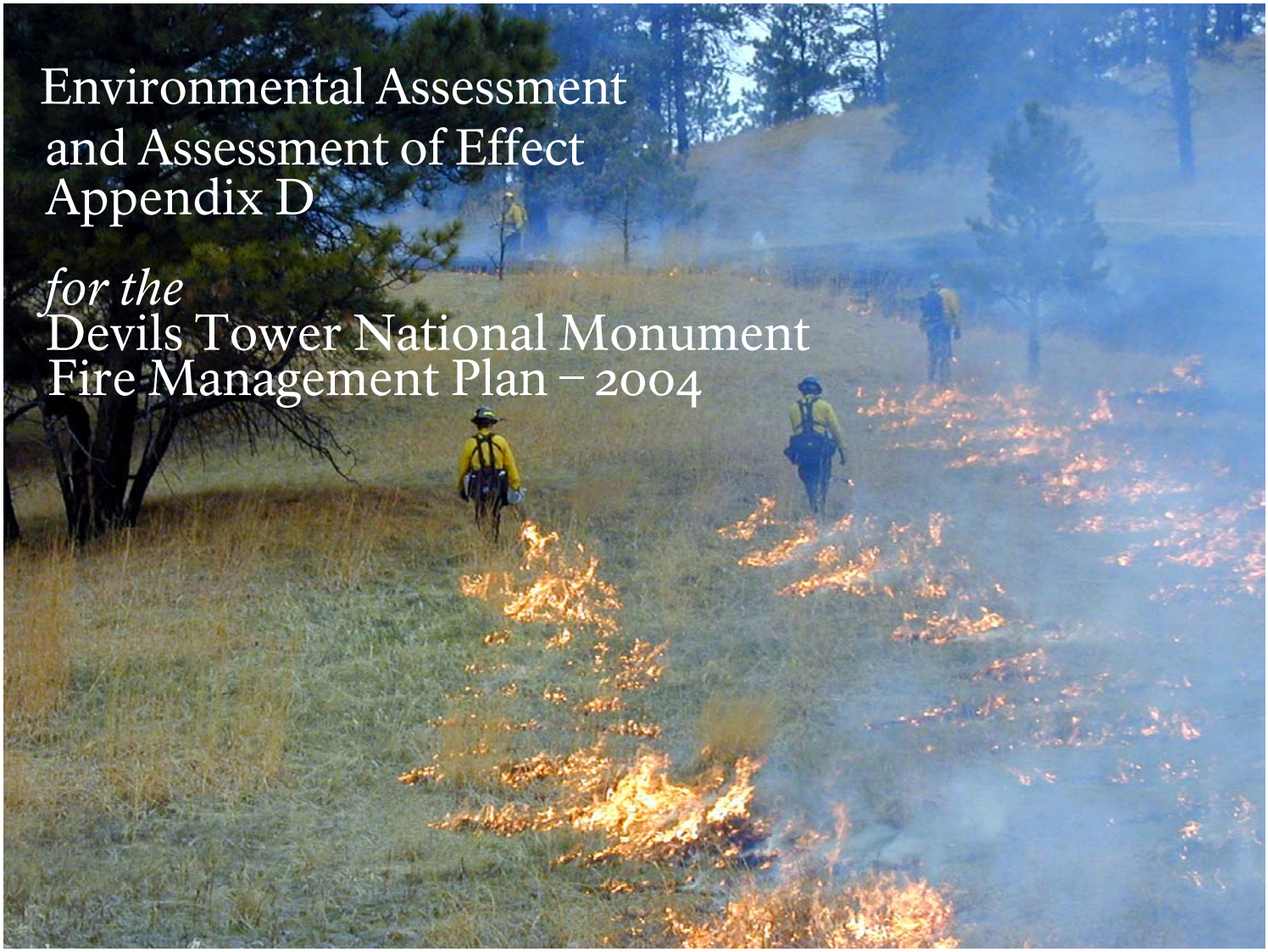
**National Park Service**
**U.S. Department of the Interior**

**Devils Tower National Monument**
**Wyoming**



# Environmental Assessment and Assessment of Effect Appendix D

*for the*
Devils Tower National Monument
Fire Management Plan – 2004

# Environmental Assessment and Assessment of Effect

## Fire Management Plan

**Devils Tower National Monument • Wyoming**

**Summary**

Devils Tower National Monument (DETO) comprises 1,347 acres in northeastern Wyoming on the northwestern edge of the Black Hills. The flora and fauna of the monument are typical of the Black Hills region of South Dakota and surrounding area in Wyoming (NPS 1998). The Belle Fourche River, which flows through the eastern side of the monument, is part of the Cheyenne River Basin. Devils Tower, one of the most conspicuous geologic features of the Black Hills region, is made up of igneous rock surrounded by sedimentary rock of the Spearfish, Gypsum Spring, and Sundance formations.

Fire represents an ecological factor of significant importance to the monument since it has occurred naturally throughout history. Since the early twentieth century, inhabitants of the Black Hills have actively suppressed wildfire. These suppression activities have altered fire's natural role in ecosystem maintenance. In the last several decades, DETO has used fire to mimic its natural role for hazard fuel reduction and native prairie restoration.

Fire has historically influenced the landscape at DETO. The existing Fire Management Plan (FMP) has been in place since 1991. The National Park Service's Fire Management Policy (*Director's Order #18: Wildland Fire Management*) (DO- 18)(USDI 2002) was revised in 2002, with specific guidance (*Reference Manual #18: Wildland Fire Management*) (RM- 18) (USDI 1999) implemented in 1999. Consequently, the monument's existing FMP is inconsistent with the new terminology, documentation guidelines and policy.

This environmental assessment is an appendix to DETO's **FMP**, which provides specific guidance and procedures for accomplishing park fire management objectives. The new FMP has been drafted to address the need to make the DETO's comprehensive fire program consistent with new management terminology, documentation guidelines and policy. This Environmental Assessment (EA) describes two alternatives and the environmental consequences of each.

**Alternative A: No Action/Comprehensive Fire Program**

This alternative would allow for current management practices to be continued. This would include all unplanned ignitions to be suppressed, ensuring adequate protection of natural and cultural resources. Prescribed fires would be used to mimic natural

occurrences. Mechanical manipulation of fuels would be utilized to aid in preparation of prescribed fire projects. This manipulation may include the use of chainsaws and hand crews to move or stack downed fuel, and/or thinning of dense stands to reduce ladder fuels before introducing fire to the landscape. This is the Preferred Alternative and its implementation is more fully described in the **Fire Management Plan.**

**Alternative B: Prescribed Fire**
This alternative would call for all unplanned ignitions to be suppressed in such a manner to reduce the threat to human life and facilities while ensuring adequate protection of natural and cultural resources. Prescribed fires would be used to mimic natural occurrences. This action would only allow for minor thinning of limbs and downed material for site preparation along unit boundaries.

Neither of the alternatives would have major environmental consequences. In meeting plan objectives, the preferred alternative (Alternative A), which is also identified in this document as the environmentally preferred alternative, would be beneficial to the alternative of prescribed fire (Alternative B).

Alternative considered but rejected include no suppression of wildland fires, no prescribed fire, wildland fire use and mechanical manipulation and transporting of fuels off the site.

**Public Comment**
Please mail or email your comments to the address below. Our practice is to make comments, including names and home addresses of respondents, available for public review during regular business hours. Individuals who wish to have their names and/or addresses withheld must state this prominently at the beginning of their comments. We will make all submissions from organizations or businesses, and from individuals identifying themselves as representatives or officials of organizations or businesses, available for public inspection in their entirety.

The public comment period on this document will remain open for 30 days. **Comments should be received by October 29th, 2004,** and may be addressed to:

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# INTRODUCTION

## PARK PURPOSE

Devils Tower National Monument (DETO) is located in northeastern Wyoming, on the northwest edge of the Black Hills and is the America's first national monument. The monument was established in 1906 under the Antiquities Act as, "an extraordinary example of the effects of erosion in the higher mountains as to be a natural wonder and an object of historic and great scientific interest…" (Presidential Proclamation 1906).

Devils Tower is made of igneous rock and is one of the most conspicuous geologic features of the Black Hills region. The nearly vertical monolith rises 1,267 feet above the meandering Belle Fourche River. DETO is sacred to many peoples and figures prominently in the belief systems and narratives of Northern Plains Indians. The monument's flora and fauna include mountain and northern plains species typical of the Black Hills Region of South Dakota.

DETO comprises 1,347 acres in northeastern Wyoming on the northwest edge of the Black Hills. The Belle Fourche River, which flows through the eastern side of the monument, is part of the Cheyenne River Basin.

The Interpretive Plan for the monument contains the following statements of significance:

- Devils Tower is a monolith of uncommon igneous rock (phonolite). It has many visually stunning, symmetrical, columnar joints, which are the tallest (some more than 600 feet) and the widest (10- 20 feet in diameter) in the world.
- The Tower has long been sacred to many peoples. It continues to be prominent in the traditional cultural beliefs and lifeways of First Nations (Plains Indians and others).
- Devils Tower commands attention due to its prominence in the landscape (867 feet from base to top). The Tower has long been a dominant landmark in the Northern Great Plains.
- Devils Tower National Monument is America's first national monument. President Theodore Roosevelt used the 1906 Antiquities Act, to create the monument. This broadened the intended use of the Act by justifying the establishment based on natural rather than cultural features.
- The dramatic character of Devils Tower provides an evocative setting for many types of experiences and forms of expression.
- The Tower has a colorful 100+ year climbing history. Management efforts, such as the landmark 1995 Climbing Management Plan, strive to balance climbing with other resource uses and values.

- Devils Tower National Monument protects mountain and Northern Plains species which meet in an ecological mix distinctive to the Black Hills.

As seen above, part of the significance of the monument is that mountain and northern plains species meet in the ecological mix distinctive to the Black Hills. Restoring and maintaining the health and diversity of the monument's natural systems is one of the park's mission goals as outlined in the *Resource Management Plan* (FMP) (NPS 1998) and the *General Management Plan* (GMP) (NPS 2002). In order to preserve many of the values for which this area was set aside, an active fire management program is needed to maintain a pre–European settlement fire dependent ecosystem. The Fire Management Plan (FMP) is a working document that details how the park will control and/or use fire to maintain park resources for future generations. The FMP is an implementation plan subordinate to and derived from the park GMP.

# PURPOSE OF ACTION

The purpose of this federal action is to provide a long–range fire management program consistent with current fire management policy and guidelines that reintroduces fire as a fundamental ecological process while ensuring public safety and protecting structures and adjacent lands. While the park does have an existing plan, it is from 1992 and needs to be revised to incorporate updated and new guidelines.

This environmental assessment is an appendix to DETO's **Fire Management Plan**, which provides specific guidance and procedures for accomplishing park fire management objectives. The Fire Management Plan has been drafted to address the need to make the DETO's comprehensive fire program (Preferred Alternative A) consistent with new management terminology, documentation guidelines and policy. In compliance with the National Environmental Policy Act (NEPA), this Environmental Assessment (EA) describes for comparative purposes the potential effects of implementing alternative fire management activities at DETO. This Environmental Assessment (EA) describes two alternatives and the environmental consequences of each. At the conclusion of the NEPA process, the drafted FMP will be refined in accordance with the selected alternative.

Included with the description of the preferred alternative is a 5–year fuels treatment plan (Appendix A). This action plan defines fuels treatment activities proposed to be implemented for the period following the approval of the monument's FMP. On a subsequent annual basis, the monument's management staff would evaluate the monument's fuel and resource conditions, progress on treatments and results, funding availability, and other issues to update the 5–year fuels treatment plan. The plan and its updates would be consistent with the program objectives and the selected alternative defined in the FMP and the EA. In this way, the fire program incorporates an adaptive management approach into its planning and program implementation. To ensure on–going compliance with specific laws such as the National Historic Preservation Act, the

Endangered Species Act, consultation for resource impacts is performed as needed on a project–by–project basis where a programmatic agreement has not been developed.

It is possible that during the FMP annual evaluation and update changes in park conditions or in policy and law may indicate that the fire management plan is no longer applicable. It is also possible that the fire program staff may propose a 5–year fuels treatment plan that is inconsistent with the FMP and EA. If the monument staff decide to revise the FMP or 5–year fuels treatment plan, and if said revisions would result in new impacts not considered in the original FMP EA, then such a program change would necessitate additional NEPA analyses. Please note that regardless of whether changes are made to the plan; if new regulatory requirements, threatened and endangered species listings, or changes to the environment have occurred since the original EA, additional compliance would be required to continue implementing the program.

# NEED FOR ACTION

In the Black Hills of South Dakota and Wyoming, ponderosa pine stands cover almost 95% of the area (Sheppard and Battaglia 2002). Black Hills forests are dynamic and have evolved with a variety of natural disturbances including variable and sometimes extreme weather, periodic fires, and insect and disease epidemics. Of these disturbances, fire was one of the most prevalent (Sieg and Severson 1996). These disturbances limited the density and extent of ponderosa pine trees across the landscape (Parrish et al. 1996, McPherson 1997). Frequent fires resulted in a forest comprised of discontinuous, distinct groups of even- aged trees with a wide range of size classes represented (Biswell 1972, Biswell et al. 1973).

Before Anglo settlement, fires in the Black Hills were started by lightning and American Indians (Sieg and Severson 1996). The mean fire interval (MFI) between 1388 and 1900 was approximately 20 to 24 years with a range of 1 to 93 years for interior ponderosa pine stands in the south- central Black Hills (Brown and Sieg 1996). More frequent fires have been reported for ponderosa pine savannas found in the foothills of the Black Hills. Fires burned approximately every 10 to 12 years with a range of 2 to 34 years in Wind Cave National Park (Brown and Sieg 1999) and every 11- 15 years with a range of 1 to 43 years near Spearfish, South Dakota (Wienk et al. 2004). Fisher et al. (1987) reported similar fire frequencies for the Devils Tower region on the northwestern edge of the Black Hills. The MFI was 19 years before 1900, and 42 years since 1900. It also has been proposed that large, catastrophic disturbances were a part of the natural disturbance regime in ponderosa pine forests of the Black Hills (Shinneman and Baker 1997).

Large- scale, anthropogenic changes in the Black Hills began with the discovery of gold in 1874, after which Anglo populations increased sharply and large quantities of timber were harvested to support growing towns and mining activities (Progulske 1974). Regulation of Black Hills forests began with the establishment of the Black Hills Forest

Reserve in 1897 and the first timber sale from the national forest system in 1899. Since that time, nearly every hectare of Black Hills forest has been cut at least once (Ball and Schaefer 2000). Frequent, low- intensity fires also ceased in the late 1800s and early 1900s, probably the result of active fire suppression, logging, geographic fragmentation, and livestock grazing (Brown and Sieg 1996, McPherson 1997, Brown and Sieg 1999). The combination of intensive silvicultural management and suppression of fires has resulted in increased density and extent of ponderosa pine stands and decreases in understory productivity, extent of interior prairies and meadows, and species diversity (Progulske 1974, Progulske and Shideler 1983, Parrish et al. 1996). In some areas covered with high densities of ponderosa pine, understory vegetation has been replaced by a thick mat of pine needles. These changes have contributed to increases in frequency and severity of insect and disease epidemics, increased severity of wildfires, and decreased number of large, old trees (Weaver 1943, Wright 1978, Covington and Moore 1992, Arno 1996).

Habeck (1985) reconstructed a ponderosa pine stand in western Montana. The study site had burned approximately every 8 to 12 years before 1900, but rarely since and the site had not been logged. He reported the density of overstory (dbh > 15cm dbh) ponderosa pine on this site in 1860 was 60 to 70 stems/acre. Covington and Moore (1994) estimated that presettlement ponderosa pine stands on basaltic soils in northern Arizona had overstory tree densities of 19- 24 stems/acre. Fire frequency averaged about every 2- 7 years in ponderosa pine forests of the southwest (Swetnam and Baisan 1996). Densities measured in current fire effects monitoring plots at the monument for overstory ponderosa pine in savanna are 95 stems/acre (45- 182 stems/acre range) and overstory ponderosa pine in ponderosa pine forest are 175 stems/acre (113- 202 stems/acre range).

Changes in the prairie- forest mosaic at the monument were examined using repeat aerial photographs, fire history, and soil- borne plant opal to estimate past vegetation (Fisher et al. 1987). A conclusion was that before active fire suppression, areas of prairie, savanna and forest were relatively stable at Devils Tower. Forests were restricted to the rough broken areas near the Tower and on protected slopes and draws. Savannas formed a transitional band between the prairies and forests and were kept open by frequent fires. Fire exclusion has resulted in diminished prairie while savannas have expanded and become more dense and sometimes becoming forest.

A fire history study conducted at the monument showed the intervals between fires falls into three groups: pre–1770, 1770–1900, and 1900 to 1983 (Fisher et al. 1987). Pre–1770 conditions had a 15 to 27–year return period of fire. From 1770 to 1900 fire frequency increased to 8–14 years between fires. This increase is likely due to use of fire by American Indians and the occupation of the area by Europeans. After 1900, fire return period lengthened to 28–42 years due to active suppression of all wildfires. According to Fisher, this suppression has resulted in a decrease in prairie area, savannas becoming dense forests, and an increase in fuel loads in all fuel types. Fisher also states the

abnormal increase in fuel loads means that under certain conditions a wildfire in the monument could completely destroy the savannas and forests.

The presence or absence of fire within a given habitat is one of the ecological factors contributing to the perpetuation or elimination of plants and animals in that habitat. Native American Indian uses of fire in this area are unclear. Exclusion or suppression of fire began in the 1900s and has changed the vegetative composition of the monument and the surrounding area. Combining all these factors, the fuel loading has increased the potential catastrophic wildland fires. This attempt to eliminate fire from the environment has altered the natural cyclic burning phases of this open pine savanna ecosystem. Pine forests and mixed grass prairies are fire–adapted and require fire for restoration and maintenance. The monument, through the decrease of natural fires and increase of suppression activities, has experienced loss of prairie habitat and the savanna areas have become closed–canopy forests.

National Park Service interdisciplinary collaboration developed the desired future conditions below for the monument with regards to vegetation and fire management. The literature cited above was used to provide guidance when forming the desired future conditions with the reference condition of pre 1900.

Fire Management Desired Future Conditions

- fuel load levels that are consistent with low intensity fires
- open–canopy ponderosa pine stands with overstory (dbh > 15cm) tree density in a range of 150–250 stems/ha (60–100 stems/acre) for ponderosa pine/mixed–grass savanna, and in a range of 200–350 stems/ha (80–140 stems/acre) for ponderosa pine forest
- non–native plant cover reduction with a relative increase in the native plant cover of grasses and forbs
- meadow and forest areas in various diverse stages of development
- mosaic within stands of ponderosa pines promoting habitat diversity

Current densities and desired future conditions at the monument for overstory ponderosa pine in savanna and ponderosa pine forest indicate a need to reduce overstory ponderosa pine.

Given the issues and need for action described above, the purpose of action is to establish a Fire Management Plan for DETO that would utilize a range of fire management strategies.

This Environmental Assessment (EA) explores the various alternatives in which the FMP and NPS policy can be carried out and analyzes the direct, indirect and cumulative impacts of the proposed fire management actions.

## OTHER RELATED PLANNING DOCUMENTS

The Regional Office approved the current Fire Management Plan for DETO in 1992. The preferred alternative in the Environmental Assessment for the plan includes mechanical removal of hazard fuels, the use of management–ignited prescribed fire, and suppression of all unplanned ignitions (NPS 1993). Generally, the objectives of the plan have been met and, therefore are being carried over into the new Fire Management Plan and are the preferred alternative in this Environmental Assessment.

The park GMP was finalized in June of 2002. It indicates that the park has an approved Fire Management Plan and is in the process of drafting a new plan that follows updated guidelines and format. The GMP also addresses the management of both wildland and prescribed fires and monitoring programs. Monitoring of prescribed fires will be conducted to record fire behavior, smoke behavior, fire decisions, and fire effects. The information gathered will be used to determine whether specified objectives were met (NPS 2002).

The monument RMP (1998) states, "… prescribed burning is essential to restore the natural scene." The project statement text for fire management notes how an absence of prescribed fire has allowed a fuel buildup that has resulted in an increased risk of catastrophic fire and outlines the basics of the park's wildfire and prescribed fire programs. It also discusses the fire history of the park and how fire will be managed according to the Fire Management Plan.

Currently, there is not a Programmatic Agreement (PA) between DETO, the Advisory Council on Historic Preservation, and the Wyoming State Historic Preservation Office (SHPO) as the previous one expired in 2002. A new PA is currently being developed and is anticipated to require prescribed fire reporting to the SHPO on an annual basis.

## OBJECTIVES

Objectives define what must be achieved for an action to be considered a success. All alternatives selected for detailed analysis must meet all the objectives to a large degree, as well as the purpose and need for action.

The following objectives have been identified:

1. Develop a plan that is consistent with current federal policies and guidelines.
2. Develop a plan of action that allows fire to occur as a fundamental ecological process.

3. Provide for the protection of human health and safety, including firefighters, agency personnel, and the public, during all phases of the fire management program.

4. Protect identified values at risk from undesirable effects of fire.

# ISSUES AND IMPACT TOPICS INCLUDED IN THIS EA

Specialists in the National Park Service, as well as other federal and state agencies identified issues and concerns about the proposed action. Impact topics are the resources of concern that could be affected by the range of alternatives. Specific impact topics were developed to ensure that alternatives were compared on the basis of the most relevant topics.

In August 2001, a press release to area newspapers and a scoping letter were sent to concerned persons requesting input to issues and concerns of the proposed Fire Management Plan.

The following impact topics were identified on the basis of federal laws, regulations, orders, National Park Service Management Policies, and issues raised during public scoping. A brief description of each impact appears below. Table 1 lists the impact topics included in the EA as well as topics considered, but not further addressed. A brief rationale for each specific topic considered but dismissed from further consideration follows the table.

## Aesthetics (visual)

There is no specific policy that guides or requires preservation of a specific aesthetic character except as defined under cultural resource preservation standards for historic landscapes. "Planning decisions will follow analysis of how proposals might affect the values that make resources significant and the consideration of alternatives that might avoid or mitigate potential adverse effects," (Management Policies 2001, sect. 5.2). A social science study conducted in the parks that evaluated the public's perception of the effects of prescribed fire (Quinn 1987), indicates a broad acceptance of the aesthetic conditions created by natural and prescribed fire events. Since aesthetic character is extremely subjective, direct and indirect impacts are analyzed in this EA.

## Air Quality

Section 118 of the 1963 Clean Air Act (42 U.S.C. 7401) requires parks to meet all federal, state and local air pollution standards. DETO is a Class II airshed as designated by the federal 1963 Clean Air Act. Air quality would be affected to various degrees by fire events inside the park. In addition, smoke generated inside the park could affect sensitive receptors outside the park. Visibility would be affected by the presence of particulates associated with smoke. Thus, air quality will be addressed as an impact topic in this document.

## Cultural Resources

The National Historic Preservation Act, as amended in 1992 (16 U.S.C. 470 et seq.), and the National Park Service Cultural Resource Management Guidelines require consideration of impacts on cultural resources listed on or eligible for listing on the National Register of Historic Places. Direct impacts to cultural resources are therefore analyzed in this EA.

## Public Health and Safety

Fire management policies emphasize that the safety of firefighters and the general public is the first priority. Fires can be extremely hazardous, even life–threatening to the surrounding rangeland, forest and private ranches. Direct and indirect impacts to public health and safety are addressed in this EA.

## Soils Resources

Fires of varying intensities may alter the physical, chemical, and biological properties of the soil as a result of vegetation removal, consumption of organics, and increased temperatures. The lack of fire may also alter soil properties as a result of no nutrient cycling in fire maintained habitat types. Microorganism populations in soils are directly influenced by temperature increases that kill the organisms, which indirectly affects the aeration, nutrients, and moisture content of the soil environment. Fire use can result in furthering the nitrogen process, nutrient cycling, vegetation flushes, and composition diversity. Direct impacts to soils are addressed in this EA.

## Vegetation Resources

The frequency, duration, and seasonality of fire have direct impacts on the composition and distribution of plant species. Direct vegetation impacts are therefore analyzed in this EA.

## Visitor Use and Experience

National Park Service Management Policies require parks to provide for visitor use. Fire events may require temporary visitor use closures for visitor protection. Emissions from fires would impact visibility and may prevent visitors from seeing the resource for which the monument was established, that is, the Tower. Fire–related activities and equipment may increase the level of sound in the monument and surrounding areas, which may affect the visitor experience.

## Wildlife Resources

The distribution and frequency of fire have direct impacts on populations of mammals, ungulates, birds, and invertebrates. Fire can also change wildlife habitat and forage quality. Fire's effect on habitat depends on its behavior characteristics. Low–severity fire increases herb diversity and stimulates plant growth, particularly among native legumes. Severe fires volatilize nutrients and occasionally decrease the ability of the soil

surface to absorb moisture. Improved nutritional levels in forage species can occur following fire. Direct and indirect wildlife impacts are therefore analyzed in the EA.

## Table 1: Impact Topics

| Impact Topic | Retain or Dismiss[a] | Relevant Regulations or Policies |
|---|---|---|
| Biological and physical resources | | |
| Aesthetics | Retain | No specific policy |
| Air quality | Retain | Federal Clean Air Act (CAA), CAA Amendments of 1990 (CAAA), NPS *Management Policies 2001* |
| Ecologically critical areas or other unique natural resources | Dismiss | NPS *Management Policies 2001* |
| Endangered or threatened species and their habitats | ESA review to be completed | Endangered Species Act (ESA), NPS *Management Policies 2001* |
| Prime and unique agricultural lands | Dismiss | Council on Environmental Quality 1980 memorandum on prime and unique farmlands |
| Soils | Retain | NPS *Management Policies 2001* |
| Vegetation | Retain | NPS *Management Policies 2001* |
| Water quality and hydrology | Dismiss | Clean Water Act, Executive Order 12088, NPS *Management Policies 2001* |
| Wetlands and floodplains | Dismiss | Executive Order 11988, Executive Order 11990, Clean Water Act, NPS *Management Policies 2001* |
| Wilderness | Dismiss | Director's Order 41, NPS *Management Policies 2001* |
| Wildlife | Retain | NPS *Management Policies 2001* |
| Cultural resources | Retain | Section 106 National Historic Preservation Act, 36 CFR 800, National Environmental Policy Act, Executive Order 13007, Director's Order 28, NPS *Management Policies 2001* |
| Paleontological resources | Dismiss | NPS *Management Policies 2001* |
| Socioeconomic considerations | | |
| Conflicts with land use plans, policies, or controls | Dismiss | NPS *Management Policies 2001* |
| Economics | Dismiss | 40 CFR 1500 Regulations for Implementing NEPA |

| Impact Topic | Retain or Dismiss[a] | Relevant Regulations or Policies |
|---|---|---|
| Energy requirements and conservation potential | Dismiss | NPS *Management Policies 2001* |
| Environmental justice | Dismiss | Executive Order 12898 |
| Indian trust resources | Dismiss | Department of the Interior Secretarial Order No. 3206, Secretarial Order No. 3175 |
| Natural or depletable resource requirements and conservation potential | Dismiss | NPS *Management Policies 2001* |
| Monument operations | Dismiss | NPS *Management Policies 2001* |
| Public health and safety | Retain | NPS *Management Policies 2001* |
| Sustainability and long–term management | Dismiss | National Environmental Policy Act, 40 CFR 1500 Regulations for Implementing NEPA, NPS *Management Policies 2001* |
| Visitor use and experience | Retain | Organic Act, NPS *Management Policies 2001* |

a/ Rationale for dismissal:

**Ecologically critical areas:** The Council on Environmental Quality regulations (40 CFR 1508.27(b)(3)) require consideration of the severity of impact (intensity) on unique characteristics of the geographic area. No ecologically critical areas have been identified within or adjacent to the monument and, therefore, this impact topic has been dismissed from further evaluation.

**Threatened and endangered species:** The Endangered Species Act of 1973 (16 U.S.C. 1531 et seq.) requires an examination of impacts on all federally listed threatened or endangered species. National Park Service policy also requires examination of the impacts on federal candidate species. The topic of threatened and endangered species was will be addresses further during consultation with the U.S. Fish and Wildlife Service. The NPS has found no adverse effects for either alternative of this plan on the following species: black- footed ferret (*Mustela nigripes*), bald eagles(*Haliaeetus leucocephalus*), Ute ladies'- tresses orchid (*Spiranthes diluvialis*). Concurrence by the U.S. Fish and Wildlife Service for findings will be sought during section 7 ESA consultation.

**Prime and unique agricultural lands:** In August 1980, the Council on Environmental Quality directed that federal agencies must assess the effects of their actions on farmland soils classified as prime or unique by the Natural Resource Conservation Service (NRCS), U.S. Department of Agriculture. Prime or unique farmland is defined as soil that particularly produces general crops such as common foods, forage, fiber and oil seed; unique farmland produces specialty crops such as fruits, vegetables, and nuts.

According to the NRCS, there are no prime or unique farmlands in DETO; therefore, the topic of prime and unique farmland has been dismissed as an impact topic in this document.

**Water quality and hydrology/wetlands and floodplains:** National Park Service policies require protection of water resources consistent with the Clean Water Act. Throughout the monument, surface water consists of a series of intermittent streams that run only after heavy thunderstorms or following heavy snowmelt. The monument utilizes well water from a 1,350 feet deep well for the utility system of the visitor center, maintenance building, administration building, and residences.

A wetlands survey was performed in June 2000. The Intermountain Support Office's Vegetation Ecologist completed this survey by visual assessments of hydrology, Crook County soils maps, and on plant identifications made by the National Park Service. Through this survey, 2 acres were identified as wetland.

The monument's Resources Management Plan (NPS 1998) indicates that the Wyoming Department of Environmental Quality has classified the Bell Fourche River as a class II River, which means that it can support game fish. A mosaic of vegetation would be left immediately adjacent to streams in prescribed fire areas to minimize the potential for erosion from runoff after a fire event.

Due to the negligible or no impact of fire activities on the water resources in the monument, this impact topic was not evaluated.

**Wilderness:** According to *Management Policies* (NPS 2001), proposals having the potential to impact wilderness resources must be evaluated in accordance with National Park Service procedures for implementing the National Environmental Policy Act. Because DETO does not have any designated or proposed wilderness areas, this impact topic was dismissed.

**Paleontological resources:** No issues pertaining to paleontological resources at the monument were identified that would be of sufficient concern to warrant detailed analysis in the EA.

**Conflicts with land use plans, policies, or controls:** Refer to the section "Other Related Planning Documents" for a discussion of the absence of conflicts with other plans.

**Economics:** The proposed action would neither change local and regional land use nor impact local businesses or other agencies. The area surrounding the monument is primarily ranch land with a small community. The town of Hulett, WY is located approximately 10 miles northeast of the monument and has a population of approximately 429 residents. The economy in the DETO area is based mainly on

agriculture, sheep and cattle ranching, cut timber processing and tourism. Fire events may bring a short–term need for additional personnel in the monument, usually provided by the local volunteer fire departments, but would not affect the communities' overall population, income, or employment basis. Therefore, this impact topic is not included in the analysis of this EA.

**Energy requirements/natural and depletable resource requirements and conservation potential:** None of the alternatives would affect energy, natural or depletable resource requirements, or conservation potential to the extent that detailed analysis would be required.

**Environmental justice:** According to the Environmental Protection Agency, environmental justice is the fair treatment and meaningful involvement of all people, regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations and policies. Fair treatment means that no group of people, including a racial, ethnic, or socioeconomic group should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of federal, state, local, and tribal programs and policies.

Presidential Executive Order 12898, "General Actions to Address Environmental Justice in Minority Populations and Low–Income Populations," requires all federal agencies to incorporate environmental justice into their missions by identifying and addressing the disproportionately high and/or adverse human health or environmental effects of their programs and policies on minorities and low–income populations and communities. The proposed action would not have health or environmental effects on minorities or low–income populations or communities as defined in the Environmental Protection Agency's Environmental Justice Guidance Under the National Environmental Policy Act (August 1997). Therefore, environmental justice was dismissed as an impact topic.

**Indian trust resources:** Indian trust assets are owned by Native Americans but held in trust by the United States. Requirements are included in the Secretary of the Interior's Secretarial Order No. 3206, "American Indian Tribal Rites, Federal – Tribal Trust Responsibilities, and the Endangered Species Act," and Secretarial Order No. 3175, "Departmental Responsibilities for Indian Trust Resources." The Bureau of Indian Affairs (BIA) and the National Park Service have formed a joint agency, the National Interagency Fire Center, to handle wildfire management on Indian trust lands based on fire management plans approved by the Indian landowner. Indian trust assets do not occur within DETO and this topic was not included in the EA analysis.

**Monument operations:** Fire events may redirect park personnel with fire qualifications from their usual responsibilities. However, the advanced scheduling of prescribed fires and the use of a weekly call–out list for response to unwanted wildland fires would allow managers to anticipate needs and develop a strategy to continue essential park

operations. Also, the Northern Great Plains Area Fire Office from Wind Cave National Park carries out the majority of activities addressed in the Fire Management Plan. Therefore, this impact topic is not included for further analysis in this EA.

**Sustainability and long–term management:** Sustainability is the result achieved by doing things in ways that do not compromise the environment or its capacity to provide for present and future generations. Sustainable practices minimize the short– and long–term environmental impacts of development and other activities through resource conservation, recycling, waste minimization, and the use of energy–efficient and ecologically responsible materials and techniques.

Project actions would not compete with, dominate monument features, or interfere with natural processes, such as the seasonal migration of wildlife or hydrologic activity associated with wetlands.

# ALTERNATIVES

All alternatives considered for analysis must be consistent with the park's purpose and significance and must meet the purpose and need for action, as well as the project's objectives. These considerations, as well as input obtained from team members, formed the basis of six alternatives that were developed for implementing a fire management plan at DETO. Two alternatives were then selected to be analyzed in this document and are described in detail below. The other four alternatives were dismissed; a description and the reasons for their dismissal also follow.

For all alternatives, the monument consists of a single fire management unit. This fire management unit encompasses all land owned and managed by the National Park Service at the monument. The fire management unit includes the monument's developed areas and others that have an identified value and are at risk from fire. This includes monument boundaries, developed areas, and administrative, historic, and archeological sites. The fire management unit would encompass a buffer approximately ¼–mile wide around the monument perimeter and would also include cultural, historic, or administrative sites that could be adversely affected by wildland fire.

See Appendix 2: Glossary of Fire Management Terms for definitions of fire management terms used in this EA.

## ALTERNATIVES ANALYZED IN THIS EA

### Alternative A – No action: Comprehensive Fire Management Program

This alternative would allow for all wildland fires to be suppressed in such a manner to reduce the threat to human life and facilities while ensuring adequate protection of natural and cultural resources. Suppression actions would consist of hand–dug fire

lines, hose lays, engine support, and helicopter support through water drops by bucket and sling loads of supplies. All other tactics would need superintendent approval prior to implementation.

Mechanical hazard fuel reduction would be utilized around historic structures to provide defensible space, which would lessen the risk of damage should a wildland fire occur. This manipulation may include the use of chainsaws and hand crews to move or stack downed fuel, and/or thinning of dense stands to reduce ladder fuels before introducing fire to the landscape. Debris associated with these projects would be removed from the site or stacked and burned on site. Until the vegetation management evolves from a restoration to a maintenance mode, mechanical methods would be required in some areas to reduce the accumulated fuels to the point where it would be safe and practical to reintroduce fire. For example, in the area north of the tower, the North Terrace unit, thinning with chain saws is necessary prior to having fire visit the area. In areas like this, piles would be created, then burned in the winter when there is snow on the ground. Then it would be possible to use fire as a tool the following year. Mechanical treatments would also be utilized at the landscape level to reduce fire behavior and limit mortality of canopy trees of ponderosa pines. These treatments would consist primarily of cutting 1–8 inch diameter trees and shrubs that have grown in among the mature trees increasing the potential for crown fire.

A goal of the program is to reintroduce fire into the ecosystem at the monument to mimic fire's historic role. This would be done through a rotational series of prescribed fires to achieve *desired future conditions*. Approximately 1,300 acres could be treated over the next 10 years. A treatment plan covering five years is included in Appendix A: 5–Year Treatment Plan. Prescribed fire would not be utilized unless adequate staffing is available and favorable weather and fuel conditions are met. Reevaluation of the prescribed fire schedule would occur every five years. In the use of prescribed fire, a mosaic of burned and unburned vegetation is desirable within the unit.

Under this alternative, manual thinning and prescribed fire would be used in the following areas and situations:

(1) Manual fuel reduction (thinning) – this prescription would be used in areas that have heavy fuels accumulation and cultural resources and/or other values that could be adversely affected by prescribed burns or wildland fire. This prescription would include hand clearing of brush, and hand cutting or limbing of selected trees with chainsaws. Vegetation would be disposed of by removal from the site or pile burning of slash. Manual thinning would be prescribed in at least three areas of the park:
   - North Terrace Unit
   - Joyner Ridge Unit

- the immediate vicinity of various identified resource values at risk, such as around historic structures to provide defensible space.

(2) Selective prescribed fire – this prescription would be used only in areas of the park containing fewer values at risk and lower fuel loading, or in areas where satisfactory fuels treatments are completed. A site–specific burn plan must be completed prior to any burn and appropriate mitigation actions must be taken for any values at risk.

### Alternative B – Prescribed Fires

This alternative would allow for all wildland fires to be suppressed in such a manner to reduce threat to human life and facilities while ensuring adequate protection of natural and cultural resources. Prescribed fires would be used to mimic natural occurrences. This action would only allow for minor thinning of fuels along unit boundaries. Approximately 1,300 acres could be treated over the next 10 years, and reevaluation of the burn schedule would occur every five years.

## ALTERNATIVES CONSIDERED BUT REJECTED

### Alternative C – No Suppression of all Wildland Fires

Under Alternative C, all ignitions would be allowed to burn in all areas and at all times, which could have significant political, socioeconomic, and environmental impacts. This alternative was rejected, as it does not meet several project objectives relating to safety, resource protection, and consistency with policy and guidelines.

### Alternative D – No Prescribed Fire

The National Park Service mission is to protect and preserve the native ecosystems it manages for the enjoyment of future generations. Guided by this mandate, the fire management program focuses on mimicking and maintaining fire as a natural process while protecting human life and property. Furthermore, RM–18 directs parks to scientifically manage wildland fire using best available technology as an essential ecological process to restore, preserve, or maintain ecosystems. Native species at DETO evolved with fire, and many are dependent upon fire for their health and survival. An absence of prescribed fire would result in degradation of the native species and increase fuel loading at Devils Tower. Because of the reasons above and the fact that it does not meet objectives 1, 2, and 4, Alternative D was not further analyzed or incorporated into other alternatives.

### Alternative E – Wildland Fire Use

Under this alternative, natural (lightning–caused) ignitions would be managed, rather than totally suppressed, in predetermined areas for resource benefit, if all prescription criteria were met. Alternative E is not feasible due to the small size of the monument and staff limitations. Also, this alternative puts valuable cultural resources and other

high values at risk, which is contrary to objective 4. Therefore, this plan does not recommend wildland fire use at the monument.

### Alternative F – Mechanical Manipulation and Transporting of Fuels off the Site

Under this alternative, hazard fuel build–ups would be mechanically manipulated and physically removed from the site. The mechanical manipulation would include the use of chainsaws and hand crews to remove downed fuel, and/or thinning of dense stands to reduce overstocking and ladder fuels. Physical removal of the fuels would then be accomplished by vehicles or other equipment and may require burning or chipping at an off–site location. For example, slash from thinning would be carried out of the woods (by hand or by driving a truck into the woods), placed in a truck, hauled to a different location, and then chipped or burned off site. The natural ecological processes would not be not be allowed to function in this fire–dependent ecosystem community, i.e., the organic material would not be "recycled" into the ground, either by ashes or decomposition. This alternative was rejected because of the high expense, impact to the soil and vegetation from removal activities, topography, which makes vehicle access difficult, and an inability to achieve objective 1.

## MITIGATION MEASURES FOR ALTERNATIVES

Mitigation measures to reduce impacts are included in the discussion of Environmental Consequences specific to each impact topic. In many cases the same mitigation measure may serve to reduce impacts on a number of resources.

- Prior to implementing a project, a review of the monument's cultural survey would be completed for any site–specific issues, and mitigation measures would be implemented for their protection. Appropriate mitigation measures would include reducing and protecting fuels on a site, excluding a site from the area to be burned and avoiding ground disturbance. Mitigation measures are subject to agreement between the NPS and SHPO.
- If during project implementation archeological resources were discovered, all work in the immediate vicinity of the discovery would be halted until the resource could be identified and documented. An appropriate mitigation strategy to protect these resources would be developed in consultation with the Wyoming State Historic Preservation Office.
- When a project is proposed, consultation with the SHPO and the affiliated tribes would be conducted.
- Prescribed fires and thinning/slash pile burning would generally be undertaken during the pre– and post–visitor use seasons when fire danger is lower and fewer visitors are present.
- Fire and slash burning would be done when climatic conditions are appropriate to ensure that smoke would not interfere with visitors at the park or cause major indirect adverse impacts to viewsheds.

- A mosaic of vegetation would be left in prescribed fire areas to help stabilize soils, reduce erosion, and provide unburned habitat for small, slow–moving fauna.
- When safety allows, natural barriers would be used.
- All sites where improvements or obstructions are removed would be rehabilitated to pre–fire conditions.
- Areas treated with prescribed fire would be monitored for fire effects following National Park Service monitoring protocols in the Fire Monitoring Handbook (USDI 2001) to determine if prescribed fire objectives are being met and to ensure no unwanted effects are occurring.
- Prescribed fire and mechanical thinning activities (excluding fire suppression) would generally be conducted during times of off–peak use.
- Wet line or scratch line (hand tools) would be favored over fire lines made with heavy equipment.
- Fire lines would be located outside of highly erosive areas and steep slopes. After fire activities, fire lines would be re–contoured, water barred, and seeded as necessary with native plant species.
- All suppression actions would follow Minimum Impact Suppression Tactics (MIST) guidelines.
- Areas of the park may be closed to ensure visitor and employee safety during prescribed fires. In some instances, the entire park may be closed to ensure visitor and employee safety in the event of a wildland fire.

# ENVIRONMENTALLY PREFERRED ALTERNATIVE

The Environmentally Preferred Alternative is determined by applying the criteria suggested in the National Environmental Policy Act (NEPA) of 1969, which is guided by the Council on Environmental Quality (CEQ). The CEQ defines the environmentally preferred alternative as "… the alternative that will promote the national environmental policy as expressed in the National Environmental Policy Act's S101." Section 101 of the National Environmental Policy Act states that "… it is the continuing responsibility of the Federal Government to …

(1) fulfill the responsibilities of each generation as trustee of the environment for succeeding generations;

(2) ensure for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings;

(3) attain the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences;

(4) preserve important historic, cultural, and natural aspects of our national heritage and maintain, wherever possible, an environment that supports diversity and variety of individual choice;

(5) achieve a balance between population and resource use that will permit high standards of living and a wide sharing of life's amenities;

(6) enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources."

The Environmentally Preferred Alternative is Alternative A, which is also the Preferred Alternative. This alternative has more long–term positive environmental impacts with lesser negative impacts than Alternative B. Specifically, the Preferred Alternative has long–term positive impacts by mimicking a natural process that would support native plant growth and survival. By supporting native plant species and communities, the Preferred Alternative would also have long–term benefits for the ponderosa pine/mixed–grass ecosystem. In doing so, the Preferred Alternative would promote the policies expressed in numbers 1, 2, 3, and 4 listed above.

# COMPARISON OF THE ALTERNATIVES

## Table 2: Comparison of the Alternatives

| Component | Alternative A – Preferred Alternative | Alternative B – Prescribed Fire |
|---|---|---|
| Wildland Fire | Not permitted – all fires are suppressed | Not permitted – all fires are suppressed |
| Prescribed Fire | Permitted | Permitted |
| Fuel Reduction – manual thinning, including slash disposal or pile burning | Hazard fuel reduction would be used around historic structures to provide defensible space and/or to reduce fire behavior and limit mortality of canopy trees | Only minor thinning of fuels along unit boundaries |

## Table 3: How Each Alternative Meets Project Objectives

| Project Objective | Alternative A –Preferred Alternative | Alternative B – Prescribed Fire Only |
|---|---|---|
| Consistent with current federal policy and guidelines | Meets objective; follows DO–18 and RM–18 | Does not meet objective; hazard fuel reduction is not addressed. |
| Allow fire as a fundamental ecological process | Meets objective; prescribed fire used to mimic fire's historic role in the ecosystem. | Meets objective; prescribed fires would be used to mimic natural occurrences. |
| Protect human health and safety during all phases of fire management | Meets objective; includes provisions to lessen the possibility of catastrophic wildfire. | Meets objective to some degree, but does not preclude occurrence of catastrophic wildfire and potential major health and safety impacts. |
| Protect resources at risk | Meets objective; provides for protection of cultural and natural resources; mitigation can be planned prior to proposed fuel reduction operations. | Meets objective to some degree, but increases chances of negatively impacting resources. |

# SUMMARY MATRIX OF IMPACTS OF ALTERNATIVES

## Table 4: Summary of Impacts of Alternatives

| Impact Topic | Alternative A: Comprehensive (Preferred) | Alternative B: Prescribed Fire Only |
|---|---|---|
| Aesthetics (visual) | Long–term, moderately positive impacts to visual aesthetics would occur under Alternative A by reducing the impacts of wildland fire as a result of fuel reduction and prescribed fire. | Under Alternative B, long–term, minor negative impacts to the visual aesthetics of the monument. Without the use of mechanical fuel reduction, higher fuel levels may allow for higher intensity fires resulting in more dramatic changes in the appearance of the area. |
| Air Quality | Alternative A would result in short–term, minor negative impacts to air quality as a result of smoke and particulate matter generation during prescribed fires or pile burning. These impacts may be offset by long–term positive impacts that may occur due to a reduced chance of a major or extensive wildfire. | Short–term, moderate negative impacts to air quality would occur under Alternative B as a result of more intense fires that would be expected to occur without mechanical fuel reduction. |
| Cultural Resources | For historic properties, Alternative A would have long term–moderately positive impacts to cultural resources by eliminating the threat of extensive, high–intensity fires and reducing damaging fuels.<br>For ethnographic properties, Alternative A would have long–term, minor, direct and indirect adverse impacts to cultural resources, with some moderate, long–term beneficial impacts by eliminating the threat of extensive, high–intensity fires and reducing damaging fuels. | For historic properties, implementation of Alternative B would result in long–term, moderately negative impacts to cultural resources by increasing the potential for wildland fires requiring suppression and reducing the park's ability to adequately prepare sites for protection during prescribed fire.<br>For ethnographic properties, implementation of Alternative B would result in both direct and indirect, minor to moderate adverse impacts on ethnographic resources in the monument. Most would be considered long–term due to the non–renewable nature of these resources. |

| Impact Topic | Alternative A: Comprehensive (Preferred) | Alternative B: Prescribed Fire Only |
|---|---|---|
| Public Health and Safety | Implementation of Alternative A would provide long–term, moderately beneficial impacts resulting from the increased protection from extreme wildfire, which can create situations with higher health and safety risks. | Moderate negative, long–term negative impacts would result from Alternative B due to an increase in the possibility of intense wildland fire and smoke/particulate matter emissions that could occur due to the build–up of fuels. |
| Soils | Under Alternative A, there would be negligible to minor adverse effects to soils in the short term, with beneficial long–term impacts. The goal of this alternative is to use prescribed fire to mimic fire's historic role in the ecosystem. This would result in long–term benefits from the reestablishment of a fire–driven nutrient cycle and increased stability of the soil strata, given increased native herbaceous ground cover and the reduced possibility of unplanned fire suppression activities. | Implementation of Alternative B would result in minor to moderate, short–term and long–term adverse effect to the soils resource from both suppression activities and higher severity wildland fires that would be more likely to occur. |
| Vegetation Resource | Under Alternative A, there would be long–term, moderate positive impacts to vegetation through a more controlled reintroduction of fire into the ecosystem, which would decrease fuel loading and the potential for more severe wildfires. | Alternative B would result in long–term, moderate adverse impacts to vegetation resources by allowing conditions of unnatural fuel and tree density to increase, increasing competition for sunlight and water. This condition would result in unnaturally hot fires in both wildland and prescribed fire situations, creating a greater potential for impacts on the resource. |
| Visitor Use and Experience | Implementation of Alternative A would result in minor to moderate and mostly short–term adverse impacts during the periods of fuels reduction and prescribed fire activities that would require restrictions on park use. However, long–term beneficial impacts | Implementation of Alternative B would result in minor to moderate, generally short–term impacts to visitor use and experience, but with the possibility of major short– and long–term impacts in the case of |

| Impact Topic | Alternative A: Comprehensive (Preferred) | Alternative B: Prescribed Fire Only |
|---|---|---|
| Visitor Use and Experience (continued) | would result from the increased protection from extensive wildfires and the resultant improved landscape scene. | widespread or extreme wildfire. |
| Wildlife Resource | Alternative A would generally result in minor, short–term, adverse impacts to wildlife. When prescribed fire is reintroduced to mimic fire's natural role in the ecosystem, the habitat variety and diversity of plant communities would increase. Wildlife would benefit from increased nutritional quality and availability of forage. This would result in long–term beneficial impacts to most species. | Alternative B could have long–term, moderate negative impacts to wildlife by inadvertently increasing the destruction of wildlife habitat associated with increased suppression activity as the result of increased fuel loading. |

# AFFECTED ENVIRONMENT

This section describes the existing environment that could be affected by the alternatives considered, if they were implemented. Each resource topic described below was selected for detailed analysis based on internal and external project scoping issues, NPS requirements, and federal laws, regulations, and orders.

## AESTHETICS (VISUAL)

In 1906 President Theodore Roosevelt recognized Devils Tower as a scientific wonder and proclaimed this magnificently columned natural structure America's first national monument. Rising majestically out of a forest of towering ponderosa pines, Devils Tower stands tall with vertical columns. Travelers are generally awestruck by their first far–off glimpse of the Tower as they approach it from the highway. At the base, they gain a perspective of this imposing rock formation, the largest of its kind in the United States. In stark contrast to the rolling hills of the Great Plains, the clear blue sky, gray tower rock, and green forest canopy leave many that view it with a peaceful feeling.

The following visual resources are taken directly from the *Devils Tower National Monument Resource Management Plan* (NPS 1998) and are updated as follows. The scenic, natural view surrounding the park contributes to the visitors' experience in the monument. Visitors can view more than 5 miles away from foot trails, much farther from off- trail, and 150 miles when climbing the tower. The view consists of the Belle Fourche River and floodplain, bordered by steep slopes and hills covered with ponderosa pine. Human- made structures that can be seen from the park include Highways 110 and 24, buildings, billboards, campgrounds, telephone and power lines, two cellular phone towers, fences, livestock, two center pivot irrigation systems, a couple of garbage dumps,

a giant flagpole and huge flag, and an occasional abandoned trailer or car. The most intrusive human- made structures seen by the visitor include the development at the entrance of the monument, the 72 river control tetrahedrons along the bank of the Belle Fourche River, and the monument employee housing area. The beacon from the new (2004) Hulett Airport can be seen circling the sky at night from behind topography (shielding line of sight) and at a distance of 7 miles. Aircraft and additional night- lights pose a risk to further deterioration of the area's vista.

Future mineral or gravel extraction or structure construction (described above) near the monument may have some adverse impacts on the scenic vista of the area. Continued commercial development next to the monument has steadily impacted the view from the monument and the view into the monument from outside. The threat of real estate development near the monument has the potential to permanently compromise the viewshed.

## AIR QUALITY

Devils Tower is classified as a Class II airshed under the Clean Air Act of 1977 (CAA). Historically, the monument and surrounding area have enjoyed excellent air quality, with only occasional short–term air pollution from transient wildland fire smoke and blowing dust. The CAA and NPS policy requires that air quality in the monument meet National Ambient Air Quality Standards (NAAQS) for specified pollutants, healthful indoor air quality at NPS facilities be ensured, and that monument activities do not contribute to deterioration in air quality. The NPS participates in regional air pollution control plans and regulations and review of permit applications for major new air pollution sources. Operations are also conducted in compliance with federal, state, and local air quality regulations (NPS 2001b:5)

The monument has also been identified by the Department of the Interior for its air-quality- related values as important attributes. The Wyoming Department of Environmental Quality (1977 to 1984) tested total suspended particulates (TSP) at the monument between 1977 and 1981 by a high- volume sampler. The TSP rose steadily from a mean of 9.9 micrograms per cubic meter ( g/m3) in 1977 to 17.6 g/m3 in 1981. A gas bubbler was used to measure sulfur dioxide and nitrogen dioxide at the monument between 1979 and 1981. Mean results ranged from 6 to 10 g/m3 during the sampling period. Air quality may be affected by current and planned energy developments in the Wyoming Powder River Basin.

Fire management activities, which result in the discharge of pollutants (smoke, carbon monoxide, and particulates), are subject to and must comply with federal, state, interstate, and local air pollution control requirements as specified by Section 118 of the CAA, as amended (42 USC 7418).

# CULTURAL RESOURCES

Cultural resources will be discussed in two separate areas, historic properties and ethnographic properties, throughout the remainder of this document.

## Historic Properties

All cultural sites within the park are protected by federal legislation (Antiquities Act of 1906, 1979 Archeological Resources Protection Act, Executive Order 11593) and Section 110 of the National Historic Protection Act. The management of cultural resources is guided by NPS–28: Cultural Resource Management Guideline. A 1997–98 survey of the monument found 21 historic and 49 prehistoric archeological sites (Molyneaux 1998). Historic sites consist of the old park entrance road, homestead site, trails, trading post and cabins and graffiti. All prehistoric sites are open, lithic scatters with the exception of two rock paintings and a hearth.

The visitor center area contains several historic resources dating back to 1917, when the original grade was cut for the national monument road. Development of monument facilities gained momentum during the 1930s with establishment of a Civilian Conservation Corps (CCC) camp at the monument. Between 1933 and 1938, the corps built a number of visitor and monument facilities, including the present entrance road. The visitor center (also known as old administration building, HS- 3, and the museum) was completed in 1935. The ranger office (also known as the custodian's residence) a few hundred feet north of the visitor center, was initially completed in 1931. In 1996, the garage of this former staff residence was converted into fully- accessible public restrooms. The CCC- constructed fire- hose house is between these two buildings, the three log and stone structures collectively are named the Old Headquarters Area Historic District. The CCC- era water delivery system and sewage disposal system of the visitor center area were judged ineligible for listing, as was the monument's trail system.

A multiple- property nomination for a number of the monument's cultural resources was approved for listing on the National Register of Historic Places on July 24, 2000. These properties are the entrance road, the entrance station (a log structure), the Old Headquarters Area Historic District, and the Tower ladder.

A recent survey conducted by NPS staff from Denver yielded no cultural landscapes within the monument. Although several historic structures adjacent to the visitor parking lot are included as part of the Old Headquarters Area Historic District, modern changes to the area's landscaping have reduced landscape integrity and, according to the form nominating the district to the National Register of Historic Places, it no longer qualifies as a cultural landscape.

## Ethnographic Resources

The Prairie Shoshone, Crow, Kiowa, Arapaho, Cheyenne, and Lakota historically used the northeast part of Wyoming, which includes the monument (Hanson and Chirinos

1997). The Tower is considered sacred to several of these tribes who still come here to practice their religious and cultural traditions. A variety of ethnographic sites have been recorded in the park and are managed in consultation with the tribes. Traditional activities occurring within the monument include prayer offerings, prayer bundles, sweat lodge rites and the Sun Dance.

This description of ethnographic resources is taken directly from the monument's GMP (NPS 2002) and is updated as follows. American Indians revered the Tower during the historic period, and many continue to value it as an important sacred place. In addition, evidence exists that during both the historic and contemporary periods, successive generations of American Indian groups have returned to the Tower and its surrounding landscape to carry out traditional rituals and ceremonies.

Devils Tower has been found eligible for listing as a traditional cultural property because it is significant for its association with the ideology, beliefs, rituals, and sacred narratives of several American Indian tribes, including the Lakota, Crow, Cheyenne, Arapaho, Kiowa, and Eastern Shoshone. Ethnohistorical data and ethnographic research have directly linked the site with the traditional beliefs of several Northern Plains tribes. Several versions of creation stories exist explaining the origins of the Cheyenne, Kiowa, and Arapaho. To the Lakota, the Tower is a sacred place of renewal and continues to be the subject of the Sun Dance, which is performed during the summer solstice. Individuals and groups of several tribes have conducted traditional ritual activities at the Tower, which include vision quests, sweat lodge rites, fasting, and praying by the Crow and Lakota; possible burials by the Arapaho and Cheyenne; and group rituals such as the Sun Dance of the Lakota.

The Tower is also significant for its association with gods and demigods who figure importantly in tribal traditions and are central to tribal creation narratives. These gods and demigods include Mato, the Great Bear, the Lakota god symbolizing wisdom, who imparted the sacred language and ceremonies of healing to Lakota shamans at Devils Tower, thus making it the birthplace of wisdom and an important connection between the tribe and the cosmos. To the Kiowa, Crow, and Arapaho, the Tower is similarly associated with legends involving the Great Spirit, the transformation of a human to a bear, and the creation of the Tower itself or of constellations.

Although the Tower Trail, which encircles the base of the Tower, marks the extent of the current traditional cultural property determination of eligibility, it is likely that other sites related to the traditional cultural use of the Tower exist outside this trail boundary and will be the subject of further ethnographic study and evaluation.

It has been determined that June is the most sensitive month for American Indian traditional religious activities at the Tower. Acknowledging the American Indian cultural values attached to Devils Tower, the National Park Service implemented a climbing management plan in 1995 that requested that climbers voluntarily refrain from

climbing in June each year out of respect for Indian traditional activities and beliefs. The plan also called for an expanded interpretive program at the monument to explain to the public the monument's cultural significance to numerous tribes.

The *Ethnographic Overview and Assessment of Devils Tower National Monument, Wyoming* (Hanson and Chirinos 1997, 33) recommends that, subject to consideration and approval by the Lakota, the National Park Service consider nominating the Sun Dance grounds to the National Register of Historic Places. Inclusion on the register could help ensure the protection of the area for the continuation of this sacred Lakota ceremony.

## PUBLIC HEALTH AND SAFETY

The health and safety of park visitors, park staff, and fire personnel are of utmost importance to the NPS. Wildfires, prescribed fires and other fire management activities can present risks to both the public and park employees.

There is only one access point into the park, which is off of Hwy 110, and the park boundary is completely fenced. No private landowners are located in the monument; however, two private landowners cross the monument to reach their property. One of these owns a bed and breakfast establishment located just outside the northwest corner of the monument. There are several private businesses at or near the monument entrance, including gift shops and a campground. Most other adjacent lands are ranches.

Park staff levels vary seasonally; approximately 20- 25 employees, volunteers and their families work in the monument during the summer and 6–9 in the winter. Of the summer staff, approximately 8–101 volunteers are housed in their personal recreational vehicles in the housing area and in the monument's campground.

Visitors to the park now average about 400,000 annually, with peaks in June, July, and August. All employees and visitors are at risk from wildfires that threaten the park, and firefighters or fire staff face direct risks. Prior to prescribed burn activities, the park notifies the public by distributing press releases to the local newspapers, distributing brochures to the public, and making phone calls to adjacent landowners to advise people of possible burn times and precautions that may be taken. If fire danger becomes high, park personnel would direct visitors appropriately and possibly close part of or the entire park.

Fire fighting resources are present within the monument. The park has a wildland fire engine and an engine boss and several type II firefighters on staff. Several of the local communities also have firefighting equipment. The town of Hulett is located approximately 10 miles northeast of the monument and Carlile is about 16 miles

southwest of the park. The nearest Black Hills National Forest firefighting equipment is approximately 30 miles southeast of the monument.

## SOILS RESOURCES

DETO's soil resources are quoted from the *Devils Tower National Monument Resource Management Plan* (NPS 1998). There are two general soil units found within the monument. The floodplain/terrace soils consist primarily of loamy soils formed in alluvium that are very deep and nearly level. The second unit covers the majority of the monument and is derived from sedimentary rock such as siltstone, sandstone, and shale. The soils are shallow to very deep, on 6%–30% slopes and are predominantly loamy. Many soils have high clay content and form a soft, sticky mud when saturated. Overall, there are 18 different types of soil in the park with slopes ranging from 0 to 75 percent. Most of the soils are described as having high erosion hazard, and some are susceptible to landslide. None of the soils are described as unusual or suitable for development by the Crook County soil survey.

Erosion is a natural and persistent process on steep, unstable soils. Although about 45 percent of the non- paved trails pass through soil types classified by NRCS (Natural Resource Conservation Service) as having severe soil limitation for trails, the low number of hikers so far has kept the erosion problem to a minimum. The only exception is erosion and soil compaction along the side of the Tower Trail, which was paved several years ago to protect the soils. There is some erosion of the Belle Fourche River stream bank caused by trespassing cattle on the southeast corner of the monument.

## VEGETATION RESOURCES

DETO supports three of the four distinct vegetation complexes that characterize the Black Hills (Dorn 1977). These include: (1) Rocky Mountain Forest Flora, dominated by ponderosa pine; (2) Great Plains Flora of mixed- grass prairie; and (3) Eastern Deciduous Forest Flora consisting mainly of green ash, bur oak, and chokecherry (*Prunus virginiana*). The top and sides of the tower support a variety of bushes, lichens, grasses, and forbs.

The pine forest habitat is the most common in the monument, totaling 62 percent of the land. Prairie areas, comprising 29 percent of the monument, are scattered throughout the pine forest and occur on the floodplain. Deciduous forest is found in strips or patches on the floodplain and in upland draws as "stringer woodlands." Small, dense thickets consisting of mostly chokecherry, wild plum (*Prunus americana*), and hawthorn (*Crataegus* spp.) are scattered in isolated patches throughout the monument. Total deciduous woodland only accounts for 5 percent of the monument.

Other species common to the pine forest are common juniper (*Juniperus communis*), Oregon grape (*Mahonia repen)*, poverty oatgrass (*Danthonia spicata*), needle–and–thread grass (*Stipa comata*), western wheatgrass (*Pascopyrum smithii*), porcupine grass

(*Hesperostipa spartea*), big bluestem (*Andropogon gerardii*), green needlegrass (*Stipa viridula*), and Kentucky bluegrass (*Poa pratensis*). Prairie grasslands of six different types cover about 29 percent of the monument; they occur in small pockets and patches within the ponderosa pine community.

About 5 percent of the monument support deciduous woodlands. The deep, shady drainage trending southwest to northeast along the south leg of the Joyner Ridge Trail is composed of pine forest above, grading into deciduous woodland. Species found in the deciduous woodland are bur oak (*Quercus macrocarpa*), green ash (*Fraxinus pennsylvanica*), chokecherry (*Prunus virginiana*), hawthorn (*Crataegus sp.*), American plum (*Prunus americana*), serviceberry (*Amelanchier sp.*), stickseed (H*ackelia deflexa*), treacle mustard (*Erysimum sp.*), and others. Large cottonwoods (*Populus deltoids occidentalis*) in the area of the Belle Fourche River campground create shade and provide habitat for wildlife, including many birds.

DETO supports vascular and non- vascular species of plants. At least 461 species of vascular plants inhabit the monument. However, the diversity of non- vascular plants is unknown. No federally threatened or endangered plant species reside in the monument. There are 6 plant species, however, that are considered species of special concern by the Wyoming Natural Diversity Database of the Nature Conservancy (Fertig, 2000).

The occurrence of 66 species of exotic plants within DETO has been documented. The state has designated eight of these species as noxious weeds. DETO's Interim Exotic Plant Management Plan classifies 22 species as widespread- disruptive, six as localized-disruptive, and 28 as innocuous. The current extent of exotic plant coverage in the monument is probably causing community- level or ecosystem- level effects, thereby significantly altering wildlife populations and natural processes such as fire regimes, nutrient cycling, hydrology, successional patterns; and altering species composition and reducing populations of native plants.

The National Park Service is developing strategies to control priority exotic invasive species in a Northern Great Plains Exotic Plant Management Plan. The monument has three main noxious weed species of concern: Canada thistle (*Cirsium arvense*), leafy spurge (*Euphorbia esula*), and hound's tongue (*Cynoglossum officinale*), which are common understory species in deciduous woodlands and prairie edges.

Over–browsing by deer in the monument has produced an obvious browse line in many areas (Jones 1990; Merrill et al. 1994; Merrill 1998). Earlier photos of the monument vegetation do not show this browse line and also show a much thicker density of shrub growth. Jones and Merrill both reported that shrub stands of snowberry (*Symphoricarpos occidentalis)* and currant (*Ribes sp.*) were sparse and saplings of oak and ash were rare. Over population of deer is speculated to be the primary cause of the lack

of shrub and deciduous tree regeneration. A long held NPS policy of total fire exclusion is believed to be a contributing factor. The abundance of deer in the monument may be due to the attraction to certain plants or cover in the monument, lack of normal population cycling due to dietary supplements from hay fields near monument, and deer using the monument as a "refuge" during the hunting season. McDaniel et al. (1991) has observed deer moving from the alfalfa fields east of the monument to forested areas on the monument. These alfalfa fields also may be supporting a higher number of deer than normal.

Observation of the deciduous stands in the monument indicates that most stands consist of mature trees with little to no successful regeneration in the understory. If this trend continues, this important habitat type will continue declining and could eventually be lost. The cottonwood trees in the campground are old, decaying and some are dying. No natural regeneration of cottonwoods takes place in this area because it is mowed throughout the summer for the campers. Attempts at planting cottonwoods to replace the mature trees met with very little success until 1996 when new methods were employed (DETO 1997). More cottonwood and other tree species need to be planted, however, to replace the plantings that fail and the aging trees, which will eventually need to be removed due to their hazard to campers. In 1996, planting efforts were extended to the primitive campground as well.

In combination with serious stress from drought, the riparian forest habitat bears little resemblance to its natural state. The floodplain environment has become much more open and arid. The regulation of flows by Keyhole Dam has resulted in a lower water table and a lack of flooding, which, in turn, has contributed to a decline in riparian forest without regeneration. The willow and cottonwood trees east of the river were especially affected. Cattle trespassing along the southeastern side of the monument near the Belle Fourche River have caused erosion of slopes and the riverbanks, compaction of soil, and trampling of plants.

As discussed previously in the need for action, National Park Service interdisciplinary collaboration developed the desired future conditions below for the monument with regards to vegetation and fire management.

- fuel load levels that are consistent with low intensity fires
- open–canopy ponderosa pine stands with overstory (dbh > 15cm) tree density in a range of 150–250 stems/ha (60–100 stems/acre) for ponderosa pine/mixed–grass savanna, and in a range of 200–350 stems/ha (80–140 stems/acre) for ponderosa pine forest
- non–native plant cover reduction with a relative increase in the native plant cover of grasses and forbs
- meadow and forest areas in various diverse stages of development
- mosaic within stands of ponderosa pines promoting habitat diversity

Current densities and desired future conditions at the monument for overstory ponderosa pine in savanna and ponderosa pine forest indicate a need to reduce overstory ponderosa pine.

## VISITOR USE AND EXPERIENCE

Recreational resources are taken directly from DETO's *Final General Management Plan, Environmental Impact Statement* (NPS 2002). Annual visitation over the past ten years has neared or exceeded 400,000. Most visitors to Devil's Tower enjoy photographing the tower, hiking area trails, camping, picnicking, and viewing wildlife. Approximately 5,000 technical rock climbers climb on the tower each year. A large proportion of the visitors walk the tower trail, the main access route to view the tower. Only a very small number of visitors hike the other trails, including the Joyner Ridge Trail and Red Beds Trail. Camping is available from April through October.

The University of Minnesota Cooperative Park Studies Unit (CPSU) conducted a survey to better understand the experience that visitors sought. Respondents rated enjoying area scenery as the most important experience. Slightly more than 80 percent of the respondents reported that they had met their goal of enjoying the scenery. About 70 percent of respondents said that "experiencing natural quiet was important" or "very important." Nearly 70 percent reported "getting away from the usual demands of life" as important or very important.

Visitation is concentrated in the prime resource area of the Tower, the visitor center area, the Tower trail and the prairie dog towns. Congestion and noise levels are problems that are affecting visitor experience during the peak season. Implementation of DETO's *Final General Management Plan, Environmental Impact Statement* is anticipated to improve visitor experience through actions including an alternative transportation system, pedestrian plaza and orientation center.

The *Final General Management Plan, Environmental Impact Statement* (NPS 2002) describes DETO's land use as follows. Land use forecasted in the description will be implemented as GMP actions are funded over the next 5 to 15 years.

A developed zone will consist of the area behind the entrance station and adjacent to the monument boundary, the main road, and a graveled parking area at the base of the Tower. A staging area for a shuttle system will be developed adjacent to the boundary, behind the entrance station. During peak visitation times, visitors will be required to park at the staging area and ride the shuttle, hike, or bicycle to reach the Tower. The staging area will accommodate visitor parking and tour bus parking. Restrooms, visitor orientation and interpretation, and a bookstore will be available here, as will interpretive program spaces, expanded picnic sites, and access to the prairie dog town and the monument trails.

A shuttle stop will be established, and tour buses could drop off and pick up passengers at the staging area, where they will be required to park after dropping off passengers. When the shuttle is not operating (in off- peak times) visitors will be directed into the staging area before continuing up the main road to the Tower. As a part of the staging area design, the current fee collection kiosk will be removed, and a new one will be placed at the staging area entrance to improve traffic circulation and reduce the queues of vehicles at the monument entrance.

At off- peak times, parking will be permitted in the current gravel- surfaced parking area, which will be paved and redesigned to accommodate most types of vehicles.

The vehicle pullouts along the main road at the prairie dog town will be replaced with larger pullouts on both sides of the road.

If funding for a shuttle system is not available or will be delayed for some time, traffic to the Tower will be managed from the staging area. For example, when parking at the Tower is full, visitors might be asked to wait at the staging area until parking becomes available. Visitors will always have the option of hiking or bicycling to the Tower.

To better accommodate incoming traffic and relieve congestion in front of the private businesses near the monument, the entrance station will be relocated closer to the shuttle staging area and the orientation center.

The **pedestrian zone** consists of the area at the base of the Tower, the Tower trail, and the prairie dog town trail. The paved parking area in front of the visitor center will be redesigned to create a pedestrian plaza.

This area will be designed and landscaped with sensitivity to the historic context of the visitor center and ranger station and to blend into the natural surroundings of the Tower. Overall, there will be fewer paved areas than at present. Vehicles will no longer be able to drive in front of the visitor center or the Tower trail trailhead. A view of the Tower will be available, and there will be less traffic noise and congestion. The current visitor center will remain. Its focus will be on interpretation rather than orientation. Facilities in this area could include interpretive exhibits, benches, an interpretive area, and walkways.

The beginning expanse of the Tower trail will be redesigned for easier access. Trails around the prairie dog town will be resurfaced to better accommodate visitor use and reduce maintenance costs.

The Joyner Ridge, Red Beds, and South Side trail systems are in the natural trailed zone. Where abandoned two- track dirt roads form part of trail system, one of the tracks will be restored to native vegetation, leaving the other track for the trail. When the shuttle is

operating, access to the Joyner Ridge trailhead might not be available (specific shuttle stops have not been determined). For this reason, a new spur trail has been established to link the Joyner Ridge and Red Beds trails.

The **semiprimitive zone** is composed of all parts of the monument not included in any other zone. The 50- space developed campground may be removed, and the picnic area and amphitheater may be relocated to a site in the staging area. Trailer dropoff areas may no longer be needed and may be restored to native vegetation and enhanced floodplain values.

The **special protection zone** is composed of the Tower and a large area in the northwest corner of the monument. Tighter restrictions will be implemented to maximize resource protection and opportunities for solitude. Parties of one to five will self- register; parties of six or more will be required to register with a ranger, and activities will be restricted to those that will result in minimal or no resource impact. Climbing is managed according to the monument's Climbing Management Plan.

The **administrative zone** consists of the north and west roads and the administrative/housing area in the southern part of the monument. To reduce impacts on resources, access to the north and west roads beyond the Joyner Ridge trailhead may be restricted to administrative and private use only. The headquarters building will be expanded to increase office and storage space.

## WILDLIFE RESOURCES

A description of DETO's terrestrial wildlife resources is taken directly from the *Devils Tower National Monument Resource Management Plan* (NPS 1998). The fauna of Devils Tower is a peripheral subset of the species typical of the Black Hills Region of South Dakota and adjacent Wyoming. Wide- ranging species occur in DETO along with many species of the Great Plains and the eastern deciduous forest. In addition, several species typical of the Rocky Mountains are isolated in the Black Hills (including DETO), an insular relict of the Pleistocene ecology of the Northern Great Plains. There have been 161 birds, 49 mammals, 21 fishes, 11 reptiles, four amphibians, and 555 insect species listed for the monument, including very rare, extirpated, and exotic species. Current species numbers from recent inventories suggest 97 birds, 39 mammals, 15 fishes, 10 reptiles and 6 amphibians.

Eight species of mammal have been recorded as extirpated. They include the gray wolf , grizzly bear (*Ursus arctos*), black bear (*Ursus americanus*), black- footed ferret , elk (*Cervus elaphus*), pronghorn antelope, bighorn sheep (*Ovis canadensis*), and bison (*Bison bison*). Although still found in modest numbers in the high Bear Lodge range, modern reports of elk in the monument are sketchy. Also, rare pronghorn are seen in small numbers in the Belle Fourche River valley, and occasionally one will wander into the monument. In 1997, two bighorn ewes appeared in the monument.

A variety of avian species use the tower. They include the turkey vulture (*Cathartes aura*), rock dove (*Columba livia*), prairie falcon (*Falco mexicanus*), the white- throated swift (*Aeronautes saxatalis*), violetgreen swallow (*Tachycineta thalassina*), Townsend's solitaire (*Myadestes townsendi*), rock wren (*Salpinctes obsoletus*), and, in winter, gray-crowned rosy finch (*Leucosticte* spp.). Peregrine falcons (*Falco peregrinus*), which have used the tower in the past, are only very rarely sighted today. Until the numbers of peregrine falcons increase enough to reestablish at DETO, prairie falcons will continue filling their niche. The NPS closes several climbing routes each spring to offer falcons nesting on the tower security from disturbance.

There is a small (approximately 40 acres) black- tailed prairie dog town at DETO. The nearest other colony is approximately 6 miles from DETO, and is topographically separated from DETO. There are no dispersal pathways between the two colonies. Several species of grasshoppers and crickets are also common within DETO.

# ENVIRONMENTAL CONSEQUENCES

The National Environmental Policy Act requires that environmental documents disclose the environmental impacts of the proposed federal action, reasonable alternatives to that action, and any adverse environmental effects that cannot be avoided should the proposed action be implemented. This analysis provides the basis for comparing the effects of the alternatives. The intensity and duration of the impacts, mitigation measures, and cumulative impacts were all assessed.

## IMPACT ASSESSMENT METHODOLOGY

### General Methodology

This section describes the environmental consequences, or potential impacts, on the natural, cultural, and human environment at DETO of implementation of the two alternatives considered in this EA. The topics discussed are the same as those described in the Affected Environment section.

The National Park Service based its impact analysis and conclusions on a review of the existing literature and park inventories, information provided by experts within the National Park Service and other agencies, and professional judgments and insights of park staff.

Impacts are described in general terms and are qualified as short–term and long–term, and adverse or beneficial, as appropriate. Impacts may also be described as direct or indirect. Direct impacts are caused by an action and occur at the same time and place as the action. Indirect impacts are caused by an action and occur later in time or farther removed from the area, but are reasonably foreseeable. Per NEPA requirements,

cumulative impacts are also discussed, and the specific method used for cumulative impact assessment is described below.

## Cumulative Effects Analysis

The Council on Environmental Quality (CEQ) regulations for implementing NEPA require assessment of cumulative effects in the decision–making process for federal projects. Cumulative effects are defined as "the impact on the environment which results from the incremental impact of the action when added to other past, present and reasonably foreseeable future actions regardless of what agency (federal or non–federal) or person undertakes such other actions" (40 CFR 1508.7). Cumulative effects can result from individually minor, but collectively significant actions taking place over a period of time. Cumulative effects are considered for both the no action and proposed action alternatives.

Cumulative impacts were determined by combining the impacts of the preferred alternative (comprehensive fire management program) with other past, present and reasonably foreseeable future actions. Therefore, it was necessary to identify other ongoing or reasonably foreseeable future projects at DETO and, if applicable, the surrounding region. Other actions with the potential to have a cumulative effect in conjunction with this project include the following:

- The Devils Tower National Monument *General Management Plan* preferred alternative.
- The park's *Resource Management Plan* implementation.
- The park's exotic plant management program.
- The construction of an airport in the town of Hulett (10 miles from the monument).
- The development of the park's *Comprehensive Interpretive Plan*.
- Previous, present, and future fire management activities (specifically, the Belle Fourche prescribed fire in 1998).
- Energy development in the region.

## Impairment Analysis

In addition to determining the environmental consequences of the preferred and other alternatives, under National Park Service Management Policies, Section 1.4 et seq. (2001), park managers must determine if management activities constitute impairment to park resources or values.

The fundamental purpose of the National Park System, established by the Organic Act and reaffirmed by the General Authorities Act, as amended, begins with a mandate to conserve park resources and values. NPS managers must always seek ways to avoid, or to minimize to the greatest degree practicable, adversely impacting park resources and values.

These laws give the NPS the management discretion to allow impacts to park resources and values when necessary and appropriate to fulfill the purposes of a park, as long as the impact does not constitute impairment of the affected resources and values. Although Congress has given the National Park Service the management discretion to allow certain impacts within parks, that discretion is limited by the statutory requirement that the NPS must leave park resources and values unimpaired, unless a particular law directly and specifically provides otherwise.

A prohibited impairment is an impact that, in the professional judgement of the responsible NPS manager, would harm the integrity of park resources or values, including the opportunities that otherwise would be present for the enjoyment of those resources or values. An impact to any monument resource or value may constitute impairment. Impairment may result from NPS activities in managing the park, from visitor activities, or from activities undertaken by concessionaires, contractors, and others operating in the park. An impact would be more likely to constitute impairment to the extent that it has a major or severe adverse effect upon a resource or value whose conservation is:

- necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the monument;
- key to the natural or cultural integrity of the monument or to opportunities for enjoyment of the monument; or
- identified as a goal in the monument's general management plan or other relevant NPS planning documents.

A determination on impairment is included in the analysis section for all impact topics relating to park resources and values.

# AESTHETICS (VISUAL)

## Methodology

The assessment of impacts uses the general methodology described above and the resource specific information provided below. Available information was obtained through interdisciplinary team meetings and relevant literature. The area of analysis for this topic included DETO and the immediate vicinity around the park. The intensity of effects and impact duration are described in the analysis below using the following criteria and definitions.

**Impact Intensity Threshold Criteria**:

**Negligible** Changes would be barely detectable, and/or would affect few viewsheds.

**Minor** Changes would be detectable; although the changes would be slight, and/or would affect some viewsheds.

**Moderate** Changes would be readily apparent, and/or would affect many viewsheds.

**Major** Changes would be severe or have exceptional benefits, and/or would affect most viewsheds.

**Impact Duration Definitions**:

**Short–term** Recovers in less than one year from the event or treatment action.

**Long–term** Takes more than one year to recover from the event or treatment action.

## Impacts of Alternative A (No Action: Comprehensive Fire Management Program)

### Impact Analysis

The convergence of Black Hills ponderosa pine and the plains grasslands provides a unique opportunity to view and enjoy aspects of two distinct ecosystems in one location. The ponderosa pine ecosystem is one that relies on fire to maintain forest health, but the role of fire has only recently been appreciated. Fire also plays a key role at Devils Tower, where the scenic qualities of the pine forest, grasslands and the Tower are paramount to visitor enjoyment.

Under Alternative A, short–term, adverse impacts to aesthetic values may be experienced but must be weighed with long–term aesthetic benefits of prescribed fire use. Immediately after a fire, black snags, and orange colored needles may be seen. In the following year, the orange needles would drop off allowing for more sunshine to filter to the ground cover, increasing the understory vegetation and covering the blackened ground. In three to five years, some of the standing snags would fall and young ponderosa pine would sprout and begin to flourish. In seven to ten years, the young trees would be approximately two to three feet tall. A low intensity fire can be used to burn off litter accumulations and thin some of the younger, weaker trees. This natural process would keep ground fuel to a minimum, while creating a more open overstory to view the Tower. Wildflowers and other forbs may be more abundant in

years following fire. Fire would stimulate the flowering of forbs. In general, open savannas are pleasing to the eye.

Alternative A, the Preferred Alternative, would allow for long–term, moderately beneficial impacts and an opportunity to minimize impacts of wildland fire due to fuel reduction and prescribed fire. The visitor would experience a pattern of prescribed fires that would be used to somewhat mimic natural fire occurrences. Following mechanical thinning, a cool burning fire can be more easily achieved.

**Cumulative Effects**
The cumulative effects to park visual aesthetics would include the visual impacts from the 1998 Belle Fourche unit prescribed fire and other prescribed burns, mechanical treatment, wildland fires in and around the monument, and an airport. The Hulett airport opened in June 2004 and could negatively affect the monument's natural quiet and viewshed. Airport planners predict nearly 10,000 takeoffs and landings per year, concentrated during the summer months. Lighting at the airport is regularly visible from inside the monument. Agreements are in place between the monument and the Airport Advisory Board to mitigate some of the impacts. Overall, the cumulative effects of Alternative A would be long–term, moderately positive impacts to visual aesthetics due to a reduction in the impacts of wildland fire as a result of fuel reduction and prescribed fire.

**Conclusion**
Alternative A would result in direct, short–term, adverse impacts to aesthetic values due the immediate results of prescribed fires. Immediately after a fire, blackened ground, black snags, and orange colored needles may be seen. These impacts would be offset by long–term, moderately beneficial impacts due to prescribed fire's role in mimicking fire's natural ecological processes.

Alternative A would not produce any major adverse impacts or impairment of aesthetic resources or values whose conservation is necessary to the purpose of the establishment of the monument that are key to the natural or cultural integrity of the monument, or that are actions identified as a management goal of the monument.

## Impacts of Alternative B (Prescribed Fire)

**Impact Analysis**
Alternative B would result in a greater range of impacts to the visual resource as a result of the various higher levels of fire intensity. Due to the added fuels at all levels, fire would have the ladder fuels to move up into the canopy of the old mature trees and fewer trees would survive such a conflagration. The higher intensity fires would result in more dramatic changes in the appearance of the area. This would result in long–term, minor adverse impacts.

**Cumulative Effects**
The cumulative effects to park visual aesthetics would include the visual impacts from the 1998 Belle Fourche unit prescribed fire and other prescribed burns, mechanical treatment, wildland fires in and around the monument, and an airport. The Hulett airport opened in June 2004 and could negatively affect the monument's natural quiet and viewshed. Airport planners predict nearly 10,000 takeoffs and landings per year, concentrated during the summer months. Lighting at the airport is regularly visible from inside the monument. Agreements are in place between the monument and the Airport Advisory Board to mitigate some of the impacts. The cumulative effects of Alternative B would be long–term, minor negative impacts to the visual aesthetics of the monument. Without the use of mechanical fuel reduction, higher fuel levels may allow for higher intensity fires resulting in more dramatic changes in the appearance of the area.

**Conclusion**
Alternative B would result in long–term, minor adverse impacts as wildland and prescribed fire intensity would increase due to a lack of fuel reduction.

Alternative B would not produce any major adverse impacts or impairment of aesthetic resources or values whose conservation is necessary to the purpose of the establishment of the monument that are key to the natural or cultural integrity of the monument, or that are actions identified as a management goal of the monument.

# AIR QUALITY

## Methodology
The assessment of impacts uses the general methodology described above and the resource specific information provided below. Available information was obtained through interdisciplinary team meetings and relevant literature. The area of analysis for this topic included DETO and the local communities within an approximate 50–mile radius. The intensity of effects and impact duration are described in the analysis below using the following criteria and definitions.

**Impact Intensity Threshold Criteria**:

**Negligible** Changes in air quality and air quality–related values would be below or at the level of detection. If detected, effects would be considered slight with no perceptible consequences to health or visibility.

**Minor** Changes in air quality and related values would be measurable; although the changes would be small, effects of smoke on health or visibility would be localized.

**Moderate** Changes in the air quality and related values would be readily apparent. The effects of smoke and other emissions to health or visibility would be sufficient to cause concern, although effects would be relatively local and short–term.

**Major** Changes in the air quality and related values would be obvious, the effect of smoke or other emissions would have substantial consequences to health or visibility, and be noticed regionally.

**Impact Duration Definitions**:

**Short–term** Recovers in seven days or less from fire or other action.

**Long–term** Takes more than seven days to recover from fire or other action.

## Impacts of Alternative A (No Action: Comprehensive Fire Management Program)

### Impact Analysis

Under Alternative A, all wildland fires would be suppressed, hazard fuels would be reduced using mechanical means, and prescribed fire would be used to mimic fire's natural ecological role.

Continuation of current practices of suppression, over the long–term, would impact air quality for extended periods. Although initial attack would occur in a timely manner, a wildland fire could potentially escape control. Large, high intensity, long–duration wildland fires could burn portions of the monument. Smoke drifting to local neighbors along the Belle Fourche River, public roads, and the city of Hulett would be impacted for extended periods. Continuation of current suppression activities also has the potential to have adverse impacts on air quality due to increased stems per acre that would burn. As activity adjacent to the monument creates the potential for more man–made ignitions, coupled with increasing fuel loads, more frequent large wildland fires may occur, increasing the chance of air quality degradation. Reducing fuels through prescribed fire and mechanical fuel reduction would reduce some of these impacts.

Short–term, minor indirect adverse air quality impacts would occur in the area because of potential for wildland fires, coupled with prescribed fire activities. However, the potential for more intense impacts and long–term impacts would decrease, since fewer areas would have high wildfire potential, due to prescribed fire treatment, thinning, and hazard fuel reduction.

Prescribed fire would be used in open woodlands and meadows, away from unprotected sensitive cultural resources, and in locations where required thinning has

already occurred. These fires would result in short–term impacts by producing more smoke more often. However, these emissions would occur under favorable smoke dispersion conditions and the State of Wyoming requires that a burn permit be issued from the State Department of Air Quality prior to performing prescribed fire activities. Impacts would also be reduced by burning during selected times when the environment can better disperse smoke and when human presence is minimal. The use of slash pile burning and some vehicles and mechanical equipment would also occur under this alternative, resulting in very minor emissions of pollutants from the small fires and internal combustion engines. These emissions would result in short–term, negligible to minor adverse impacts to air quality and air quality–related values.

**Cumulative Effects**
Cumulative effects to local and regional air quality would be minor, short–term and adverse, depending on timing and extent of other emissions that would coincide with fire events within the monument. Fire management activities in the surrounding areas, emissions from local development and automobiles, emissions from regional industry (coal–fired power plants and coalbed methane development), and management activities in the monument, when viewed together, would result in minor short–term adverse impacts on air quality.

**Conclusion**
Alternative A would reduce fuel accumulations most rapidly under prescribed conditions that protect air quality resulting in short–term, minor negative impacts as a result of smoke and particulate matter generation during prescribed fires or pile burning. These impacts may be offset by long–term positive impacts that may occur due to a reduced chance of a major or extensive wildfire.

Alternative A would not produce any major adverse impacts or impairment of air quality resources or values whose conservation is necessary to the purpose of the establishment of the monument that are key to the natural or cultural integrity of the monument, or that are actions identified as a management goal of the monument.

## Impacts of Alternative B (Prescribed Fire)

**Impact Analysis**
Under Alternative B, all wildland fires would be suppressed and prescribed fire would be used to mimic natural occurrences. No mechanical hazard fuel reduction would occur.

Effects due to wildfire suppression would be similar to Alternative A except that mechanical fuel reduction would not be used to aid in reducing adverse impacts.

Prescribed fire would be conducted in the same manner as Alternative A to mimic natural occurrences, which would only allow for minor thinning of fuels along unit boundaries. Prescribed burning would result in short–term impacts by producing more smoke more often. A lack of mechanical thinning around historic structures would increase the risk of damage should a wildland fire occur. Fire behavior would also increase. However, emissions due to pile burning, and vehicle and equipment use associated with mechanical fuel reduction would be nonexistent, which is beneficial to air quality.

Fuel loading within the monument would continue to increase both the amount of emissions from unplanned fires and the risk of fire potential. These emissions of air pollutants, including particulates and smoke, would result in short–term, moderate, indirect, adverse impacts to public health and visibility on an intermittent basis and would result in the short–term, moderate direct adverse impacts on air quality due to possible localized exceedences of some standards. Adverse effects would decrease to minor levels as fuel levels are slowly reduced.

Short–term, minor to moderate negative impacts to air quality would occur as a result of more intense fires that would be expected to occur without mechanical fuel reduction and the use of prescribed fires.

**Cumulative Effects**
Cumulative effects to local and regional air quality would be moderate, short–term and adverse, depending on timing and extent of other emissions that would coincide with fire events within the monument. Wildland fires in or near the monument, fire management activities in the surrounding areas, emissions from local development and automobiles, emissions from regional industry (coal–fired power plants and coalbed methane development), and management activities in the monument, when viewed together, would result in moderate short–term adverse impacts on air quality.

**Conclusion**
Alternative B would result in minor to moderate, short–term adverse impacts to air quality and air quality–related values due to an increase in fuel loading and the possibility of wildfires.

Alternative B would not produce any major adverse impacts or impairment of air quality resources or values whose conservation is necessary to the purpose of the establishment of the monument that are key to the natural or cultural integrity of the monument, or that are actions identified as a management goal of the monument.

# CULTURAL RESOURCES

## Methodology

The assessment of impacts uses the general methodology described above and the resource specific information provided below. Available information was obtained through interdisciplinary team meetings and relevant literature. The area of analysis for this topic included DETO and the lands immediately adjacent to the park boundary. The intensity of effects and impact duration are described in the analysis below using the following criteria and definitions.

## Historic Resources

**Impact Intensity Threshold Criteria**:

**Negligible** Impact is at the lowest levels of detection – barely measurable with no perceptible consequences, either adverse or beneficial to historic resources. For purposes of Section 106, the determination of effect would be *no adverse effect.*

**Minor** Adverse impact – disturbance of a site, which results in little, if any, loss of significance or integrity and the National Register eligibility of the site is unaffected. For purposes of Section 106, the determination of effect would be *no adverse effect.*

Beneficial impact – maintenance and preservation of a site. For purposes of Section 106, the determination of effect would be *no adverse effect*.

**Moderate** Adverse impact – disturbance of a site that does not diminish the significance or integrity of the site to the extent that its National Register eligibility is jeopardized, but impact is readily apparent. For purposes of Section 106, the determination of effect would be *adverse effect*.

Beneficial impact – stabilization of a site. For purposes of Section 106, the determination of effect would be *no adverse effect*.

**Major** Adverse impact – disturbance of a site diminishes the significance and integrity of the site to the extent that it is no longer eligible to be listed in the National Register; impact is substantial, noticeable, and

permanent. For purposes of Section 106, the determination of effect would be *adverse effect*.

Beneficial impact – active intervention to preserve a site. For purposes of Section 106, the determination of effect would be *no adverse effect*.

## Impacts of Alternative A (No Action: Comprehensive Fire Management Program)

### Impact Analysis

Under both alternatives, prescribed fires and wildland fires around the monument would have an impact on archaeological resources. The monument completed an 100 % archeological survey in 1998 (Molyneaux 1998).

Some vehicle use would be needed for suppression activities, prescribed fire actions, and mechanical fuel reduction. Vehicle use may include wildland fire engine, pickup truck, and ATV use on roads and roadless areas throughout the park. Decisions on vehicle use would be in accordance with the "minimum tool concept," which allows for selection of a vehicle necessary to successfully and safely accomplish the objectives with the least impact on resources. While vehicular traffic can have a damaging impact on surface remnants, foot travel would not likely cause excessive damage. To prevent the potential crushing or scattering of archaeological resources, vehicle traffic should be kept to a minimum and avoid areas of known historic resources.

Alternative A would benefit the archaeological resources through the use of thinning to reduce the canopy closure allowing for fire to remain as a surface event during both wildland and prescribed fires. Impact mitigation measures would include reducing and protecting fuels on a site, excluding a site from the area to be burned and avoiding ground disturbance. These measures would lower fire intensities and potentially decrease the impact on the resource. This work would serve to restore a more historic appearance around the sites as well as enhancing the protection of the identified sites.

### Cumulative Effects

Cumulative effects to historic properties include local and regional development, erosion, collection of artifacts, past fires and fire activities, and past ground–disturbing activities around and within the monument. Smaller, planned maintenance projects for the monument would not contribute substantially to cumulative impacts, since these can be planned in advance, with site surveys and use of various mitigation measures. Under Alternative A, cumulative effects would be reduced, as fuel reduction would result in fewer, lower intensity wildland and prescribed fires.

**Conclusion**
Alternative A would have long term–moderately positive impacts to cultural resources by eliminating the threat of extensive, high–intensity fires and reducing damaging fuels.

Archeological surveys would be conducted prior to implementing either alternative. Alternative A would allow for prescribed fire to increase the level of the protection of cultural resources.

Alternative A would not produce any major adverse impacts or impairment of historic resources or values whose conservation is necessary to the purpose of the establishment of the monument that are key to the natural or cultural integrity of the monument, or that are actions identified as a management goal of the monument.

## Impacts of Alternative B (Prescribed Fire)

**Impact Analysis**
Alternative B has the greater potential to impact archaeological resources through increase suppression activity, due to increased fuel loading. Implementation of prescribed fires would be more difficult due to the inability to prepare the sites for protection through the use of mechanical fuel reduction.

There is the possibility that fire or use of equipment could expose previously unknown sites or artifacts that had been obscured by vegetation, or forest litter, which could be viewed as a benefit. However, runoff and erosion after the fire could displace these artifacts from their historic or prehistoric context, causing loss of site integrity. Adverse indirect impacts could also occur in unauthorized collecting occurred following a fire. Rehabilitation of burned areas could also disturb site or cause loss of site integrity.

**Cumulative Effects**
Alternative B would add to the cumulative losses of historic resources from the possibility of intense wildland fires, which may lead to increased erosion and ground–disturbing activities during fire suppression, and a lack of fuel reduction in preparation for prescribed fire.

**Conclusion**
Implementation of Alternative B would result in long–term, moderately negative impacts to cultural resources by increasing the potential for wildland fires requiring suppression and reducing the park's ability to adequately prepare sites for protection during prescribed fire.

Alternative B would not produce any major adverse impacts or impairment of historic resources or values whose conservation is necessary to the purpose of the establishment

of the monument that are key to the natural or cultural integrity of the monument, or that are actions identified as a management goal of the monument.

## Ethnographic Resources

**Impact Intensity Threshold Criteria**:

**Negligible** Impacts would be barely perceptible and would alter neither resource condition, such as traditional access or site preservation, nor the relationship between the resource and the affiliated group's body of practices and beliefs. For purposes of Section 106, the determination of effect would be *no adverse effect*.

**Minor** Adverse impact – Impacts would be slight and noticeable, but would neither appreciably alter resource conditions, such as traditional access or site preservation, nor alter the relationship between the resource and the affiliated group's body of practices and beliefs. For purposes of Section 106, the determination of effect would be *no adverse effect*.

Beneficial impact – impacts would allow access and/or accommodate a group's traditional practices or beliefs. For purposes of Section 106, the determination of effect would be *no adverse effect*.

**Moderate** Adverse impact – Impacts would be apparent and would alter resource conditions. Something would interfere with traditional access, site preservation, or the relationship between the resource and the affiliated group's practices and beliefs, even though the group's practices and beliefs would survive. For purposes of Section 106, the determination of effect would be *adverse effect*.

Beneficial impact – impacts would facilitate traditional access and/or accommodate a group's traditional practices or beliefs. For purposes of Section 106, the determination of effect would be *no adverse effect*.

**Major** Adverse impact – Impacts would alter resource conditions. Something would block or greatly affect traditional access, site preservation, or the relationship between the resource and the affiliated group's body of practices and beliefs, to the extent that the survival of a group's practices and/or beliefs would be jeopardized. For purposes of Section 106, the determination of effect would be *adverse effect*.

Beneficial impact – impacts would encourage access to and/or accommodate a group's traditional practices or beliefs. For purposes of Section 106, the determination of effect would be *no adverse effect*.

## Impacts of Alternative A (No Action: Comprehensive Fire Management Program)

### Impact Analysis

Under Alternative A, fire would still occur within the monument, but the selective use of prescribed fire plus the proposed fuels reduction activities, would help prevent extreme wildfires in the future.

The entire monument has been surveyed for ethnographic sites (Hanson and Chirinos 1997). Prescribed fire would be conducted in less sensitive areas and in areas where manual thinning has already reduced the density of fuel, so that burns could be controlled and kept at low intensity. Also, all prescribed burn plans would adhere to requirements of NHPA, and pre–burn surveys and the implementation of cultural resource protection measures would keep impacts to minor levels.

During thinning, some unknown sites could be damaged by vehicular traffic and work crews trampling sites and dragging slash over the ground surface. Damage could be managed by cutting limbs and brush into sizes that can be transported without dragging or heavy vehicular use. All slash burning areas would be located away from known resources, or located in previously disturbed areas in areas that have been surveyed. Direct adverse impacts from thinning would be minor.

Ethnographic resources in the monument would be protected through the careful planing of fires and fuel reduction, plus working with the tribes and SHPO to identify such resources.

### Cumulative Effects

Under Alternative A, cumulative impacts would result from surrounding fires, maintenance projects, exotic plant projects, development in and around the monument and unauthorized collecting of artifacts. With the use of prescribed fire and fuels reduction, long–term cumulative adverse impacts to ethnographic resources would be minor, with long–term moderate beneficial impacts due to the decreased potential for more intense and widespread wildfires.

### Conclusion

Under Alternative A, there would be long–term, minor, direct and indirect adverse impacts to cultural resources, with some moderate, long–term beneficial impacts by eliminating the threat of extensive, high–intensity fires and reducing damaging fuels.

Alternative A would not produce any major adverse impacts or impairment of ethnographic resources or values whose conservation is necessary to the purpose of the establishment of the monument that are key to the natural or cultural integrity of the monument, or that are actions identified as a management goal of the monument.

## Impacts of Alternative B (Prescribed Fire)

**Impact Analysis**

Under this alternative, there would be an increase in fuel loading due to a lack of mechanical fuel reduction, which could result in increased wildfire occurrence and intensity. If higher intensity fires occurred, the effects of wildfires under Alternative B could be extensive because of the greater intensity of heat penetration into subsurface sites, the complete consumption of wood, and the more extensive suppression activities. Fires could continue to smolder in vegetation and along roots near cultural resources, damaging sites. Ethnographic resources would be at risk from fire, suppression activities, and the buildup of fuels.

Fire suppression could also affect ethnographic resources. The use of heavy equipment could directly damage surface artifacts. While some of the disturbances caused by suppression could be avoided by careful planning of hand lines, the ability to consider and protect all cultural resources during a wildfire is difficult.

Since the monument's cultural resources are nonrenewable, most adverse effects on ethnographic resources would be considered direct and long–term. The intensity of impacts would depend on the intensity, duration, and location of fires, and the mitigation efforts that could be implemented. Given the higher potential for more intense wildfire as time goes on, Alternative B would result in minor to moderate, short– and long–term, direct and indirect adverse impacts to ethnographic resources.

**Cumulative Effects**

Alternative B would add to the cumulative losses of ethnographic resources from the possibility of intense wildland fires, which may lead to increased erosion and ground–disturbing activities during fire suppression.

**Conclusion**

Alternative B would result in both direct and indirect, minor to moderate adverse impacts on ethnographic resources in the monument. Short–term impacts may occur, but most impacts would be considered long–term, due to the non–renewable nature of these resources.

Alternative B would not produce any major adverse impacts or impairment of ethnographic resources or values whose conservation is necessary to the purpose of the establishment of the monument that are key to the natural or cultural integrity of the monument, or that are actions identified as a management goal of the monument.

**Section 106 Summary**
Upon completion, this environmental assessment will be sent to the Wyoming State Historic Preservation Office for review and comment in partial completion of NHPA Section 106 compliance for implementation of the fire management plan at DETO. Government–to–Government consultation with concerned American Indian tribes (see list of recipients in the "Consultation/Coordination" section of this EA) has been initiated to help ensure that no adverse impacts occur to ethnographic resources during project implementation.

The environmental assessment provides detailed descriptions of two alternatives (including a no–action alternative), analyzes the potential impacts associated with possible implementation of each alternative, and describes the rationale for choosing the preferred alternative. Also contained in the environmental assessment are mitigation measures that would help avoid adverse effects on cultural resources. For example, prior to implementation of a project, possible impacts to historical sites/structures and archeological sites would be addressed and mitigation measures would be implemented for their protection. Work limits would be established so that fuels removal and prescribed fire activities, including potential ground disturbing activities, would be carefully planned in areas containing cultural sites. Slash disposal areas would be situated away from cultural sites. Fuels would be removed from the vicinity of vulnerable sites. This work would be accomplished under the direction of a resource professional. Note that reduction of fuels adjacent to historic properties would have long–term beneficial impacts on these resources by making them much less vulnerable to future wildland fires.

The monument has been intensively surveyed for cultural resources (Molyneaux 1998). Pursuant to 36CFR800.5, implementing regulations of the National Historic Preservation Act (revised regulations effective January 2001), addressing the criteria of effect and adverse effect, the National Park Service finds that the implementation of the fire management plan at DETO in these previously surveyed areas, with identified mitigation measures, would not result in adverse effects to archeological, historic, or ethnographic resources eligible for or listed on the National Register of Historic Places.

All work would be performed in compliance with the Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation and would be planned in consultation with the State Historic Preservation Officer. As appropriate, mitigation measures would be developed in consultation with the Wyoming State Historic Preservation Officer and interested persons prior to implementation of the preferred alternative.

To reduce subsequent unauthorized collecting from areas where fuels have been removed, fire treatment personnel would be educated about cultural resources in general and the need to protect any cultural resources encountered. Work crews would be instructed regarding the illegality of collecting artifacts on federal lands to avoid any

potential ARPA (Archeological Resources Preservatives Act) violations. This would include instructions for notifying appropriate personnel if human remains were discovered. In the unlikely event that cultural resources are discovered during treatment, work would be halted in the vicinity of the resource, and procedures outlined in 36 CFR 800 would be followed.

The National Park Service is committed to further consultation with affiliated tribes and with the Wyoming State Historic Preservation Officer regarding both the cultural resources surveys and proposed mitigation measures. The monument would continue to work with American Indians to protect resources valued by the tribes.

# PUBLIC HEALTH AND SAFETY

## Methodology

The assessment of impacts uses the general methodology described above and the resource specific information provided below. Available information was obtained through interdisciplinary team meetings and relevant literature. The area of analysis for this topic included DETO and the local communities immediately adjacent to the park. The intensity of effects and impact duration are described in the analysis below using the following criteria and definitions.

**Impact Intensity Threshold Criteria**:

**Negligible** There would be no impacts, or the impacts would be at the lowest levels of detection and would not have an appreciable effect on public health and safety, with no injuries or loss of life.

**Minor** The impact would be detectable, but would not have an appreciable effect on public health and safety, with few or minor injuries and no loss of life.

**Moderate** The impacts would be readily apparent and would result in substantial, noticeable effects to public health and safety on a local scale, with possible serious injuries, but no loss of life.

**Major** The impacts would be readily apparent and would result in substantial, noticeable effects to public health and safety on a regional scale, or with the possibility of extremely serious injuries and/or loss of life.

**Impact Duration Definitions**:

**Short–term** Impacts would last for the duration of the fire or treatment action.

**Long–term** Impacts would last longer than the duration of the fire or treatment action.

## Impacts of Alternative A (No Action: Comprehensive Fire Management Program)

### Impact Analysis

Suppression of wildland fire is inherently dangerous. Strict adherence to safety guidelines for fire fighting, equipment and procedures would minimize accidents. All prescribed fire operations would be conducted by red–carded firefighters. Factors that impact firefighter health and safety include smoke inhalation, blisters, injuries from equipment use, and in severe cases, burns from wildland fires. Impacts to the public include smoke inhalation, and in severe cases consumption of dwellings and loss of life.

Over time, Under Alternative A, there would be less chance of extreme or widespread wildfires in the area due to the reduction of fuels in the monument and the use of prescribed fire in the monument. This would result in a long–term, indirect, beneficial impact to local and regional health and safety, since the possibility of more severe health and safety impacts due to unplanned fire suppression efforts would be substantially reduced.

The actions involved with the use of prescribed fire and manual fuel reduction would involve more controlled conditions and pre–planning for the protection of health and safety, as well as appropriate notification and permitting prior to taking action. Also, prescribed fires and fuel reduction activities would be planned for seasons of low visitor use whenever possible. All prescribed fires would have an updated approved prescribed fire plan that contains measures to provide for public and firefighter safety. In addition, prescribed fire notices in local newspapers, brochures for the public and phone calls to adjacent landowners would advise them of burn times and precautions that may be taken. Therefore, the potential for adverse impacts related to fire control efforts, setting of fires for prescribed burns and slash pile burns, smoke release, and use of chainsaws and equipment for thinning and limbing would be lessened, resulting in negligible or minor, adverse, short–term impacts. These impacts are often very localized, with few off–site adverse health and safety concerns to nearby residents.

Alternative A, in the short–term, may increase the frequency of smoke emissions through the burning of slash piles and prescribed fires. This process can be implemented with smoke dispersal levels that are favorable and thus lessen impact on

the public. In the long–term this would allow for safer suppression action of firefighters and more manageable elements for prescribed fires.

**Cumulative Effects**
Cumulative impacts to public health and safety include those that could result from the park's actions plus those from fire policies outside the park and other activities within the park that involve health and safety issues. Adverse health and safety impacts from smaller maintenance projects would be very short–term and negligible to minor, based on the types of projects normally undertaken, the health and safety planning that would precede these projects, and prior good safety records. The park is currently developing a Comprehensive Interpretive Plan for the next several years. This plan would provide additional avenues for information to be relayed to the public. Cumulative impacts to public health and safety under Alternative A would be less than under Alternative B, since the additional fuels reduction over time would reduce the potential for widespread or extreme wildfires, resulting in a cumulative beneficial impact. Adverse impacts relating to fire fighting and fire and fuels management activities would be minor to moderate and short–term.

**Conclusion**
Implementation of Alternative A would provide long–term, moderately beneficial impacts resulting from the increased protection from extreme wildfire, which can create situations with higher health and safety risks. It would also result in more localized, negligible to minor, short–term adverse impacts from the prescribed fire and fuels reduction activities.

The Preferred Alternative (Alternative A) would allow for a greater measure of safety to the public and firefighter.

## Impacts of Alternative B (Prescribed Fire)

**Impact Analysis**
Under Alternative B, existing park safety procedures and full suppression of all wildland fires in the monument would continue to ensure the health and safety of park visitors, staff, and the residents of the surrounding communities. Strategies would be in place to minimize risks to wildland firefighters and prescribed fire personnel. Safety impacts would be related to the severity of wildland fire and its location and prescribed fire and fuel reduction activities. With the buildup of fuel that would occur over time under Alternative B, more potential for severe fire behavior would exist, as well as more adverse impacts on the health and safety of the firefighters and park personnel. Health of nearby residents would also be of greater concern due to indirect impact of exposure to smoke. Direct impacts, including injuries and possible loss of life and property, could also occur.

Alternative B would provide some of the same benefits as the proposed action. However, the possibility of an intense wildland fire and smoke emissions would increase with the build up of fuels resulting in moderate, long–term adverse impacts to public health and safety. In addition, the possibility of extreme wildfire could cause the chances of major short–term impacts to increase.

**Cumulative Effects**
Cumulative impacts under Alternative B would be greater than under Alternative A, since the lack of fuels reduction would allow more fuels to build up over time, increasing the potential for widespread or extreme wildfires and moderate, long–term adverse impacts may result.

**Conclusion**
Moderate, long–term negative impacts would result from Alternative B due to an increase in the possibility of intense wildland fire and smoke/particulate matter emissions that could occur due to the build–up of fuels.

# SOILS RESOURCES

## Methodology

The assessment of impacts uses the general methodology described above and the resource specific information provided below. Available information was obtained through interdisciplinary team meetings and relevant literature. The area of analysis for this topic included DETO and immediately adjacent lands. The intensity of effects and impact duration are described in the analysis below using the following criteria and definitions.

**Impact Intensity Threshold Criteria**:

| | |
|---|---|
| **Negligible** | Effects to soil attributes would be below or at the lower levels of detection. |
| **Minor** | Effects would be detectable, but generally of limited area and localized. |
| **Moderate** | Effects would be readily apparent and result in a change to the soil character over a relatively wide area. |
| **Major** | Effects would have a substantial and possibly permanent consequence. Effects would be readily apparent, long–term, and substantially change the character of the soils over a large area. |

**Impact Duration Definitions**:

**Short–term** Recovers in less than three years from fire or other action.

**Long–term** Takes more than three years to recover from fire or other action.

## Impacts of Alternative A (No Action: Comprehensive Fire Management Program)

### Impact Analysis

Under Alternative A, there would be negligible to minor adverse effects to soils in the short–term, with beneficial long–term impacts. The goal of this alternative is to use prescribed fire to mimic fire's historic role in the ecosystem. This would result in long–term benefits from the reestablishment of a fire–driven nutrient cycle and increased stability of the soil strata, given increased native herbaceous ground cover and the reduced possibility of unplanned fire suppression activities.

### Cumulative Effects

Cumulative impacts to soils include the effects from fire and suppression activities in the monument and on adjacent lands, plus soil disturbance from other projects planned for the area, some limited vehicle use for projects, and human presence in and around the monument. As fire would be restored to a more natural role over the long–term, vehicle use for fuels management and related wildland fire projects would decline, offsetting impacts from non–fire related activities. Therefore, cumulative adverse effects to soils under Alternative A are predicted to be minor and relatively localized, with reclamation and revegetation of burned areas providing beneficial effects over time.

### Conclusion

Under Alternative A, there would be negligible to minor adverse effects to soils in the short term, with beneficial long–term impacts. The goal of this alternative is to use prescribed fire to mimic fire's historic role in the ecosystem. This would result in long–term benefits from the reestablishment of a fire–driven nutrient cycle an increased stability of the soil strata, given increased native herbaceous ground cover and the reduced possibility of unplanned fire suppression activities.

Alternative A would not produce any major adverse impacts or impairment of soils resources or values whose conservation is necessary to the purpose of the establishment of the monument that are key to the natural or cultural integrity of the monument, or that are actions identified as a management goal of the monument.

## Impacts of Alternative B (Prescribed Fire)

**Impact Analysis**
Implementation of Alternative B would result in minor to moderate, short–term and long–term adverse effect to the soils resource from both suppression activities and higher severity wildland fires that would be more likely to occur.

**Cumulative Effects**
High–intensity wildland fires resulting from continued fuels buildup are more probable under Alternative B and would likely result in more severe impacts to soils stability.

**Conclusion**
Implementation of Alternative B would result in minor to moderate, short–term and long–term adverse effect to the soils resource from both suppression activities and higher severity wildland fires that would be more likely to occur.

Alternative B would not produce any major adverse impacts or impairment of soils resources or values whose conservation is necessary to the purpose of the establishment of the monument that are key to the natural or cultural integrity of the monument, or that are actions identified as a management goal of the monument.

# VEGETATION RESOURCES

## Methodology

The assessment of impacts uses the general methodology described above and the resource specific information provided below. Available information was obtained through interdisciplinary team meetings, vegetation cover maps and relevant literature. The area of analysis for this topic included DETO and area immediately adjacent to the monument boundary. The intensity of effects and impact duration are described in the analysis below using the following criteria and definitions.

**Impact Intensity Threshold Criteria**:

**Negligible** Changes in vegetation communities would not be measurable, with no effect on native species populations. Any effects would be small in scale and no species of special concern would be affected.

**Minor** Changes in vegetation communities or species populations would be measurable, with small and localized effects to a relatively minor portion of any species population.

**Moderate** Changes in vegetation communities or species populations would be readily apparent, with effects to a sizeable segment of the species' population over a relatively large area.

**Major** Changes in vegetation communities or species populations would have a considerable long–term effect and affect a relatively large area in and out of the park. Species of special concern could be affected. Reclamation success could not be guaranteed.

**Impact Duration Definitions**:

**Short–term** Recovers in less than three years from fire or other action.

**Long–term** Takes more than three years to recover from fire or other action.

## Impacts of Alternative A (No Action: Comprehensive Fire Management Program)

### Impact Analysis

Under Alternative A, all wildland fires would be suppressed, hazard fuels would be reduced using mechanical means, and prescribed fire would be used to mimic fire's natural ecological role.

Researchers are in agreement that fire provides an overall benefit to the continued growth, health and maintenance of the mixed–grass prairie ecosystem (Vogl 1979, Wright and Bailey 1980). Although research findings conflict as to whether fire benefits or harms a particular species during a specific stage of growth, they generally agree that fire plays an integral role in maintaining the mixed grass prairie ecosystem.

Given the rapid growth characteristics and the chemical composition of most grassland species, decomposition occurs slowly in the absence of fire in this ecosystem. Thus fires have the direct effect of removing stagnant, dead plant accumulations while converting that mass to ash and charcoal. The ash/charcoal material returns a number of minerals and salts to the soil, thus recycling them for new plant growth. Indirectly, the higher soil temperatures in the post–burn environment increase fungal, bacterial, and algal activities, which in turn increase available nitrogen. In addition to increasing nitrification of the soils and increasing mineral and salt amounts in the soil, the ash and charcoal residue resulting from incomplete combustion aids in soil buildup and soil enrichment by being added as organic matter to the soil profile. The added material works in combination with dead and dying root systems to make the soil more porous and better able to retain water. In general, fires tend to stimulate plant growth, resulting in larger, more vigorous plants, greater seed production, and increased protein and

carbohydrate content. Fires also tend to increase species diversity and reduce woody species relative to grass and forb species.

Cool–season, non–native grasses are usually decreased by fire, although responses vary somewhat depending on seasonality, frequency, residence time, and soil moisture conditions. Research indicates that Kentucky bluegrass (*Poa pratensis*), crested wheatgrass (*Agropyron cristatum*), smooth brome (*Bromus inermis*), and downy brome (*Bromus tectorum*) are reduced by fire, particularly by repeated spring fires (Whisenant 1987; U.S. Department of Agriculture 2000).

Both warm and cool season native grasses are present throughout the monument, but cool season grasses are a bit more predominant. Spring fires may initially reduce some cool season species, but the populations quickly rebound. Warm season natives often benefit from spring fires.

Historically, fire played a major role in shaping ponderosa pine (*Pinus ponderosa*) forests. Brown and Sieg (1996 and 1999) researched fire history in the Black Hills and found that the fire return interval for the area was 11 years, with a range of 1 to 28 years (Fischer et al. 1987). This regular fire regime basically ended with the settlement of the region in the late 19$^{th}$ century. In the absence of fire, ponderosa pine forests have become denser and have encroached on prairie and meadow areas adjacent to ponderosa pine stands.

Ponderosa pine forests are well adapted to fire as they have thick bark, deep roots, self–pruning branches, long needles, and large buds, all of which make them very resistant to fire (FEIS 2003). Many of the species found in the mixed–grass prairie are also found as a component of the understory in ponderosa pine stands, especially in the ponderosa pine/mixed–grass prairie ecotone. As a result, the ponderosas pine understory responds much the same to fire as mixed–grass prairie. Prescribed fires in ponderosa pine forests can thin stands and reduce dog–hair thickets (very dense stands of young trees), which reduces wildland fire hazards and increases production of understory vegetation species (Wright and Bailey 1982).

Both alternatives provide for the use of prescribed fire for resource benefits. That is, prescribed fire may be used to stimulate the growth of native species or reduce the growth of non–native species, either directly or indirectly. This may be the primary goal of a prescribed fire, or a product of prescribed fire for fuel reduction. In many cases a prescribed fire unit identified for fuel reduction would be burned during a specific season and with a specific ignition pattern based on species, wind and topography, thus realizing both resource benefit and fuel reduction. Fire monitoring would continue to be used to assess the effects of fire on specific species, following standard monitoring protocols (Fire Monitoring Handbook 2001). The direct and indirect effects of prescribed fires are generally beneficial to the native vegetation species, although individual plants of some species may be destroyed by fire. All units would be assessed

prior to prescribed fire implementation. Fire would be excluded from sensitive resource areas and during certain conditions.

Both alternatives provide for suppression of unwanted wildland fires that would have a direct negative effect on vegetation. The impact of suppression activities would be reduced by the use of Minimum Impact Suppression Tactics (MIST). That is, suppression activities would generally favor wet–line or scratch line over fire lines made with heavy equipment. The use of MIST would reduce the impact on vegetation resources.

Alternative A would allow for a more controlled reintroduction of fire to the ecosystem with minor impacts due to the thinning activities. Due to the potential for lessened impacts through treatment activities that allow for fire to more closely mimic its natural role in the ecosystem, Alternative A would result in a long–term, positive impact of vegetation resources.

**Cumulative Effects**
The cumulative impacts to vegetation include those arising from activities within the monument and the surrounding area, and projects, such as exotic plant management, planned for within the monument boundaries. Previous and potential future fire suppression operations (vehicle compaction, fireline construction, etc.) and mechanical fuels reduction and prescribed fire activities would result in negligible to minor adverse impacts as suppression actions become less frequent with decreasing fuels across the landscape. Other management activities or uses would add to the overall impacts on vegetation over time, resulting in long–term minor to moderate impacts to vegetation, depending on the extent and severity of fires and the nature and location of the projects. The exotic plant management program would have positive impacts by reducing populations of non–native plants, allowing restoration of native species. Proper timing of fires, corresponding to vegetation type and fire function, would mitigate these adverse impacts.

**Conclusion**
Alternative A would result in a long–term, positive impact of vegetation resources by allowing prescribed fires to more closely mimic its natural role in the ecosystem.

Alternative A would not produce any major adverse impacts or impairment of vegetation resources or values whose conservation is necessary to the purpose of the establishment of the monument that are key to the natural or cultural integrity of the monument, or that are actions identified as a management goal of the monument.

## Impacts of Alternative B (Prescribed Fire)

### Impact Analysis

As stated above, both alternatives provide for the use of prescribed fire for resource benefits and provide for suppression of unwanted wildland fires that would have a direct negative effect on vegetation.

Alternative B would allow continuous adverse impacts to vegetation resources by allowing unnatural fuel conditions. Tree density would also probably decrease, but not to the extent of Alternative A. This condition would increase the competition for sunlight and water and would also result in unnaturally hot fires in wildland fire conditions and prescribed fires. These fires would then have a greater potential of long–term, moderate adverse impacts on the resource.

### Cumulative Effects

The cumulative impacts to vegetation include those arising from activities within the monument and the surrounding area, and projects, such as exotic plant management, planned for within the monument boundaries. Previous and potential future fire suppression operations (vehicle compaction, fireline construction, etc.) and mechanical fuels reduction and prescribed fire activities would result in negligible to minor adverse impacts as suppression actions become less frequent with decreasing fuels across the landscape. Other management activities or uses would add to the overall impacts on vegetation over time, resulting in long–term minor to moderate impacts to vegetation, depending on the extent and severity of fires and the nature and location of the projects. Cumulative impacts under Alternative B would be greater than Alternative A due to increased fuel loads and the greater possibility of wildland fires.

### Conclusion

Alternative B would result in a long–term, positive impact of vegetation resources by allowing prescribed fires to more closely mimic its natural role in the ecosystem. However, Alternative B has a greater potential of long–term, moderate adverse impacts on the resource due to unnatural fuel conditions from the lack of mechanical fuel reduction.

Alternative B would not produce any major adverse impacts or impairment of vegetation resources or values whose conservation is necessary to the purpose of the establishment of the monument that are key to the natural or cultural integrity of the monument, or that are actions identified as a management goal of the monument.

# VISITOR USE AND EXPERIENCE

## Methodology

The assessment of impacts uses the general methodology described above and the resource specific information provided below. Available information was obtained through interdisciplinary team meetings and relevant literature. The area of analysis for this topic included DETO and land immediately adjacent to the park. The intensity of effects and impact duration are described in the analysis below using the following criteria and definitions.

**Impact Intensity Threshold Criteria**:

**Negligible** Changes in visitor use and/or experience would be below or at the level of detection. The visitor would not likely be aware of the effects associated with the alternative.

**Minor** Changes would be small, though detectable. The visitor would be aware of the effects, but the effects would be slight and would not disrupt the visitor experience such that the park's values and facilities could not be enjoyed.

**Moderate** Changes would be readily apparent and the visitor would be aware of the effects, which would degrade or limit the visitor's enjoyment of the park's values and/or facilities.

**Major** Changes would be readily apparent and have important and possibly permanent consequences. The visitor would be aware of the effects, which would result in the visitor not being able to fully experience the enjoyment of park values and/or facilities.

**Impact Duration Definitions**:

**Short–term** Effects occur only during the fire or other action.

**Long–term** Effects continue to occur after the fire or other action.

## Impacts of Alternative A (No Action: Comprehensive Fire Management Program)

### Impact Analysis

Under Alternative A, there would be less chance of extreme wildfires in the area due to the reduction in fuels and the use of prescribed fire within the monument. This would

result in a long–term, indirect, beneficial impact to visitor use and enjoyment, as the possibility of larger scale destruction of natural and cultural resources would be substantially lessened. Noise, smoke, and odor generation would also be reduced along with periods of reduced visibility. Avoiding wildfire damage and the resultant disruption to visitors, especially during the high tourist season, would increase the beneficial impacts of this alternative.

Prescribed fires and thinning/slash pile burning would generally be undertaken in certain limited locations during the pre– and post–visitor use seasons when fire danger is lower and fewer visitors are present. Also, fire and slash burning would be done when climatic conditions are appropriate to ensure that smoke would not interfere with visitors at the park or cause major indirect adverse impacts to viewsheds. More frequent instances of visitor use restrictions and disturbance may occur due to smoke and odor, and noise from equipment, vehicles, and chainsaws during these activities. However, these impacts would be very short–term and localized. Therefore, these activities would have negligible to minor short–term adverse impacts on visitor use and experience.

**Cumulative Effects**
Cumulative impacts to visitor use and experience include those that result from the park's actions plus disruption from minor projects planned within the park. The effects of implementing the GMP preferred alternative, which includes a shuttle system, staging area, and pedestrian plaza are generally beneficial and moderate to major. The effects from the smaller maintenance projects would be very minor and short–term, with limited noise and disruption; access would not be denied to most areas of the park. Under Alternative A, the fuels reduction program would result in fewer extensive wildfires and adverse impacts on visitor use and experience from such instances would be minor to moderate and short–term. Long–term, beneficial impacts would occur due to the protection of local resources from the adverse effects of wildfire suppression.

**Conclusion**
Implementation of Alternative A would result in minor to moderate and mostly short–term adverse impacts during the periods of fuels reduction and prescribed fire activities that would require restrictions on park use. However, long–term beneficial impacts would result from the increased protection from extensive wildfires and the resultant improved landscape scene.

## Impacts of Alternative B (Prescribed Fire)

**Impact Analysis**
Under Alternative B, visitor use and experience would be subject to few, if any, adverse impacts until fire occurred within or near the monument. Then suppression activities and the fire itself would disrupt public enjoyment and use of the park for the duration of

the fire, and possibly for extended periods after widespread or extreme wildfires. The short–term adverse impacts would be minor to moderate, and include loss of access to the affected areas of the park and surrounding areas, and possibly additional restrictions on use of certain facilities, depending on the location and severity of the fire. Fire and the associated suppression efforts could affect areas more heavily used by visitors, primarily the Tower Trail, campground, picnic area, and other trails, by directly causing damage to these areas or by causing noise, smoke, traffic, odors, or decreased visibility that would detract from the visitor experience in or near the area.

Under Alternative B there would be a higher possibility of extensive and widespread wildfire due to the expected buildup of fuels from suppression and lack of fuels reduction efforts. A more extensive wildfire would be likely to occur during the hotter summer months when visitor use is highest. This would result in similar types of impacts as described above, but to a greater degree, with possible closure of the park and surrounding forest for a longer period of time. The visitor experience in future years may also be affected, since the cultural and/or natural resources that attract visitors to the park could be either changed or damaged, and it could take years to restore or replace the natural landscape and cultural attributes of the monument. Some resources are nonrenewable and could be permanently lost to the park. In this case, impacts to visitor use and experience could approach major, long–term levels of intensity.

**Cumulative Effects**
Cumulative impacts include those listed for Alternative A, but in Alternative B firefighting activities that may occur would result in minor, short–term adverse effects on visitor access and enjoyment, with the level of impacts dependent on the location, extent, and intensity of the fires. Cumulative adverse impact would range from minor to moderate, and could be short– or long–term in duration, with some possibility of major impacts if extensive wildfires damaged many of the highly used areas of the park during prime tourist season.

**Conclusion**
Implementation of Alternative B would result in minor to moderate, generally short–term impacts to visitor use and experience, but could possibly result in major short– and long–term impacts in the case of widespread or extreme wildfire.

# WILDLIFE RESOURCES

## Methodology
The assessment of impacts uses the general methodology described above and the resource specific information provided below. Available information was obtained through interdisciplinary team meetings, spatial and inventory data, and relevant literature. The area of analysis for this topic included DETO and area immediately

adjacent to the park. The intensity of effects and impact duration are described in the analysis below using the following criteria and definitions.

**Impact Intensity Threshold Criteria**:

**Negligible** There would be no observable or measurable impacts on native fish and wildlife species, their habitats, or natural processes sustaining them. Impacts would be well within the range of natural fluctuations.

**Minor** Impacts on native fish and wildlife would be detectable and localized, but would not be expected to be outside the natural range of variability and would not be expected to have any long–term effects on native species, their habitats, or natural processes sustaining them.

**Moderate** Impacts on native fish and wildlife would be detectable and could be expected to be outside the natural range of variability and to have long–term effects on native species, their habitats, or the natural processes sustaining them.

**Major** Impacts on native fish and wildlife would be detectable, and would be expected to be outside the natural range of variability and have long–term effects on native species, their habitats, or the natural processes sustaining them. The change would be substantial and possible permanent.

**Impact Duration Definitions**:

**Short–term** Recovers in less than one to three years after fire or other action (depending on the species).

**Long–term** Takes more than one to three years to recover after fire or other action (depending on the species).

## Impacts of Alternative A (No Action: Comprehensive Fire Management Program)

### Impact Analysis

Small Mammals
Wildland and prescribed fire may have some direct mortality on small mammal species, as individual animals may perish due to exposure to smoke and flames. Indirectly, fire may impact the population as a result of reducing the amount of available cover and increasing the amount of predation by raptors and other animals; however, leaving a

mosaic burn pattern on the landscape would mitigate these potential effects. Prescribed fire would have the beneficial effect of increasing food for small mammals.

Birds
Direct mortality from fire probably does not occur in most bird species because they are able to move out of harm's way. Indirectly, fire may cause birds to nest in other locations immediately after the event if specific nesting areas are burned.

Reptiles
Very little information is available in literature on the direct effects of fire on snakes and lizards, but in general there may be some direct mortality. The fact that there are no reports of high mortality for any herptile species may indicate that they are not highly vulnerable to fire.

Ungulates
Fire probably does not have direct mortality on most healthy ungulates because they are able to move away from the flame front and out of harms way. The fire may kill sick, diseased or immobile ungulates. Indirectly, fire may cause ungulates to concentrate in specific areas immediately after the event to search for food or protective areas.

Effects on white–tailed and mule deer habitat are widely varied and well documented in literature. In general, fires that create mosaics for forage and cover are beneficial. Deer prefer foraging in recently burned areas (once growth begins) compared to unburned areas, although preference may vary seasonally (Davis 1976, Williams et al. 1980). This preference may indicate an increase in plant nutrients, which usually occurs following fire. Prescribed fire in grass communities reduces litter that otherwise inhibits new growth of grasses. This rejuvenates and improves the communities through increased nutrient content and palatability of forage (Dasmann and Dasmann 1963).

Alternative A allows for the use of mechanical treatments to prepare the resources for the reintroduction of fire to mimic conditions favorable to fire dependent species. Through this process, wildlife habitat areas can be managed more effectively, decreasing the potential of stand replacement events.

**Cumulative Effects**
Cumulative impacts include past, present, and reasonable foreseeable future fire management activities, combined with other administrative and maintenance actions in the planning area would result in short–term, minor adverse impacts to wildlife, assuming mitigation is used and prescribed fires occur in appropriate seasons to minimize impacts on breeding animals. Human movements around wildlife may add to the short–term disruption of certain species. Alternative A would result in more beneficial impacts to wildlife, especially as habitat improves with fire and non–fire treatments.

**Conclusion**
Alternative A would generally result in minor, short–term, adverse impacts to wildlife. When prescribed fire is reintroduced to mimic fire's natural role in the ecosystem, the habitat variety and diversity of plant communities would increase. Wildlife would benefit from increased nutritional quality and availability of forage. This would result in long–term beneficial impacts to most species.

Based on the potential benefits of habitat improvements gained from mechanical treatment and fire on the landscape, a long–term, positive impact to wildlife resources would occur by implementing Alternative A.

Alternative A would not produce any major adverse impacts or impairment of wildlife resources or values whose conservation is necessary to the purpose of the establishment of the monument that are key to the natural or cultural integrity of the monument, or that are actions identified as a management goal of the monument.

## Impacts of Alternative B (Prescribed Fire)

**Impact Analysis**
Basically, impacts to small mammals, birds, reptiles, and ungulates would be the same as under Alternative A.

Alternative B could inadvertently increase the destruction of wildlife habitat associated with increased suppression activity as the result of increased fuel loading. Under this alternative the use of prescribed fire has the potential to increase fire intensities that may destroy thermal cover areas.

**Cumulative Effects**
Cumulative impacts include past, present, and reasonable foreseeable future fire management activities, combined with other administrative and maintenance actions in the planning area would result in short–term, minor adverse impacts to wildlife, assuming mitigation is used and prescribed fires occur in appropriate seasons to minimize impacts on breeding animals. Human movements around wildlife may add to the short–term disruption of certain species. Under Alternative B, cumulative impacts may be moderate and long–term due to destruction of wildlife habitat associated with intense wildfires and suppression activities.

**Conclusion**
Alternative B could have long–term, moderate negative impacts to wildlife by inadvertently increasing the destruction of wildlife habitat associated with increased suppression activity as the result of increased fuel loading.

Alternative B would not produce any major adverse impacts or impairment of wildlife resources or values whose conservation is necessary to the purpose of the establishment

of the monument that are key to the natural or cultural integrity of the monument, or that are actions identified as a management goal of the monument.

# CONSULTATION AND COORDINATION

## SCOPING

Agencies contacted for information or that assisted in identifying important issues, developing alternatives, or analyzing impacts include: the Advisory Council of Historic Preservation; the U.S. Department of Interior – Fish and Wildlife Service; the National Weather Service, Rapid City, South Dakota; the Wyoming State Department of Air Quality; and the Wyoming Game and Fish Department.

Public scoping for the preparation of the proposed fire management plan and EA included distribution of a letter in August 2001 to solicit input on alternatives and other aspects of the planning process.

The letter was mailed to 105 individuals, organizations, tribes and government agencies and was made available at the monument Visitor Center. It introduced the purpose and need for the plan and provided preliminary descriptions of actions being considered. Comments were requested by September 16, 2001.

Comments from three organizations were received: the BearLodge Multiple Use Association; the Office of County Commissioners for Crook County, WY; and the Wyoming Game and Fish Department. The BearLodge Multiple Use Association expressed concern about scenic values of the monument with regards to fire management and noxious weed eradication efforts. The Crook County Office of Commissioners also expressed concern regarding protection of the aesthetic qualities of the monument. The Wyoming Game and Fish Department only indicated that they had no terrestrial or aquatic concerns with the proposed fire program. All of these issues were considered in the development of the FMP alternatives and impact analysis.

Upon completion, this EA will be sent to the Wyoming SHPO and USFWS for their respective Section 106 NHPA and Section 7 ESA review.

This EA will also be sent to the agencies, tribes, and organizations listed below. It will also be available at the monument's administration building as well as on the NPS web site. Notice will be placed in public newspapers and press releases will be distributed to local media. All comments received during the public review period will be assessed by the NPS for their substance. Should substantive comments be received from the public, a determination will be made as to whether it would be appropriate to make a decision on this proposed plan, or whether a new EA or EIS should be prepared.

# LIST OF PREPARERS AND PRINCIPAL CONTRIBUTORS

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|---|---|---|
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| Ann Gavin | former Resource Management Specialist | Devils Tower National Monument |
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| Greg Cody | NEPA/106 Specialist | Intermountain Regional Office – Denver |
| Lisa Eckert | Superintendent | Devils Tower National Monument |
| Chas Cartwright | Former Superintendent<br>Current Superintendent | Devils Tower National Monument<br>Dinosaur National Monument |
| Christopher Moos | Previous Administrative Officer | Devils Tower National Monument |
| Scott Brown | Chief Ranger | Devils Tower National Monument |
| Doug Alexander | Area Fire Management Officer | Northern Great Plains Fire Office – Wind Cave NP |
| Bill Gabbert | Previous Area Fire Management Officer | Northern Great Plains Fire Office – Wind Cave NP |
| Cody Wienk | Area Fire Ecologist | Northern Great Plains Fire Office – Wind Cave NP |
| Andy Thorstenson | Lead Fire Monitor | Northern Great Plains Fire Office – Wind Cave NP |
| Greg Anderson | Wildlife Biologist | Wyoming Game and Fish |

# LIST OF RECIPIENTS

A press release announcing availability and how to obtain hard or digital copies will be emailed to climbing groups, climbing publications, climbing guides, area newspapers and area radio stations. Adjacent landowners, other interested parities and the following, state and local agencies; tribes; and organizations will be mailed a copy of this document.

**Federal Agencies**

Advisory Council of Historic Preservation
Big Horn National Forest
Bighorn Canyon Recreation Area
Badlands National Park
Black Hills National Forest
Bridger–Teton National Forest
Bureau of Land Management – Newcastle
Bureau of Land Management – Wyoming State Office
Fort Laramie National Historic Site
Fossil Butte National Monument
Grand Teton National Park
Jewel Cave National Monument
Mount Rushmore National Memorial
National Weather Service, Rapid City, South Dakota
Office of Wyoming Senator Craig Thomas
Office of Wyoming Senator Mike Enzi
Shoshone National Forest
Wind Cave National Park
U.S. Fish and Wildlife Service
U.S. Representative Barbara Cubin
WASO Office of Strategic Planning
Yellowstone National Park

**State Agencies**

Keyhole State Park
Wyoming Governor Dave Freudenthal
Wyoming Department of Transportation
Wyoming Department of Air Quality
Wyoming Department of Environmental Quality
Wyoming Game and Fish Department
Wyoming State Historical Preservation Office
Wyoming State Park and Historic Sites
Wyoming State Representative Marlene Simons

**American Indian Tribes**
Standing Rock Sioux
Cheyenne River Sioux
Northern Cheyenne Tribe
Turtle Mountain Chippewa
Apache Tribe of Oklahoma
Three Affiliated Tribes
Rosebud Lakota
Flandreau Santee Sioux Tribe
Ogalala Lakota
Kiowa Tribe of Oklahoma
Standing Rock Tribal Preservation
Cheyenne Arapaho Tribes of Oklahoma
Kiowa Tribe of Oklahoma
Tom Van Norman, Cheyenne River Sioux
North Arapaho
Adeline Whitewolf, Northern Cheyenne
Crow Creek Lakota

**Local Agencies**
Belle Fourche Chamber of Commerce
Buffalo Chamber of Commerce
Crook County Commissioners
Crook County School District #1
Crook County Sheriff
Crook County Weed and Pest
Devils Tower Conservation District
Gillette Chamber of Commerce
Hulett Chamber of Commerce
Hulett City Council
Moorcroft City Council
Newcastle Chamber of Commerce
Pine Haven City Council
Sheridan Chamber of Commerce
Spearfish Chamber of Commerce
Sundance City Council

**Organizations**
Access Fund
BearLodge Multiple Use Association
Devils Tower Natural History Association
Devils Tower Tourism Association
National Park and Conservation Association
Sierra Club – Black Hills

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# APPENDIX 1: 5–YEAR TREATMENT PLAN

| DETO – Prescribed Fires | | | | |
|---|---|---|---|---|
| **FY** | **NAME** | **ACRES** | **SEASON** | **OBJECTIVE** |
| 04 | North Terrace | 226 | Fall | Fuel Reduction |
| 05 | Southwest | 132 | Spring | Restoration |
| 08 | Joyner Ridge | 104 | Fall | Fuel Reduction |
| 09 | Belle Fourche | 238 | Fall | Fuel Reduction |

| DETO – Mechanic Fuel Treatments | | | | |
|---|---|---|---|---|
| **FY** | **NAME** | **ACRES** | **SEASON** | **OBJECTIVE** |
| 06 | Joyner Ridge | 104 | Spring | reduce ladder fuels |
| 07 | Joyner Ridge | 40 | Winter | burn piles |

*see Treatment Unit map in Appendix 3

# APPENDIX 2: GLOSSARY OF FIRE MANAGEMENT TERMS

The following terms are defined in RM–18.

**Control** – A strategy involving aggressive suppression efforts and would be the strategy of choice whenever the imminent threat of life ort property exists or when fire behavior is potentially extreme.

**Containment** – This strategy entails the use of natural or human–made barriers to stop the spread of the fire under prevailing and forecasted weather conditions to the fullest extent possible to minimize resource damage and to restrict an unwanted wildland fire to a defined area. It would be utilized when no significant values are at risk and fire behavior predictions preclude direct attack to assure firefighter safety.

**Confinement** – Confinement entails minimal suppression action intended to limit fire spread to a certain acceptable geographic area. This strategy may be used depending on size, irregular boundaries, and the values of resource at risk adjacent to the monument.

**Prescribed Fire** – Any fire ignited by management actions to meet specific objectives. A written approved prescribed fire plan must be completed and appropriate NEPA requirements followed prior to ignition.

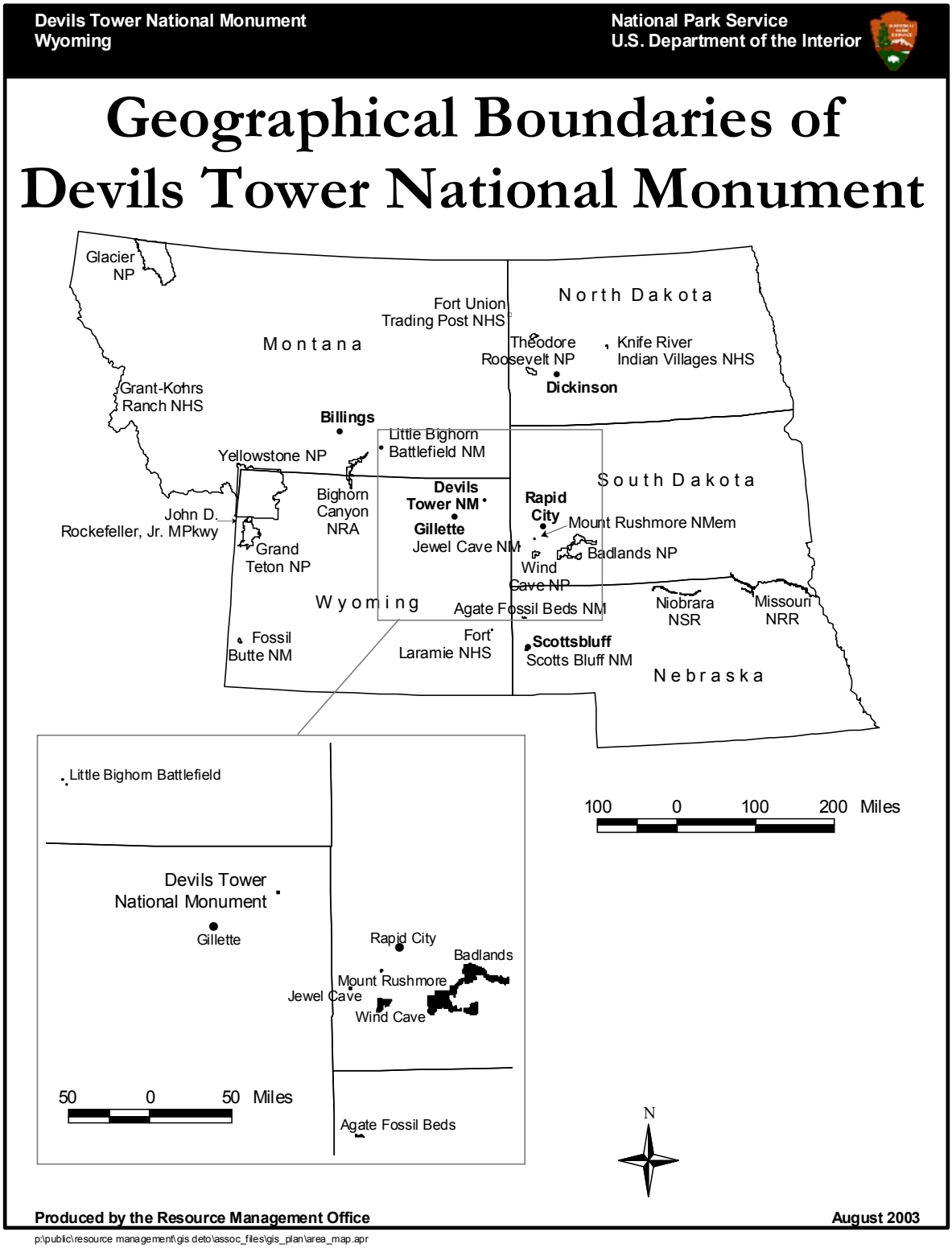
**Wildland Fire Use** – The management of naturally ignited wildland fires to accomplish specific pre–stated resource management objectives in pre–defined geographic areas outlined in Fire Management Plans.

**Wildland Fire Suppression** – An appropriate management response (control, contain, confine) to wildland fire that results in curtailment of fire spread and eliminates all identified threats from the particular fire. All fire suppression activities provide for firefighter and public safety as the highest consideration, but minimize the loss of resource values, economic expenditures, and/or the use of critical firefighting resources.

**"Park"** and **"Monument"** are used interchangeably in this document.

# APPENDIX 3: GRAPHICS

## GEOGRAPHICAL AREA MAP

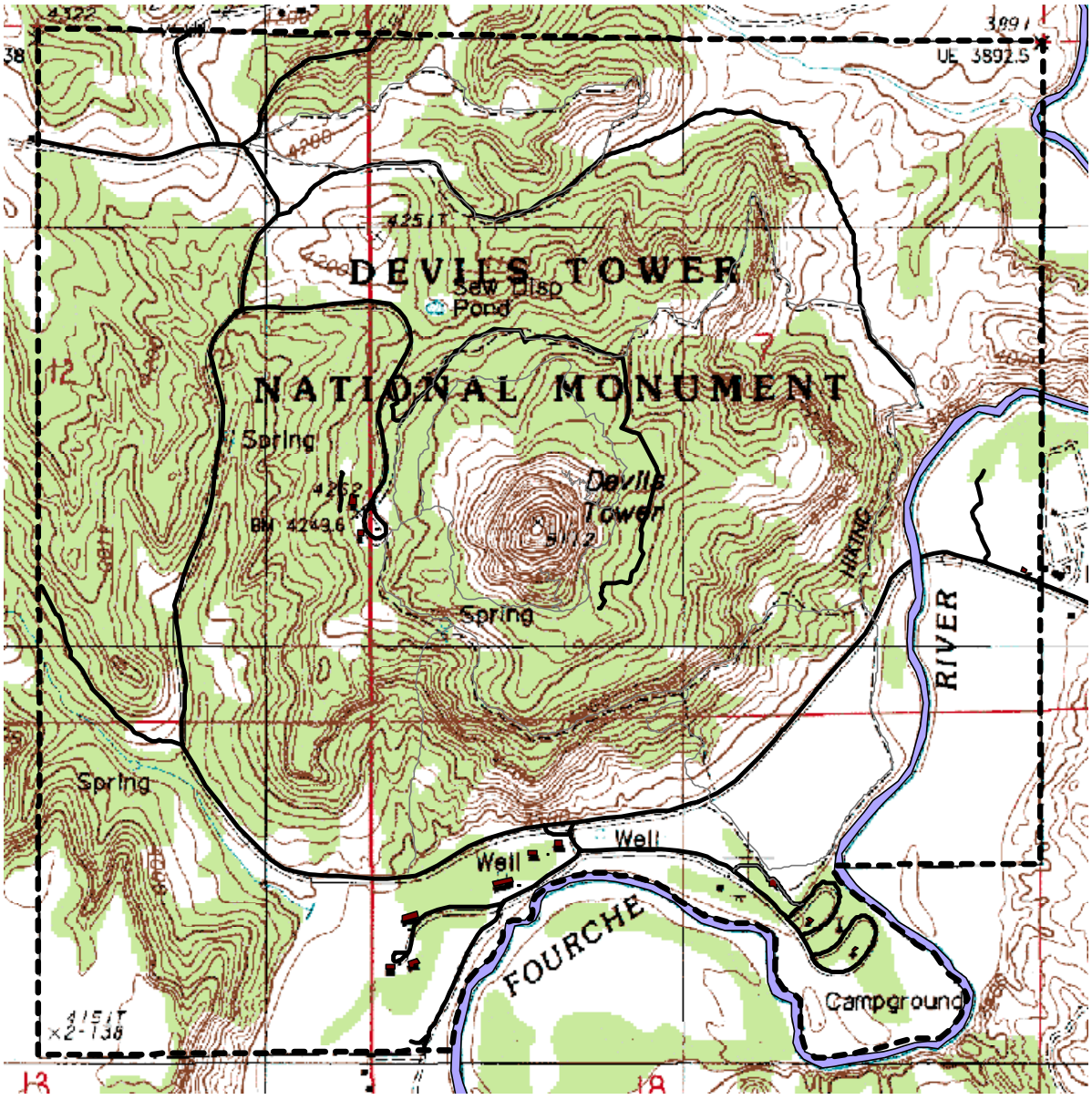


# PARK MAP

Devils Tower National Monument
Wyoming

National Park Service
U.S. Department of the Interior

## Devils Tower National Monument




250 0 250 500 Meters

N

Park Boundary

Produced by the Resource Management Office

August 2003

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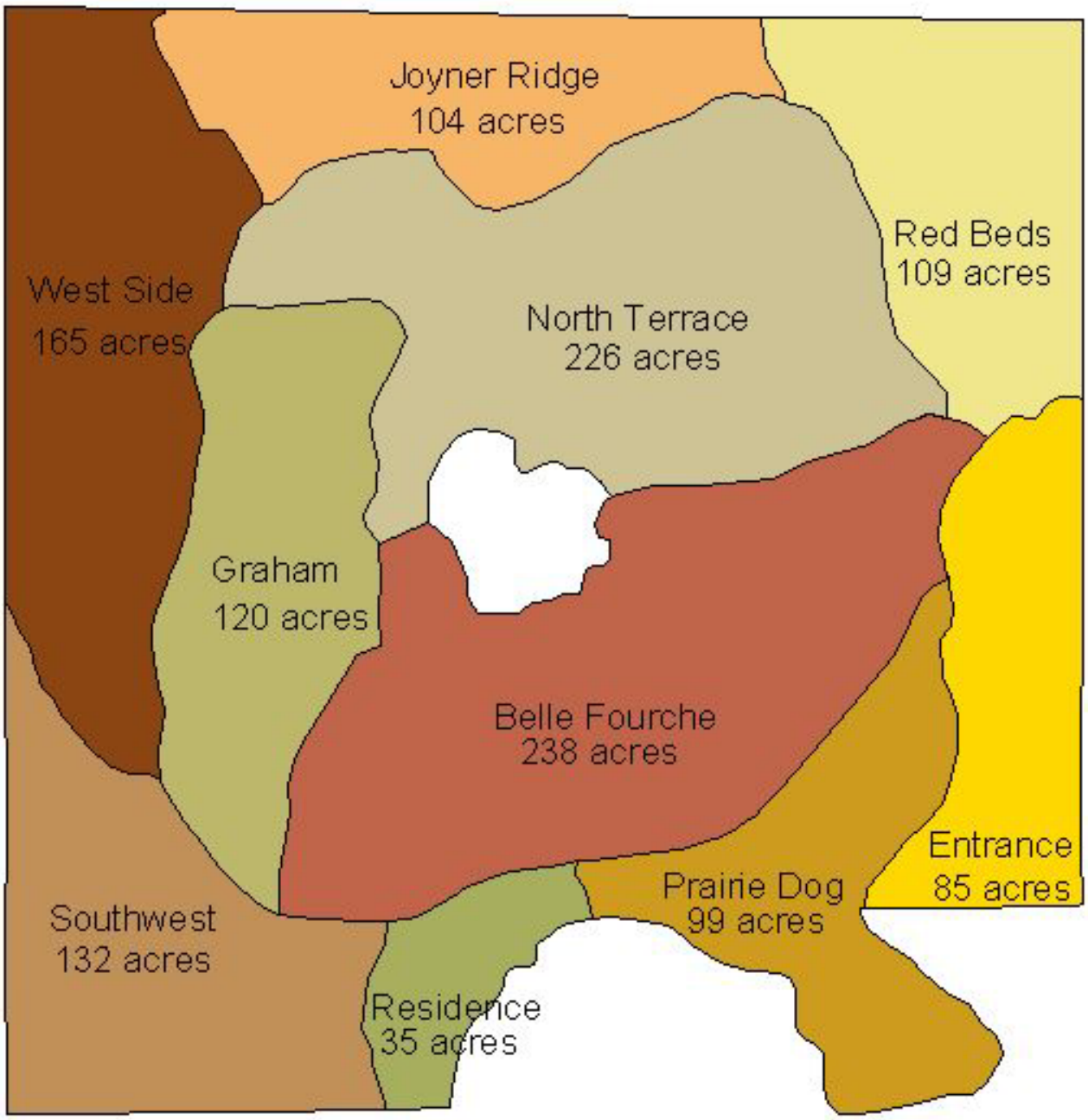
# TREATMENT UNIT MAP



**National Park Service**
**U.S. Department of the Interior**

**Devils Tower National Monument**
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