

ENVIRONMENTAL ASSESSMENT

for

FIRE MANAGEMENT PLAN
BRYCE CANYON NATIONAL PARK
UTAH

UNITED STATES DEPARTMENT OF INTERIOR
NATIONAL PARK SERVICE

JANUARY 1994

I. PURPOSE AND NEED

Fire has been suppressed in Bryce Canyon National Park since the early 1900's when the area was managed by the U. S. Forest Service. Fire suppression and other land management practices have altered plant community structure and composition and results in artificially high fuel loads (Buchanan and Harper 1981, Roberts et al. 1992).

Fire suppression activities have unintentionally deprived the land of what is now understood to be necessary for perpetuation of certain ecological processes. As a result there is an alteration to the fire adapted communities of the park. In turn, this is creating a decline in the biological diversity of the park.

There is an ongoing need to ensure the perpetuation of park ecosystems and natural resources while managing wildland fire to provide protection of life, property and cultural resources.

The restoration of fire to park ecosystems is an important objective in managing the natural resources of Bryce Canyon National Park. The preparation of a Fire Management Plan for Bryce Canyon is required by The National Park Service Wildland Fire Management Guidelines (NPS-18).

The NPS Wildland Fire Management Guidelines further defines the service wide goal of wildland fire management:

To achieve the resource objective of the park through prevention of human-caused wildfire, to minimize the negative impacts on resources from all wildland fires that occur, and to guide the use of prescribed fire as an integral part of the resources management program in a manner which will minimize the risk to the lives of employees, visitors, neighbors and their property.

The Park's Natural Resources Management Plan reinforces the implementation of a comprehensive fire management program, including:

- fire suppression
- prescribed burning
- fire monitoring
- fire research

II. ALTERNATIVES

The following alternatives were analyzed for this environmental assessment. Under both of the alternatives, appropriate suppression response will be taken on all wildfires, including human-caused fires, escaped prescription burns and any lightning-caused fires.

Alternative A. Full Suppression

Under this alternative all ignitions within Bryce Canyon National Park, including those of natural origin (lightning) would be suppressed. Suppression would be accomplished through the use of confinement, containment or control tactics. No prescribed burning or mechanical fuel manipulation would be conducted.

Alternative B. Management Ignited Prescribed Fire (Prescribed Burning) (PREFERRED ALTERNATIVE)

Under this alternative management fires, ignited by qualified park personnel, would be used to simulate the ecological effects of natural fire, and to reduce hazard fuels. Management ignited prescribed fires would be used throughout Bryce Canyon National Park. These fires would be intentionally ignited to accomplish management objectives in specific areas under prescribed conditions identified in approved prescribed burn plans. All other ignitions (whether of natural or human origin) would be suppressed. All prescribed fires would be monitored and possible research projects may be involved. Mechanical manipulation of fuels for the preparation of prescribed fires may be used. This manual manipulation may include the use of chainsaws and handcrews to move or stack downed fuels for ignition at selected times.

Alternatives Considered But Rejected:

1. No Action

Under this alternative all ignitions would be allowed to burn in all areas and at all times. This alternative was rejected due to unacceptable risk to human life and property, with significant political, socioeconomic and environmental impacts.

2. Prescribed Natural Fire Program

Under this alternative, natural (lightning-caused) ignitions would be managed in predetermined areas if all prescription criteria are met. This alternative was rejected due to the relatively small size of the park and the degree of Forest Service (Dixie National Forest) lands (with commercial timber) surrounding the park.

3. Mechanical Manipulation of Fuels Only

Under this alternative, hazard fuel buildups would be removed or manipulated strictly by mechanical means to the extent practicable. This alternative was rejected due to extremely high costs and the fact that natural ecological processes would still not be allowed to function in this fire dependent community. This option would result in substantial damage to the resource from heavy equipment use.

III. AFFECTED ENVIRONMENT

A. Description of the Park

Bryce Canyon National Park is comprised of approximately 35,835 acres (14,250 hectares) on the east face of the Paunsaugunt Plateau in south central Utah. Bryce Canyon was set aside as a National Park to preserve the spectacular erosional remnants (hoodoos) along the scarp of the plateau. The park is generally long and narrow. Elevations range from 6,600 to 9,100 feet.

The vegetation of the park can be generally categorized into five community types:

1. ponderosa pine
2. pinyon pine/Utah juniper
3. Rocky Mountain juniper/ponderosa pine
4. ponderosa pine/white fir
5. black sagebrush/needle and thread

The climate is characterized by cold snowy winters and cool summers with frequent afternoon thundershowers.

B. Adjacent Land Owners

Bryce Canyon National Park is bordered by federal, state and private lands. Dixie National Forest abuts the park to the south and west. The east boundary is a mixture of private, state, Forest Service and Bureau of Land Management property. Additional private lands adjoin the park, primarily to the north where Ruby's Inn is located.

C. Fuels

The ponderosa pine community (northern one-third of the park) has been studied to determine fire frequencies prior to the suppression actions associated with management by the U. S. Forest Service and National Park Service. Fires burned through the ponderosa pine forest near the current developed area (housing/headquarters) on the average of 3.3 years prior to 1900 (Wight 1989). Buchanan and Tolman (1983) document a fire frequency of every 4 to 7 years in a study that had transects throughout the ponderosa pine and mixed conifer forest of the Park. Their study also indicated that aspen groves had decreased in size and number due to fire suppression. With the suppression efforts of this century, the fuels have not been burned by periodic low intensity fires. The resulting buildup of fuels increase the potential for high intensity fires which are more difficult to suppress (Buchanan and Tolman, 1983).

D. Wildlife

Database of Bryce Canyon National Park list 5 species of amphibian, 11 species of reptile, 83 species of mammal and 189

species of birds to have been observed within the park to date. A large number of the birds and mammals are migratory and are not year-round residents.

Three species are federally listed. The endangered peregrine falcon (Falco peregrinus anatum) nests on high cliff faces and is not likely to be significantly affected by prescribed fires. Bald eagles (Haliaeetus leucocephalus) are not residents in the park and will not be affected by a prescribed fire program. The Utah prairie dog (Cynomys parvidens), a threatened species, occupies meadow areas and may be effected by prescribed fires in the meadow areas.

The northern goshawk (Accipter gentilis) is a Category 2 species. Currently two goshawk nests are known. In 1993 both of these nests produced young. One nest is located near the Bryce Canyon Lodge and will not be affected by a prescribed fire program. The second known nest is located near Paria Point. Fire in this area may have an affect on this nest.

Utah Prairie Dogs:

The Utah prairie dog is the western-most of the genus Cynomys. The species' range, which is limited to the southwestern quarter of Utah, is the most restricted of all prairie dog species in the United States. As could best be ascertained by Collier (1975), the species distribution was much broader prior to control programs and in the past extended across the desert almost to the Nevada-Utah state line. At one time, the species occupied about 700 sections in 10 areas of southwestern Utah. The total species distribution was estimated to be 95,000 animals prior to control programs in the 1920's (Turner 1979).

By the 1960's. the Utah prairie dog species distribution was greatly reduced due to disease (plague), poisoning, drought and human related habitat alterations resulting from cultivation and poor grazing practices. Studies by Collier and Spillett (1972) indicated that the Utah prairie dog had declined or been eliminated from major portions of its estimated historical range. By 1972, they estimated that there were 3,300 Utah prairie dogs in 37 separate colonies. It appeared from this estimate that the Utah prairie dog would be extinct by the year 2000 (Collier and Spillett 1973).

The Utah prairie dog was listed as an endangered species on June 4, 1973, pursuant to the Endangered Species Conservation Act of 1969.

Data from the 1993 statewide count shows a spring census of approximately 3,529 (unpublished data from Kenneth McDonald, Utah Division of Wildlife Resources). This represents a population decline from a peak in 1989 of approximately 7,000 animals. The re-establishment of Utah prairie dog populations on public lands

is crucial to ensuring the continued existence of the species and called for in the Utah Prairie Dog Recovery Plan (1991). Thus, in 1972, the Utah Division of Wildlife Resources (UDWR) initiated a transplant program to move animals from private agricultural lands to areas of historic occupancy on public lands. From 1972 to 1989, roughly 14,000 dogs were transplanted to public land sites (Coffen 1989).

Due to a general increase in population numbers in the early 1980's, UDWR petitioned the U. S. Fish and Wildlife Service (USFWS) to remove the Utah prairie dog from the endangered species list. Upon reviewing all pertinent biological data, the USFWS determined that the Utah prairie dog was not currently in danger of extinction and published the Final Rule reclassifying the species to threatened in the May 29, 1984 Federal Register.

The Utah prairie dog was reintroduced into Bryce Canyon National Park in 1974. Additional prairie dogs were occasionally translocated into Bryce Canyon until 1987. Their numbers have averaged about 184 for the last three years. In the fall of 1992, 114 prairie dogs were trapped in Bryce Canyon National Park and relocated to the Awapa Plateau. Mortality due to automobiles in the park varies by year, with the last three years averaging 48 dogs killed per year.

Crocker-Bedford (1975) state that the vegetation height within a colony must be low enough to allow standing prairie dogs to scan their environment for predators. Controlled grazing, which may help control vegetation height, is not allowed inside the park. Therefore some method to reduce vegetation height is needed. Mechanical cutting is not practical.

The proposed action (prescribed fires in the meadows in late fall) "may effect" the prairie dogs. We believe that prescribed fires in the meadows after the prairie dogs have gone underground for the winter will enhance their potential habitat. Fires will reduce woody vegetation and increase sight visibility. By burning only one half of acreage of any individual meadow, the potential for deleterious effects are greatly reduced.

Mexican Spotted Owls:

The recent listing as "threatened" of the Mexican spotted owl (Strix occidentalis lucida) may necessitate additional considerations. Mexican spotted owls have not been observed within the park nor on the forest service administered lands adjacent to the park boundaries. However, very little of the park or forest service land adjacent to the park have been surveyed for this species. Over the next several years, surveys are being planned to examine areas of high probability for spotted owls. Should any spotted owls be located, the U. S. Fish and Wildlife Service will be consulted before any prescribed burning is initiated which may impact the owls.

Northern Goshawk:

Goshawks prefer nesting habitat of older-aged stands that have a high density of large trees, high tree canopy cover and high basal areas. Their foraging areas include a diversity of vegetation structure such as snags, downed logs, woody debris, openings, large trees, herbaceous and shrubby understories (Reynolds et al. 1992). Fires will help maintain the desired foraging area, but a fire may result in destruction of the nest tree.

E. Vegetation

Roberts (et al. 1991) identified 17 habitat types within the park, comprised of three shrub-dominated types, one rush/sedge type, three woodland types and ten forest types.

No species of plants are threatened or endangered. However five species of plants are Category 2 (candidate for federal listing).

The five species are as follows:

1. Reveal paintbrush (Castilleja revealii)
2. yellow cryptanth (Cryptantha ochroleuca)
3. platy penstemon (Penstemon bracteatus)
4. Paria breadroot (Pedimelum pariense)
5. Jones' golden aster (Heterotheca jonesii)

Fire would not significantly impact the populations of any of these species; to the contrary, the return of fire into the ecosystem should enhance them.

F. Air Quality

Bryce Canyon National Park is a mandatory Class I air quality area as specified by the Clean Air Act. A Memorandum of Understanding exist between the National Park Service, Rocky Mountain Region and the Utah Air Quality Board specifying the exchange of information that needs to occur in order to carry out a prescribed fire program.

G. Water and Soils

The plateau top has no permanent bodies of water. Below the rim top several perennial springs provide water for both wildlife and backcountry campers. Drainages off the rim are intermittent. The Tropic Ditch, a man-made irrigation canal will not be impacted by the Fire Management Program.

No wetlands or floodplains would be impacted by any alternative.

Soils of the Park are typically shallow and skeletal, a combination leading to very low moisture availability. A large portion of the park is classified as badlands, rock outcrop or

rubble rather than as developed soil.

H. Cultural Resources

Some areas of the Park have been archaeologically surveyed. The earliest evidence of human presence in the Bryce Canyon area is of the Basket Maker culture. The Basket Makers, as well as the Pueblo Indians, whose civilization followed, lived in the lower, warmer valleys east of Bryce Canyon. They both may have hunted and gathered food within the Park. The more recent Piute Indians also passed through the area in search of game and food.

Most of the historic resources are associated with the period of early park development in the 1920's and early 1930's. The Bryce Canyon Lodge and Deluxe Cabins were added to the National Historic Register in 1987. Several other buildings, including the former administration building (Nature Center), a number of historic cabins, the general store and numerous other buildings are eligible for inclusion on the historic register.

IV. CONSEQUENCES OF THE PROPOSED ACTION AND ALTERNATIVE ACTIONS

A. Vegetation

Alternative A: Full Suppression

Under this alternative unnatural vegetation patterns would occur due to the removal of fire from the ecosystem. Many species, as well as the health of ecosystems, depend on fire. Fire dependent plant communities and their associated species would disappear. Vistas would continue to close in, resulting in decreased visual enjoyment for the park visitor and employees. Higher intensity fires would occur. Suppression activities would result in adverse resource impacts from firelines, helispot construction and other activities.

Alternative B: Management Ignited Prescribed Fire (Preferred Alternative)

The effects on vegetation depend on fire behavior and the type of vegetation involved. Variations in fire intensity, temperature, flame length, duration, time of day and season will influence the impact of fire.

Fire may kill or damage individual plants but many plants will survive through various fire adaptations. Individuals of some species are inherently more resistant to fire and therefor survival rates differ.

Prescribed burns would prevent catastrophic damage to fire tolerant species and would reduce fuel accumulations that could contribute to large and potentially dangerous conflagrations.

Prescribed burns, especially for hazard fuel reductions, are often conducted during the season best suited to control efforts. Burning during these times of year can increase mortality rate of some plant species that are not fire adapted. Thus hazard fuel burning, in some instances, can reduce the biological diversity of an area.

Due to decades of fire suppression in Bryce Canyon, some areas have very high fuel loads. Prescribed fires in these areas of high fuels loads could become uncontrollable or may result in the mortality of plants that are fire adapted.

Manual manipulation of fuels may be considered a portion of preparation of a management ignited prescribed burn. This manipulation may include line preparation using hand tools, wet line or foam techniques and the movement of downed fuels to nearby areas where they may be safely ignited. Manual

manipulation would not include the use of heavy equipment (dozers, front end loaders, etc.). Jackpots (concentrations) of downed fuels would be cut with chainsaws and manually moved from the area or piled in a location where the piles could be ignited without the threat of mortality to mature trees or the threat of a crown fire.

B. Fuels

Alternative A: Full Suppression

Implementing this alternative would create a gradual and unnatural increase in fuel accumulations leading to increased potential of wildfires of greater size and intensities than would occur under natural fire regimes. Control capabilities would be compromised or exceeded, and suppression expenses increased. The potential of threat to life and property also rises. Under full suppression there is an increased potential for large destructive fires.

Alternative B: Management Ignited Prescribed Fire (Preferred Alternative)

Prescribed burning would reduce accumulations of fuels which contribute to large and potentially catastrophic fires. Prescribed fires in areas where fuel loads are very high may be unable to be controlled. Mortality to trees may be increased due to the potential of a crown fire or too intense of a fire for the trees to survive.

The combination of prescribed burning and mechanical fuel manipulation would allow the reduction of fuels that, if not reduced, would contribute to large, potentially catastrophic fires. Mechanical manipulation would allow for fuel reduction at jackpots so that fire intensities near areas with a crown overstory is reduced. However, some crown opening is desirable in order to allow for the return of aspen. For this reason, not all jackpots of fuels will be pre-treated.

C. Wildlife

Alternative A: Full Suppression

Wildlife populations would be influenced directly and indirectly by the impacts on associated vegetative communities. The increased probability of intense wildfires would lead to fire-caused mortalities. The potential for inadvertent wildlife habitat destruction could occur from fire suppression activities such as fireline construction as well as loss of successional stages for habitat.

A full suppression policy will not have any impacts on bald eagles. Full suppression may result in decreased habitat for

prairie dogs and goshawks. Peregrines should not be impacted by a full suppression policy.

Alternative B: Management Ignited Prescribed Fire (Preferred Alternative)

This alternative would allow greater flexibility in planning for, locating and avoiding disturbance to wildlife populations. Habitat impacts would be determined by prescribed timing, location, conditions and patterns.

Considering the small size of the park and the modest proposed prescribed fire program, any impacts to wildlife would be minimal. The proposed prescribed burns would include less than 1000 acres per year, allowing for a mosaic of vegetation.

The threatened Utah prairie dog occupies meadows with vegetation that is short in height. These meadows require fire to maintain the grass and forbs and to decrease the brush and tree encroachment. Prescribed fires in the late fall, after the prairie dogs have gone into hibernation, would enhance the habitat for this species. A maximum of one half the individual meadows would be burned in a given year.

The endangered peregrine falcon occupies rocky cliffs and prescribed fire should not effect this species. Prescribed fires would occur in the spring or fall. These times minimize disturbance to the fledglings and adult birds.

Prescribed burns will create a mosaic of vegetation. This variety of vegetation will create and maintain a variety of habitat types to facilitate a greater diversity of wildlife including goshawks. Bald eagles should not be impacted by this option.

D. Air Quality

Alternative A: Full Suppression

Implementation of this alternative would generate a short term reduction of particulate matter from fires due to suppression efforts. The type and amount of emissions would vary greatly dependent upon fuel moisture, fire intensity and other physical characteristics of the environment. This alternative would increase the potential for severe episodes of air pollution due to accumulated fuels resulting from suppression actions. The potential for large, high intensity fires which are difficult to suppress would continue to increase, further contributing to uncontrolled and undesirable impacts to air quality and visibility.

Alternative B: Management Ignited Prescribed Fire (Preferred

Alternative)

Local air quality will be effected for short periods of time during prescribed burns, with air quality returning to normal following the completion of burning. Particulate matter will be the primary pollutant with localized effects, therefore no significant long-term health impacts are expected. The effect of particulate matter and visibility on local communities and commercial establishments can be lessened by the proper use of smoke management and public notification. The controlled nature of these burns makes their effect on air quality less severe than from catastrophic wildfires.

E. Soils

Alternative A: Full Suppression

Long-term impacts of this alternative, with increased potential for catastrophic fire, indicate possible adverse impacts to soils. The diurnal temperature regime would be altered from the effects of catastrophic fire due to loss of shading and insulating cover. Fire suppression activities may severely impact soils during episodes of catastrophic fire. Some erosive effects would result from the construction of firelines and other ground disturbing activities.

Alternative B: Management Ignited Prescribed Fire (Preferred Alternative)

Because of the controlled area, timing and intensity of prescribed burning in this alternative, there should be little or no long- or short- term changes in soils within the prescribed burn areas. Some erosive effects would result from the construction of firelines and other ground disturbing activities. Firelines created as a result of burn activities would be rehabilitated to minimize erosion. Burning is often patchy which prevents soils in these areas from sheet erosion as well as increasing interception of precipitation. In areas where fuels may be piled by manual manipulation, there is the possibility that small areas (less than 500 square feet) may have a fire intensity that could result in changes to the soil chemistry. However, these areas where fuels burn hot and the soils are affected would mimic natural burns where jackpots of fuels exist.

In this alternative, there will be little impacts on the watersheds since the total areas treated will be relatively small.

F. Cultural Resources

Alternative A: Full Suppression

Recorded cultural resources would receive protection from wildfire under this alternative. Potential for cultural resource damage by fire would increase in the long-term scenario. There would be an increased possibility of destruction of previously unrecorded cultural resources as a result of fire suppression activities such as fire line construction and backfiring operations. Risk to historic buildings increases as the chance for a catastrophic fire increases.

Alternative B: Management Ignited Prescribed Fire (Preferred Alternative)

With the scheduled nature of burning under this alternative, there is an ability to plan for, locate, and avoid the disturbance of cultural resources due to either ignition or fire control activities. Dangerous fuel buildups near known cultural resources would be reduced. Historic structures would receive increased protection by reducing fuels through controlled burns around the historical districts.

G. Safety

Alternative A: Full Suppression

The occurrence of catastrophic fires resulting from high fuel loadings caused by fire suppression would pose a threat to the safety of both firefighters and the public. Efforts at direct attack or suppression of severe fires would pose a threat to firefighter safety due to the nature of the activity. Examples of this are fireline construction, cutting down trees, helicopter transport, backfiring operations and exposure to smoke.

Alternative B: Management Ignited Prescribed Fire (Preferred Alternative)

The implementation of prescribed burning allows fireline construction to be accomplished in a safe manner due to the ability to schedule such activities and to plan their construction in an orderly fashion. Fires are ignited in a preplanned pattern and generally are of low intensity. There is a potential safety problem from prescribed fires that may escape control lines.

H. Economic

Alternative A: Full Suppression

In the short-term, suppression of potentially damaging fires would reduce economic loss. Long-term there is increased risk for catastrophic fires, possibly causing economic disruption from

loss of natural resources and deterioration of the visitor experience. As fire hazards increase due to the continuing buildup of fuels, the magnitude of the suppression effort would rise as would associated cost. There is the potential of direct loss of capital improvements as a result of catastrophic fire events.

Alternative B: Management Ignited Prescribed Fire (Preferred Alternative)

Prescribed burning would reduce hazard fuel accumulations around structures and other improved properties. This would reduce economic loss from catastrophic fires. There is a potential loss from prescribed fires that may escape control lines. Additionally, prescribed burning is a highly cost effective land management tool.

I. Visual or Aesthetic Values

Alternative A: Full Suppression

Implementing this alternative would reduce the short-term visual effects (charring of bark and scorching of foliage) that would result from other alternatives utilizing prescribed fire. However the increased potential for high-intensity fire would develop over the long run would result in drastic changes in the aesthetic appearances of affected areas.

Alternative B: Management Ignited Prescribed Fire (Preferred Alternative)

Through the use of prescribed burns, areas with sensitive visual resources can be protected from fire and certain fire suppression activities, or burned with lower-intensity fire, resulting in minimal changes to aesthetics. Short-term visual effects would consist of charring of bark and scorching of foliage. Prescribed fires would open vista points along the main road through the park and the number of aspen trees may increase. This would result in increase visitor enjoyment, especially in the fall months when aspen leaves are changing color.

J. Overall Program Risk

Alternative A: Full Suppression

In the short term, full suppression poses the least amount of risk to natural resources and developments in the park and surrounding areas. In the long-term, fuel buildups will increase the potential for large, uncontrollable fires that will pose a significant risk to developed areas and natural

resources in and near the park. The chance that a fire starting in the park and spreading to adjacent lands increases in the long-term.

Alternative B: Management Ignited Prescribed Fire (Preferred Alternative)

This alternative presents a low amount of short-term risk. Prescribed burns are conducted by trained park personnel and are conducted only in conditions that present an opportunity to control. There is limited potential for fire escape. Long-term risk is moderate as compared to Alternative A.

V. CONSULTATION AND COORDINATION

The following individuals were consulted in the preparation of this environmental assessment:

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U. S. DEPARTMENT OF INTERIOR
NATIONAL PARK SERVICE
ENVIRONMENTAL ASSESSMENT

FIRE MANAGEMENT PLAN
BRYCE CANYON NATIONAL PARK
GARFIELD AND KANE COUNTIES, UTAH

Summary:

Bryce Canyon National Park has extensive ponderosa pine and mixed conifer forest covering a large portion of its 35,835 acres. Fire was a natural component of this forest until suppression of fire started around the turn of the century. With the decades of fire suppression, changes have occurred to the forests of the park. Species diversity is declining, aspens are disappearing and densities of trees are increasing. The potential for a catastrophic fire increases as fire is continued to be suppressed.

The Fire Management Plan calls for continued suppression of all wildfires. Planned ignitions (prescribed fires) are called for in order to perpetuate park ecosystems and to reduce fuel loads. These prescribed fires will be started under specific conditions of weather, fuel moisture and personnel availability. Objectives of the prescribed fires will be documented in individual burn plans. Monitoring and research of fire effects will determine if management goals are being achieved and if burn prescriptions are appropriate.

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