

**Appendix D. 1992 Environmental Assessment and Finding of No Significant Impact (FONSI) for the 1992 Yellowstone National Park Wildland Fire Management Plan.**

UNITED STATES DEPARTMENT OF INTERIOR  
NATIONAL PARK SERVICE

## DRAFT ENVIRONMENTAL ASSESSMENT

for

WILDLAND FIRE MANAGEMENT PLAN  
YELLOWSTONE NATIONAL PARK  
*Idaho/Montana/Wyoming*

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June 1991

### SUMMARY

The Draft Environmental Assessment presents four alternative strategies for managing wildland fires in Yellowstone National Park. These alternatives include a proposal and a no-action alternative. Each alternative seeks to protect human life, developments, and cultural resources, and to perpetuate natural resources and their associated processes. The proposal and the alternatives were analyzed for their effects on natural and cultural resources and the area's social and economic fabric.

The proposal would manage wildland fires using the full range of fire management techniques: suppression, management-ignited prescribed fire, and prescribed natural fire. Three zones would be established where fires would be suppressed or permitted based upon their threat to human life, developments, and cultural resources. Conditions that determine when, where, or if a fire is permitted include availability of manpower, equipment, and funding, predicted weather conditions, fuels, and fuel moisture content.

The no-action alternative would continue the full-suppression actions now in place throughout the park. Alternative B would use suppression techniques and management-ignited prescribed fire only to manage wildland fires. Alternative C would use suppression techniques and prescribed natural fire only to manage wildland fires. In Alternatives B and C, zones and prescriptions would be established, as in the proposal, to determine when, where, how, or if fires would be permitted.

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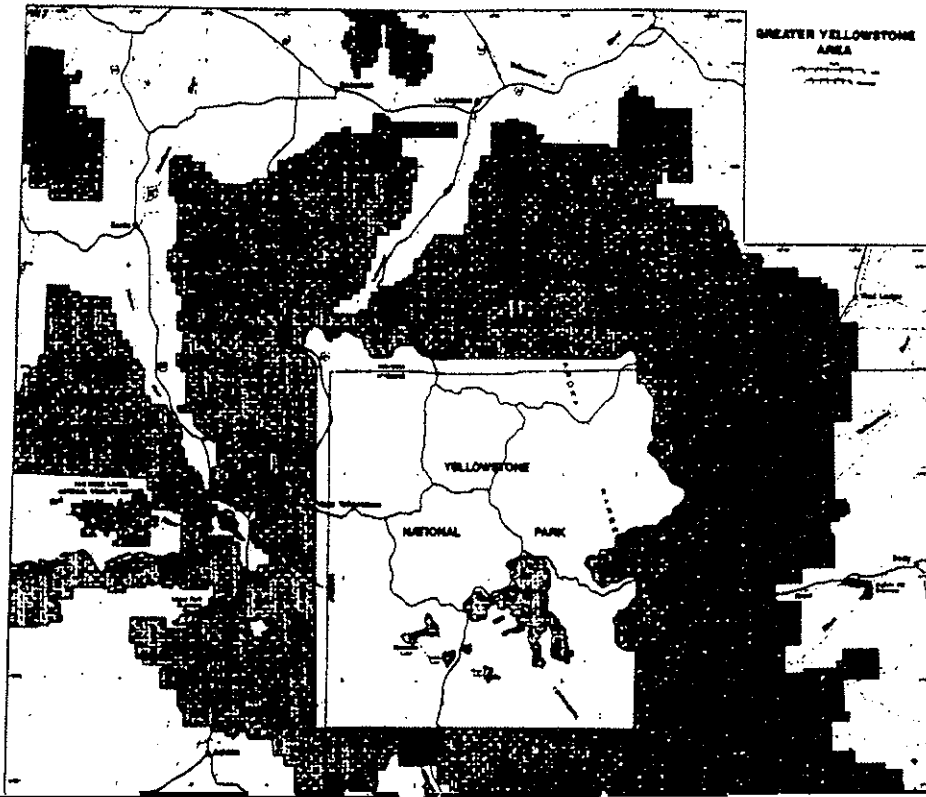
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## PURPOSE AND NEED FOR THE PLAN

### FIRE MANAGEMENT HISTORY

The recorded history of wildland fires in Yellowstone dates to the first expeditions during the years 1869 to 1872. These eyewitness accounts report fires of many square miles burning in various areas of the park. They also describe the mosaic patterns left by earlier fires. Other early writers and excerpts from Superintendents' reports state that often fires were started by lightning. Many fires, however, were caused by humans. These fires resulted from campfires allegedly left burning by park visitors, hunters attempting to drive game from the park, or abandoned Indian warming and cooking fires.

In 1872 Yellowstone National Park was established for the "... benefit and enjoyment of the people." In the 1870s, the interpretation of this enabling legislation was to preserve and protect park resources. Because fire was seen as a destructive force, the fire management policy for the first 100 years evolved into one of aggressively suppressing all forest fires.

The Leopold Report (Leopold et al. 1963) signaled a change in policy and attitude about fire's role in the environment. This government report suggested that natural areas in the National Park System be managed to create a reasonable illusion of primitive America, and to maintain the biotic associations that prevailed when each area was first visited by white man. The report sought to explain the important and dynamic role natural fire plays in an ecosystem. As part of a management strategy, the changes caused by fire could improve the health and increase the diversity of the natural environment.

In 1972 Yellowstone responded to the policy changes initiated by the Leopold Report by preparing a natural fire management plan (NPS 1972). The plan designated 340,784 acres in two backcountry regions of the park, the Mirror and Two Ocean plateaus, as natural fire zones. Ten fires burned a total of 831 acres in the fire seasons of 1972, 1973, and 1974. The successful experience of these seasons led to the revision of the plan. This revised plan, including an environmental assessment (NPS 1976) prepared under the National Environmental Policy Act, expanded the Natural Fire Zone to include most of the park. Developed areas and a buffer zone around the park boundary were excluded from the Natural Fire Zone. The revised plan was approved and implemented in 1976 and remained in effect until suspended in July 1988. Since July 1988, the park has suppressed all fires regardless of origin.

### FIRE HISTORY STUDIES

Written records of fires in the park date back to 1870, and significant fires are noted in annual Superintendents' reports. Fire statistics from 1872 through 1899 are very sketchy with only large fires being reported. Record keeping improved somewhat at the turn-of-the-century. From 1900 through 1929 approximately 374 fires burned 11,670 acres. Reliable fire statistics have been kept since 1930. In the last 60 years, 1900 fires have burned 908,052 acres. Lightning-caused fires numbered 1209 while 691 were human-caused. The most active fire season in recorded history was 1988. A total of 793,880 acres were burned. Forty-five fires originating within Yellowstone burned approximately 301,880 acres. Five fires originated outside Yellowstone and burned approximately 492,000 acres within the park. The largest fire, the North Fork fire, burned a total of 406,359 acres. It was human-caused and began on the Targhee National Forest.

Three fire history studies have been conducted in Yellowstone. One study concentrated on the shrubs and grasslands of the northern range (Houston 1973). Another study was conducted on the Little Firehole River watershed (Romme 1979). A third study reconstructed the fire history of a 320,000 acre study area located on the subalpine plateaus in the south-central part of the park (Romme and Despain 1989). Currently, a fire history study is underway in the upper Lamar River drainage. Fire history studies conducted in Montana and Alberta, Canada (Arno 1980), in similar fuel types, support a conclusion that

fire has had a substantial influence on plant community succession and that fire has long played an ecological role in the environment.

Houston's study (1973), on the edge of the low-elevation sagebrush steppe, sampled 34 trees with an average age of 322 years. Analysis revealed that the average mean interval between fires was 53 to 96 years with mean intervals for individual trees ranging from 36 to 108 years. The mean adjusted fire interval for the study area was 20 to 25 years, with 8 to 10 large fires burning significant acres over the last 300 to 400 years. Fire suppression efforts, 1886 until 1972, were almost completely successful on the sagebrush steppe of the northern range. Since suppression efforts began, the largest fire during that time had been approximately 460 acres.

The fire history studies done by Arno (1980) in the subalpine forests of Montana and Alberta reported fire frequencies ranging from 63 to 153 years. Romme and Despain (1989) study of 320,000 acres in Yellowstone's subalpine forests experienced fire frequencies of about 300 to 400 years. This study reported that less than 10 percent of the watershed had burned in the previous 350 years. The study concluded that most of the study area was an even-aged stand and had last burned between 1690 and 1740.

An analysis of the two studies suggests that fuel accumulation is a reason for the differences between the fire frequency estimates. The study area in Yellowstone was at a higher elevation with growing conditions that are less productive, leading to less understory growth. Additionally, Arno's study (1980) reported larger areas of mountain pine beetle infestation, contributing to fuel accumulation on the forest floor and making it possible for fires to spread through the area more frequently.

The fire history of Yellowstone has been influenced by man and man's suppression efforts. Romme and Despain (1989) evaluated Yellowstone's fire history in light of the 1988 fires and suggested that fire suppression efforts since 1886 may have only postponed the fires of 1988 by a few decades. They noted that large fires might have occurred during the dry summers of 1949, 1953, 1960, and 1961 without fire suppression efforts. They further noted that fire behavior in terms of heat release, flame height, and rate of spread were probably similar to the fires that burned a significant percent of their study area around 1700. They concluded that the 1988 fires represent a nearly natural event and were mainly the result of extremely warm, dry, and windy weather coinciding with an extensive forest cover of highly flammable fuels, mainly lodgepole pine, that had been established by extensive fires that burned a significant portion of Yellowstone around 1700.

In another area of study, archeological records show that man has occupied the Yellowstone Plateau for at least the last 12,000 years (Lahren 1971). Excavations have revealed that early humans throughout North America used fire for agriculture, food gathering, hunting, and warfare. Records of early fur trappers and expeditions in Yellowstone attribute many fires to Indians, set for hunting, warfare, and even to drive trappers out of their hiding places (Bonney and Bonney 1970).

## **MANAGEMENT POLICIES, GUIDELINES, AND OBJECTIVES**

The park's wildland fire management plan has been suspended since July 1988. In the fall of 1988 a Fire Management Policy Review Team was appointed by the Secretaries of the Departments of Interior and Agriculture. The team issued a final report in May 1989. This report reaffirmed the basic soundness of natural fire policies in national parks and wilderness areas but offered recommendations to improve federal fire management. These recommendations have been incorporated into the National Park Service's Wildland Fire Management Policy Guideline (NPS-18, revised June 1990).

Fire management in Yellowstone is based upon this policy and the revised guideline. National Park Service management directs each park to prepare a wildland fire management plan that is appropriate for

that park's purpose and resources. This guideline identifies fire as the most aggressive natural resources management tool employed by the National Park Service. The guideline classifies all wildland fires as either wildfires or prescribed fires. Prescribed fires, naturally-ignited or management-ignited, may be authorized by an approved wildland fire management plan and contribute to a park's resource management objectives. Wildfires are unplanned events and may not be used to achieve resource management objectives.

The NPS Wildland Fire Management Policy Guideline (NPS-18) identifies three paramount considerations for each park's fire management program. They are:

1. The protection of human life, both employee and public.
2. The protection of facilities and cultural resources.
3. The perpetuation of natural resources and their associated processes.

Further interpretation of this guideline and related policies is found in Yellowstone's Master Plan (1974), Resource Management Plan (1983), Statement For Management (1986), and other approved documents. Specifically, they state the park's objectives for wildland fire management as follows:

- Protect human life, property, and designated resources.
- Allow fire to play its ecological role in the park to the greatest extent possible through the use of appropriate management techniques.
- Suppress wildfires in a safe, cost-effective, and environmentally sensitive manner commensurate with the values at risk.
- Maintain an active fire prevention program.
- Maintain a fully qualified fire management staff to implement the fire management plan.
- Maintain an interpretive and public information program that will educate the public on the ecological role of fire in the park and provide daily fire danger and situation information.

## **PLANNING ISSUES**

The preparation of Yellowstone's Wildland Fire Management Plan began in July 1990. In accordance with the National Environmental Policy Act (NEPA), the park asked interested groups, public agencies, and the public to identify significant issues related to wildland fire management in Yellowstone. More than 150 responses were received during the 90-day comment period. The concerns that were significant to the respondents were the effects fire has on:

- the safety of park visitors, nearby residents, and firefighters
- private property, such as homes and businesses, near the park
- area economic resources such as lost business revenues and disruption of the social patterns of area visitors and residents



- natural resources such as wildlife, vegetation, soils, and aquatic life
- coordination between the park, surrounding national forests, and states
- air quality in the park and areas downwind, and the effect of large fires on global warming
- transportation systems and municipal infrastructure such as roads, bridges, and water systems
- the park's budget in an era of tighter money
- cultural resources such as historic structures and archeological sites
- backcountry resources and accessibility to trail and lakes

**The proposal and alternatives evaluated in this draft environmental assessment address these concerns and the policies and objectives of the National Park Service. Through public comments on the proposal, alternatives, and environmental assessment, a final plan will be prepared. Until a final plan is approved, the park will continue to suppress all fires.**

## AREA DESCRIPTION

### NATURAL RESOURCES

Yellowstone National Park, encompassing 2,221,772 acres (3,472 square miles), occupies a large mountainous plateau in the northern Rocky Mountains. Elevations range from 5,200 feet to over 11,000 feet and average 8,000 feet. The park is characterized by several broad, forested volcanic plateaus surrounded by the Absaroka Mountain Range on the east, the Gallatin Mountain Range on the north, and the Red Mountains on the south. Lakes such as Yellowstone, Shoshone, Lewis, and Heart are prominent features in the park as are the Yellowstone, Snake, Lewis, Madison, Gibbon, Firehole, Gardner, and Lamar rivers.

Yellowstone contains the world's largest and most active geothermal areas. These areas were among the principal reasons for the park's establishment. Approximately 120 thermal areas in 9 major basins have been identified. These areas include geysers, hot springs, mud pots, and fumaroles.

Yellowstone's climate can be divided into four distinct seasons. Winter is characterized by daily maximum temperatures dropping below freezing with snow accumulations beginning in late October. These weather conditions last into late March or early April. Spring is characterized by melting snow, cool to cold nights, and cool to warm days beginning in early April and lasting into June. Summer lasts through August and is characterized by warm days, frequent thunderstorms, and infrequent freezing nighttime temperatures. In September, freezing nighttime temperatures and warm to cool days are common.

There are two major climatic types in Yellowstone, valley and mountain. The valley type is common to large valleys and central plateaus and is similar to that of the Great Plains with peak precipitation falling as

Yellowstone's air and water quality are considered nearly pristine. The park is designated as a Class I airshed under the Federal Clean Air Act meaning that Yellowstone is charged with protecting air quality values, including visibility. Streams and lakes are also designated as Class I by the State of Wyoming, primarily for the purposes of wastewater discharge.

### **CULTURAL RESOURCES**

Native Americans occupied the greater Yellowstone area beginning at least 12,000 years ago. Archeological sites include hunting and gathering camps, trails, and obsidian quarries, among others. More than 400 archeological sites have been recorded; but, comprehensive archeological surveys of the park have not been completed. One site, Obsidian Cliff, has been nominated as a National Historic Landmark. The majority of the sites, though, have not been evaluated for eligibility to the National Register of Historic Places. Many of Yellowstone's historic sites exist today as archeological sites.

Yellowstone was established in 1872, becoming the world's first national park. A civilian administration from 1872-1886 was followed by the Army. The Army administered the park from 1886 until the National Park Service was established in 1916. A number of historic structures remain within the park. Many of these facilities were designed and built by the Northern Pacific Railway and its concessioner around the turn of the century. Others were built by the Army prior to 1916 and by the National Park Service during the first two decades of its jurisdiction. Many buildings, bridges, and other structures built during this era embody the rustic style of park architecture popular prior to 1940. Stonework, massive timbers, and decorative woodwork were used in a way to make buildings compatible with the natural setting. Examples of rustic architecture are the Old Faithful Inn and the museum at the Norris Geyser Basin.

Surveys of Yellowstone's visitors were conducted in 1987 and 1989 (Machlis and Dolsen 1988; Littlejohn, et al. 1990). They document generally consistent visitor use patterns and perceptions before and after the fires of 1988. Recreational activities such as viewing wildlife and thermal features, photography, walking, and visiting museums were the primary activities reported in both visitor surveys. Since the fires of 1988, viewing the changes brought about by the wildfires has become a popular visitor activity. Other activities reported include fishing, camping, hiking, horseback riding, and boating.

The survey showed that Yellowstone visitors come from all 50 states; however, the Rocky Mountain states, California, and Washington each represented between 4 percent to 11 percent of the total park visitation. International visitation represented approximately 7 percent of total park visitation.

The popularity of recreation and tourism in the area make the communities in the greater Yellowstone area heavily dependent upon federally-managed lands. These communities and their businesses receive significant income by providing goods and services to park visitors. Local businesses also benefit from annual NPS and concessioner expenditures for salaries, goods, and services. Short-term benefits result from periodic capital-improvement projects.

# PROPOSED WILDLAND FIRE MANAGEMENT PLAN AND ALTERNATIVES

Three alternatives, in addition to the proposal, representing a range of management strategies were considered. These alternatives address all or most of the NPS and Yellowstone National Park wildland fire management objectives. These alternatives also address the concerns raised by the public and other agencies.

## PROPOSAL

### WILDLAND FIRE MANAGEMENT STRATEGIES

The proposed Wildland Fire Management Plan identifies three integrated strategies to direct wildland fire management in Yellowstone: suppression, management-ignited prescribed fire, and prescribed natural fire.

**Suppression:** This strategy includes all actions initiated to limit the growth of a wildfire. A wildfire is defined as a free burning and unwanted fire. These types of fires will always be suppressed. Three options allow the fire manager to suppress wildfires at minimum cost and minimum impact consistent with values at risk. The definitions of the suppression options are:

**Confine.** A wildfire that is restricted within predetermined natural boundaries until it burns itself out. Little or no suppression action is taken. This technique is used in areas with extensive natural barriers and negligible values at risk

**Contain.** A wildfire that is restricted to a defined area, using a combination of natural and constructed barriers. These barriers will stop the spread of fire under prevailing and forecasted weather conditions until the fire burns itself out.

**Control.** A wildfire that is aggressively fought with personnel, equipment, and aircraft to halt its spread and to extinguish all hot spots until it is declared out.

Suppression actions may use all available equipment except for bulldozers and other vehicles, such as fire engines, driven off designated roads. Bulldozers and other vehicles will not be used in any backcountry area proposed as wilderness. Bulldozers may be used only with the written approval of the Regional Director.

**Prescribed Natural Fire:** This strategy involves the management of fires ignited by natural means (usually lightning) that are permitted to burn under specific environmental conditions. Prescribed natural fire objectives will be to perpetuate natural resources and associated processes. Fires will be allowed to continue burning as long as they stay within predetermined areas and burning conditions (prescription).

fires. Once the wildfire is brought under control and resources are again available, management may continue other planned and approved management-ignited prescribed fires.

## **FIRE MANAGEMENT ZONES**

The Wildland Fire Management Plan divides Yellowstone into three management zones (see Figure 2): Suppression, Conditional, and Prescribed Natural Fire. The Suppression Zone is established to emphasize protection of personal safety, property, and other resources. The Conditional Zone is established to allow management-ignited prescribed fire and prescribed natural fire to burn only when they exhibit limited potential to spread beyond predefined boundaries. The Prescribed Natural Fire Zone is established to allow naturally-ignited fire to play its ecological role in the park.

### **Suppression Zone**

**Description:** The Suppression Zone is intended to ensure the maximum protection for personal safety, property, and specific cultural resources. All fires that originate in or burn into this zone despite their cause will be immediately suppressed. Hazard fuel reduction may be accomplished by management-ignited prescribed fire or mechanical methods.

**Area:** This zone includes all developed areas. A one-half mile (0.5) buffer on the windward (southwest) side and a one-quarter mile (0.25) buffer in all other directions around developed areas delineates this zone.

The developed areas encompass approximately 2,200 structures and 38 recreational sites. Included in these developed areas are: Mammoth Hot Springs, Tower Junction, Lamar Ranger Station, Northeast Entrance, Norris, Madison, Canyon, Fishing Bridge, Lake, Old Faithful, Grant Village, South Entrance, East Entrance, West Entrance, and Bechler Ranger Station.

### **Conditional Zone**

**Description:** The Conditional Zone is also intended to ensure the protection of personal safety, property, and other specific cultural resources. The cause of all fires in this zone will be determined to ensure appropriate management actions. Prescribed natural fires will be allowed to burn in this zone under more conservative prescriptions than applied in the Prescribed Natural Fire Zone.

Each prescribed natural fire will be monitored daily with all decisions revalidated to ensure each fire will remain within prescription. Prescribed natural fires originating on other federal lands may be accepted by Yellowstone providing they are within the allowed prescriptions of this zone. Any fire predicted to exceed, or that has exceeded, prescription will be declared a wildfire and appropriate suppression action will be initiated.

**Hazard fuel reduction may take place in this zone.** The objective is to reduce fuel accumulations, break up continuous fuels, and reduce the threat of unwanted fire.

**Area:** The Conditional Zone consists of the area from the park boundary to one and one-half miles (1.5) inside the park boundary and includes the Soda Butte drainage from the mouth of the Lamar River to the Northeast Entrance, and the Middle Creek drainage of the Shoshone River located inside the park boundary. Improvements such as campgrounds, picnic areas, backcountry cabins, isolated cultural resources sites, the powerline corridor, telephone installations, and roads located in this zone will receive special consideration and the appropriate fire management action will be taken.

## **ALTERNATIVES**

### **ALTERNATIVE A - NO ACTION: SUPPRESSION ONLY**

**Goal:** Utilize fire management activities that will provide for maximum personal safety and protection of property and other resources through suppression actions only. Fire would play only an incidental ecological role in Yellowstone.

**Description:** Under this alternative, fires would be fully suppressed using the suppression strategy and tactics described in the proposal. No management-ignited fires would be initiated nor would naturally-ignited fires be allowed to burn. Hazard fuel reduction along the boundaries and around developed areas would be accomplished only by mechanical methods. Mechanical methods include tree and brush removal using chainsaws, feller buncher machines, and other physical removal techniques. This alternative returns the park's fire management policy to its pre-1972 management strategy. Since July 1988, this is the alternative being implemented except for hazard fuel reduction.

**Implementation:** Staff, equipment, and other resources required to suppress approximately 90 per cent of the predicted fires and to accomplish hazard fuel reduction would be available. For fire activity above this level, the park would rely on other agencies to supplement the park's resources. This need would likely vary from year to year.

### **ALTERNATIVE B - MANAGEMENT-IGNITED PRESCRIBED FIRE ONLY**

**Goal:** Provide for maximum personal safety and protection of property and other resources through suppression actions. Natural fire cycles would be duplicated through management-ignited prescribed fires. No prescribed natural fires would be allowed.

**Description:** One zone would be established within the boundaries of the park in which only Management-Ignited Prescribed Fires would be allowed to burn. All other fires would be suppressed. Areas within this zone would be evaluated annually. Selections for burning would be based on such conditions as location within the park, proximity to developments, availability of resources to manage the fire, and the fire effects desired by managers. Current and anticipated budgetary conditions would limit the size and number of fires ignited each year. Environmental considerations and fire prescriptions would ensure that management ignited fires would be managed to ensure the protection of personal safety, property, and other resources. This alternative would not ensure that sufficient acreage was burned over

In these areas all fires would be suppressed despite their origin. A Naturally-Ignited Fire Zone would be established for all other areas of the park. Naturally-ignited fires occurring within this zone would be permitted to burn when specific environmental conditions and other factors were met. Some of these conditions and factors would be the type, quantity, and moisture content of burnable material, location within the park, predicted weather conditions, proximity to development, availability of resources to manage the fire, and ability to achieve resource management objectives. Prescribed Natural Fires would be allowed to continue burning as long as they stayed within prescription. Fires exceeding these limits would be suppressed. No management-ignited prescribed fires would be ignited in this zone and all human-caused fires would be suppressed. Application of these factors would vary throughout the park to ensure maximum personal safety, and provide for the protection of property and other resources.

**Implementation:** Although the frequency of naturally-ignited fires varies from year to year, the park would be staffed, equipped, and supplied to manage or suppress about 90 percent of the predicted fire activity. For fire activity above this level, the park would rely on outside agencies to supplement the park's crews. This need would likely vary from year to year.

#### **ALTERNATIVES CONSIDERED BUT REJECTED**

**No Suppression:** All fires, despite their ignition source, environmental conditions, or location would be allowed to burn unchecked.

This alternative was rejected because it does not meet the NPS Wildland Fire Management Policy Guideline for protection of human life, developments, and cultural resources.



**Consequences of Fire:** The whooping cranes summer in the southern half of the park. The habitat they occupy is characterized by wet meadows. The two cranes present in Yellowstone in 1988 were observed to be actively feeding during and after the wildfires. The habitat may have benefitted from fire due to accelerated nutrient cycling and the concentration of nutrients in wet meadows. Food may be more available in recently burned areas where cover is minimal. Whooping cranes can reasonably escape direct effects from fire by moving their location. The proposed action will have no effect on the existence of the whooping crane population in the ecosystem.

Open meadows and lakeshore habitats are used as foraging areas by peregrine falcons. Nesting habitats, located on steep cliffs, provide peregrines protection from direct mortality as a result of fire. Prey species' mobility makes them unlikely to succumb to direct fire effects. Changes in vegetative cover may affect the species composition and thus change the falcon's prey base. The opening of the forest canopy may improve the peregrines' ability to secure passerine prey. The habitat appears to be saturated and monitoring indicates that the fires of 1988 had little effect on peregrine falcons in Yellowstone. The proposed action will not affect the existence of the peregrine falcon population in the greater Yellowstone ecosystem.

In 1988, five bald eagle nests were destroyed when fire burned the nest trees. However, bald eagle occupancy of their territories remained quite high, as observed in post-fire monitoring flights in late October and early November of 1988. A total of 11 eaglets fledged from bald eagle nests in the park that year; the birds had fledged before the fires entered these nesting territories. Bald eagles were frequently observed capturing prey that were fleeing fires throughout the summer of 1988. Fire burn patterns also provide ample new trees for eagle nests. Once secure nesting trees were found, bald eagles returned to pre-1988 productivity. The proposed action is not likely to adversely affect the continued existence of the bald eagle population in the greater Yellowstone ecosystem.

### **Mammals**

**Affected Environment:** The threatened grizzly bear (*Ursus arctos horribilis*) is the only federally listed mammal resident of Yellowstone. The endangered northern Rocky Mountain grey wolf (*Canis lupus*) occurred historically in Yellowstone but was extirpated in the 1930s. The greater Yellowstone grizzly bear population is the second largest of the recovery populations and is estimated to have a minimum of 200 bears. The Grizzly Bear Recovery Plan (USFWS In review) is the basic management document guiding the recovery effort. Scientists and managers developing a model of the GYE grizzly bear population recognize two key factors influencing the potential recovery of the grizzly bear population in the Yellowstone ecosystem. These factors are the effectiveness of habitat available to grizzly bears and grizzly bear mortalities. To ensure the protection and recovery of this threatened population it is necessary to minimize bear mortality, especially among breeding females, and to maintain critical habitat. The Grizzly Bear Recovery Plan outlines actions necessary to accomplish this, and the stated population goals are a means by which to monitor progress toward the two factors.

The Grizzly Bear Recovery Plan (USFWS In review) proposes setting population goals as follows:

1. 15 females with cubs-of-the-year annually over a running six-year average
2. 15 of 18 bear management units occupied by sows with young, from a running three-year sum of observations, and no two of the occupied bear management units adjacent to each other
3. known mortality does not exceed seven total or two adult females annually, averaged over six years

**Consequences of Fire:** Fire can affect grizzly bears by causing direct mortality and/or by causing changes in grizzly bear habitat. The 1988 report of the Interagency Grizzly Bear Study Team (Knight et.al. 1989) states that the deaths of 2 grizzly sows and 2 cubs may be attributed to the 1988 wildfires. In a study of bear movements related to the fires, Blanchard and Knight (In press) found that of 21 radio-monitored

grizzly bears, 13 moved into burned areas immediately after fire passed, 3 bears remained in areas during a fire, 3 stayed outside of areas that burned, and 2 were unaccounted for. Fire did not affect denning sites, use of annual home ranges, and rates of movement before and after the fires.

Fires that have the capability to cause direct mortality of bears are not likely to recur in one bear's lifetime. But, given the emphasis on minimizing mortality, especially of adult female bears, large-scale, intense fires may affect the grizzly population in the ecosystem by causing direct mortality of individual bears. The significance of any such loss would depend on other mortalities in and outside the park occurring at the time.

Of short-term benefit to the grizzly population in 1988 was an increased supply of ungulate carcasses in several locations (Blanchard and Knight 1989.) This cannot be predicted for any individual fire, and is not likely to occur if burns are small in scale and lack crown-fire accompanied by strong winds and limited visibility.

Changes in vegetative cover and composition affect grizzly bear habitat quality. Such effects are likely to be complex and difficult to predict. Fire may stimulate ground cover and early seral stages, which are likely higher in quality for bears than existed pre-fire in older lodgepole pine stands. Whitebark pine is a primary food source for bears, particularly in the late summer and fall. It is the mixed stands of whitebark pine and those areas where red squirrels cache pine cones in middens that are primarily used for foraging by grizzly bears. Significant seed production in whitebark pine trees is not likely to occur until trees are approximately 100 years old. Maintaining mixed stands containing mature, cone-producing whitebark pine

## **Plants**

**Affected Environment:** There are no federally-listed threatened or endangered plant species in Yellowstone.

## **Candidate Species**

A number of plant and animal species are currently listed by the U.S. Fish and Wildlife Service as Category 2 candidate species. Category 2 species are those for which current information indicates that listing them as threatened or endangered is possibly appropriate, but that the conclusive data needed on biological vulnerability and threat are not available. Further biological research and field study may be needed to ascertain the status of Category 2 species.

**Affected Environment:** The lynx (*Felis lynx*) and the wolverine (*Gulo luscus*) are mid-sized carnivores who are generally believed to range in Yellowstone. The lynx' resident breeding status in the park is uncertain, although sightings have been reported throughout the park's history. It is generally impossible to verify the reliability of sightings, particularly since the similarly-looking bobcat (*Felis refus*) is present. Slightly more evidence exists to suggest that a breeding population of wolverine exists in the GYE, though abundance and distribution are undocumented for this species as well. These two carnivores are wide-ranging, generally solitary in nature, and prey or scavenge on other mammals, such as those found on ungulate ranges.

The spotted bat (*Euderma maculatum*) has not been documented in Yellowstone, but could exist here. The western big-eared bat (*Plecotus townsendii*) has been collected in the Mammoth area, and likely is widely distributed in the park, though it has not been studied here. It generally lives in caves. The only recorded specimen of Preble's shrew (*Sorex preblei*) in Yellowstone was collected at Lamar Ranger Station; again, no information exists on its distribution or abundance in the park.

The Arctic grayling (*Thymallus arcticus*) exists in several lakes in Yellowstone. A fluvial form that lived entirely in riverine habitats historically occurred in the Madison River drainage and below the barrier falls in the Firehole and Gibbon rivers. The fluvial Arctic grayling is now very rare in the upper Missouri River basin and may no longer occur in Yellowstone. The park is therefore considering a plan to restore fluvial Arctic grayling in several streams.

Category 2 bird species include the ferruginous hawk (*Buteo regalis*), an uncommon migrant, the mountain plover (*Charadrius montanus*), the long-billed curlew (*Numenius americanus*), and the burrowing owl (*Athene cunicularia*), all of which are rarely or accidentally recorded in the park.

Ross' bentgrass (*Agrostis rossiae*) is a category 2 plant species endemic to Yellowstone National Park. Ross' bentgrass is found in the truly unique habitat that surrounds the park's thermal areas. In the early 1980s the USFWS proposed listing *Agrostis rossiae* as an endangered species. This led to a thorough inventory and the location of additional populations of Ross' bentgrass in the park. Currently, there is a dated Memorandum of Understanding between the USFWS and the NPS which specifies that the park continue active monitoring and protection of *Agrostis rossiae* in lieu of federal listing.

**Consequences of Fire:** Fire effects related to these species have not been investigated in the Yellowstone ecosystem. Effects on solitary and wide-ranging predators such as the wolverine and lynx are likely to be very minimal. Populations of these animals are primarily limited by prey abundance and distribution; the wolverine is a scavenger and the lynx a predator of lagomorphs and rodents. Long-term changes in either predator's prey base is not likely to occur as a result of naturally occurring fire.

The bats of concern primarily eat moths and beetles and dwell in cliff or cave habitats. Being mobile, bats are not likely to be directly affected by fires. Invertebrate prey species quickly respond to perturbations, and fires should not cause long-term changes in bat populations.

The grayling population could be indirectly affected by fire since sedimentation, nutrient influx, and short-term changes in invertebrate populations affect riverine systems. These effects are not likely to affect entire river drainages at one time, though, and do provide certain benefits to the aquatic environment.

Biologists observed large numbers of raptors, apparently attracted by smoke columns, into recently burned areas in the Yellowstone ecosystem in 1988. In one instance, more than 40 ferruginous hawks were observed hunting open meadows in the park, feeding on voles and pocket gophers (Mills 1989). Hawks likely benefit for several years from the decreased ground cover which makes it easier to locate prey. This hawk and the other three candidate bird species are observed so rarely in the ecosystem that fire effects are likely to be negligible.

Ross' bentgrass grows only in thermal areas, where very little other vegetation can survive. There is not enough vegetative cover to carry a fire through these micro-habitats, and the thermal areas are generally located within suppression zones due to their proximity to roads and developed areas.

#### **WATER QUALITY**

**Affected Environment:** Approximately 10 percent of Yellowstone National Park is covered by water. Over 100 alpine lakes and ponds dot the plateau, the largest of which is the 139-square-mile Yellowstone Lake. Other major lakes include Shoshone, Lewis, and Heart. River systems in the park consist of the Gardner, Lamar, Yellowstone, Madison, Firehole, Lewis, and Gibbon. The Yellowstone River originates above Yellowstone Lake and flows north and east of the Continental Divide to North Dakota where it joins the Missouri River. The Yellowstone is the longest undammed major river in the lower 48 states.

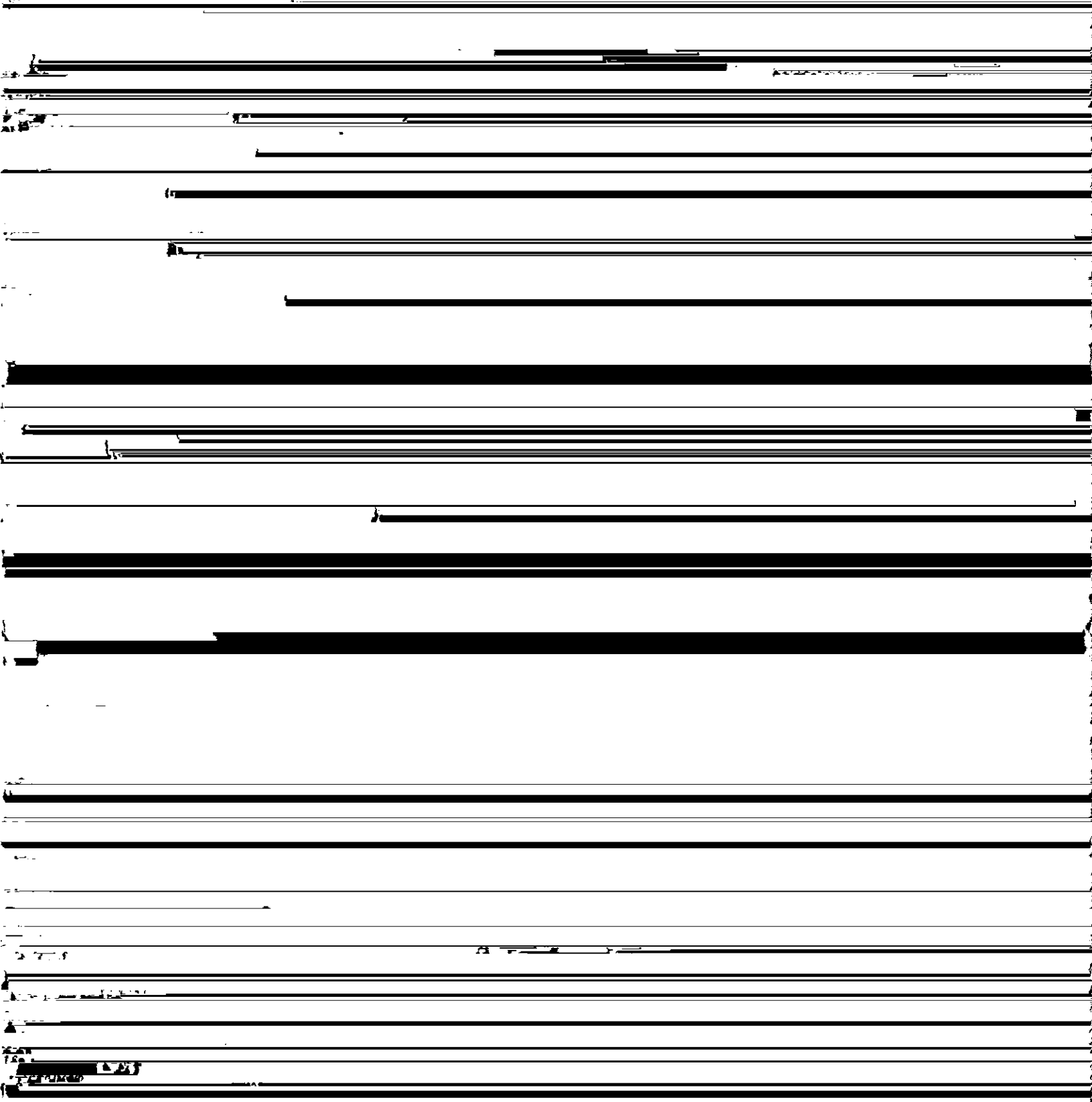
The Snake River originates near the park's southern boundary and eventually flows west of the Continental Divide to Washington where it joins the Columbia River.

**Consequences of Fire:** Large fires have the potential to increase the total water yield from a drainage and cause the peak runoff to occur earlier in the spring. Removal of vegetation by fire can enhance the possibility that erosion would increase for 1-5 years following the burn. Rapid snowmelt and summer thunderstorm events may intensify these natural erosional processes. Increased sedimentation may occur in the short-term (1-5 years) and may alter the pre-fire aquatic conditions enough to change the ecological and successional state in ponds, lakes, and streams (Christensen et al. 1989; Minshall et al. 1989).

Reduced shading following fires can increase stream and lake temperatures for many years. In a subalpine environment, such as Yellowstone, this can increase the pace of physiological and ecological processes,

provide an essential dietary component of the threatened grizzly bear, endangered bald eagle, and other wildlife. Sport fishing is also a popular activity in the park.

**Consequences of Fire:** The effects of fire on aquatic ecosystems and fisheries can be classified as immediate, intermediate, and long-term. Immediate effects can include raised water temperatures, pH, and alkalinity, as well as problems associated with suppression efforts, such as fire retardant accidentally



or wood (i.e., carbon, phosphorus, nitrogen, calcium, and potassium) are generally released as ash, but are also carried in smoke and fall to the earth's surface over a broad geographic area. While these events have not been widely studied, it is thought that these nutrients may stimulate plant production in areas receiving the fall-out from forest fires. Smoke is also known to have anti-fungal properties but the effect of these properties on adjacent unburned plant communities is poorly studied.

Air quality standards for allowable emissions are based on health effects. These standards are intended to protect sensitive members of the populations with adequate safety margins. Intense exposures and effects to humans from smoke is usually limited to firefighters suppressing forest fires or personnel conducting management-ignited prescribed fires. A more detailed discussion on air quality can be found in Chapter XI, Air Quality/Smoke Management Guidelines of the Yellowstone National Park Fire Management Plan.

## **VISUAL QUALITY**

**Affected Environment:** The Yellowstone landscape is dominated by expansive forests interspersed with mountain peaks, meadows, lakes, rivers, and wetlands. The uneven terrain and frequent open spaces offer vistas of mountain ranges as well as the opportunity to view wildlife.

**Consequences of Fire:** Evaluation of visual quality is a subjective measure, and the public's response to burned areas varies widely. While some individuals are disturbed by the burned forests, other take the opportunity afforded by recent fires to observe fire-caused natural processes at work and view new vistas. Additionally, there are many other areas throughout the park which display the contrast between areas that have burned over the past 500 years.

In areas intensively used by the public, fire rehabilitation efforts may necessitate removal of hazard trees, stabilization of the soil, and other efforts to diminish impacts of fire suppression actions. In the backcountry, fire lines may need to be rehabilitated to stabilize the soil and diminish the visual impact of the fire lines. Whenever possible, natural processes would be allowed to take their course.

## **CULTURAL RESOURCES**

### **ARCHEOLOGICAL**

**Affected Environment:** Native Americans occupied the greater Yellowstone area beginning at least 12,000 years ago. Historically the area was visited by Shoshone, Crow, Gros Ventres, Flathead, and Nez Perce. A few bands of Shoshone-speaking Sheepeaters occupied the park during the early and middle nineteenth century. A number of Euro-American historic sites exist today as archeological sites. Intensive archeological inventories have occurred on 0.5 to 1 percent of Yellowstone's 2.2 million acres, and 10 percent of the park has had cursory inventories. As a result of these inventories, more than 400 archeological sites have been recorded. These sites include occupation sites, chipping sites, tipi rings, wickiups, trails, quarries, and dumps, among others. The majority of these sites have not been evaluated for the National Register of Historic Places; however, one site, Obsidian Cliff, has been nominated as a National Historic Landmark.

**Consequences of Fire:** Fire effects on archeological resources would vary depending on the type of resource affected and the associated suppression and rehabilitation efforts used. The majority of Yellowstone's archeological resources would be little affected by fire, but resources composed of combustible materials (such as wickiups) could be destroyed. Suppression and rehabilitation efforts could severely impact archeological resources. It is possible that fire may expose archeological resources by clearing ground vegetation.

## **HISTORIC RESOURCES**

**Affected Environment:** Historic resources relating to European-American exploration and occupation, military administration, NPS administration, and early concessions operations include roads, bridges, backcountry cabins, museums, entrance stations, residences, and hotels. Designated National Historic Landmarks include the museums at Norris, Madison Junction, and Fishing Bridge; the Old Faithful Inn; and, the Northeast Entrance Station. Yellowstone has over 100 structures on the National Register of Historic Places including the Albright Museum at Mammoth, the Lake Yellowstone Hotel, and Fishing Bridge. There are 952 additional structures listed as potentially eligible to the National Register. Some historic structures, such as some of the park's backcountry patrol cabins, are located outside of developed areas; however, the majority of historic structures are located in the park's 6 historic districts. These districts are located within the existing developed areas. Some structures are adaptively used, but many, such as residences, maintenance facilities, and concession facilities, retain their original uses.

**Consequences of Fire:** Fire could result in the loss of significant cultural resources. Historic structures and museum collections could be affected by fire and fire related activities.

## **SOCIAL AND ECONOMIC ISSUES**

### **VISITOR USE AND SERVICES**

**Affected Environment:** During the last decade, visitation to Yellowstone has ranged between 1.9 million in 1980 and 2.8 million in 1990. Most of this visitation traditionally occurs during the summer months of June, July, and August, although the shoulder seasons (spring and fall) are growing in popularity. Nearly 30,000 visitors enter the park on peak summer days.

Surveys of Yellowstone's summer visitors were conducted in 1987 and 1989 (Machlis and Dolsen 1988; Littlejohn et al. 1990; Bath 1991). They document generally consistent visitor use patterns and perceptions before and after the fires of 1988. Recreational activities such as viewing wildlife and thermal features, photography, walking, and visiting museums were the primary activities reported in both visitor surveys. Other activities reported include fishing, camping, hiking, horseback riding, and boating.

A wide variety of services are available within the park. Services provided by the National Park Service range from emergency medical services and law enforcement to interpretive programs to water and sewage treatment facilities. Eleven heavily-used campgrounds with more than 1800 campsites are accessible from park roads. The park also maintains about 300 backcountry campsites accessible from more than 2000 miles of trails. During the peak summer months Yellowstone hires seasonal employees and additional people volunteer their services to the park.

Services such as lodging, meals, souvenirs, supplies, medical services, and gasoline are provided by five authorized concessioners. These authorized concessioners are:

**TW Recreational Services, Inc. (TWRS).** This concessioner operates approximately 2130 overnight lodging units (7100 pillows), 18 food service outlets, 9 gift shops, 3 horse operations, 2 camper-services stores, 1 marina, and a 353-site recreational vehicle campground. TWRS maintains a summer staff of about 2200.

**Hamilton Stores, Inc.** Hamilton Stores, Inc., operates 15 general stores. Eight of these stores offer a variety of food services. This concessioner has the exclusive right within the park to sell souvenir items on which the name "Yellowstone" appears. During the peak season a staff of about 885 is employed.

Yellowstone Park Medical Services. This concessioner provides the park's medical services, including a 14-bed emergency stabilization unit at Lake, ambulance services, sale of prescription drugs, and 2 clinics. The clinic at Old Faithful is operated seasonally and the Mammoth clinic is operated year-round. During the summer, these facilities employ a staff of about 45.

Yellowstone Park Service Stations (YPSS). Yellowstone Park Service Stations operates 8 service stations including wrecker and repair service at 5 locations. In the summer, YPSS employs a staff of about 97.

Firebox, Inc. Firebox, Inc., provides firewood through vending machines located in six campgrounds. This concessioner employs a staff of about 12 during the peak season.

**Consequences of Fire:** Fire may affect visitor use and services within Yellowstone in a variety of ways. The extent of the effects is directly related to the size, location, and duration of the fire.

Small fires and the smoke they generate, as well as suppression or monitoring activities, cause little, if any,

inconvenience to the visitor. If the fire is visible from roadways or trails, the visitor's experience could be enhanced by the opportunity to witness the ecological role of fire in the park. There would be little effect on park concessioners from small fires.

Large fires, however, could have more pronounced effects. The extent of these effects would be largely determined by the location and duration of the fire. Smoke from large fires could create health hazards for those with respiratory conditions and could limit short- or long-distance views. To ensure visitor and employee safety, appropriate health and other safety warnings would be issued. Temporary closures of roadways and developed or backcountry areas could occur. Smoke generation and temporary closures are usually short-term and visitor experiences and use patterns soon return to pre-fire conditions. These effects may cause anxiety in some park visitors. This could prompt some visitors to leave sooner than planned or to bypass those areas affected by fire. Other visitors may take the opportunity to witness the natural phenomena of fire.



To the north of town, there are numerous ranches. The town has its own water and sewage treatment facilities. The sewage facility serves both Gardiner and Mammoth Hot Springs.

The incorporated town of West Yellowstone, Montana, population 735, lies adjacent to the park's west entrance. Located in Gallatin County, West Yellowstone is surrounded by the park and the Gallatin National Forest. Tourism is the primary economic base for the town. Motels, service stations, restaurants, bars, and souvenir shops predominate. Recreational outfitters provide fishing, camping, bicycling, and hunting services. Some park and concessioner employees reside in West Yellowstone and frequent local businesses. Sewage treatment facilities and water for the park's west entrance are provided by West Yellowstone.

The unincorporated towns of Silver Gate and Cooke City, Montana, with a combined population of approximately 140 year-round residents, lie one mile apart and 2 miles outside the park's northeast entrance. Both towns are located in Park County and are surrounded by the park and the Gallatin National Forest. Tourism provides the primary economic base for the towns although timber production and mining are also important industries. Motels, service stations, restaurants, bars, and souvenir shops predominate. Recreational outfitters provide hunting, fishing, and camping services. Several park employees reside in the Silver Gate-Cooke City area. Both towns depend upon the park for sewage and garbage disposal and emergency medical and law enforcement assistance.

Cody and Jackson, Wyoming, and the developments between these towns and the park rely on Yellowstone tourism despite not being immediately adjacent to the park. These areas have a diversified economic base emphasizing recreation on both national forest and national park lands. Numerous motels, guest lodges, dude ranches, art galleries, museums, service stations, restaurants, bars, and souvenir shops predominate in these areas. Recreational outfitters provide a wide variety of services.

**Consequences of Fire:** Disruptions, such as temporary closures of roads, developed areas or backcountry areas, could cause social and economic fluctuations in the surrounding communities. The extent of these disruptions would vary depending on the size, location, and duration of each fire. Fires that are small, remote, or of short duration would have little, if any, affect on area communities.

Large fires could result in positive or negative impacts on area communities under any of the four fire management alternatives. As fires grow in size, it is more likely that temporary closures of roads and developed or backcountry areas will be necessary to ensure safety of area residents and visitors and to facilitate fire monitoring or suppression activities. These temporary closures may cause people to cancel reservations or to change their Yellowstone area travel plans. This reduced tourism is likely to negatively impact specific business sectors but not the area economy as a whole.

Conversely, as fire size grows the expenditures for monitoring or suppression activities increase. Many of these expenditures are made in the area communities when agencies purchase food, fuel, and other materials in the area. These expenditures are likely to positively impact specific business sectors and the area economy as a whole.

The net overall effect from a suppression (alternative A) or a combined fire management program (proposal) from all fires, regardless of size, is neutral to slightly positive.

The above conclusions are supported by data from previous years' firefighting costs and a report prepared by the Research and Statistics Division, Department of Administration and Fiscal Control, State of Wyoming, entitled "The Yellowstone Fires of 1988: An Analysis Based on Sales Tax Collections and Various Park Related Data". This study summarized economic effects of the 1988 fires on the Wyoming economy using tax revenues as a means of determining sales volumes.

The report analyzed tax collections from Sublette, Park, Fremont, and Teton counties located in northwestern Wyoming. The overall conclusion was that the impact of the 1988 fires was of a generally positive nature in terms of taxable sales. Sales tax collections for this area increased an average of 4.94 percent in 1988 over the same period in 1987. Tax collections were up 14.38 percent in Sublette County, 8.71 percent in Fremont County, 4.13 percent in Park County, and 1.67 percent in Teton County.

Establishments selling petroleum, lodging, food, and other necessities to firefighting agencies and personnel found many buyers. Regionally, the service sector as a whole declined 8 percent in 1988 as compared to the same period in 1987. However, the lodging component increased by 24 percent, the retail trade increased by 6 percent, and the eating and drinking component increased by 2 percent. It cannot be predicted with any certainty if small-scale fires would have similar economic effects.

Costs for fire management programs need to be averaged over the 300- to 400- year fire cycle of the Yellowstone ecosystem. Fire activity and the associated costs of suppression or monitoring vary widely from year-to-year based on several conditions that include weather (precipitation, temperature, relative humidity, wind, and lightning) and fuels (fuel type, loading, and moisture content). Since meaningful fire suppression began in Yellowstone more than sixty years ago (including the period following the 1976 change to a prescribed natural fire program), fire management costs have ranged widely. In 1981 virtually no firefighting costs were incurred while in 1988 about \$150,000,000 was spent suppressing the fires that burned throughout the Yellowstone ecosystem. It is generally not useful or accurate to compare fire management/suppression costs on a per acre basis. Comparisons between suppression programs (alternative A) and a combined fire management program (similar to the proposal) in ecosystems with a more frequent fire cycle (10 to 20 years) have shown that over the length of the fire cycle costs for all types of programs are similar. It is possible that the combined program (proposal) could be slightly more expensive than total suppression (alternative A). Management programs similar to alternative B and alternative C are estimated to be significantly more costly over the length of the fire cycle. Because there is no history of fire management over the length of Yellowstone's fire cycle it is not possible to accurately estimate the cost of implementing the proposal or the alternatives.

## **OTHER AGENCIES**

**Affected Environment:** Yellowstone National Park is at the center of a 12 million acre ecosystem. The states of Montana, Idaho, and Wyoming as well as seven national forests and Grand Teton National Park have principal management responsibility for most of this land. A large portion of these lands is used for timber harvest and livestock grazing. However, the greater part of these areas is used for watershed protection, outdoor recreation, wildlife management, and wilderness values.

Jurisdictional boundaries between these agencies and states are not drawn based upon natural fire breaks. Fires that occur within Yellowstone have the potential to burn onto adjacent forests or into Grand Teton National Park. Conversely, fires occurring on adjacent forest and park lands can spread into Yellowstone. Wildland fire management objectives vary somewhat between agencies. Management of wildland fire, then, requires cooperation between agencies.

**Consequences of Fire:** Coordination, sharing of information, and mutual assistance are the primary consequences of fire in Yellowstone. Extensive coordination has accompanied the preparation of Yellowstone National Park's draft Wildland Fire Management Plan. Each agency has reviewed each of the other agencies' fire management objectives and is sharing information in a timely manner.

Mutual assistance during pre-fire planning and fire monitoring or suppression activities utilizes each agency's resources. Assistance is coordinated through the Interagency Fire Center in Boise, Idaho, and, when appropriate, directly between Yellowstone and Grand Teton National Parks, the seven national forests, and the three states. This process ensures that each agency's objectives are met to the extent possible.

## MEETING WILDLAND FIRE MANAGEMENT OBJECTIVES

The consequences of fire have been discussed for each of the primary natural, cultural, and social and economic resources of Yellowstone National Park and the surrounding area. How well the proposal and the three alternatives meet the park's six wildland fire management objectives is discussed below.

**OBJECTIVE ONE:** Protect human life, property, and designated resources.

**Proposal:** The proposal achieves this objective by designating suppression zones around all developed areas. The park's developed areas include the centers for visitation, the majority of property, as well as designated resources requiring protection. Additionally, these areas contain most of the park's historic structures and many of the known archeological sites. In designated suppression zones, protection of life, property, and other resources would be maximized. In the conditional and prescribed natural fire zones, there are limited improvements and other designated resources requiring protection. In these zones emphasis would be placed on achieving other fire management objectives. Overall, the proposal seeks to minimize risks to human life, property, and designated resources while balancing those risks against other wildland fire management objectives.

**Alternative A - Suppression Only:** This alternative maximizes the protection of life, property, and designated resources by suppressing all fires regardless of cause or location. By suppressing all fires, the risks to these resources would be the least of the four alternatives. However, these risks will increase over time.

**Alternative B - Management-Ignited Prescribed Fire Only:** This alternative seeks to protect life, property, and designated resources by allowing management-ignited prescribed fires only. All other fires would be suppressed. Although fire managers would ignite fires so that there would be a limited risk to the values of this objective, the risks would not be negligible. A management-ignited prescribed fire could exceed prescriptions and require suppression. Under these circumstances a management-ignited prescribed fire could threaten human life, property, or designated resources.

**Alternative C - Prescribed Natural Fire Only:** This alternative would protect life, property, and designated resources through the application of specific fire prescriptions similar to those in the proposal's prescribed natural fire zone. The lack of suppression and conditional zones would put the values of this objective at slightly greater risk than the proposal or the other alternatives would.

**OBJECTIVE TWO:** Allow fire to play its ecological role in the park to the greatest extent possible through the use of appropriate management techniques.

**Proposal:** The proposal utilizes a variety of fire management techniques to achieve this objective. The conditional and prescribed natural fire zones allow fire to play its ecological role within fire management prescriptions. Prescriptions are intended to assure that fires achieve the other wildland fire management objectives.

The park's natural resources would generally respond to fire as described in the consequences of fire sections of this document. The Endangered Species Act requires that a determination be made as to the effects of the proposal on threatened and endangered species. Based on the information presented in the consequences of fire section for threatened and endangered species, the following determinations, subject to concurrence by the U.S. Fish and Wildlife Service, have been made:

**Peregrine Falcon (*Falco peregrinus*):** The proposal will not affect the existence of the peregrine falcon population in the greater Yellowstone ecosystem.

**Bald Eagle (*Haliaeetus leucocephalus*):** The proposal is not likely to adversely affect the continued existence of the bald eagle population in the greater Yellowstone ecosystem.

**Whooping Crane (*Grus americana*):** The proposal will have no effect on the existence of the whooping crane population in the ecosystem.

**Grizzly Bear (*Ursus arctos horribilis*):** The proposal is not likely to adversely affect the existence of the grizzly bear population in the ecosystem.

Fire's ecological role would be maximized in the conditional and prescribed natural fires zones. If fires in these zones exceed prescription, they would be suppressed. All human-caused fires that are not pre-planned management-ignited prescribed fires would be suppressed.

**Alternative A - Suppression Only:** This alternative does not achieve this objective. By suppressing all fires, fire's ecological role would be severely limited. Fire impacts would only occur when initial attack suppression actions fail and the fire becomes an escaped fire.

Additionally, fire suppression activities would cause impacts to many of the park's natural resources during construction of fire lines and through the use of fire retardant.

The short-term impacts of this alternative to threatened and endangered species would probably be similar to the proposal. It is not known how threatened and endangered species would respond to the long-term vegetative changes resulting from a fire suppression policy.

**Alternative B - Management-Ignited Prescribed Fire Only:** This alternative achieves this objective in a limited way. Management-ignited prescribed fires would not fully re-create a natural fire situation either in location or condition. Naturally ignited fires would be suppressed leading to the fire suppression impacts discussed under alternative A above.

Threatened and endangered species would respond similarly to the proposal and no significant adverse effects on the four listed species are expected.

**Alternative C - Prescribed Natural Fire Only:** This alternative achieves this objective by allowing natural fires only to occur anywhere in the park. Specific fire prescriptions would limit and suppress some fires, but this alternative maximizes fire's ecological role in the park. Greatest potential for large wildfires to occur exists under this alternative.

Threatened and endangered species would respond similarly to the proposal and no significant adverse impacts on the four listed species are expected.

**OBJECTIVE THREE:** Suppress wildfires in a safe, cost-effective, and environmentally sensitive manner commensurate with the values at risk.

The proposal and the three alternatives would each achieve this alternative by utilizing the three suppression techniques of confine, contain, and control.

**OBJECTIVE FOUR:** Maintain an active fire prevention program.

This objective is a policy requirement of the National Park Service. The proposal and the three alternatives would each achieve this objective.

**OBJECTIVE FIVE:** Maintain a fully qualified fire management staff to implement the fire management plan.

The proposal and the three alternatives would each achieve this objective.

**OBJECTIVE SIX:** Maintain an interpretive and public information program that will educate the public on the ecological role of fire in the park and provide daily fire danger and situation information.

The proposal and the three alternatives would each achieve this objective.

### **CUMULATIVE EFFECTS OF THE PROPOSAL**

An analysis of cumulative effects from the implementation of the draft Wildland Fire Management Plan includes existing development and management actions. Consideration is also given to reasonably foreseeable future actions. This analysis acknowledges the ongoing parkwide community plans, Lake Village/Bridge Bay Development Plan, campsite replacement study (replacement of camping sites affected by the closure of the Fishing Bridge campground), and the Bison Management Plan. Each of these plans will include further public review and continue the analysis of cumulative effects.

As a matter of course, fire affects most resources dramatically. Vegetation is burned and some animals are killed during a fire. Although the effects of fire can be dramatic, the draft Wildland Fire Management Plan is not expected to cause any adverse long-term effects on any park resource. It is a specific objective of the proposal to allow fire to play its ecological role in the park within the context of other fire management objectives.

The cumulative effects on threatened and endangered species from this plan, in consideration of other reasonably foreseeable actions, are not expected to be adverse. Although the draft Wildland Fire Management Plan may affect the bald eagle and grizzly bear, the consequences of pursuing a management program using a combination of prescribed natural fires, management-ignited prescribed fires, and suppression is not likely to adversely affect the continued existence of these species in the ecosystem.

## CONSULTATION, COORDINATION, AND PREPARERS

The process followed in reviewing and revising the Wildland Fire Management Plan has included consultation and coordination with many agencies and organizations. The process began almost immediately following the 1988 suspension of Yellowstone's natural fire policy, which had been approved in 1976.

Even as fire suppression efforts continued throughout the summer and fall of 1988, park officials began asking what could have been done differently. In the fall of 1988, the U.S. Departments of Interior and Agriculture created the interagency Fire Management Policy Review Team. This team's responsibility was to review the individual fire reports in the context of the entire summer and with the benefit of hindsight. The team's preliminary report was issued in December 1988 and the final report followed in May 1989. The findings of the team reaffirmed the basic soundness of natural fire policies in national parks and wilderness areas, but offered recommendations to improve federal fire management.

Using the findings of the Fire Management Policy Review Team, the National Park Service and the U.S. Forest Service met to interpret and find a common means to implement the recommendations. These recommendations were then incorporated into the National Park Service's Wildland Fire Management Policy Guideline (NPS-18) which was revised in June 1990.

Concurrent with the revisions to NPS-18 and other fire policy reviews, the superintendents and fire managers from Yellowstone and Grand Teton national parks and the forest supervisors and fire managers of the Bridger-Teton, Gallatin, Custer, Targhee, and Shoshone national forests met to begin the development of the Greater Yellowstone Area Interagency Fire Management Planning and Coordinating Guide. This guide, finalized in June 1990, interpreted each agency's service-wide recommendations into recommendations specific to the greater Yellowstone area.

Yellowstone National Park started a review and analysis of its 1976 Fire Management Plan during the winter of 1989 concurrent with many of the other policy review efforts. In September 1990 the park sent out more than 500 scoping statements to parties interested in wildland fire management in Yellowstone. More than 150 responses were received and analyzed. Ten concerns were significant to the respondents. These concerns are identified and addressed in the Planning and Issues section of this document.

Under the provisions of Section 7 of the Endangered Species Act, as amended, Yellowstone National Park is consulting with the U.S. Fish and Wildlife Service regarding the affects on the park's four threatened and endangered species. This consultation is occurring concurrent with the public review of the draft Wildland Fire Management Plan and Environmental Assessment.

Copies of these documents are also being reviewed, concurrently, by the State Historical Preservation Offices of Wyoming, Montana, and Idaho.

The Draft Wildland Fire Management Plan and the Draft Environmental Assessment have been coordinated with and reviewed by the greater Yellowstone area federal land managers and those individuals listed below as consultants. The Draft Environmental Assessment was prepared by the core team listed below.

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Jane Roybal, Biologist, U.S. Fish and Wildlife Service, Cheyenne Office  
Wayne Smetanka, Fire Management Officer, Custer National Forest

## BIBLIOGRAPHY

- Albin, Douglas P. 1978. Some Effects of Forest Fires on Selected Streams in Yellowstone National Park. Master of Science Thesis, Humboldt State University, California. 55 pp.
- Alley, J.J. and R.E. Moore. 1989. Small mammal communities in the first year following the Fan Creek fire in 1979. Final Report, NPS-YNP. Contract #CX-1200-9-8035. Yellowstone National Park.
- Arno, Stephen F. 1980. Forest fire history in the northern Rockies. *Journal of Forestry* 78(8):460-465.
- Bath, Alistair J. 1991. Yellowstone National Park visitor attitudes toward fire management issues in the park. National Park Service Report. 17pp.
- Blanchard, Bonnie, M. and Richard R. Knight. In Press. Reactions of Yellowstone grizzly bears to wildfire. *Can. Field Nat.*, 1991.
- Bonney, O.H. and L. Bonney. 1970. *Battle Drums and Geysers*. Swallow Press, Chicago. 622 pp.
- Bendell, J.F. 1974. Effects of fire on birds and mammals, pp. 73-138. In T.T. Kozlowski and C.E. Ahlgren (eds.). *Fire and Ecosystems*. Academic Press, New York. 542 pp.
- Chew, R.M., B.B. Butterworth, and R. Grechman. 1958. The effects of fire on the small mammal populations of the chaparral. *J. Mammology* 40:253.
- Christensen, N.L., Chariman. 1988. Ecological consequences of the 1988 fires in the greater Yellowstone area. Final Report, The Greater Yellowstone Post-fire Ecological Assessment Workshop. 58 pp.
- Christensen, N.L., J.K. Agee, P.F. Brussard, J.M. Peek, S.J. Paine, F.J. Swanson, J.W. Thomas, S. Wells, S.F.



- Koch, E.D. and C.R. Peterson. 1989. A preliminary survey of the distribution of amphibians and reptiles in Yellowstone National Park. Final report NPS-YNP. 7 pp.
- Koehler, G.M. and M.G. Hornocker. 1977. Fire effects on marten habitat. *J. Wildl. Mgmt.* 41:500-505.
- Lahren, L.A. 1971. Archeological investigations in the upper Yellowstone Valley, MT: a preliminary synthesis and discussion. In: A.H. Stryd and R.A. Smith (eds.). *Aboriginal Man and Environments on the Plateau of Northwestern America*. University of Calgary Archeological Association.
- Lawrence, G.E. 1966. Ecology of vertebrate animals in relation to chapparal fire in the Sierra Nevada foothills. *Ecology* 47:278-291.
- Leopold, A.S., S.A. Cain, C.M. Cottam, I.N. Gabrielson, T.L. Kimball. 1963. Wildlife Management in the National Parks. *Trans. N. Am. Wildl. Nat. Resource Conf.* 24:28-45.
- Littlejohn, Margaret, Dana E. Dolsen, Gary E. Machlis. 1990. Visitor Services Project, Report 25, Yellowstone National Park. Univ. of ID, Coop. Park Studies Unit. 34 pp.
- Lyon, L.J., H.S. Crawford, E. Czuhai, R.L. Fredericksen, R.F. Harlow, L.J. Metz, and H.A. Pearson. 1978. Effects of fire on fauna. U.S.D.A. Forest Service, Gen. Tech. Rpt. WO-6, Washington, D. C.
- Machlis, Gary E. and Dana E. Dolsen. 1988. Visitor Services Project, Report 15, Yellowstone National Park. Univ. of ID, Coop. Park Studies Unit. 56 pp.
- Mattson, David J. and Charles Jonkel. 1989. Stone pines and bears. Presented at Symposium on Whitebark Pine Ecosystem: Ecology and Management of a High-Mountain Resource, Bozeman, MT, March 29-31, 1989.
- McEncaney, T. 1988. *Birds of Yellowstone*. Roberts Rinehart, Inc., Publishers. Boulder, CO. 171 pp.
- Mills, Susan (editor). 1989. The greater Yellowstone post-fire assessment. U.S. Forest Service and National Park Service greater Yellowstone coordinating committee. 146 pp.
- Minshall, G.W., J.T. Brock, and J.D. Varley. 1989. Wildfires and Yellowstone's stream ecosystem. *BioScience* 39:707-715.
- National Park Service. 1972. Natural Fire Management Plan, Yellowstone National Park.
- National Park Service. 1976. Final Environmental Assessment, Natural Fire Management Plan, Yellowstone National Park. 36 pp.
- National Park Service. 1990. NPS-18, Wildland Fire Management Policy Guideline. Revised June 1990.
- Pfister, A.R. 1980. Postfire Avian Ecology in Yellowstone National Park. M.S. Thesis. Washington State Univ., Pullman, WA. 35 pp.
- ~~Reinart, Daniel B. and David J. Mattson. 1989. Red squirrels in the whitebark zone. Presented at~~

- Romme, W.H. 1979. Fire frequency in subalpine forests of Yellowstone National Park, pp. 27-34. In: Proceedings of the Fire History Workshop, University of Arizona.
- Romme, W.H. and D.G. Despain. 1989. Historical perspective on the Yellowstone fires of 1988. *BioScience* 39:695-699.
- Singer, F.J. and B.B. Ackerman. 1975. Winter habitat relationships of five ungulate species in Glacier National Park, MT. Unpublished Rpt., Glacier N.P., MT.
- Singer, F.J., W. Schrier, J. Oppenheim, and E.O. Garten. 1989. Drought, fires, and large mammals. *BioScience* 39:716-724.
- State of Wyoming. 1989. The Yellowstone Fires of 1988: An Analysis Based on Sales Tax Collections and Various Park Related Data. 23 pp.
- Streubel, D. 1989. Small Mammals of the Yellowstone Ecosystem. Roberts Rinehart, Inc., Publishers. Boulder, CO. 152 pp.
- Taylor, D.L. 1969. Biotic Succession of Lodgepole Pine Forests of Fire Origin in Yellowstone National Park. National Geographic Society Research Reports 12:693-702.
- Taylor, D.L. 1969. Biotic Succession of Lodgepole Pine Forests of Fire Origin in Yellowstone National Park. Ph.D. Thesis, University of Wyoming, Laramie. 320 pp.
- Taylor, D.L. and W.J. Barmore. 1980. Post-fire succession of avifauna in coniferous forests of Yellowstone and Grand Teton National Parks, Wyoming, pp. 130-145. In R. M. DeGraff, (ed.). Proceedings of the Workshop on Management of Western Forests and Grasslands for Non-game Birds. U.S.D.A. Forest Service, Gen. Tech. Rpt. INT-86, Intermtn. Forest and Range Exp. Station, Ogden, UT.
- Tevis, L. 1956. Effects of a slash burn on forest mice. *J. Wildl. Mgmt* 20:405-409.
- Varley, J. 1989. Wildfire and wild trout in 1988: Do you want to hear the bad news or the good news first?, pp. 128-131. In Frank Richardson and R.H. Hamre, (eds.). Wild Trout, Proceedings of the Symposium, 1989. 233 pp.
- Wood, M.A. 1981. Small Mammal Communities after Two Recent Fires in Yellowstone National Park. M.S. Thesis. Montana State University, Bozeman, MT. 58 pp.

Substantive Comments and  
National Park Service Responses

Following are the substantive comments on the Draft Wildland Fire Management Plan/Environmental Assessment and the National Park Service response. The comments are organized under the heading used in the draft document. Similar comments have been consolidated for this analysis.

**PURPOSE AND NEED FOR THE PLAN**

**Comment:** The plan makes little or no mention of specific plans to insure cooperation of fire management between Yellowstone National Park, neighboring communities, and private landowners.

**Response:** The mechanism for cooperation between the park and neighboring communities and private landowners is through local, regional, and national "Memorandums of Understanding". The fire prevention analysis provides an opportunity for concerned parties outside the park to identify specific concerns.

**Comment:** The list of consultants does not include anyone from outside the federal bureaucracy.

**Response:** The process of soliciting public comments occurred during August and September of 1990 as part of the scoping statement period. This comment period was open to all public groups and individuals. The park received 349 written comments during this period. Equal consideration is given to all comments, although there are few groups or individuals outside state agencies, federal agencies or educational institution that have the experience or expertise that would render them credible.

**Comment:** The plan has not resolved the need for a coordinated fire management plan for the entire Yellowstone area.

**Response:** Following the 1988 fires, the Forest Service and Park Service agreed to increased interagency fire cooperation through the Greater Yellowstone Area (GYA) Fire Planning and Coordination Guide and Memorandums of Understanding. The coordination guide includes provisions to assure similarity of fire management plans and mandates mutually acceptable decisions will be made where boundaries join. But, it still remains that differences in management objectives and legislative mandates exist between forests and parks which make a single plan unattainable.

**Comment:** Have the agencies in this area ever considered having one agency take responsibility for fire management and fire dispatch in the entire Greater Yellowstone Area?

**Response:** This idea has been discussed. The task is possible, but the difference in land management objectives would most likely result in conflict among managers required to work under the system. The local agencies have personnel that are more familiar with terrain, weather patterns, local factors, policies and agency personnel. It would be difficult for one agency to manage all types of fire as well as the individual Fire Management Officers's and their fire staffs currently do. A single fire dispatch center would be a duplication of what already exists to handle local dispatch needs and include additional expense.

**Comment:** Many legal analysts say that a mere Environmental Assessment is inadequate and the Park Service is required by the National Environmental Policy Act to do a full Environmental Impact Statement.

**Response:** NEPA is clear when an Environmental Assessment and an Environment Impact Statement are

required. Research has proven that fire is a natural force in the environment. The interpretation by the Park Service, as implemented in Yellowstone, allows for fire to play its natural role in the environment. The natural fire management plan began in 1972. An updated plan and Environmental Assessment was approved in 1976. The current proposal does not differ significantly from the 1976 plan and no significant concerns of negative affects from fire have been identified during the current scoping or draft comment period.

Comment: The plan as issued refers to Appendices not included with the document.

Response: The Appendices are supplemental information to the plan. They do not alter in any way the operation and implementation of the plan. They provide required information and blank forms to be filled out at certain levels of fire activity throughout the fire season. They are included in the final version of the Fire Management Plan.

Comment: If local suppression resources and funding are not available to manage the fire, then how do you take appropriate suppression response action?

Response: Requests for initial support resources are made to adjoining agencies in the GYA. When initial resources are inadequate then additional orders are placed with the Regional Coordination Center in Missoula. If funding is inadequate to manage the fire then appropriate suppression action will be taken.

Comment: Fire management efforts described in the plan will not come cheap, and you should assure that your program is adequately budgeted and funded to allow full implementation.

Response: Funding for the fire management program in Yellowstone comes from national funds. The intent of this program, like all fire programs in the United States, is to fund programs to handle 90% of normal (or average) fire activity. Ordering of additional resources is through interagency channels. Funding for emergency operations, i.e. fire suppression, is for the time of the emergency as determined by the agency affected. Congress passes a supplemental appropriation bill to cover emergency fire suppression operations after the fiscal year.

#### **AREA DESCRIPTION**

Comment: The document lacks protection measures needed to assure people living around the Park public safety and protection of private property.

Response: One of the operational goals of the plan is to prevent unwanted fire outside the park from affecting private landowners. One must also remember that total suppression gives no guarantees for complete protection of property. Each fire will be evaluated, predictions will be made as to how much each will potentially burn. This will be completed within the first two hours after detection. Any fire that at the time of ignition threatens to burn outside park boundaries onto private land will be declared a wildfire and suppression actions immediately taken.

#### **PROPOSED WILDLAND FIRE MANAGEMENT PLAN**

Comment: The plan hasn't include a cover type for beetle killed lodgepole pine.

Response: Development of the cover type classification was to view the continuous process of succession in recognizable "phases". Beetle killed lodgepole pine is not a "phase" of succession, but is a component of old-growth lodgepole forests, specifically late-LP2, LP3 and LP types.

**Comment:** The plan continues the normal confusion and delay factor that most NPS areas insure in handling initial attack responsibilities. You have failed to establish line responsibility for this task.

**Response:** The evaluation of each fire will begin upon detection. All fires in the suppression zone will be initial attacked immediately. All fires in the PNF and Conditional Zones will be evaluated for potential candidates as PNF's. A decision to declare a fire a Prescribed Natural Fire will be completed in the first two hours after a fire is detected. Line responsibility is from the Superintendent to the Chief Ranger to the respective District Ranger. Suppression of wildfires will be under the authority of the District Ranger with assistance from the Fire Management Office. Determination of Prescribed Natural Fire status is by the Fire Management Committee.

**Comment:** The Prescribed Natural Fire section is vague as to who will assign Fire Monitors and when they will be assigned.

**Response:** The Fire Management Officer will assign fire monitors. They will be assigned for each fire to complete required documentation. A prescribed fire manager also will be assigned for each fire to do daily revalidation that the fire will remain within prescription. The Prescribed Fire Manager will determine, based on the activity of the fire and its potential, whether to assign the fire monitors to remain on site for the duration for the fire or to only take the initial fuel samplings and complete the initial documentation on site.

**Comment:** The range of effects of the fire management activities of the alternatives on biodiversity does not appear to have been investigated to the extent necessary to make a well informed decision.

**Response:** Biodiversity is a phrase that has different meaning in different contexts. As such, the EA addresses fire effects at the species, community, and landscape levels through both time and space to allow for biological consideration at different spatial, temporal and organizational levels.

**Comment:** How is area of permittable burn predetermined?

**Response:** Each individual fire is evaluated according to fuels, weather, terrain, and observed fire behavior to predict if that fire will remain within the PNF or conditional zone. If predicted to burn outside either of these zones, the fire is declared a wildfire and suppressed. If declared a Prescribed Natural Fire, then the fire will be allowed to burn freely until it goes out on its own provided each day the prediction is for it to remain within the PNF or conditional zones.

**Comment:** What are the "values at risk"?

**Response:** Values at risk of concern is defined as are all private land and structures outside the park and all structures within the park. Attempts will be taken to protect all structures threatened by fire both outside and inside the park with the main emphasis placed upon protecting human life.

**Comment:** The plan is too specific about the equipment which will not be allowed to fight fires.

**Response:** The intent of the plan is to allow all normal fire suppression equipment to be used. No equipment has specifically been denied but the plan assures that the approval for the use of certain equipment comes from the Regional Director instead of the Superintendent.

Comment: If a human-caused fire is started that has potential benefits in reducing long term hazards why will it be suppressed?

Response: The park philosophy is that fire is neither good or bad, just natural and as such will not be managed or interpreted as having benefits or disadvantages. The proposed plan strives to

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encourage natural processes. Human-caused fires are not considered as part of this process. This does not preclude using planned ignitions for hazard fuel removal

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Comment: Who will be "writing the prescription" and how will the locations and extent of allowable burn be decided?

Response: The go-no-go prescriptions to determine initially whether a fire will be suppressed or declared a Prescribed Natural Fire are included in the plan. The determination as to the maximum size a fire will be allowed to attain is by the Fire Management Committee based on prescription parameters referenced in the Fire Management Plan.

Comment: It is unclear how the Park uses fire behavior, fuel types, and annual weather cycles with site and area-specific fuel load information to write fire prescriptions.

Response: The fire behavior, fuel types and annual weather cycles provide past historical knowledge of exactly how and to what extent fires burned under specific weather conditions. Site specific information, fuel information and current weather conditions are compared to known fire information to get a better estimate how the current fire will burn.

Comment: The plan does not discuss how biological diversity is impacted by large scale fires as exhibited during the summer of 1988 as compared to smaller controlled blazes that can promote a more diverse aged forest.

Response: Both the Fire Management Plan and Environmental Assessment stress that fires seldom burn in uniform patterns across the landscape. While prescribed burns are practical in some fuel types, they could seldom be implemented in the lodgepole fuel types of Yellowstone without great expense.

Comment: The plan does not consider using management ignited prescribed fire to in effect do the same job as prescribed natural fire; i.e. burn large area of land in a uncontrolled manner to enhance management objectives.

Response: Management objectives are not to burn large areas of land. The objective is to allow for natural processes. Management Ignited Prescribed Fires are not natural processes but serve the function of reducing fuel accumulation around developed areas, thus reducing the threat of unwanted fire around developed areas. Management Ignited Prescribed Fires may be used along certain boundary areas if determined to meet all management objectives to protect private property outside the park from being impacted by unwanted fire.

Comment: There does not appear to be much concern or effort made to work with the surrounding communities and effected constituencies that may have real concerns.

the writing and implementation of a fire prevention plan. Offers were made to discuss with any person, group or other entity the full range of fire management topics included in the plan and environmental assessment as part of the review process.

**Comment:** Adopt an upper limit of acreage that will be allowed to burn in Yellowstone during any given period reflecting fire frequency shown in studies.

**Response:** Fires tend to burn large acreages during periods of drought and warm, windy weather conditions. It is impossible to predict these weather cycles or patterns. If all fires are suppressed during years that have the potential to remain dry, warm, and windy then fuel accumulation will eventually set the stage for large, intense fires to occur. A limit will be set for each individual fire, not for acreages.

**Comment:** The plan should consider the impact that reburn of 1988 fire areas will cause to reforestation.

**Response:** The areas that burned are classified and identified into fuel types. Research is conducting studies on reforestation in many areas that burned in 1988. The fuels in the burned areas are such that they will not support large fires again until significant reproduction is present. This may require as many as 75 years in most areas.

## **AFFECTED ENVIRONMENT/CONSEQUENCES OF FIRE**

### **Natural Resources**

**Comment:** Exotic plants (noxious weeds) and the effects of fire on the spreading of noxious weeds is not mentioned in the plan not in the Environmental Assessment.

**Response:** The relationship between fire and noxious weed establishment and spread across the landscape is a poorly understood phenomena in the general scientific community. The observation is that the most noxious weeds (spotted knapweed, leafy spurge, dalmation toadflax, etc.) did not colonize and spread into burned areas. Only Canada thistle, which was first recorded in the park over a century ago, has taken advantage of burned area and has slightly increased in areas previously occupied.

**Comment:** When will air quality acceptability trigger suppression?

**Response:** The latest air quality regulations require the states to establish regulations for Management Ignited Prescribed Fires. The states of Wyoming, Montana and Idaho have yet to take action regarding these air quality standards. All factors regarding smoke dispersal patterns, accumulation of smoke in local communities adjacent to or down wind from the park, will be considered in the daily revalidation of Prescribed Natural Fires. If the level of smoke becomes unacceptable, the fire will be declared a wildfire and suppression actions will be taken.

**Comment:** I hear and read from time to time that replanting efforts are going on in Yellowstone. What is the policy on this?

**Response:** Yellowstone has not replanted any of the burned areas. The areas disturbed by fire suppression efforts of 1988 were rehabilitated in 1988 and 1989 by drawing onsite vegetation back onto firelines and waterbarring. These areas have successfully reseeded and revegetated naturally. No seeding or replanting of tree seedlings occurred. Research plots show that most areas that burned in 1988 have reseeded/revegetated naturally.

Comment: The plan should address the protection of major stands of white bark pine as their destruction may adversely affect the recovery of the grizzly bear population in the ecosystem.

Response: Any fire starting in or projected to burn significant acreage of white bark pine will be reviewed subject to threatened and endangered species consultation with appropriate officials.

Comment: The Plan should recognize the sensitivity of some wildlife species to human and aircraft disturbance associated with fire management activities.

Response: The Park Aviation Plan addresses sensitive flight zone areas where aircraft use is not allowed except emergencies, so as not to disturb certain wildlife species and sensitive human use areas.

#### **Cultural Resources**

Comment: Can known sites of cultural and biological significance be plotted on a map and opinions offered on what kind of fires and what kind of fire suppression techniques should or shouldn't be used prior to fires occurring rather than waiting for a fire to react?

Response: All known cultural sites are plotted. Unfortunately, surveys for cultural sites have been completed on only about 1% of the park. The plan states that the staff cultural resources coordinator will be contacted when suppression actions are taken on large fires to help in surveying the area and locating sites to avoid. Suppression actions will avoid the identified areas.

#### **Social and Economic Issues**

Comment: The plan contains no action for compensation of loss of property outside the Park due to uncontrolled wildfire and negligent fire management.

Response: The plan is an operational document and does not address each point of concern in each section. The federal government has a formal process by which any individual may file a tort claim for damage done to their private property. The determination about the validity of the claim goes to the Regional Solicitor who makes a decision as to the validity of each claim.

Comment: The plan does not adequately protect utilities providing service to ratepaying public in bordering states.

Response: Utility services (usually power poles and telephone junction boxes) are treated as developed sites and all reasonable efforts to protect these services will be made. The problem is that in the forested fuel types in Yellowstone, the fire management staff and suppression efforts cannot guarantee that a forest fire will not burn any telephone poles. The telephone and power line occupies a cleared corridor throughout the park that is through a forested canopy of trees and impossible to protect along its entire route from damage by fire. A solution to ensure minimal impact by fire is to place the power and telephone lines underground.

Comment: The fire prevention plan, public information and education efforts should be strengthened.

Response: Fire prevention is now required by the National Park Service as part of the Fire Management Plan. The prevention plan will address public involvement and education needed for Yellowstone to carry out its fire management program. Through implementation of this plan, Yellowstone will attempt to improve public awareness and solicit public concerns regarding the implementation of



the fire management plan. The educational process will be an ongoing yearly program.

## MEETING WILDLAND FIRE MANAGEMENT OBJECTIVES

- Comment:** We are concerned about "mechanical hazard tree reduction" in developed zones, particularly as it might affect visual quality and visitor experience in those areas.
- Response:** Hazard tree reduction in developed zones is the removal of trees identified as dead standing or damaged that have the potential to do damage or fall on the park visitor. The vegetation management specialist uses approved standards for identifying hazard trees. The intent of removing hazard trees is to protect the public.
- Comment:** While the Environmental Assessment listed how well the proposal and alternatives would meet fire management objectives, it did not explicitly detail the ecological consequences of each alternative, nor costs needed to implement each.
- Response:** The Environmental Assessment summarized research data in addressing areas of concern as to the consequences of fire. The intent of the EA is to consider how fire affected all major areas of the environment. The cost to implement each proposal is addressed and discussed at great length. No conclusions could be drawn about exact cost of implementation due the extreme variability with each fire season. No two fire seasons are the same. One year is dry and many fires burn many acres. Other years are wet and few fires burn minimal acreages. No well defined and consistent cost figures have been generated. Therefore data on costs that could not be substantiated was not included.
- Comment:** Request for a fifteen year moratorium on all fires with full suppression, to allow the Park to recover.
- Response:** The park vegetation is recovering. Most burned areas of the past show natural revegetation. Historical data shows that at least 50 years of vegetative growth is necessary before a previously burned area has enough fuel to burn again. A 15 year moratorium (which would not be successful in an extremely dry and windy year like 1988) with no guarantee of success would not have much effect on most areas that burned in 1988.
- Comment:** One alternative not addressed in the 1991 fire plan and environmental assessment is to log the forest.
- Response:** Yellowstone's enabling legislation does not allow commercial logging, grazing or mining. The 1872 legislation provides that the park be protected from commercial exploitation.

## **FINDING OF NO SIGNIFICANT IMPACT**

### **ENVIRONMENTAL ASSESSMENT WILDLAND FIRE MANAGEMENT PLAN**

#### **YELLOWSTONE NATIONAL PARK IDAHO/MONTANA/WYOMING**

Yellowstone National Park prepared the Environmental Assessment (EA) of the revised Wildland Fire Management Plan using the findings of the Fire Management Policy Review Team, appointed by the Secretaries of Agriculture and Interior, and the results of scientific research.

The preferred alternative (Proposal) will manage wildland fires using the full range of fire management techniques. Naturally-ignited fires would be allowed to burn in certain areas of the park under specific conditions. Management-ignited prescribed fires would be initiated by National Park Service personnel to accomplish a variety of objectives including hazard fuel reduction and the reintroduction of fire to those areas of the park where suppression has altered the natural fire regime. Fires that will be suppressed include all human-caused fires; all fires which pose a threat to human life, developments, or cultural resources; any natural ignition which does not meet prescription parameters at the time that it is discovered; and any natural or management-ignited prescribed fires which exceed prescription parameters while burning. Suppression will be accomplished using confine, contain, or control strategies.

On July 12, 1991, the park released the draft Wildland Fire Management Plan and Environmental Assessment for public review. A mailing was conducted to all interested parties, and a press release was issued to media-related contacts. On July 17, 1991, 140,000 "Report and Comment Forms" on Yellowstone National Park's Wildland Fire Management Plan were distributed through nine regional newspapers and the park's five Visitor Centers. The report and comment forms were also distributed directly in the communities of Cooke City, Big Sky, and Gardiner, Montana. The formal public comment period for the Environmental Assessment closed on August 30, 1991. By September 11, 1991, 349 written comments were received.

Of the 349 responses, approximately 41 percent were supportive of the park's preferred alternative (Proposal), approximately 10 percent favored full suppression of all fire occurring in Yellowstone National Park (Alternative A), 1 percent preferred the use of Management-Ignited Prescribed Fire Only (Alternative B), approximately 14 percent favored allowing natural processes to work to the greatest extent possible, with the provision that priority be given to the protection of people and property (Alternative C), and 34 percent did not express support for a particular alternative or presented other alternatives.

A majority of the respondents listed concerns that were not directly related to fire management. They included: the 1988 fires; protection of natural resources; management policy (harvesting of timber and reforestation); protection of human life, developments, and

cultural resources; economic and political influences on the park's fire management; research; interagency cooperation; fire prevention and public information programs; and funding for the proposed Wildland Fire Management Plan.

The U.S. Fish and Wildlife Service reviewed the Environmental Assessment for compliance with Section 7 of the Endangered Species Act (ESA) and determined that the overall effects would be beneficial to listed species. They requested that each prescribed burn be reviewed for ESA compliance. This will be handled through the Park Compliance Program for each action.

The Wyoming, Montana, and Idaho state historic preservation offices reviewed the plan for compliance with Section 106 of the National Historic Preservation Act. Idaho State Historical Society pointed out that fire would affect noncombustible materials found at archaeological sites. Montana's State Historic Preservation Office, Montana Historical Society suggested that we take a more proactive approach to protecting cultural resources from fire-related activities. Wyoming's Department of Commerce, Division of Parks & Cultural Resources, State Historic Preservation Office concurred with the fire management goals for the protection of historic and prehistoric cultural resources. They recommended that the plan include provisions for cultural resource inventories subsequent to fire activities where substantial ground cover was removed. If, during the implementation of this program, cultural resources are discovered or may possibly be affected, the resources will be protected, and the appropriate state historic preservation office will be notified.

The proposal does not constitute an action that normally requires preparation of an environmental impact statement (EIS). The proposal will not have a significant effect on the

