-based management strategies. This increases the risk of escaped fires and generates complaints about

smoke and altered scenic values. In these areas, the use of fire may be limited in spatial extent and, even where fire introduction is desirable, progress may be slow.

Smoke is perceived as a factor that may affect land managers' ability to use larger and more frequent wildland fire for restoration and maintenance of fire-dependent ecosystems. Several Federal air quality programs under the Clean Air Act (CAA) regulate wildland fire emissions. The Environmental Protection Agency (EPA) is required to set air quality standards for pollutants that affect public health. States are then required to submit plans to ensure measures will be taken to meet those air quality standards. Local areas may also develop plans that may be more (but not less) restrictive than State and national standards.

In areas where air quality standards are violated, measures must be taken to reduce emissions. Emission control measures for fires that are used to meet management objectives include smoke management techniques that minimize and disperse smoke away from smoke-sensitive areas. Smoke from fires may also cause standards to be exceeded in communities miles away from the source. Currently, prescribed fires are not considered to be a significant cause of nonattainment, but with increased burning to reduce fuels and restore or maintain ecosystem health, this may change. In many areas, fire managers and local air quality authorities have successfully worked together to accomplish fire and land management objectives, resolve conflicts with smoke emissions, and avoid violation of air quality standards. With guidance from the national level to provide consistent interpretation, further cooperation at the local level will help to achieve a balance of air quality and other ecosystem goals.

Fire is a unique tool that land managers can use to complement agency missions and land management objectives. But in order to successfully integrate fire into natural resource management, informed managers, partners, and the public must build upon sound scientific principles and social values. Research programs must be developed to create this foundation of sound scientific principles. Before fire is applied on an ecosystem-scale, an understanding of historical fire regimes, as well as a knowledge of the current conditions of each system, is needed. Then all parties must work together in the land management planning and implementation process according to agreed-upon goals for public welfare and the health of the land.

EDUCATION

For many people, fire remains a fearsome, destructive force that can and should be controlled at all costs. Smokey Bear's simple, time-honored "only you" fire prevention message has been so successful that any complex talk about the healthy, natural role of fire and the scientific concepts that support it are often lost by internal and external audiences. A comprehensive message is needed that clearly conveys the desired balance of avoiding fires with adverse effects while simultaneously increasing ecologically beneficial fire.

The ecological and societal risks of using and excluding fire have not been adequately clarified and quantified to allow open and thorough discussions among managers and the public. Few understand that integrating fire into land management is not a one-time, immediate fix but a continual, long-term process. It is not an end in itself but rather a means to a more healthy end. Full agency commitment to internal and external information and education regarding fire and other ecological processes is needed. Adaptive and innovative fire and land management is severely limited when agency employees and the public misunderstand or remain skeptical about the role of fire.

THE TASK

The task before us — reintroducing fire — is both urgent and enormous. Conditions on millions of acres of wildlands increase the probability of large, intense fires beyond any scale yet witnessed. These severe fires will in turn increase the risk to humans, to property, and to the land upon which our social and economic well-being is so intimately intertwined.

RECOMMENDATIONS: PLANNING

GOALS

- Fire management goals and objectives, including the reintroduction of fire, are incorporated into land management planning to restore and maintain sustainable ecosystems. Planning is a collaborative effort, with all interested partners working together to develop and implement management objectives that cross jurisdictional boundaries.
- Clearly defined fire management goals, objectives, and actions are developed and updated in comprehensive Fire Management Plans. The use of fire to sustain

ecosystem health is based on sound scientific principles and information and is balanced with other societal goals, including public health and safety, air quality, and other specific environmental concerns.

ACTIONS

Federal agencies will:

- use a compatible fire management planning system that recognizes both fire use and fire protection as inherent parts of natural resource management; this system will ensure adequate fire suppression capabilities and support fire reintroduction efforts.
- develop Fire Management Plans for all areas subject to wildland fires. These plans will:
 - use information about fire regimes, current conditions, and land management objectives as a basis to develop fire management goals and objectives.
 - address all potential wildland fire occurrences and include a full range of fire management actions.
 - use new knowledge and monitoring results to revise fire management goals, objectives, and actions.
 - be linked closely to land and resource management plans.
- develop research programs that provide a sound scientific basis for the integration of wildland fire into land-use and resource management.
- create a system for coordination and cooperation among land managers and regulators that explores options within existing laws to allow for the use of fire to achieve goals of ecosystem health while at the same time protecting individual components of the environment, human health, and safety. This system will:
 - allow for early collaboration during the process of developing new land management plans and provide a mechanism for incorporating input as existing plans are implemented or revised.

- encourage land managers and regulators to enter into agreements that set forth the actions each will take before and during the time fire is reintroduced in their area of responsibility.
- continue ongoing efforts to jointly develop compatible, ecosystem-based, multiple-scale, interagency land management plans that involve all interested parties and facilitate adaptive management. This process will:
 - fully integrate ecological concepts that consider long-term dynamics and cross agency boundaries.
 - effectively incorporate current fire-related information, including scientific knowledge, risk assessment, social and economic concerns, and public health considerations.
 - ensure that existing land management plans are revised or updated to address the above actions.

**RECOMMENDATIONS:
REINTRODUCTION OF FIRE**

GOAL

- Based upon sound scientific information and land, resource, and fire management objectives, wildland fire is used to restore and maintain healthy ecosystems and to minimize undesirable fire effects. Fire management practices are consistent for areas with similar management objectives, regardless of jurisdiction.

ACTIONS

- Federal agencies will:
- expedite the decision-making process by jointly developing criteria for evaluating ecosystem condition by ecosystem type and for prioritizing areas for the reintroduction of fire to meet resource objectives and reduce hazards. This process will identify those ecosystems:

- where fire does not need to be reintroduced (fire is not a significant natural component, or the fire regime has not been altered).
- where fire is unlikely to succeed (fire would be adverse, such as areas significantly altered by fuel accumulations and species changes); determine appropriate, ecologically sound alternatives for these areas.
- where treatment with fire is essential or potentially effective (fire is needed to improve resource conditions or reduce risk and hazard).
- jointly implement ecosystem-based fire management programs to accomplish resource or landscape management objectives when consistent with land management plans. These programs will:
 - strive to maintain the long-term integrity of the natural resources and minimize the undesirable effects of fire.
 - address the highest-priority needs in ecosystem assessment, monitoring, and management and determine the appropriate scope of fire use, consistent with historical fire regimes, including extent, timing, and risks and consequences.
 - use existing tools and develop new ones to address today's more fragmented landscapes and to enhance our ability to manage wildland fires of varying size and intensity.
 - illustrate the management actions and their results by establishing or expanding fire management demonstration areas.
- conduct a collaborative fire research program to improve the predictive understanding of wildland fire and its relationship to ecosystem dynamics and to strengthen the technological capabilities and organizational framework necessary to sustain the role of fire in natural ecosystems.

**RECOMMENDATIONS:
EDUCATION**

GOAL

- Clear and consistent information is provided to internal and external audiences about existing conditions, management goals and objectives, the role of fire in achieving these objectives, and alternatives and consequences of various fire management strategies. As a result, informed audiences participate fully in the land and fire management planning processes.

ACTIONS

Federal agencies will:

- establish an interdisciplinary team that includes all agencies, regulators, and other partners to design a consistent fire-role and -use message for decision makers and the public. This message will:
 - describe and clearly explain issues such as ecosystem condition, risks, consequences (including public health impacts), and costs in open dialogue with internal and external constituents.
 - be designed to maximize open communications and reduce polarization among conflicting interests regarding the use of fire.

- build on existing interagency efforts to develop and implement a strategic plan that educates the general public and agency personnel about the role of fire. As part of this effort, agencies will:

- develop and widely transmit a clear message about the important role of fire as a natural process and the risks and consequences of its use and exclusion.

- integrate this message into existing agency communication systems, agency and partner initiatives (such as forest health, ecosystem management, etc.), and all external outreach efforts, including television, magazines, newspapers, and public meetings.

- encourage, create, and coordinate partnerships to achieve consistency in messages, build public trust, and obtain public opinion.

- develop mandatory national and regional interagency training programs to instill in all employees an understanding of the role of fire in natural systems.

USE OF WILDLAND FIRE



Igniting a wildland fire using drip torches is an effective resource management tool. Here, fire is being used to restore critical wildlife habitat. (Photo courtesy of National Interagency Fire Center.)

SITUATION

BACKGROUND

The use of wildland fire to accomplish land and resource management objectives is referred to as prescribed fire, the deliberate application of fire to wildlands to achieve specific resource management objectives. Prescribed fires may be ignited either by resource managers or by natural events such as lightning. Wildland fire may be used to accomplish a number of resource management purposes, from the reduction of fuel hazards to achieving specific responses from fire-dependent plant species, such as the regeneration of aspen. Often, multiple fire protection and resource management benefits are achieved concurrently.

Prescribed burning is a well-established practice utilized by public and private land managers. In order to effectively use prescribed fire, land managers must prepare comprehensive burn plans. Each plan specifies desired fire effects; weather conditions that will result in

acceptable fire behavior; and the forces needed to ignite, hold, monitor, and extinguish the fire. Generally, the practice of prescribed burning has been used on a relatively small scale and confined to single land ownerships or jurisdictions. Success has been built around qualified and experienced people, their understanding of plant communities and terrain conducive to the use of fire, adequate funding, a supportive public, and a willingness on the part of agency administrators to assume a reasonable amount of risk to achieve desired results.

Recent fire tragedies in the West have helped to focus attention on the need to reduce hazardous fuel accumulations. Many areas are in need of immediate treatment of both live and dead vegetation to prevent large-scale, high-intensity fires and to maintain their sustainability as healthy ecosystems. Fuel treatment may be achieved by mechanical, chemical, biological, and manual methods, including the use of fire. Strategic landscape-scale fuel management and fire-use planning, often integrating a variety of treatment methods, will be necessary to cost-effectively reduce fuel hazards to acceptable levels and to achieve both ecosystem health and resource benefits. Both naturally occurring fuels and hazardous fuel accumulations resulting from resource management and land-use activities must be addressed.

IMPLEMENTATION

Managing for landscape health requires expansion of cooperative interagency prescribed fire programs. Agencies must make a commitment with highly qualified people, from leader to practitioner, and provide funding mechanisms to conduct the program. Federal agencies must foster a work force that understands the role of fire and, at the same time, raise the level of public understanding. Public opinion and perception may limit increases in interagency prescribed fire programs if this is not achieved. Therefore, continued Federal efforts to work collaboratively with and educate private landowners, interest groups, and the media is paramount. Education efforts should focus on exposing the public to accurate information on the environmental, social, and economic benefits that result when prescribed fire is used; how natural resources may be maintained; and the risks involved, including those associated with not taking any action. Increased use of

wildland fire may also increase public exposure to smoke and reduced visibility. Understanding of the trade-offs involved is an important educational objective.

Recent concerns about potential climate change caused by increased carbon dioxide in the atmosphere have also raised questions about the potential impacts of increasing the use of fire. Current analysis suggests that the carbon dioxide released from prescribed fires is ultimately removed by the subsequent regrowth of vegetation. Lower-intensity prescribed fires emit far less carbon dioxide than high-intensity fires. Therefore, if the occurrence of high-intensity fires is reduced through an increase in prescribed burning, a net reduction in carbon dioxide emissions will be achieved. On the other hand, the effects of global warming and increased carbon dioxide on fire occurrence are still being determined. Possibilities include higher rates of fuel accumulation and a warmer climate with more days that favor the occurrence of wildland fire. This may mean it is even more important to increase the use of fire for ecosystem management and hazard fuel reduction. The policies described in this report are consistent with current concerns about climate change. In any case, information about changes in the atmosphere should be incorporated into the preplanning required by these policies.

ADMINISTRATIVE BARRIERS

In the current atmosphere of downsizing and reduced budgets, agencies may not be able to maintain sufficient numbers of qualified personnel to accomplish broad-scale prescribed fire programs. Many of the employees who are most experienced in the application of prescribed fire are the same employees who are responsible for wildfire suppression. This can lead to competition for their time during the fire season. Administrative procedures also inhibit temporary hiring of personnel needed to conduct on-the-ground prescribed burning activities.

Current direction on hazard-duty pay also tends to limit the number of prescribed fire professionals. This direction restricts fire-related hazard pay to fire suppression activity within or adjacent to the perimeter of an uncontrolled wildfire, even though prescribed fire practitioners are exposed to as much risk, if not more, from smoke and other environmental factors than firefighters engaged in suppressing wildfire.

Retirement benefits have also been a factor in career choices involving prescribed fire. Recently, the BLM recognized that, based on 5 CFR 831.900 and 842.800, prescribed fire activity qualifies for primary coverage under special firefighter retirement. In some agencies, however, prescribed fire activity qualifies only for secondary coverage, resulting in a career choice limitation.

To provide optimal biological benefit to forests and rangelands, the timing and intensity of prescribed fire used for ecosystem maintenance should resemble a natural occurrence. Historically, fires were often very large; however, current land-ownership patterns, development, and the processes of funding and conducting prescribed fire are not conducive to replicating this process. For example, it is difficult to have a landscape-size project without involving lands of another ownership, and there are barriers to spending agency funds on non-agency lands. Further, planning, budgeting, and accomplishment-reporting processes do not encourage managers to plan large projects with multiple benefits, even when located entirely on agency-administered lands.

Lastly, there is no consistent method to determine the potential for a prescribed fire to escape, nor is there a mechanism to compare the values at risk from an escaped fire versus those at risk by continuing to exclude fire. When a prescribed fire does escape, the only way a private property owner can be compensated for more than \$2,500 in damages is to pursue a tort claim against the Federal government. To prevail, the damaged party must prove negligence on the part of the agency. This cumbersome process leads to ill will between the managing agency and neighboring landowners, adversely affecting cooperation.

RISK MANAGEMENT

Because of the potential for unintended consequences, prescribed fire is one of the highest-risk activities that Federal land management agencies engage in. Escaped prescribed fires can result from poorly designed or poorly executed projects; they can also result from events beyond the control of those conducting the project, such as unpredicted winds or equipment failure. Currently, the stigma associated with an escaped prescribed fire does not distinguish between poor performance and an unfortunate consequence of unplanned events.

Although fire is used to accomplish resource objectives in many areas of the United States, other than in the South it is rarely used enough to improve ecosystem health or to reduce fuel hazards on a landscape scale. One reason for this is a lack of commitment to the use of fire. While land management agencies as a whole generally recognize the role of fire as a natural process, not all individual disciplines and managers fully understand or support this role. Some managers are unwilling to accept the risk of potential negative consequences associated with prescribed fire. Differences of opinion concerning the effect of fire on specific resources, such as cultural resources, water quality, air quality, and certain flora and fauna, can also impede the use of fire as a management tool.

**RECOMMENDATIONS:
IMPLEMENTATION**

GOALS

- The use of wildland fire is accepted as an essential process in a fully integrated program to improve forest and rangeland health and to maintain wildland ecosystems.
- Wildland fuels are managed at levels consistent with wildland fire protection and resource management objectives identified in land and resource management plans.
- Agencies collectively and cooperatively develop and maintain an organization that can effectively plan and safely implement prescribed fire and fuel management programs.

ACTIONS

Federal agencies will:

- jointly develop programs to plan, fund, and implement an expanded program of prescribed fire in fire-dependent ecosystems.
- facilitate the planning and implementation of landscape-scale prescribed burns across agency boundaries. Seek opportunities to enter into partnerships with Tribal, State, and private land managers to achieve this objective where appropriate.
- require appropriate treatment of fuel hazards created by resource-management and land-use activities.

- conduct all prescribed fire projects consistent with land and resource management plans, public health considerations, and approved prescribed burn plans.
- implement the National Wildfire Coordinating Group (NWCG) interagency prescribed fire qualification and certification standards.
- train and maintain a qualified and adequate work force to plan and implement interagency prescribed fire projects safely and effectively, and make these personnel available when needed.
- jointly develop simple, consistent hiring and contracting procedures for prescribed fire activities.
- Conduct research and development on fuel treatment alternatives and techniques.

**RECOMMENDATIONS:
ADMINISTRATIVE BARRIERS**

GOAL

- Administrative procedures support the accomplishment of prescribed burning programs and objectives.

ACTIONS

Federal agencies will:

- seek authority to eliminate internal barriers to the transfer and use of funds for prescribed fire on non-Federal lands and among Federal agencies.
- seek authority or provide administrative direction to eliminate barriers to carrying over from one year to the next all funds designated for prescribed fire.
- work with the Office of Personnel Management to acquire authority for hazard pay to compensate employees exposed to hazards while engaged in prescribed burning activities.
- clarify that prescribed fire positions qualify for primary coverage under special firefighter retirement and issue appropriate guidance to field offices.

**RECOMMENDATIONS: RISK
MANAGEMENT / SUPPORT**

GOALS

- Risk of escaped prescribed fire is minimized through sound planning and execution.
- Agencies within the Departments of Agriculture and the Interior support employees when properly planned and conducted prescribed fire projects have unfavorable outcomes.

ACTIONS

Federal agencies will:

- jointly develop an assessment process for determining the probability of success and/or failure associated with the use of prescribed fire and evaluating potential positive and negative consequences. As a part of this process, the effects of not conducting the project will also be evaluated.

- jointly develop tools to identify, assess, and mitigate risks from prescribed fires.

- create an organizational climate that supports employees who implement a properly planned prescribed fire program.

- reevaluate prescribed burn planning and execution requirements to ensure adequacy of direction without unnecessary constraint.

Secretaries of the Interior and Agriculture will seek legislation providing for prompt reimbursement to private landowners for damages resulting from escaped prescribed fires originating on Federal lands.

PREPAREDNESS AND SUPPRESSION



Helicopter with bucket fighting a wildland fire. Aircraft and other mechanized equipment are important tools in suppressing and managing wildland fire. (Photo courtesy of National Interagency Fire Center.)

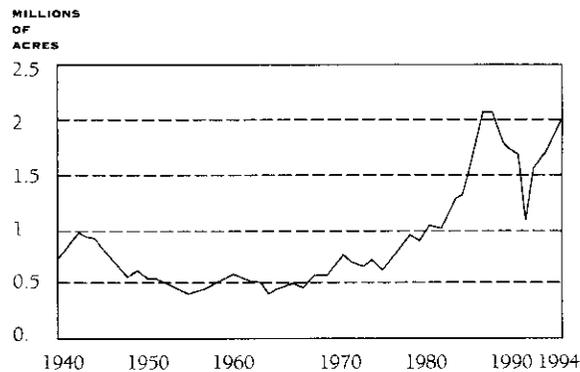
SITUATION

The business of suppressing wildland fires is costly, time-consuming, and often dangerous to firefighters and the public. Wildland fires occur unexpectedly and create an emergency in which firefighters race to minimize harm to valuable resources or property. Despite public expectations, when the combination of excessive fuel build-up, topography, extreme weather conditions, multiple ignitions, and extreme fire behavior occurs, it is impossible to immediately suppress every wildland fire. Firefighters' safety and their ability to contain and limit the spread of fires can only be ensured by preparing well ahead of time, thoroughly examining various possibilities of fire numbers and sizes, and developing contingency plans to cope with them.

Our ability to plan for and suppress fires is negatively impacted by successes in the past. Almost one hundred years of fire suppression, coupled with

other resource management activities, has altered the landscape and resulted in millions of acres of forests and rangelands at extremely high risk for devastating fires to occur. Already we are seeing the effects through an increase in the number of fires and acres burned, as shown in the table below. This trend, combined with a number of existing policies and procedures, impacts all aspects of interagency preparedness and suppression, including safety, planning, priority setting, and organizational response capability. In some cases, agencies are individually attempting to solve these problems. However, in light of diminishing work forces and funding, it is critical that Federal wildland fire management agencies work together and with cooperators to arrive at common solutions and successful strategies.

**WILDFIRE TRENDS - ELEVEN WESTERN STATES
AVERAGE ACRES BURNED, 1940-1994**



SAFETY LEADERSHIP

The environment of numerous and complex wildland fires and overextended firefighting resources has led to increased potential for compromising firefighter safety. Agency administrators and fire managers struggle to get the job accomplished, and while they focus on suppressing fires, sufficient attention may not be paid to safety. They may not provide adequate oversight to make sure employees are in good physical condition and adequately rested so they are mentally and physically prepared for the challenge of firefighting. As suppression actions increase, it becomes more difficult to ensure that all the necessary information to make good firefighting strategic decisions is shared.

Reorganization and downsizing efforts are compelling Federal agencies to look at new ways to accomplish their programs, including firefighting. Retirements and organizational changes have changed the demographics and experience levels within the fire program. In some cases, agency administrators and fire management officers do not have the same level of experience in fire management oversight as did their predecessors. Managers are rarely rewarded for success or given incentives to improve. Further, the demands created by more complex natural resource issues and multiple program priorities have diverted administrators' attention away from the fire management program. Lack of oversight and attention to preparedness can result in crisis decision making and safety failures. When fires become emergencies, public and political pressures may take precedence over suppression plans that are based on values to be protected and the best use of available firefighting resources.

**VALUES TO BE PROTECTED AND
PREPAREDNESS PLANNING**

Values at risk, or more clearly, values to be protected are a primary consideration when determining strategies for large-fire suppression. Only anticipated fire suppression costs and losses in values have been considered in these calculations, because in suppression operations, the objective as predetermined in land management plans and Congressional budget appropriation language is to suppress wildfires at the least total cost. While fire benefits have been considered in planning the fire suppression resources for budget allocations, positive benefits of fires have not been factored into the formulation or choice of suppression strategies.

Use of values-to-be-protected criteria in fire suppression has not been consistent across agencies, and the definition is too narrow without considering fire benefits as well. These practices contribute, sometimes significantly, to inflated fire suppression costs. The values-to-be-protected concept should be revised to reflect current recognition of the positive benefits of fire as compatible with agency land management objectives, as well as the need for a broader range of strategic suppression alternatives for large fires to hold costs in check and recognize limits of firefighting resources.

Preparedness planning is critical to ensure that imminent fire situations are recognized, that an appropriate level of fire protection is provided in support of land and resource management goals and objectives, and that appropriate priorities are established and actions taken. The absence of carefully developed and specific preparedness plans frequently results in poor decisions that lead to costly operational mistakes or unsafe practices during emergency situations. Another critical aspect of preparedness planning is development and implementation of wildland fire prevention plans. The objective of these plans, as demonstrated by the message of Smokey Bear over the past 50 years, is to prevent unauthorized ignition of wildland fire.

PROTECTION PRIORITIES

Standard criteria have been established to guide fire suppression priorities. These have been based on the potential for the fire to destroy: (1) human life, (2) property, and (3) resource values. Human life remains the first priority; however, the second priority of property over natural or cultural resource values is being questioned by fire managers and others. It limits managers' flexibility to consider low-value properties relative to higher-valued natural or cultural resources. Property protection is a significant contributor to inflated suppression costs as well as increased size of wildfires when limited suppression resources are concentrated to protect property. More flexibility is needed in assessing the relative values of property and natural/cultural resources in order to achieve economic efficiency.

PROTECTION CAPABILITY

Differences in budget processes among agencies inhibit full cooperation. The most important issue is the separate funding requests for seasonal severity funding, where coordinated planning and funding for pre-positioning resources on a local basis is a critical part of preparedness. This requires shifting funds from emergency suppression to pre-positioning resources. Differences in the use of emergency firefighting appropriations among agencies also inhibit cooperation on prescribed fire actions. Standardization of budget processes and solution of some of these budget barriers will help to incrementally improve fire suppression capabilities.

**RECOMMENDATIONS:
SAFETY LEADERSHIP**

GOAL

- Every firefighter, every fireline supervisor, every fire manager, and every agency administrator takes positive action to ensure compliance with established safe firefighting practices.

ACTIONS

Federal agencies will:

- establish fire management qualifications based on program complexity, and staff existing and future agency administrator and fire management vacancies with individuals who meet these qualifications and who are committed to accomplishing the total fire management program.
- develop appropriate tools (training, handbooks, job performance guidelines, planning documents) necessary to assist administrators and fire management personnel to develop and manage a safe and effective fire management program.
- through training, job details, or other methods, increase experience and fire qualifications of agency administrators and fire management personnel.
- enforce a system of accountability to manage a safe and efficient fire management program based on standard job performance requirements. These requirements should include items specifically related to safety and will recognize and reward success and provide disciplinary action for failure.
- establish partnerships with contractors; cooperators, such as rural and volunteer fire departments; and others, which encourage and assist them to adopt and implement Federal standards for training, qualifications, firefighting equipment, personal protective equipment, etc.

**RECOMMENDATIONS:
VALUES TO BE PROTECTED
& PREPAREDNESS PLANNING**

GOAL

- Federal agencies maintain preparedness planning and suppression programs to prevent unacceptable loss from fire. Agencies implement consistent strategies based on estimates of suppression costs commensurate with values to be protected.

ACTIONS

Federal agencies will:

- define values to be protected, working in cooperation with State, local, and Tribal governments; permittees; and public users. Criteria will include environmental, commodity, social, economic, political, public-health, and other values.
- develop long-range interagency wildland fire management objectives, based on values to be protected, across geographic and agency boundaries.
- develop interagency preparedness planning based on established interagency wildland fire management objectives.
- develop interagency strategies to implement preparedness plans. These strategies must consider both initial-attack and extended-attack capability and should include the full range of available cooperator and contractor resources.
- develop consistent language to be included in budget appropriations, enabling the full spectrum of fire management actions on wildland fires.
- work together and with other affected cooperators, groups, and individuals to develop and implement fire prevention plans to prevent unauthorized ignition of wildland fire.

**RECOMMENDATIONS:
PROTECTION PRIORITIES**

GOAL

- Firefighter and public safety is the first priority when managing wildland fire. Federal agencies have established protection priorities that recognize the relative values of property and natural/cultural resources to be protected.

ACTIONS

Federal agencies will:

- provide first for firefighter and public safety. Once people are committed to an incident, those resources become the highest value to be protected and receive the highest management considerations.
- protect property and natural/cultural resources secondary to firefighter and public safety.
- base the second protection priority on the relative values of property and natural/cultural resources when firefighting personnel and equipment are limited.

**RECOMMENDATIONS:
PROTECTION CAPABILITY**

GOAL

- Federal agencies maintain sufficient fire suppression and support capability.

ACTIONS

Federal agencies will:

- use standard criteria to assess overall suppression and support requirements.

- examine and identify, on an interagency basis, employee availability at each organizational level, based on fire qualifications and other necessary skills to provide needed suppression and support. This will include planning for both initial attack and extended attack at the local level.
- develop and utilize, to the maximum extent possible, the concept of closest initial attack forces and interagency staffing for wildland fire suppression and support, optimizing the use of the Federal and non-Federal work force. Qualified contractors are a component to be considered in suppression and support planning.
- use an analysis and decision making process that considers, on an interagency basis, existing and potential fire severity; suppression resource commitment and availability; prescribed fire activity; environmental, social, and political concerns; and other pertinent factors.
- develop interagency severity plans to provide increased fire suppression capability in emergency situations, including accessing additional resources, pre-positioning resources, and training emergency firefighters.
- develop a standard interagency planning, budgeting, and staffing process.

WILDLAND/URBAN INTERFACE PROTECTION



Fire threatening homes in the wildland/urban interface. Flammable building materials and homes surrounded by dense vegetation create a dangerous fuel source and hazardous conditions. (Photo courtesy of National Interagency Fire Center.)

SITUATION

BACKGROUND

The wildland/urban interface is defined as the line, area, or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels (SAF, July 1990). It is synonymous with the term "intermix."

In reviewing current conditions, it is evident that wildland/urban interface fire protection and prevention is not a new problem, nor are the recommended solutions newly conceived. Many of the reports and recommendations generated in the aftermath of the wildfires that destroyed homes are very similar in content and substance. For example, documents created as early as 1960 and through the 1970s and 1980s all contain the same goals, i.e., "create a uniform hazard rating system" or "wildland fuels must be managed near structures."

The problem is not one of finding new solutions to an old problem but of implementing known solutions. Deferred decision making is as much a problem as the fires themselves. If history is to serve us in the resolution of the wildland/urban interface problem, we

must take action on these issues now. To do anything less is to guarantee another review process in the aftermath of future catastrophic fires.

CURRENT STATUS

Wildland/urban interface protection is important to the Federal government because Federally managed lands are located adjacent to or among State lands and developed private lands. Past fire management practices have contributed to a build-up of highly flammable, decadent fuels on those Federal lands that are adjacent to private residential developments. The result is that fire hazards and risks, as well as the population, are increasing in the wildland/urban

interface adjacent to many Federal lands. In these areas, Federal wildland firefighters are often called upon to assist local agencies. In some cases, Federal agencies are the only source of fire protection. Federal firefighting resources may also be asked to provide assistance where there is no direct threat to Federal lands, such as occurred on Long Island, New York, in August 1995. However, with limited amounts of money, time, equipment, and people, a fire burning in the interface currently demands the protection of scattered structures at the sacrifice of natural resources elsewhere. This represents a significant fiscal liability to the Federal treasury, State and local governments, and insurance carriers. There are often large unreimbursed costs to property owners as well. In addition, Federal response in the interface creates a safety concern, "spreading Federal firefighters thin" and placing them in situations for which they may not be adequately trained or equipped.

Recent fires such as the 1994 Tye fire in Washington, the 1994 Chicken and Blackwell/Corral complexes in Idaho, the Southern California fire siege of 1993, and the 1991 Oakland Hills fire are clear examples of the complexity of protecting the wildland/urban interface.

Nearly every State has experienced wildland/urban interface fire losses, including the Pine Barrens in New Jersey, Piedmont in North and South Carolina, Palmetto in Florida, and Jack Pine in the Lake States.

The interface has become a major fire problem that will escalate as the nation moves into the 21st century. People continue to move from urban areas to rural areas. These new wildland/urban immigrants give little thought to the wildfire hazard and bring with them their expectations for continuation of urban emergency services. The National Fire Protection Association (NFPA) estimates that since 1985 wildfire destroyed more than 9,000 homes and resulted in the deaths of many firefighters and private citizens. It is estimated that in 1994 \$250 - \$300 million of Federal wildland fire suppression dollars were spent in protecting the wildland/urban interface. Since fiscal year 1970, the Federal Emergency Management Agency (FEMA) has provided approximately \$64 million in fire suppression assistance grants to States for the suppression of fires on publicly or privately owned forests or grasslands that have threatened destruction that would constitute a major disaster.

Recent reports such as the National Commission on Wildfire Disasters Report (1993) and Fire In Rural America (1992) document the continued expansion from urban areas to rural areas. There is limited data to quantify the extent of the current or projected growth in the wildland/urban interface; however, it is clear from recent episodes that losses will continue to increase in the future.

Fire protection problems in the wildland/urban interface are very complex. Complicated barriers must be overcome to address them. These barriers include legal mandates, zoning regulations, fire and building codes, basic fire protection infrastructure, insurance/fire protection grading and rating systems, environmental concerns, and Fire Protection Agreements. Political, social, and psychological factors further complicate the problems. There is no one simple solution. Leadership and cooperation are essential.

The autonomy and multiple mandates of Federal agencies contribute to inconsistent and sometimes conflicting policies and procedures. Federal, Tribal, State, and local agencies, as well as the private sector, are all facing the wildland/urban interface protection issue. Even though past reports, reviews, and mitigation plans have articulated the problems and recommended solutions, many of the problems still have not

been solved. We can no longer continue to study, but must have a commitment to carry out solutions.

The ability of the Federal agencies to provide leadership for solving interface protection problems is complicated because responsibilities extend beyond the Departments of the Interior and Agriculture. FEMA is directly responsible for providing Fire Suppression Assistance Grants and, in certain cases, major disaster assistance and hazard mitigation grants in response to fires. Fire Suppression Assistance Grants are provided to a State for the suppression of a forest or grassland fire on public or private lands that threatens to become a major disaster. The grants are provided to protect life and improved property and may include funds for equipment, supplies, and personnel. A Fire Suppression Assistance Grant is the form of assistance most often provided by FEMA to a State for a fire. The grants are cost-shared with States. FEMA's U.S. Fire Administration (USFA) provides public education material addressing wildland/urban interface issues, and the USFA's National Fire Academy provides training, primarily for structural fire service organizations. The Environmental Protection Agency (EPA) has regulatory responsibility concerning air quality, smoke management, and other environmental issues. The Department of Defense has direct suppression responsibility on military reservations and may also be tasked to provide suppression assistance.

But there is no central coordination, and there is no single policy that clearly defines the Federal land manager's role or requires agencies to take compatible actions in the wildland/urban interface. Only the National Park Service has specific structure protection responsibility, and only for their facilities on their lands. Current Federal agency mission statements, and operational policies vary and generally restrict activity within these areas. As a result, Federal land managers and fire personnel are uncertain about their role. Further, personnel are often inadequately trained and equipped, but in practice they are expected to provide assistance.

Uncertainty over the role of Federal land management agencies in the wildland/urban interface is a barrier to effective fire protection. This was validated by public comments received during the public scoping process and from the comments received during the Draft Report comment period for this policy review. It is also apparent in current policies of the Federal land management agencies. There is a dichotomy between Federal policy

and expectations. Agency administrators' views on this issue cover the entire spectrum from "the Federal government has no business in the urban interface" to "Federal involvement is essential in the interface." This causes confusion and operational inconsistency both before and during suppression efforts.

Current Federal agency wildland/urban interface policies are limited to providing emergency assistance and training and cooperating in prevention efforts. But property owners and elected officials generally have a broader perception of Federal responsibility and consequently oppose Federal government withdrawal from wildland/urban interface fire protection.

Current Federal policy that protection priorities are (1) life, (2) property, and (3) resources limits flexibility in decision making when a wildfire occurs. Wildland suppression resources are often diverted to protect property with less value than adjacent or intermixed natural resources, and the safety of wildland fire personnel is compromised. Federal agencies' capability to fulfill their resource-protection responsibilities outside of the interface is weakened by commitment of firefighting resources before and during wildland/urban interface fires. Firefighter safety is threatened when they are placed in a position of operating beyond their training, experience, and equipment capabilities. In addition, after-action reports indicate that fire suppression resources are often "over-mobilized," which results in inefficient use and under-utilization. Generally, in emergency situations, protection agencies respond with more suppression forces than can be effectively managed in the interface.

Current protection programs and policies do not include all urban and wildland fire protection entities with statutory responsibility, which has led to inefficiencies in training and operations. Operations in the wildland/urban interface are not always well organized and safe due to inconsistent qualifications, performance standards, and experience among local, State, and Federal agencies and Tribal governments. Performance qualifications in the wildland/urban interface are divided between the structural and wildland fire certification systems, resulting in inconsistencies.

Primary responsibility for wildland/urban interface fire prevention and protection lies with property owners and State and local governments. Property owners have responsibility for compliance with State statutes and local regulations where they exist. These primary responsibilities should be carried out in partnership with the Federal government and private sector.

PUBLIC PERCEPTION OF RISK AND FIRE PREVENTION

In general, the public does not perceive a risk from fire in the wildland/urban interface. Further, property owners believe that insurance companies or disaster assistance will always be there to cover losses. When people believe the government will protect them from natural hazards, the damage potential of a catastrophic event increases. Fire prevention efforts, official pronouncements, and media depictions of imminent risk have been shown to have little effect on those in danger (Beebe and Omi, 1993). The effects of public education efforts have not been significant when compared to the need. Unless a catastrophic event occurs, wildland/urban interface protection issues generate little interest. There is a widespread misconception by elected officials, agency managers, and the public that wildland/urban interface protection is solely a fire service concern.

Local incentives to property owners, State and local organizations, and the private sector are an effective way to reduce the overall involvement of the Federal government in the wildland/urban interface. The Federal government itself has few mechanisms to encourage incentives to resolve the problems in these areas. There are two programs delivered through the USDA Forest Service: Rural Fire Prevention and Control (RFPC) and Rural Community Fire Protection (RCFP) that provide cost-share grants to Rural Fire Districts. The annual Federal share of these programs has remained relatively stable, totaling approximately \$16 million and \$3 million, respectively. Renewed focus of these programs, emphasizing local solutions, is encouraged.

Effective fire prevention in the wildland/urban interface is critical because of the values at risk. Traditional fire prevention campaigns have not recognized the beneficial role of fire in the environment. However, wildland agencies are beginning to incorporate this message, while structural fire prevention activities generally exclude wildland fire and thus depict all fire as undesirable. This sends conflicting messages to the public, particularly where prescribed fire is a desirable fuels management tool in wildland/urban interface protection.

It has been suggested that adjustments to insurance company premiums are the key to providing mitigation activities or to reducing wildland/urban interface hazards. Insurance companies are not in a

position to provide large economic incentives to address issues locally through a change in the existing grading and rating criteria or by supporting prevention or hazard mitigation activities. There is poor communication within and among the insurance industry and fire service organizations. The insurance industry does not fully understand wildland/urban interface problems, and the public and the fire service do not understand the role of the insurance industry in the interface. Currently, Insurance Service Offices/Commercial Risk Services (ISO/CRS) grading and rating criteria do not reflect wildland/urban interface hazards or protection needs at specific risk locations. Because fire risk constitutes only a relatively small portion of the homeowner's insurance cost, premium-reduction incentives are not necessarily the answer. Insurance companies can, however, help with education, improvements in building code rating systems, and revised protection criteria in the wildland/urban interface. Antitrust laws prohibit insurance companies from working together to establish minimum insurance requirements, and in some States, laws such as the Fair Access to Insurance Requirements Plan (FAIR) give homeowners access to insurance coverage generally without regard to the wildland/urban interface.

It has also been suggested that Federal costs could be reduced by billing property owners for suppression costs. While Federal agencies may have authority to seek reimbursement for fire suppression services in the wildland/urban interface, the probability of successful collection is extremely low. This is due to broad tort laws related to responsibility and negligence, existing State fire laws regarding point of fire origin and determination of suppression responsibility, and what constitutes reasonable action and appropriate hazard mitigation. The corollary is that the government can be sued for fires that originate on Federal land and burn onto private property.

The current fire protection infrastructure, such as roads and water-delivery systems, is often inadequate for property and resource protection during fast-moving wildfires. The cost of improving the existing infrastructure would be staggering. During major fire operations in the wildland/urban interface, most structure loss occurs in the first few hours of an incident. This is often due to a lack of fire-safe vegetation management practices. These losses will continue until appropriate access, landscaping, and construction standards are implemented and enforced.

HAZARD AND RISK ASSESSMENT PROCESS

Without a consistent process that assesses wildland/urban interface hazard and risk, values, and loss experience, it is difficult to prescribe appropriate mitigation measures. State and local communities perceive determination of hazard and risk – as well as regulation in response to these issues – as a local prerogative. Further, that regulation, through ordinances, is also determined by local governments. A nationally adopted hazard assessment model would likely lead to the implementation of options and alternatives that can be utilized in fire and building codes for new and existing construction. Developers, builders, and property owners generally oppose standards because they fear potential building restrictions and higher costs. Wildland/urban interface maps could be developed based on this uniform criteria.

MODEL PROGRAMS

Some areas of the country are facing wildland/urban issues collaboratively. These are model programs that include local solutions. Summit County, Colorado, has developed a hazard and risk assessment process that mitigates hazards through zoning requirements. In California, the Los Angeles County Fire Department has retrofitted more than 100 fire engines with fire retardant foam capability, and Orange County is evaluating a pilot insurance grading and rating schedule specific to the wildland/urban interface. All are examples of successful programs that demonstrate the value of presuppression and prevention efforts when combined with property-owner support to mitigate hazards within the wildland/urban interface. The International Fire Code Institute (IFCI) is developing an "urban-wildland" fire code.

FIRE PROTECTION AGREEMENTS

Current Federal agency wildland/urban interface protection policies do not lay out a clear, compatible, and unified role for the Federal land managing agencies. Consequently, some Federal agencies perceive they bear the heaviest burden in Fire Protection Agreements. Some administrators enter into agreements committing Federal firefighters, equipment, and money without understanding the implications of their actions. Still others are confused about the differences among Federal mutual-aid assistance, Fire Protection Agreements, and FEMA fire suppression assistance grants to States for declared fires.

PARTNERSHIPS

The key to solving the total wildland/urban interface problem rests with development of a unified, collaborative partnership among Federal agencies; Tribal, State, and local governments; and the private sector. This partnership should identify risks, hazards, values, and responsibilities. To be successful, the emphasis must be at the local level, supported by the States and coordinated with the Federal agencies. This fire protection and prevention issue cannot be solved by any one entity acting independently. Meanwhile, these long-term issues do not preclude Federal agencies from developing a compatible policy for wildland/urban protection on the lands they administer.

PROPOSED ROLE OF FEDERAL AGENCIES

The proposed role of the Federal land managing agencies in the wildland/urban interface is reducing fuel hazards on the lands they administer; cooperating in prevention and education programs; providing technical and financial assistance; and developing agreements, partnerships, and relationships with property owners, local protection agencies, States, and other stakeholders in wildland/urban interface areas. These relationships focus on activities before a fire occurs, which render structures and communities safer and better able to survive a fire occurrence.

The following protection priorities proposed in this report will guide fire planning and operations in the wildland/urban interface: 1) life and 2) property and natural/cultural resources based on relative values to be protected, commensurate with suppression costs.

Under the proposed policy, in emergency responses, the primary role of the Federal government is wildland firefighting. The Federal agencies may assist local protection agencies within the scope of Federal firefighters' training and experience. Often this involves working among structures. In these cases, attempting to protect the exterior of structures from fire is inevitable. Agreements should clarify respective roles and responsibilities regarding fire suppression in the wildland/urban interface. Federal, State, Tribal, and local agencies must share in the cost and allocation of suppression resources. The Federal government does not bear this responsibility alone.

In order to fulfill this proposed role, there must be training, qualifications, and equipment performance

standards. Standards must be institutionalized within existing training curricula, qualifications systems, and equipment performance criteria.

In support of others, the role of FEMA in the wildland/urban interface is to encourage comprehensive disaster preparedness plans and programs, increase the capability of State and local governments, and provide for a greater understanding of FEMA's programs at the Federal, State, and local levels. FEMA provides Fire Suppression Assistance to States in response to fires on public or private land that threaten to become a major disaster, encourages the development and implementation of viable multi-hazard mitigation measures, and provides training to clarify FEMA's programs.

FEMA administers the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act), which may provide assistance in response to a fire. First, a major disaster may be declared by the President when any natural catastrophe causes damage of sufficient severity and magnitude to warrant major disaster assistance. Such assistance supplements the efforts and available resources of States, local governments, and disaster relief organizations in alleviating the damage, loss, hardship, or suffering caused by the event. Second, Fire Suppression Assistance Grants may be provided to a State for the suppression of a forest or grassland fire that threatens to become a major disaster on public or private lands. These grants are provided to protect life and improved property and may include funds for equipment, supplies, and personnel. Third, following a major disaster declaration, the FEMA Hazard Mitigation Grant Program provides for long-term hazard mitigation projects and activities to reduce the possibility of damages from all future fire hazards and to reduce the costs to the nation for responding to and recovering from the disaster. States must have an approved hazard mitigation plan in place to receive either a Fire Suppression Assistance Grant or a Hazard Mitigation Grant.

The USFA serves to provide information to the public and training and standardization for structural fire service organizations. It is a member of the National Wildfire Coordinating Group's (NWCG) Wildland/Urban Interface Steering Committee and provides impetus to continue programs that address the wildland/urban interface issue.

RECOMMENDATIONS: RESPONSIBILITY

GOALS

- Wildland/urban interface fire protection policies are compatible among Federal agencies and promote partnerships with Tribal, State, and local governments and the private sector.
- Federal agencies address wildland/urban interface protection needs occurring on and adjacent to Federal lands through collaborative planning, analysis, and cooperative action across agency boundaries.

ACTIONS

Federal agencies will:

- adopt an operational role in the wildland/urban interface that includes wildland firefighting, hazard fuels reduction, cooperative prevention and education, and technical assistance.
- identify and fund, on a cost-share basis, high-priority fuels management activities on Federal lands adjacent to wildland/urban interface areas identified through a fire protection assessment process that considers relative values to be protected. These activities may involve adjacent non-Federal lands.
- lead by example in utilizing fire-safe standards at Federal facilities.

RECOMMENDATIONS: PREPAREDNESS

GOALS

- Fire Protection Agreements and partnerships are developed, approved, and promoted to clarify responsibilities and to provide for pre-fire hazard and risk mitigation activities and suppression preparedness.
- Firefighters are properly trained and equipped to ensure firefighter safety during wildland/urban interface operations.

ACTIONS

Federal agencies will:

- ensure that all wildland/urban interface areas are covered by Fire Protection Agreements; renegotiate existing agreements as needed to reflect a Federal

responsibility that is compatible with Federal policy and to ensure that State and local responsibilities are apportioned appropriately. Agreements will address all partners in these areas.

- incorporate wildland/urban interface considerations into agreements, operating plans, land management plans, and agency Fire Management Plans.

- charge the National Wildfire Coordinating Group with:

- identifying specialized skills and training that are needed by both wildland and structural fire agencies in the interface and incorporating those requirements into the Wildland Fire Qualification System to provide for safe and efficient operations in the wildland/urban interface.

- developing operational curricula, in cooperation with the National Fire Academy, for protection in the wildland/urban interface.

- implementing training through inter-agency systems and joint training activities and augmenting fire training not available at the State and local levels.

- identifying and implementing equipment standards for wildland/urban interface operation.

- identifying and establishing a data-collection mechanism, in coordination with Tribal, State, and local governments; insurance industry; National Fire Protection Association; and others, to better assess the nature and scope of the wildland/urban interface fire problem.

- increase emphasis on cost-share program assistance in the wildland/urban interface through the Forest Service State and Private Cooperative Fire Program, including training and equipping of State and local agencies. Assess and revise, as needed, other mechanisms to ensure funding is directed to agencies with wildland/urban interface responsibilities.

- educate agency personnel on Federal cost-share and grant programs, Fire Protection Agreements, and other related Federal programs so the full array of assistance available to States and local agencies is understood.
- participate in the development and execution of a national wildland/urban interface fire hazard mapping scoping study in cooperation with Tribal, State, and local governments and the private sector.

**RECOMMENDATIONS:
PUBLIC EDUCATION**

GOAL

- An informed public understands the hazards and risks from fire in the wildland/urban interface and the prevention methods available to mitigate these hazards.

ACTIONS

Federal agencies will:

- increase communication with wildland/urban interface property owners, planners, elected officials, and others through education and awareness messages about the role of fire in wildland ecosystem health, inherent risks in wildland/urban interface areas, available prevention/protection measures, and Federal disaster assistance programs.
- expand programs, curricula, and distribution systems for wildland/urban interface educational materials in cooperation with structural protection agencies.
- support and participate in public education efforts in cooperation with the Insurance Institute for Property Loss Reduction (IIPLR) and fire and building code organizations.

**RECOMMENDATIONS:
PARTNERSHIPS**

GOALS

- Public fire protection roles, responsibilities, and activities within the wildland/urban interface are identified through a partnership among Federal, Tribal, State, local, and private entities.
- Responsibility is focused on individual property owners and local, county, and State governments, in cooperation with Federal agencies, to reduce losses within the wildland/urban interface.

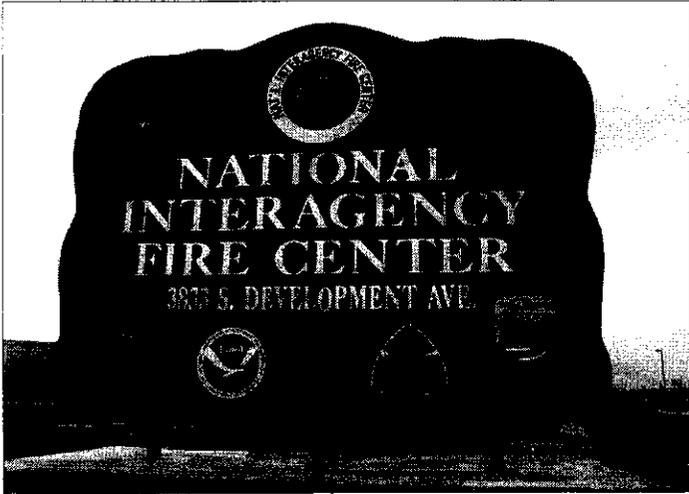
ACTIONS

Federal agencies will:

- utilize the recently rechartered National Wildland/Urban Interface Fire Protection Program, which includes the Department of the Interior, Department of Agriculture, FEMA's U.S. Fire Administration, National Association of State Foresters, National Association of State Fire Marshals, and National Fire Protection Association, to focus on wildland/urban interface fire protection issues and actions.
- utilize the Western Governors' Association (WGA) as a catalyst for involving State agencies, as well as local and private stakeholders, with the objective of developing an implementation plan to achieve a uniform, integrated national approach to hazard and risk assessment and fire prevention and protection in the wildland/urban interface.
- work with the States to develop viable and comprehensive wildland fire hazard mitigation plans and performance-based partnerships.



COORDINATED PROGRAM MANAGEMENT



The National Interagency Fire Center in Boise, Idaho, provides national-level wildland fire operational guidance and program coordination. (Photo courtesy of National Interagency Fire Center.)

SITUATION

The issues grouped in this section reflect the need for consistency across all aspects of fire management. They include accountability; measurement of program efficiency; organization; legal and policy analysis of programs, authorities, responsibilities, and liabilities; weather support; and data management.

ACCOUNTABILITY

Most employees and many fire managers don't believe that fire accomplishments or failures, especially in suppression activities, can be measured. There is a widely held view that agency administrators are neither held accountable for failures nor rewarded for accomplishments. This aggravates the perception that agency administrators can give fire management planning, fire suppression, and fire-use activities a low priority without being held responsible for the consequences. Furthermore, there is a perception by employees that only political or public pressure affects agency administrators' involvement with fire.

This perception of a lack of accountability is increased by managers not speaking out in support of the fire program, not motivating employees to become certified and to be available for fire-suppression and fire-use duties, limiting forces available for regional or national mobilization, or de-emphasizing fire priorities. This per-

ception is also exacerbated by agency administrators' broad interpretations and varying levels of implementation of policies requiring support of fire suppression activities.

EFFICIENCY

A growing concern shared by Members of Congress, agency administrators, and the public is the cost of fighting large wildfires. Some critics believe expenditures are excessive and that the crisis nature of wildfire has led to imprudent use of personnel, equipment, and supplies. Others believe that firefighting practices are not as effective as some natural forces in bringing wildfires under control and that fire suppression efforts should take better advantage of weather, terrain, fuel, and other natural conditions. In the future there will be

less tolerance for excessive expenditures on large-fire suppression. The costs and benefits of fire suppression activities must be analyzed. Analyses done so far have not resulted in improved practices or reinforced confidence in current suppression strategies.

Services provided by Federal agencies are being critically scrutinized, both internally and externally, to determine the relative priority of every program and its contribution to the agency mission and the public good. As part of that scrutiny, returns on investments in the fire program must be compared with returns in other programs. Every activity within the fire management program must be analyzed according to its economic efficiency. For example, presuppression activities such as prevention and preparedness must contribute to reduced suppression costs, and prescribed fire programs must show a return in improved or restored ecosystems or reduced suppression costs.

Agency administrators must be able to analyze program economic efficiency in order to establish the priority and scope of the fire management program. Current information on fire program benefits and costs are neither reliable nor consistent, and present program analysis methodologies are inadequate and inconsistent among Federal agencies. One dilemma is the question of what values should be included in such an analysis of diverse Federal wildlands. However, commodity, non-commodity, and social values all must be considered.

ORGANIZATIONAL ALTERNATIVES

Each Federal agency currently maintains its own separate fire management organization, with qualified employees from other programs available as the fire situation dictates. Federal agencies and cooperators also share resources nationally; and, in some cases, local interagency fire organizations exist, contract services are used, or other innovative approaches, such as the Alaska Fire Service, are being developed or used to accomplish the fire management mission. The Federal fire work force is currently decreasing at an uncomfortable rate, particularly in key specialized skills. More aggressive examination and implementation of organizational alternatives are hampered by the inability to measure relative efficiencies among these alternatives.

LEGAL AND POLICY ANALYSIS

Fire program activities and the increasing interconnection between fire activities and existing environmental, public health, and tort laws require inter-Departmental legal and policy analysis to ensure coordination and compliance. Consequences of prescribed fire activities, where fire is allowed to play a natural role or is introduced into the wildlands, may conflict with some interpretations of existing laws or regulations. Currently, these differences are identified independently by each agency and resolved on a case-by-case basis.

WEATHER SUPPORT

Fire weather forecasting is a sophisticated and long-standing tool used by fire managers. As fire behavior prediction techniques have improved and become paramount in wildland fire management, weather support has become a critical factor. Fire weather support is critical to firefighter and public safety and protection of public health. Maintaining the current capability as well as enhancing future services is essential to managing a safe and effective fire management program. In addition, longer-term fires demand forecasts beyond the six- to ten-day reliable range.

Fire weather services are provided on request by the National Weather Service (NWS) as a special program in that agency; however, increasing demands for weather support, especially spot fire weather forecasts, coupled with diminished resources in the NWS, have caused demands to exceed the existing capability. Pre-fire season predictions are often requested by managers in order to prioritize workloads. Long-range severity forecasts are commonly needed for

pre-positioning suppression forces, but they are either not available or are unreliable. As agencies seek to increase the use of fire as a management tool, demands for spot fire weather forecasts and other services could far exceed present weather support capability.

DATA MANAGEMENT

Accurate, organized, and accessible information about natural/cultural resources and fire activities is the basis for coordinated agency program decisions and is critical to effective and efficient program management.

Agencies have not achieved complete consistency in compiling, managing, and accessing fire information, which prevents a reliable, holistic view of the Federal fire program. Although some data, such as historical wildland fire patterns, response to past management actions, resource values, prescribed fire statistics, and hazard mapping have been collected, it is incomplete, difficult to use, and not portrayed consistently. In some cases, such as the wildland/urban interface, the types of data needed are only now being identified.

RECOMMENDATIONS: ACCOUNTABILITY

GOAL

- Agency administrators and fire program managers conduct the fire management program in accordance with established policies, procedures, standards, and direction.

ACTIONS

Federal agencies will:

- develop and utilize consistent fire management qualification standards and specific selection criteria for fire program managers.
- establish job performance standards for agency administrators and fire managers that clearly reflect the complexity and scope of fire management responsibilities.
- provide consistent and adequate training for agency administrators commensurate with their roles and responsibilities in fire management.
- ensure that agency administrators and fire program managers are held accountable for conducting the fire program in accordance with established policies, procedures, standards, and direction.

- ensure that trained and certified employees participate in the wildland fire program as the situation demands; employees with operational, administrative, or other skills support the wildland fire program as needed; and administrators are responsible, accountable, and make employees available.
- jointly manage fire use and suppression resources and activities to achieve accomplishment of both programs concurrently.

- use these criteria to analyze, with cooperators, a broad range of organizational alternatives on a national, regional, and local basis. Examples of alternatives include: a single Federal fire organization; contracts with States, private sector, Tribal governments, military, or combinations thereof; and status quo.

**RECOMMENDATIONS:
EFFICIENCY**

GOAL

- A system is developed and used to analyze the relative efficiency of specific activities of the fire management program.

ACTION

Federal agencies will:

- jointly develop a standard methodology for measuring and reporting fire management efficiency that includes commodity, non-commodity, and social values. This methodology should specifically address, among other considerations, the costs and benefits of large-fire suppression.

**RECOMMENDATIONS:
LEGAL & POLICY ANALYSIS**

GOAL

- Federal agencies have a clear legal foundation for the various fire management policies and programs.

ACTIONS

Federal agencies will:

- jointly identify the legal context for reintroducing fire into wildlands and develop options for accomplishment. Options may include modifying regulations to address ecological processes where appropriate; exercising broader interpretations of policy; or resolving obstacles at regional and local levels, including those on non-Federal lands. Based on this interpretation, develop standardized agreements or new agreements that permit these activities.
- clarify and differentiate between agency liability and personal liability resulting from prescribed fire, based on legal review and interpretation of tort law.
- early in the process, involve public health and environmental regulators in developing the most workable application of policies and regulations.

**RECOMMENDATIONS:
ORGANIZATIONAL
ALTERNATIVES**

GOAL

- The wildland fire program is managed through the most efficient and effective organization available.

ACTION

Federal agencies will:

- develop criteria to be used in evaluating alternative fire management organizations. Some examples of criteria include: meeting land management objectives, reintroducing fire in the ecosystem, ensuring cost effectiveness, effectively dealing with wildland/urban interface fire protection, and using partnerships and cooperative relationships.

The Secretaries of the Interior and Agriculture will direct the Office of the Solicitor and the Office of the General Counsel, in coordination with the Department of Justice and other appropriate Federal agencies, to conduct and publish a comprehensive legal review on wildland/urban interface fire protection to provide the legal foundation for Federal actions. This review will address:

- current authority under Federal laws such as the Organic Act, National Forest Management Act, Robert T. Stafford Disaster Relief and Emergency Assistance Act, and the Federal Land Policy and Management Act.

- the subjects of tort liability, budget authorities, cooperative agreements, mitigation activities, and natural resource protection/environmental laws.

RECOMMENDATIONS: WEATHER SUPPORT

GOAL

- Sufficient fire weather resources are provided to meet the total wildland fire management program needs.

ACTIONS

- The Secretaries of the Interior and Agriculture, together with the Secretary of Commerce, will assess current and projected requirements for fire weather products necessary to support total wildland fire management program needs.
- The Secretaries of the Interior and Agriculture, together with the Secretary of Commerce, will evaluate alternative methods, including non-Federal sources, to provide weather service to the agencies' fire management programs.
- The Secretaries of the Interior and Agriculture will seek commitment from the Secretary of Commerce to research and develop technology to provide accurate, long-range weather forecasts.

RECOMMENDATIONS: DATA MANAGEMENT

GOAL

- Federal agencies achieve a coordinated Federal fire information database that supports critical decisions related to the fire management program.

ACTIONS

Federal agencies will:

- standardize fire statistics and develop an easily accessible common database.
- jointly identify, develop, and use tools needed for ecosystem-based fire management programs with mechanisms to integrate fire-related databases with other systems. These tools will include:
 - the collection of ecosystem-related data such as disturbance regimes, historical fire patterns, response to management actions, and others.
 - consistent methods to track and access fire-use statistics and administrative costs.
 - mechanisms to transfer and exchange fire management systems information.
- cooperate with Tribal, State, and local governments to establish a data-collection mechanism to better assess the nature and scope of the wildland/urban interface fire problem.
- take a lead role in the adoption of the National Fire Incident Reporting System standards for all fire agencies that operate in the wildland/urban interface and modify existing reports to reflect wildland/urban interface fire protection data.
- complete a national wildland/urban interface fire hazard scoping and mapping study in partnership with the Western Governors' Association; Tribal, State, and local governments; and the private sector.

APPENDICES



APPENDIX I: REFERENCES

- (1) Manfreda, M. J., In press. Attitude trends regarding controlled-burn fire policies. In Fire in Wilderness and Park Management conference, Missoula, MT.
- (2) Tampa Declaration: Environmental Regulation and Prescribed Fire Conference. In prep.
- (3) Ahlgren, I.F and C.E. Ahlgren. 1960. Ecological effects of forest fires. The Botanical Review 26:483-533.
- (4) Biswell, H.H. 1972. Fire ecology in ponderosa pine grassland. Proceedings, Tall Timbers Fire Ecology Conference 12: 69-97.
- (5) Cooper, C.F. 1960. Changes in vegetation, structure, and growth of southwestern pine forest since white settlement. Ecological Monographs 30:129:164.
- (6) Bright, A. D., In prep. Influencing public attitudes toward prescribed fire policies. In Environmental Regulation and Prescribed Fire Conference, Tampa, FL.
- (7) Hardy, C. C., 1995. *Research Study Proposal: Change in Fuels Over Time*. USDA Forest Service, Intermountain Fire Sciences Laboratory, Missoula, Montana, 16 pp.
- (8) USDI, 1994. *Draft Strategic Plan for the Interagency Fire Education Initiative*.
- (9) *Report of the National Commission on Wildfire Disaster*, 1994.
- (10) USDA-Forest Service, 1994. *Fire-Related Considerations and Strategies in Support of Ecosystem Management*.
- (11) USDI-National Park Service, 1994. *Fire Management and Ecosystem Health in the National Park Service*.
- (12) USDA-Forest Service, 1994. *Western Forest Health Initiative*.
- (13) Thomas, Jack Ward, 1994. Chief, USDA Forest Service, Statement before House Agriculture and Natural Resources Committees, Oversight Hearing.
- (14) Armstrong, Robert, 1994. Assistant Secretary, Land and Minerals Management, Department of the Interior, Statement before House Agriculture and Natural Resources Committees, Oversight Hearing.
- (15) USDI, 1994. Forest Health Briefing Statement, House Agriculture and Natural Resources Committees, Oversight Hearing.
- (16) *Report of the Interagency Management Review Team*, 1994. South Canyon Fire.
- (17) *Results from a Nationwide Survey on Forest Management*, 1994. American Forests, Washington, D.C., 9 pp.
- (18) Covington, W. Wallace, Richard L. Everett, Robert Steele, Larry L. Irvin, Tom A. Daer, and Allan N.D. Auclair, 1994. *Historical and Anticipated Changes in Forest Ecosystems of the Inland West of the United States*. Food Products Press, New York.

- (19) Sampson, R. Neil. and David L. Adams (eds), 1994. *Assessing Forest Ecosystem Health in the Inland West*. Food Products Press, New York, 461 pp.
- (20) Agee, James K., 1993. *Fire Ecology of Pacific Northwest Forests*. Island Press, Washington, D.C., 493 pp.
- (21) *Final Report on Fire Management Policy*, 1989.
- (22) Pickett, S.T.A., and B.S. White (eds), 1985. *The Ecology of Natural Disturbance and Patch Dynamics*. Academic Press, New York, 472 pp.
- (23) Sanders, K., and J. Durham (eds), 1985. *Rangeland Fire Effects: A Symposium*, Boise, Idaho, 124 pp.
- (24) Pyne, S.J., 1982. *Fire in America: A Cultural History of Wildland and Rural Fire*. Princeton University Press, Princeton, New Jersey, 654 pp.
- (25) Clements, F.E., 1936. *Nature and Structure of the Climax*, J. of Ecol., 24:252-284.
- (26) USDA-Forest Service, 1995. *Course to the Future: Positioning Fire Management*.
- (27) Beebe, Grant S., and Philip N. Omi, September 1993. *Wildland Burning: The Perception of Risk*. Journal of Forestry.
- (28) Federal Emergency Management Agency, July 1992. *Report of the Operation Urban Wildfire Task Force*, FA-115.
- (29) Williams, Woody, March/April 1995. *Pushed to the Limit*. NFPA Journal.
- (30) Orange County, 1993. *Fire Storm*.
- (31) *Report of the Orange County Wildland/Urban Interface Task Force (and Addendum)*, July 1994.
- (32) United States Fire Administration, 1990. *Wildland Fire Management: Federal Policies and their Implications to Local Fire Departments*.
- (33) Sierra Front Wildfire Cooperators, 1992. *Wildfire Protection for Homeowners and Developers: A Guide to Building and Living Fire Safe in the Wildlands*.
- (34) De Crosky, Michael T., 1992-93. *A Montana Approach to Rating Risks in Wildland Developments*. Fire Management Notes, Volumes 53-54, Number 4, USDA-Forest Service.
- (35) National Association of State Foresters, 1994. *Fire Protection in Rural America: A Challenge for the Future*, A Report to Congress.
- (36) NFPA, 1991. *Protection of Life and Property from Wildfire*, NFPA 299.
- (37) Governor's Office of Emergency Services, California, 1993. *After-Action Report: The Southern California Wildfire Siege*.

- (38) Montague, Ronald E., and Richard E. Montague, December 1994. *Firewise Planning*, Wildfire.
- (39) Mason, Eric, September 1994. *Firestorm Documentary*. Portland, Oregon.
- (40) The National Wildland Urban Interface Fire Protection Initiative, 1993. *The Oakland/Berkeley Hills Fire: October 20, 1991*. NFPA.
- (41) Heinzelman, M.L. 1981. Fire intensity and frequency as factors in the distribution and structure of northern ecosystems. In: *Fire regimes and ecosystem properties*. USDA Forest Service. General Technical Report WO-26.
- (42) Kozlowski, T.T. and C.E. Ahlgren (eds). 1974. *Fire and Ecosystems*. Academic Press, New York.
- (43) Mooney, H A., T.M. Bonnicksen, N.L. Christensen, J.E. Lotan and W.A. Reiners (Technical Coordinators). *Fire regimes and ecosystem properties*. Proceedings of the conference held December 11-15, 1978. Honolulu, HI. USDA Forest Service, General Technical Report WO-26.
- (44) Oliver, C.D. and B.C. Larson. 1990. *Forest Stand Dynamics*. McGraw-Hill. New York
- (45) van Wageningen, J. W. 1984. Fire suppression effects on fuels and succession in short fire interval wilderness ecosystems. P. 119-126 in: *Proc. Symp. and Workshop on Wilderness Fire*. USDA, For. Serv. Gen. Tech. Rep. INT-182. 424 p. New York.
- (46) Parsons, D.J. 1976. The role of fire in natural communities: an example from the southern Sierra Nevada, California. *Environmental Conservation* 3(2):91-99.
- (47) Rowe, J.S. 1983. Concepts of fire effects on plant individuals and species. In: *The Role of Fire in Northern Circumpolar Ecosystems*. R.W. Wein and W.A. Maclean (eds). Wiley, New York.
- (48) Sampson, R. Neil and David L. Adams (eds). 1994. *Assessing Forest Ecosystem Health in the Inland West*. New York. Food Products Press.
- (49) Sando, R.W. 1978. Natural fire regimes and fire management - foundations for direction. *Western Wildlands* 4(4):34-44.
- (50) Weaver, H. 1959. Ecological changes in the ponderosa pine forest of Cedar Valley in southern Washington. *Journal of Forestry* 57:12-20.
- (51) White, P.S. 1979. Pattern, process, and natural disturbance in vegetation. *Botanical Review* 45:229-297.
- (52) Wright, H.A. and A.W. Bailey. 1982. *Fire Ecology - United States and Southern Canada*. Wiley, New York.



APPENDIX II: WORK GROUPS

FEDERAL WILDLAND FIRE MANAGEMENT POLICY AND PROGRAM REVIEW

STEERING GROUP

Dr. Charles Philpot, Co-Chair	USDA Forest Service
Claudia Schechter, Co-Chair	DOI / Office of the Secretary
Dale Bosworth	USDA Forest Service
Dr. Mary Jo Lavin	USDA Forest Service
Mike Edrington	USDA Forest Service
Dr. Ann Bartuska	USDA Forest Service
Lester K. Rosenkrance	DOI / Bureau of Land Management
Rick Gale	DOI / National Park Service
Dr. Robert Streeter	DOI / U. S. Fish & Wildlife Service
Keith Beartusk	DOI / Bureau of Indian Affairs
Stan Coloff	DOI / National Biological Service
Dr. Jan van Wagendonk	DOI / National Biological Service
Jim Douglas	DOI / Office of the Secretary
Carrye B. Brown	U. S. Fire Administration
Rich Przywarty	NOAA / National Weather Service
Richard Krimm	Federal Emergency Management Agency
Sally Shaver	U. S. Environmental Protection Agency

CORE TEAM

Tim Hartzell, Co-Chair John Chambers, Co-Chair	DOI / Bureau of Land Management USDA Forest Service	Washington, DC Washington, DC
MaryBeth Keifer, <i>Role of Wildland Fire in Resource Management</i>	National Park Service	Sequoia/Kings Canyon Nat'l Parks Three Rivers, CA
Walt Tomascak <i>Use of Wildland Fire</i>	USDA Forest Service	Northern Region Missoula, MT
Joe Stutler <i>Preparedness and Suppression Coordinated Program Management</i>	USDA Forest Service	Inyo National Forest Bishop, CA
Mike Dietrich <i>Wildland/Urban Interface Protection</i>	Bureau of Land Management	Salem District Salem, OR
Pat Entwistle <i>Public Involvement/Support</i>	Bureau of Land Management	National Interagency Fire Center Boise, ID
Shayla Simmons	Department of the Interior	Washington, DC
Gene Lessard	USDA Forest Service	Washington, DC
Dr. Sharon Friedman	USDA Forest Service	Washington, DC

SUBJECT - MATTER TEAMS

ROLE OF WILDLAND FIRE IN RESOURCE MANAGEMENT

MaryBeth Keifer, Team Leader	National Park Service	Sequoia/Kings Canyon Nat'l Parks Three Rivers, CA
Steve Botti	National Park Service	National Interagency Fire Center Boise, ID
Gardner Ferry	Bureau of Land Management	National Interagency Fire Center Boise, ID
Claire Hong	Environmental Protection Agency	Region 10 Seattle, WA
Bill Leenhouts	Fish & Wildlife Service	National Interagency Fire Center Boise, ID
Gene Lessard	USDA Forest Service	Washington, DC
Ron Myers	The Nature Conservancy	Tallahassee, FL
Neil Sampson	American Forests	Washington, DC
Susan Sater	USDA Forest Service	Pacific Northwest Region Portland, OR
Gale Sitter	Bureau of Land Management	Klamath Falls District Klamath Falls, OR
Peter Teensma	Bureau of Land Management	Oregon State Office Portland, OR
Dr. Jan van Wagtendonk	National Biological Service	Yosemite Field Station El Portal, CA

ACKNOWLEDGEMENTS

John Core	WESTAR	Portland, OR
Randy Eardley	Bureau of Land Management	Boise District Boise, ID
Jennifer Jones	Bureau of Land Management	Idaho State Office Boise, ID
Rick Tholen	Bureau of Land Management	Idaho State Office Boise, ID

USE OF WILDLAND FIRE

Walt Tomascak, Team Leader	USDA Forest Service	Northern Region Missoula, MT
Russ Davis	Bureau of Indian Affairs	Billings Area Office Billings, MT
Linda Gross	Bureau of Land Management	Kremling Resource Area Kremling, CO
Rich Lasko	USDA Forest Service	Chippewa National Forest Cass Lake, MN
John Lissoway	National Park Service	Bandelier National Monument Los Alamos, NM
Dennis Macomber	Fish & Wildlife Service	Region 1 Portland, OR
Larry Mahaffey	Bureau of Land Management	National Interagency Fire Center Boise, ID
Mark Rounsaville	USDA Forest Service	Southern Region Atlanta, GA
Paul Tine	USDA Forest Service	Eastern Region Milwaukee, WI

**PREPAREDNESS & SUPPRESSION
COORDINATED PROGRAM MANAGEMENT**

Joe Stutler, Team Leader	USDA Forest Service	Inyo National Forest Bishop, CA
Dan Clark	Kern County Fire Department	Bakersfield, CA
Dean Clark	National Park Service	Yosemite National Park, CA
Mike Edrington	USDA Forest Service	Pacific Northwest Region Portland, OR
Rick Gale	National Park Service	Washington, DC
Geoff Middaugh	Bureau of Land Management	Vale District Vale, OR
John Roberts	USDA Forest Service	National Advanced Resources Technology Center Marana, AZ
Roger Trimble	Bureau of Land Management	Washington, DC
Sue Vap	USDA Forest Service	Wenatchee National Forest Wenatchee, WA
Kathy Voth	Bureau of Land Management	Grand Junction District Grand Junction, CO

WILDLAND/URBAN INTERFACE PROTECTION

Mike Dietrich, Team Leader	Bureau of Land Management	Salem District Salem, OR
Bill Baden	National Fire Protection Assoc.	Quincy, MA
Ron Coleman	State Fire Marshal	Sacramento, CA
Jim Farrel	National Park Service	National Interagency Fire Center Boise, ID
Dean Flesner	Insurance Institute for Property Loss Reduction	Bloomington, IL
Cal Gale	Fish & Wildlife Service	Region 4 Atlanta, GA
Paul Hefner	Bureau of Land Management	Grand Junction District Grand Junction, CO
Russ Johnson	USDA Forest Service	San Bernardino National Forest San Bernardino, CA
Tom Minnich	U.S. Fire Administration	Emmitsburg, MD
Bill Patterson	Federal Emergency Management Agency (Retired)	Region 9 Presidio, CA
Larry Schwab	Insurance Institute for Property Loss Reduction	Bloomington, IL
Mark Stanford	Texas Forest Service	Lufkin, TX
Jim Stires	Bureau of Indian Affairs	Billings, MT
Rosey Thomas	Bureau of Land Management	Carson City District Carson City, NV

ACKNOWLEDGEMENTS

Karen Forbes	Federal Emergency Management Agency	National Office Washington, DC
Mark Merritt	Federal Emergency Management Agency	National Office Washington, DC
Phil Omi	Colorado State University	Ft. Collins, CO

PUBLIC INVOLVEMENT/SUPPORT

Pat Entwistle, Team Leader	Bureau of Land Management	National Interagency Fire Center Boise, ID
Dave Morton	USDA Forest Service	Pacific Southwest Region San Francisco, CA
Jack DeGolia	USDA Forest Service	Beaverhead National Forest Dillon, MT
Judy Kissinger	USDA Forest Service	Washington, DC
Mike Apicello	USDA Forest Service	National Interagency Fire Center Boise, ID
Pat Tolle	National Park Service (Retired)	Gassville, AR

