

# FIRE MANAGEMENT IN THE NORTH FORK OF THE FLATHEAD RIVER, MONTANA: AN EXAMPLE OF A FULLY INTEGRATED INTERAGENCY FIRE MANAGEMENT PROGRAM

David L. Bunnell

U.S. Department of Agriculture, Forest Service, National Interagency Fire Center, Boise, ID 83705

G. Thomas Zimmerman

U.S. Department of the Interior, National Park Service, National Interagency Fire Center, Boise, ID 83705

## ABSTRACT

As natural resource managers place greater emphasis on an ecosystem-based planning and management strategy, the application of prescribed fire is receiving increasing importance. However, protection needs and social, political, and economic concerns necessitate the maintenance and expansion of highly efficient wildfire suppression capabilities. Restoration of fire as an essential ecological process in conjunction with the maintenance and development of a highly effective suppression organization is desirable and supported by the recently completed Federal Wildland Fire Policy and Program Review. It is necessary to effectively balance both important programmatic aspects of fire management, full integration of available management options where all functions are planned for, implemented, and evaluated. In 1994, fire management activities along the North Fork of the Flathead River in northwestern Montana clearly illustrate how a fully integrated interagency fire management program can accomplish a range of objectives through the application of available fire management options. This paper describes how the U.S. Forest Service, National Park Service, and Montana Department of State Lands cooperatively and concurrently implemented prescribed fire strategies for: (1) management of ignited and prescribed natural fire; (2) initial attack suppression programs consistent with general land management plans; (3) implementation of individual fire assessment processes of Escaped Fire Situation Analysis (EFSA) and fire situation analysis (FSA) procedures to direct the judicious assignment of critical resources and economically efficient actions of aggressive control; and (4) containment and confinement of wildfires during a peak season of local, regional, and national wildfire activity.

*Citation:* Bunnell, David L., and G. Thomas Zimmerman. 1998. Fire management in the North Fork of the Flathead River, Montana: an example of a fully integrated interagency fire management program. Pages 274–279 in Teresa L. Pruden and Leonard A. Brennan (eds.). Fire in ecosystem management: shifting the paradigm from suppression to prescription. Tall Timbers Fire Ecology Conference Proceedings, No. 20. Tall Timbers Research Station, Tallahassee, FL.

## INTRODUCTION

Fire is a powerful force of nature. It has historically functioned as a natural process in most terrestrial ecosystems. During the twentieth century, agency efforts at ecosystem management are being designed to permit protection and preservation of existing communities of plants and animals and sustained use of natural consumptive products on a site-specific basis. As our knowledge of natural communities and processes expands, we are revising and developing appropriate management strategies. We now have the knowledge and technology to realize opportunities to minimize adverse impacts to life and property through sophisticated and aggressive fire suppression, to realize incremental and beneficial effects in hazard reduction and ecosystem restoration and maintenance through the specific application of fire, and to restore the function of fire as a natural process through natural fire management.

A fully integrated fire management program is one in which all aspects of the fire management program are planned for, implemented, and evaluated. Special-

ized experience and expertise are prerequisite to successful implementation of certain program functions and not all administrative units have the capability necessary to implement a fully integrated fire management program. However, the need for this capability is increasing in response to escalating forest health issues and fuel accretion problems, especially in western forest ecosystems. Resolution of these complex issues is paramount to integrated fire management and offers strong justification for recommendations to increase the use of prescribed fire, both on a temporal and spatial scale, as well as improving protection program efficiency. Compounding complexity levels are differences among agencies in policy and program direction, but negotiation between agencies can reduce apparent differences and promote similar goals.

The recently completed Federal Wildland Fire Policy and Program Review (USDI/USDA 1995) identifies fire management issues involving inconsistency in agency policy. It recognizes the role of fire in resource management, use of prescribed fire and fuel management, wildfire preparedness and suppression, and wildland-urban interface protection. This review supports the role of fire as an essential ecological process and

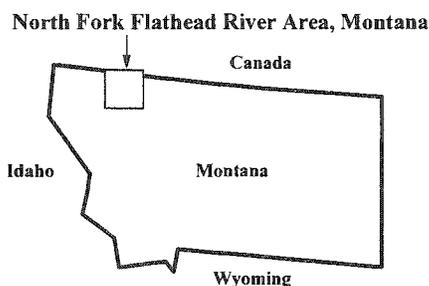


Fig. 1. General location map showing the North Fork of the Flathead River area.

natural change agent and encourages recognition and inclusion in planning processes. The review also encourages agencies to institute a fire management program that ensures accomplishment of both prescribed fire and suppression objectives concurrently. Employing a fully integrated fire management program is the most viable and efficient method to accomplish this goal. A significant example of an existing approach that has produced some notable results is presented by the coordinated actions between Glacier National Park, the Flathead National Forest, and the Montana Department of State Lands, Northwestern Lands Office, in northwestern Montana.

The purpose and objectives of this paper are to describe how these agencies have closely cooperated to minimize agency differences, and promote integrated fire management to accomplish common objectives. Outputs from the 1994 fire season are used to show how this program functions.

### NORTH FORK AREA FIRE MANAGEMENT PROGRAMS, NORTHWESTERN MONTANA

The North Fork of the Flathead River Area is situated in northwestern Montana (Figure 1) and is bounded by the Continental Divide to the east, the international border with British Columbia, Canada to the north, the Whitefish Mountains to the west, and the Middle Fork and main Flathead Rivers to the south. It includes areas of Glacier National Park, Flathead National Forest, Stillwater State Forest to the west, Coal Creek State Forest, and numerous private developments along all the rivers running through the area (Figure 2). These developments are concentrated along the rivers with communities at Polebridge along the North Fork, Apgar at the southern end of Lake McDonald in Glacier National Park, and West Glacier along the Middle Fork of the Flathead River. The communities of Columbia Falls and Whitefish are situated southwest of the area at the base of the Whitefish Range, 18 and 14 miles (29, 22 kilometers) north of Kalispell, respectively.

It is important also to understand the fire regime or history of the historic fire cycle in the North Fork area. This area includes 11 different conifer species ranging from low elevation ponderosa pine (*Pinus ponderosa*) and Douglas-fir (*Pseudotsuga menziesii*)

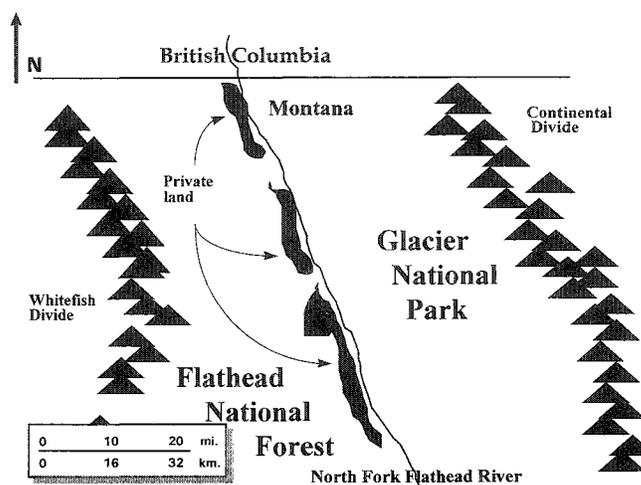


Fig. 2. Schematic illustration of land distribution and developments in the North Fork of the Flathead River area.

associations to high elevation subalpine larch (*Larix lyallii*) and whitebark pine (*Pinus albicaulis*) communities. The two dominant species are lodgepole pine (*Pinus contorta*) and western larch (*Larix occidentalis*) which comprise overstory cover types for approximately two-thirds of the valley floor and mid-elevations. The condition of the lodgepole pine type is also of note. It is essentially mature and has been heavily infected by mountain pine beetle (*Dendroctonus ponderosae*) in the decades of the 1970's and 1980's causing high mortality, 60 to 80% in many extensive areas of mature stands. Fire is a relatively infrequent disturbance agent in most areas of the North Fork. The fire regime in lodgepole pine is measured at over 100-year intervals in most stands dominated by lodgepole pine. Fire had been effectively excluded from these areas of the park and forest. Noted exceptions included stand-replacement wildfires in 1967 (the Huckleberry Mountain Fire) and 1988 (the Red Bench Fire). Both of these wildfires occurred during drought years similar to the 1994 fire season. Historic fire disturbance occurs infrequently in these stands, but its primary role is stand replacement, which is only possible on broad scales under extended drought conditions.

#### Glacier National Park Fire Management Program

Following the Fire Management Policy and Review of 1989, all National Park Service units were instructed to prepare or revise Fire Management Plans prior to continued use of fire management activities other than total suppression. Glacier National Park completed a Fire Management Plan which provided for a fully integrated fire management program supporting suppression, management-ignited prescribed fire (MIPF), and prescribed natural fire (PNF) activities. This plan, approved in 1991, lists three primary objectives:

- Restore fire to its natural role in the park to the maximum extent possible and enable the natural processes to function essentially unimpaired by human influence.

Table 1. Comparison of fire management objectives of federal and state land management agencies in the North Fork Area of Flathead River, Montana.

Objective	State and Private	Glacier National Park	Flathead National Forest
Protect life and property	X	X	X
Minimize adverse effects of suppression	X	X	X
Restore fire to its natural role to the maximum extent possible and enable natural processes to function essentially unimpaired by human influence		X	
Use prescribed fire to meet management objectives and enhance, maintain, and restore ecosystem health		X	X
Reduce activity created fuel hazards to appropriate levels	X		X
Reduce natural fuel accumulations to appropriate levels		X	X

- Protect human life and property from wildfire.
- Minimize adverse effects of fire suppression.

#### Flathead National Forest Fire Management Program

Since no designated wilderness areas are present in the North Fork, no policy or fire plan revision was required in 1989. Fire management actions continue to be directed by the Fire Management Action Plan which is an operations addendum to the Flathead Forest Plan, approved in 1985. Management-ignited prescribed fire opportunities are identified in the Forest Plan, segregated by specific management goals and objectives. A full range of appropriate suppression response considerations are offered as well, pending analysis of firefighter risk, public exposure, economic considerations, and potential resource loss. Planning documents direct the following goals and objectives in general:

- Protect human life, property, and resource values from loss by wildfire.
- Reduce natural fuel accumulation through use of prescribed fire.
- Enhance resource values with prescribed fire.
- Enhance regeneration potential for featured species with prescribed fire.
- Minimize costs and losses from wildfire.

#### State and Private Fire Management Activities

The Montana State Department of Lands, Northwestern Land Office, manages the Coal Creek State Forest under direction of the Stillwater and Coal Creek Forest Management Plan, approved in 1990. This plan provides direction to meet the following objectives:

- Protect life and property.
- Protect natural resources.
- Reduce fire hazard from activity-produced fuels with prescribed fire.

#### Interagency Fire Management Concerns

Prevailing winds predominate from the west in the North Fork drainage. Any fire ignition, upwind from the extensive private lands that lie in irregular north-south configurations on the valley floor, constitutes potential threats to life and property. This consistent weather and topographic feature constrains some man-

agement considerations and intensifies others. The extensive and damaging 1988 wildfire (Red Bench) demonstrated the potential severe effects of wind-driven fire events in overmature decadent lodgepole pine overstories. The local people were highly impacted by the threat of this fire, including rapid evacuation, significant loss of structures, and heavy smoke production. In light of this experience and the expanse of relatively continuous and maturing fuel accumulations, any fire activity is viewed as potentially adverse by many local residents.

Having three distinct management organizations in this area results in differing management objectives and agency missions. The National Park Service mandate is primarily one of resource preservation. The Forest Service mission is clearly to promote sustained use and conservation of resources, while the state objectives are focused on resource protection. Fire management objectives dominant in these programs are presented in Table 1.

#### Interagency Cooperation

During previous years, Glacier National Park seasonal firefighters and apparatus assisted Flathead National Forest personnel on various prescribed burning projects. This provided opportunities for acquiring additional experience in prescribed burning techniques, increased familiarity with equipment prior to the wildfire season for park personnel, and reduced costs and increased fire management capability on the national forest. Another integration of personnel is also very advantageous. Prior to 1994, Glacier National Park provided one or two personnel to the Flathead Interagency Hot Shot Crew which afforded significant opportunities to gain wildfire suppression experience on a repetitive basis and subsequently increased expertise for Glacier National Park firefighters.

As each fire season progresses, forces are deployed and positioned to provide a maximum of suppression capability in areas where wildfire loss could be minimized. All three participating agencies negotiated an interagency agreement in 1988 that provided for a centralized approach to detection, suppression, and wildfire support. Through the function of the Flathead Interagency Dispatch Center in Kalispell, Montana, the full operational integration of the fire management program is achieved.

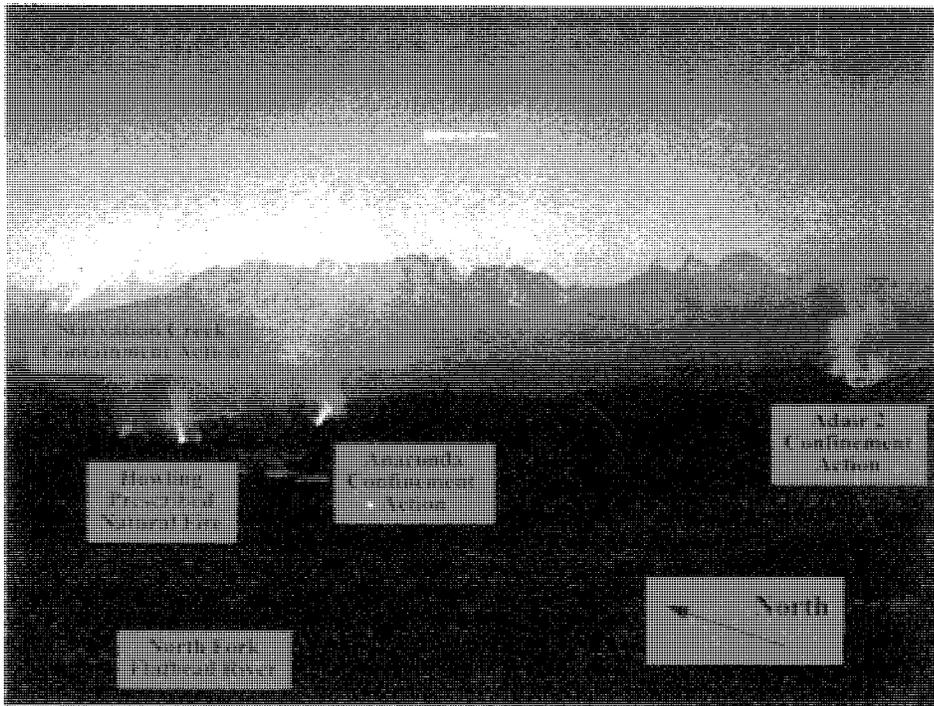


Fig. 3. Multiple fire activity during the 1994 fire season—North Fork Flathead River, Montana. (National Park Service file photograph).

On multiple occasions, Flathead Interagency Dispatch Center is able to pre-position State of Montana, Glacier National Park, and Flathead National Forest resources to replace agency resources previously committed. This function also reduces the impacts on initial attack and prescribed fire program personnel by handling the activities and needs of formalized teams, conducting project level wildfire suppression, and directing prescribed fire actions of all three agencies simultaneously.

## DISCUSSION

The winter of 1993–1994 was mild and contained snow levels that were well below the historic average. These conditions of relative drought followed a year of above average precipitation. Above average grass-forb growth was attributed to the excellent growing conditions of 1993. By early 1994, drought conditions had caused this vegetation to become very dry. The response of this fuel component to fire was defined by the early prescribed fire applications by the Flathead National Forest in March. Big game winter range management objectives were met in the Cedar Creek drainage in the southern most area of the North Fork region by management-ignited prescribed burns during late March, 30–45 days prior to the average initial burning dates associated with these low elevation south-facing aspects.

Further evidence of continued early drying was shown by the success of additional prescribed burns conducted in the lower third of the North Fork. Multiple harvest units in the Lackalaho Creek drainage were ignited by helitorch to reduce hazardous activity-created fuel accumulations and to expose mineral soil

to enhance natural regeneration of western larch and lodgepole pine. The late April and early May applications were conducted on north and east aspects above 5,000 feet (1,600 meters) in elevation. These sites normally are not predisposed to burning prior to mid-July during an average year.

Fire behavior observed during these early prescribed fire applications was indicative of local conditions. Throughout the West, similar reports of above average burning conditions were testament to the continuing drought conditions. Early thunderstorms began producing wildfires that challenged suppression crews during late June. All indications of an above average season were present and corroborated in many areas by early July, with the majority of local resources already committed to large wildfires in the southwest and Great Basin areas. Without substantial and prolonged moisture systems, the prospect of large fire development from uncontrollable fires was imminent.

The 1994 fire season in the western United States was the most extensive ever recorded. The Flathead Interagency Dispatch Center handled the busiest season in their history by responding to nearly 300 wildfires including three fires requiring formal type 1 or 2 Incident Management Teams. In the North Fork Flathead River area within this interagency fire management zone, multiple fire ignitions occurred frequently (Figure 3). During 1994, 36 fires were evaluated: 30 fires were suppressed with control strategies; 3 fires were suppressed under containment strategies; 2 fires were suppressed under confinement strategies; and 1 fire, Howling, was managed as a prescribed natural fire (Figure 4).

The 30 control actions minimized loss to high value resources and threats to private property or mini-

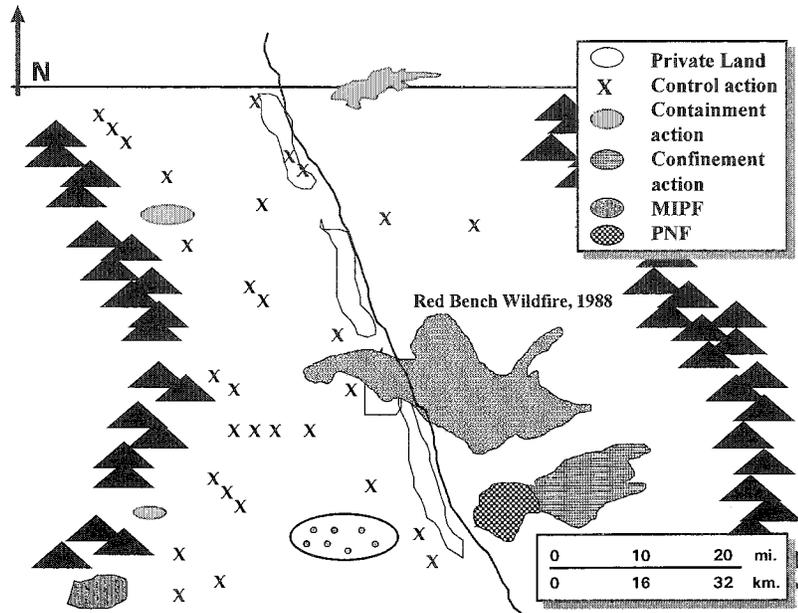


Fig. 4. Schematic illustration of wildland fire management activity during the 1994 fire season delineated by management strategies (MIPF = management-ignited prescribed fire, PNF = prescribed natural fire).

mized fire behavior potential adjacent to existing complex fire situations. The five containment and confinement suppression decisions were determined on the basis of low risk to resource loss, threat to private property, firefighter safety, and judicious use of critical fire suppression resources needed to ensure adequate initial attack capability on higher priority fires. The Howling fire was managed as a prescribed natural fire to permit natural fire occurrence to function as a natural disturbance element on native plant and animal populations in the park. Even during a critically intense period of wildfire activity, wildfire protection and prescribed fire objectives continued to be accomplished concurrently. Figure 5 shows the proportion of each type of strategic fire management application employed during 1994 in the North Fork area.

The applied success of integrated fire management is clearly apparent through analysis of several elements of the fire management program. During periods of multiple fire activity, essentially all Glacier National Park personnel were committed to on-going wildfire or prescribed fire actions. Interagency initial attack re-

sources were positioned in strategic locations on the Flathead National Forest and in Department of State Lands locations adjacent to the park for interagency support to ensure adequate suppression response capabilities in high-value areas.

After initial evaluation and size-up by Glacier National Park personnel, Flathead National Forest personnel were asked to evaluate the long-term effects of the Howling PNF from their experience in managing several similar fires in the Bob Marshall Wilderness during previous seasons. Glacier National Park requested a special team to manage the Howling PNF to provide the highest level of expertise available. This team successfully reduced the impact of this fire on local personnel which permitted local forces to successfully deal with daily fire suppression activities. This also reduced potential impacts on the Flathead Interagency Dispatch Center and other agencies. In addition, the actions of this highly skilled team provided consistent updates on strategic and tactical implementation that generated high levels of confidence in adjacent agencies. Some of this confidence was borne from their technical ability to model the fire and project potential outcomes using the best combinations of available science and experience.

Realistic, consistent, professional management of the Howling PNF during this extensive wildfire season was vital to the prescribed fire element of the national fire management program. It is important to have a sense of the pressure the management of this fire produced on the Glacier National Park staff, the National Park Service itself, and agencies supporting this prescribed natural fire decision. For the previous several months, all western resource agencies were combating fires with traditional wildfire control actions. Significant loss had already been experienced in resource damage and fire suppression expense. No loss was

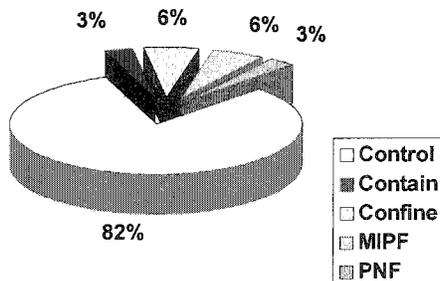


Fig. 5. Proportion (in percent) of each type of strategic management application utilized in the North Fork area during the 1994 fire season (MIPF = management-ignited prescribed fire, PNF = prescribed natural fire).

greater or more visible than the tragic loss of life that occurred in Colorado and New Mexico battling wildfires. These tragedies occurred weeks after the initial Howling PNF decision while the fire was still small and could have been easily extinguished. Promoting a long-duration PNF in a high-profile area like Glacier National Park during this type of national focus on wildfire created significant internal and external communication challenges.

## SUMMARY

After six years of implementation of an integrated fire management program in the North Fork between three different land management agencies, some general and specific outputs are quantifiable and recognizable. Centralizing the initial attack dispatch function has increased administration efficiency by reducing the need for personnel. Maybe more importantly, it has allowed for the collection of all information in one location to provide for more consistent decisions made by full-time professionals. These decisions are based on objectives of all agencies. The coordination of initial attack increased economic efficiency. Recent budgetary constraints have occurred during a period of escalating firefighting complexity due to increased fuel loads and urban sprawl in high-risk areas. No single agency can afford to provide suppression resources capable of meeting needs experienced during extensive fire seasons under the threat of multiple ignitions. The combination of resources between agencies has collectively increased the capability and effective strength of each individual agency.

Fire management program effectiveness is also enhanced by the centralization of the large fire support function of the Flathead Interagency Dispatch Center. When large prolonged fire actions occur, agency fire managers do not have to become involved in the daily operation or needs of these fires. This allows for increased flexibility in analyzing program level priorities and overall fire management responsibilities. With the support function looking closely at each "small picture," the fire manager can devote adequate attention to the "big picture" issues. Each of these management elements are important, but here, responsibility for each element is more clearly defined. Thus, specialists in each area can be more effective.

In combination, these programs and management efficiencies put all the agencies in better position to meet individual agency goals and objectives. Each of the three agencies involved in fire management in the North Fork have different objectives. The primary objective of each agency involved follows:

Department of State Lands—resource protection  
 Glacier National Park—resource preservation  
 Flathead National Forest—resource conservation

Each agency also has different budget levels and

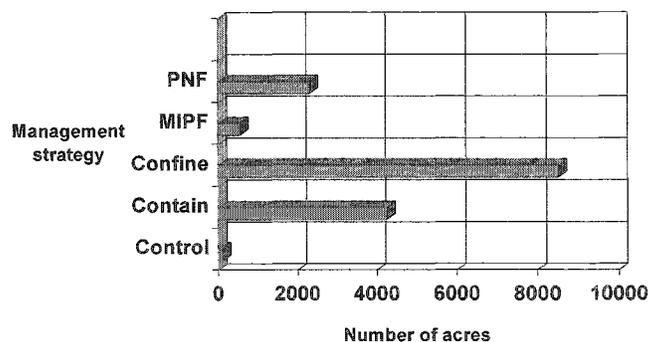


Fig. 6. Distribution of acres affected by individual management strategies utilized in the North Fork area during the 1994 fire season (MIPF = management-ignited prescribed fire, PNF = prescribed natural fire).

subsequent fire management capabilities. Agency objectives, resource capability, and management expertise have all been accepted and effectively blended together. The result has been recognized as a highly functioning integrated fire management program that included all program elements of appropriate fire suppression, management-ignited prescribed fire, and prescribed natural fire. Figure 6 shows how the implementation of an integrated fire management program resulted in distribution of strategic applications in the North Fork area in 1994. It is clear from this figure that a significant resource impact resulted from use of a multi-faceted program rather than a one-dimensional approach of fire control only. The consistent application of these elements produced successful initial attack capability, management-ignited prescribed fire applications to meet multiple resources and agency objectives, and prescribed natural fire applications that perpetuate the natural role of fire in a highly visible environment.

This program has proven to be successful in both high and low fire incidence seasons. Based on our collective experience and professional expectations, we feel it is well-rounded and fully tested. We invite you to contact us regarding any aspect of this program or its implementation.

## ACKNOWLEDGMENTS

Authors wish to acknowledge the assistance of Wally Bennett, U.S. Forest Service, Flathead National Forest, regarding 1994 wildland fire management statistics and accomplishments; and the support of Gladys Crabtree, National Park Service, National Interagency Fire Center, for assistance in developing figures and presentation graphics.

## LITERATURE CITED

U.S. Department of Interior and U.S. Department of Agriculture. 1995. Federal Wildland Fire Management Policy and Program Review. Final Report. Washington, DC.