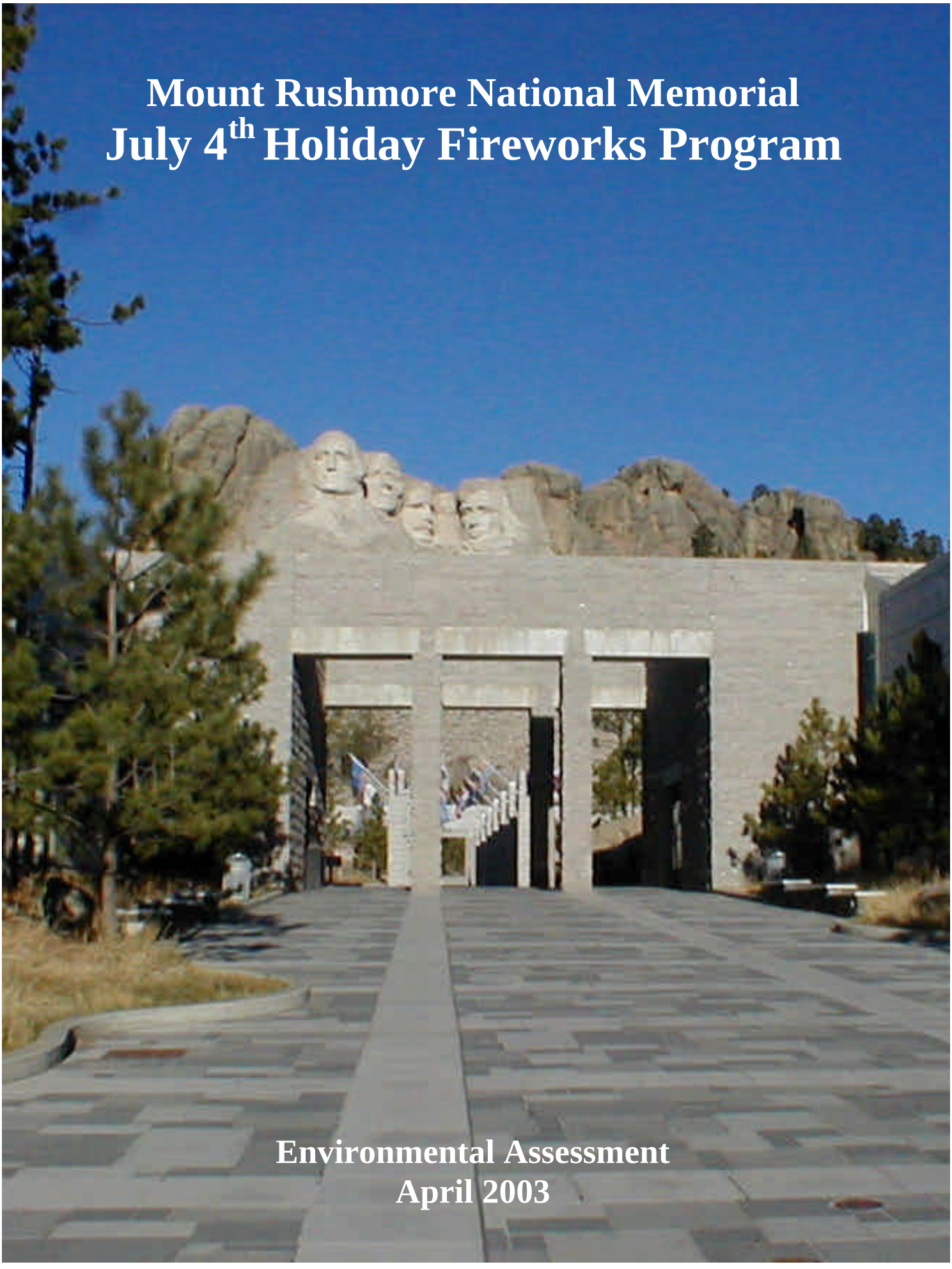
Mount Rushmore National Memorial
July 4th Holiday Fireworks Program



Environmental Assessment
April 2003

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Chapter 1 - Purpose and Need

1.1 INTRODUCTION

This Environmental Assessment (EA) documents the results of a study of the potential environmental impacts of an action proposed by the National Park Service to continue a fireworks display at Mount Rushmore National Memorial as part of its July 4th Holiday celebrations.

This EA has been prepared in compliance with:

- The National Environmental Policy Act (NEPA) of 1969 (42 United States Code (USC) 4321 et seq.), which requires an environmental analysis for major Federal Actions having the potential to impact the quality of the environment;
- Council of Environmental Quality Regulations at 40 Code of Federal Regulations (CFR) 1500-1508, which implement the requirements of NEPA;
- National Park Service Conservation Planning, Environmental Impact Analysis, and Decision Making; Director's Order (DO) #12 and Handbook.

The Purpose of an Environmental Assessment (EA)

There are three primary purposes of an EA:

- To help determine whether the impact of a proposed action or alternative could be significant, thus an environmental impact statement (EIS) is needed;
- To aid in compliance with NEPA when no EIS is necessary by evaluating a proposal that will have no significant impacts, but that may have measurable adverse impacts; and
- To facilitate preparation of an EIS if one is necessary.

Key goals of NEPA are to help Federal agency officials make well-informed decisions about agency actions and to provide a role for the general public in the decision-making process. The study and documentation mechanisms associated with NEPA seek to provide decision-makers with sound knowledge of the comparative environmental consequences of the several courses of action available to them. NEPA studies, and the documents recording their results, such as this EA, focus on providing input to the particular decisions faced by the relevant officials. In this case, the Superintendent of Mount Rushmore National Memorial is faced with a decision to continue a fireworks display at Mount Rushmore National Memorial as part of its July 4th Holiday celebrations.

In making decisions about National Park Service administered resources, the Park Service is guided by the requirements of the 1916 Organic Act and other laws, such as the Clean Air Act, Clean Water Act, and Endangered Species Act. The authority for the conservation and management of the National Park Service is clearly stated in the Organic Act, which states the agency's purpose: "...to conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations." This authority was further clarified in the National Parks and Recreation Act of 1978: "Congress declares that...these areas, though distinct in character, are united...into one national park system.... The

authorization of activities shall be construed and the protection, management, and administration of these areas shall be conducted in light of the high public value and integrity of the National Park System and shall not be exercised in derogation of the values and purposes for which these various areas have been established, except as may have been or shall be directly and specifically provided by Congress."

The busts of four American Presidents – George Washington, Thomas Jefferson, Abraham Lincoln, and Theodore Roosevelt – were sculpted on the southeastern granite face of Mount Rushmore as "…a memorial… commemorative of our national history and progress…" (Act of March 3, 1925). This basic legislation authorized the carving and established the purpose of what was to become Mount Rushmore National Memorial. Subsequent legislation included charges to "administer, protect, and develop" the memorial. President Franklin Delano Roosevelt placed Mount Rushmore under the jurisdiction of the National Park Service by executive order on June 10, 1933. The purpose for which the park was established is to preserve and protect the memorial sculpture and the natural setting, and to provide for the access of the public and for the inspirational and educational appreciation of the cultural and natural resources of the memorial.

The requirements placed on the National Park Service by these laws, especially the Organic Act mandate that resources are passed on to future generations "unimpaired" (DOI, 2001a). This EA addresses whether the actions of the various alternatives proposed by Mount Rushmore National Memorial impair resources or values that are (1) necessary to fulfill specific purposes identified in the enabling legislation of the memorial, (2) key to the natural or cultural integrity of the memorial or opportunities for enjoyment of the memorial, and (3) identified as a goal in the memorial's general management plan or other Park Service planning documents (see *Chapter 3 – Environmental Consequences*).

1.2 PURPOSE AND NEED

The mission statement for Mount Rushmore National Memorial is "to preserve and protect [the Memorial] while providing for the education and enjoyment of the public." The purpose statement for the Memorial is to "commemorate our national history and progress through the visages of George Washington, Thomas Jefferson, Abraham Lincoln, and Theodore Roosevelt" and "provide the opportunity for a contemplative visitor experience as related to the sculpture and its setting." It further states that the purpose for the Memorial is to provide for recreational opportunities.

The purpose for conducting a marquee event, such as fireworks, at Mount Rushmore National Memorial during the July 4th holiday is to celebrate the national history and spirit of democracy, and to provide for the education and enjoyment of the public. There is a need for the Memorial to host a fun, inspirational, traditional, and educational program celebrating our nation's birthday that reaches a diverse local, national, and international audience.

1.3 BACKGROUND

Mount Rushmore National Memorial consists of 1,238 acres and is located on the central slope of the Black Hills of western South Dakota, in Pennington County (see Figure 1-1). The Black Hills are a forested mountain range in southwest South Dakota and northern Wyoming covering approximately 2 million acres. Granite knobs, peaks, ridges and valleys covered with ponderosa pine and dotted with meadows characterizes Mount Rushmore. Nearby communities include Rapid City, Hill City, and Keystone. Federal, state, and private lands surround the memorial. It is adjacent to the Black Elk Wilderness Area, the Peter Norbeck Wildlife Preserve, and the Hell Canyon and Mystic Districts of the Black Hills National Forest. The northeast corner of the memorial is bordered by the town of Keystone with a year round population of 300 and a significant increase of seasonal population from April through September.

Throughout its history, Mount Rushmore National Memorial has celebrated the national history and spirit of democracy during the July 4th Holiday. More recently, the Memorial has sponsored a variety of programs and activities during the Holiday celebration as part of its on-going effort to reach out to a diverse local, national, and international audience. Beginning in 1998, the Memorial included a fireworks program during the July 4th Holiday to celebrate the completion of the new visitor facilities. The popularity of that first fireworks program led to subsequent fireworks displays over the next three years. The fireworks program was cancelled in 2002 because of the severe drought in the Black Hills and the resulting fire danger. During 4 of the past 5 years, the fireworks program held during the July 4th Holiday has become widely popular on a local, national, and international scale. In 2001, over 30,000 people visited the Memorial to watch the fireworks display, and approximately 10 million people viewed news coverage about it on local, national, and international television.

Eighteen wildfires have started on the Memorial as a result of the fireworks programs; however, all of the fires were quickly suppressed and, in total, burned no more than 2 acres. Nevertheless, one hundred years of wildland fire suppression in the region has resulted in an increased density of pine stands and abundant ladder fuels (e.g. dead and dry lower limbs, small trees), which create ideal conditions for severe crown fires. Fire suppression activities have also reduced the complex mosaic of forests and grasslands and increased the risk of catastrophic fire. The historic pre-European settlement pattern of frequent, low-severity ground fire, which removed ground fuels, has shifted to a pattern of potential high severity wildfires that may threaten life, property, and memorial resources.

The Memorial recently approved its revised and updated Fire Management Plan (December 2002). This plan calls for the suppression of all naturally ignited and man-made wildfires, and allows for proactive efforts to help reduce the current high fire risk to the Memorial and surrounding communities. The Memorial intends to reduce the hazardous fuel levels in its ponderosa pine forests over the next several years by expanding its thinning and prescribed fire program. A majority of past and on-going thinning activities have been conducted along the road corridor and adjacent to visitor use areas. Under the expanded

Wildfires are any non-structure fires, other than prescribed fires, that occur in the wildland.

Prescribed Fires are any fires ignited by management actions in defined areas under predetermined weather and fuel conditions to meet specific objectives.

fire management program, additional thinning treatments will first be conducted in forest stands near the Memorial boundaries, especially near Keystone, and within approximately 1,500 feet of the sculptures. The Memorial will also employ prescribed fire in previously thinned areas to reduce hazardous fuels and to restore the natural fire regime to the ponderosa pine forests.

The Memorial follows the 2001 National Park Service Management policies associated with fireworks as guidance for the fireworks program. The policy states that fireworks displays will not be permitted if they pose an unacceptable risk to park resources or values. In all instances, the decision to approve or deny a request is made by the superintendent, following consultation with the regional safety office. Fireworks displays are conducted in compliance with the National Fire Protection Association Code for the Display of Fireworks (NFPA 1123).

1.4 FIREWORKS OBJECTIVES

The overall objectives of the Mount Rushmore July 4th Holiday Celebration Fireworks Program are the following:

- Provide a quality educational program for visitors;
- Provide an emotional experience that will build a constituency for the Memorial;
- Provide a nationally recognized event that promotes visitation to South Dakota;
- Promote partnerships and sprit of cooperation between the tourism organizations locally and statewide;
- Provide for visitor, employee, and partner safety and resource protection;
- Provide management and support for wildland and structural fire protection, law enforcement and emergency medical services;
- Effectively manage parking and traffic flow expected for the event;
- Effectively manage and support the logistics for the event.

1.5 SCOPING ISSUES AND IMPACT TOPICS

On November 15, 2002, a scoping letter describing the Proposed Action and requesting public comments was sent to a mailing list of 163 individuals and organizations (see Coordination and Consultation Section in this document for a complete listing of those individuals, organizations, and agencies who received the scoping notice). On November 28, the Memorial issued a press release to multiple news outlets (newspaper, radio, television) about the proposed action and the open-house public scoping meeting to be held on December 6, 2002. On December 4, 2002 and December 6, 2002 the Memorial distributed a press release in the Rapid City Journal that invited the public to an open house to discuss the Proposed Action and offer their thoughts and concerns about the advantages, disadvantages, and impacts that might occur. The open house was held on December 6, 2002 in Rapid City, South Dakota and 20 people signed the attendance list. Local television news aired coverage of the public open house meeting and the Rapid City Journal published an article about the meeting on the following day, December 7, 2002.

The Memorial also conducted 2 internal scoping meetings with National Park Service employees on December 3, 2002 and December 5, 2002. The former meeting was held in Omaha, Nebraska

at the National Park Service Midwest Regional Office, where 18 people signed the attendance list. The latter meeting was held in Keystone, South Dakota at Mount Rushmore National Memorial, where 32 people signed the attendance list.

The major issues and concerns that came from the open house, internal scoping meetings, and other public input (e.g. email, written and telephonic correspondence) were evaluated and sorted. The park received 133 comments from interested parties during the scoping process. Issues determined to be important were those related to the effects of the proposed action, and those not already adequately addressed by laws, regulations, and policies. Important issues were considered in developing and evaluating the alternatives to the Proposed Action discussed in this EA. The following issues were developed and paraphrased from the comments received during the scoping period and are not actions or issues developed by the Memorial management.

1.5.1 *Important Issues*

General Issues

- Issue: It is appropriate that the Memorial have some type of fun, inspirational July 4th celebration; it is inappropriate for that event to be a fireworks program because of the fire danger and because National Park Service policy prohibits fireworks from being ignited over forested areas;
- Issue: The Memorial should consider Laser Light Shows or other displays (music, historians, historic portrayals) as a safer alternative for a great patriotic entertainment event;
- Issue: The Memorial should have a combination of events, such as fireworks and a laser show, and the fireworks should be phased out over time;
- Issue: The Environmental Assessment should include the "Go/No-Go" decision-making criteria for the fireworks program, and that criteria should be publicized prior to the program;
- Issue: We should focus our efforts on a patriotic program that is guaranteed to occur every year; and
- Issue: It is unlawful for any person or agency to light fireworks in the Black Hills Fire Protection District.

Vegetation Issues

- Issue: The ponderosa pine stands on the Memorial and in the adjacent Black Hills National Forest, Black Elk Wilderness Area, and Norbeck Wildlife Preserve are at risk to catastrophic fire from accidental fire ignitions resulting from the Mount Rushmore fireworks program.

Wildlife Issues

- Issue: The fireworks program may impact wildlife in and around the Memorial.

Park Operations

- Issue: Past fireworks have damaged electrical cables in the vicinity; and
- Issue: The National Park Service should not continue to pay the expenses for this program; the money spent by the Memorial to fund this program would be better spent on other more pressing park operations and needs.

Wilderness Issues

- Issue: Noise from the fireworks program may degrade the wilderness experience of recreationists in the adjacent Black Elk Wilderness Area; and
- Issue: The Black Elk Wilderness Area is at risk to catastrophic fire from accidental fire ignitions resulting from the Mount Rushmore fireworks program.

Economic Issues

- Issue: Fireworks at Mount Rushmore have had a very positive effect on the image of South Dakota and have gone a long way in promoting tourism in the state;
- Issue: The program is very expensive and may not really result in a large increase in revenue for the local and state economies;
- Issue: The fireworks program benefits the local and regional economies and indirectly promotes visitation to South Dakota and the Black Hills during other parts of the year, not just the July 4th Holiday;
- Issue: The State of South Dakota and the Black Hills gets free and valuable advertising from local, national, and international news coverage of the fireworks event;
- Issue: There would be a large impact to the natural resources and uses of the surrounding Forest Service lands (timber and grazing) if a wildfire escaped suppression efforts during the fireworks display;
- Issue: Volunteer and non-profit groups are financially benefited as a result of their participation with Memorial concessions during the fireworks celebration;
- Issue: Providing law enforcement personnel to help with the fireworks program can be expensive for the South Dakota Highway Patrol, Rapid City Police Department, and Pennington County Sheriff's Department; and
- Issue: The costs incurred by the NPS to prepare for this event are high, and the expenses will be real costs even if the fireworks program is cancelled in any given year.

Socio-economic Issues

- Issue: The fireworks program is a patriotic display that celebrates the best of America and provides an emotional experience for all those who attend or view it through the media;
- Issue: Fireworks at Rushmore instill a great sense of patriotism;
- Issue: The Fireworks program is getting so popular that there are too many people attending, or trying to attend, the event;

- Issue: There is no better place than Mount Rushmore for citizens located in the West to celebrate the July 4th Holiday with fireworks; citizens on the East Coast have the National Mall and Statue of Liberty to celebrate July 4th;
- Issue: Because of the controversial nature of the fireworks program, I believe the event has now created a rift between the National Park Service and some Rushmore Society members, and we should not continue with a program that threatens that special relationship;
- Issue: The program helps cultivate partnerships between the NPS, the Mount Rushmore Society and numerous independent tourism organizations and attractions in the Black Hills; and
- Issue: The fireworks event promotes esprit de corps among the local population.

Human Health and Safety Issues

- Issue: Fireworks at Mount Rushmore are proven to cause wildfires;
- Issue: If the fireworks program is to proceed, the NPS should strongly consider drought conditions, the state of hazardous fuels in surrounding forests, and the terrain that firefighters would have to traverse to suppress any ignitions;
- Issue: The continuation of this planned ignition of wildfire without secure fire perimeters, adequate firefighting forces, or a written plan runs counter to professional fire management;
- Issue: Fireworks at Rushmore would be unsafe because there is a concentration of the general public, very limited access, and congested traffic conditions. The opportunity to compromise public safety is real;
- Issue: With the high fire risk associated with the forest in the area, I would suggest that, at the very least, the ponderosa pine should be thinned and prescribed fire applied to the area prior to restoring the fireworks event;
- Issue: The Memorial should have an evacuation plan in place in case a catastrophic wildfire occurs during the event;
- Issue: It is unsafe to expose firefighters to the suppression of wildfires at night in extremely steep and rocky terrain; suppression efforts have already caused 2 injuries to firefighters during the fireworks programs, one of them a serious knee injury;
- Issue: Fireworks at the Memorial will commit dozens of firefighters to manage the event when they would be better served elsewhere during the peak of the fire season;
- Issue: The wildfire risk to nearby towns, such as Keystone, and private property is high; and
- Issue: Because there is a finite number of fire management and law enforcement personnel in the Black Hills region, and since most, if not all of these personnel are required at the Mount Rushmore fireworks program, other parts of the region are temporarily at greater risk should an emergency occurs that requires the attention of these same personnel.

Cultural Resource Issues

- Issue: The talus slope and surrounding area is littered with remnants of past firework shells;
- Issue: The concussion from the fireworks explosions may create structural failure on the visages;
- Issue: A section 106 Consultation must be completed 1) since the Hall of Records canyon lies within the Historic District and the potential impacts to the Historic District from the preparation and lighting of the fireworks, and 2) since there would be a fire risk to the historic structures on the Memorial;
- Issue: Tribal concerns should be addressed in the Environmental Assessment; and
- Issue: The cultural landscape will be impacted if the forested areas of the Memorial are burned up in a wildfire.

1.5.2 *Other Issues Considered but not Further Analyzed*

- Issue: An Environmental Impact Statement should be conducted on this program because it is too political and the manager cannot say "No Significant Impact". At this time, it is unclear whether or not there would be a significant impact to the human environment as a result of conducting a fireworks program to celebrate the July 4th Holiday. This Environmental Assessment is being prepared to identify and determine the environmental consequences resulting from a fireworks event, or other alternative program, such as a laser show, and a determination of significance will be made as a result of the analysis. If the analysis determines that a significant impact would occur, then the Superintendent would prepare an Environmental Impact Statement. The fact that an individual believes the program is too political is not a "trigger", as defined by the National Environmental Policy Act, that automatically requires the National Park Service to prepare an Environmental Impact Statement.

- Issue: This EA process is dishonest because it is being conducted to justify past and future fireworks event. The Superintendent is preparing this environmental assessment to help identify and determine the environmental consequences resulting from a fireworks events, or other alternative program, such as a laser show, to celebrate the July 4th Holiday. Armed with the environmental assessment, the Superintendent can make a more informed decision about whether or not he/she should continue the fireworks program or replace it with another fun and inspirational event. The fact that an individual(s) perceives this process as dishonest in that it seeks to justify past and future fireworks programs is outside the scope of this environmental assessment.

- Issue: Mount Rushmore should get legislative approval and funding for conducting fireworks so that it will not continue to contradict National Park Service policy on fireworks over forested areas. In all past fireworks displays at Mount Rushmore National Memorial, the Superintendent requested and obtained a waiver from the Director of the National Park Service, which permitted the fireworks celebration. Seeking legislative approval from the United States Congress to conduct and fund fireworks at Mount Rushmore every July 4th Holiday is an option available to the Superintendent. Seeking a

waiver each year from the Director of the National Park Service is another option. Regardless of which path the Superintendent takes, the issue of whether or not the Superintendent should seek legislative approval is outside the scope of this environmental assessment.

- Issue: The National Park Service no longer observe the traditions of the sculpture maintenance crew preparing for the work or use of the traditional equipment (bosun's chair, winches, cables, etc.). The fact that the National Park Service no longer observes the traditions of the sculpture maintenance crew's preparing for the work or use of traditional equipment is outside the scope of this environmental assessment. The decision by the Superintendent of Mount Rushmore National Memorial to continue or discontinue the fireworks program during the July 4th Holiday has no cause and effect relationship with his/her decision to observe the traditions of the sculpture maintenance crew.

- Issue: Security "improvements" in the Hall of Records valley will forever detract from the feeling one derives from entering the valley. These improvements have eclipsed the historic fabric and replaced it with the coldness of technology and the surrounding hardened barriers. Security improvements in the Hall of Records Valley, and any potential environmental consequences resulting from those improvements are outside the scope of this environmental assessment. The decision by the Superintendent of Mount Rushmore National Memorial to continue or discontinue the fireworks program during the July 4th Holiday has no cause and effect relationship with past and any on-going security improvements.

- Issue: The fireworks explosions are a violent means of celebration and simulate bombing. The use of fireworks to celebrate the nation's birthday is widely considered as a "traditional" way to celebrate the July 4th Holiday. While some individuals may perceive fireworks as violent and disapprove of their use in any celebration, that perception reflects their personal beliefs. Therefore, the issue is outside the scope of this Environmental Assessment.

- Issue: The Superintendent of Mount Rushmore should not be the only person responsible for making a "go" decision for the fireworks event in any given year. While the Superintendent may look to others for their opinion on whether to conduct or not conduct the fireworks event in any given year, the final decision and ultimate responsibility for the event rests solely with the Superintendent at Mount Rushmore National Memorial. Therefore, this issue is not considered for further analysis in this Environmental Assessment.

1.5.3 *Impact Topics Considered in this EA*

Impact topics are derived from issues raised during internal and external scoping. Not every conceivable impact of a proposed action is substantive enough to warrant analysis. The following topics, however, do merit consideration in this EA:

Soils: Wildfires that may result from a fireworks program and fire suppression activities can adversely impact soils, therefore, impacts to soils are analyzed in this EA.

Water Resources (including Wetlands): NPS policies require protection of water resources consistent with the Federal Clean Water Act. Mount Rushmore National Memorial contains several intermittent streams and wetlands. Fire suppression efforts and wildfires that may result from a fireworks program can adversely impact stream channels and wetlands, therefore, impacts to water resources are analyzed in this EA.

Vegetation: Ponderosa pine of varying age is the dominant vegetation type in the memorial. An area of the memorial contains one of the largest stand of old growth ponderosa pine in the Black Hills. Starling Basin, located in the southern part of the memorial, has been described as a "type habitat" that is rare in the Black Hills. Since fire suppression efforts and wildfires that may result from a fireworks program can impact vegetation and the ponderosa pine forest stands on and off the Memorial, vegetation impacts are analyzed in this EA.

Wildlife: There are resident populations of various species of reptiles, amphibians, birds, mammals, fish, and invertebrates that can be impacted by the concussion blasts and by wildfires that may result from a fireworks program. Therefore, impacts to wildlife are evaluated in this EA.

Air Quality: The Federal 1970 Clean Air Act stipulates that Federal agencies have an affirmative responsibility to protect a park's air quality from adverse air pollution impacts. Moreover, Mount Rushmore is located in a Class II area. While the park generally enjoys excellent air quality, it is not pristine air quality. Air pollution from industrial and electric utility facilities in the region, which includes nitrate and sulfate emissions, impact air quality at the memorial. All types of fires generate smoke and particulate matter, which can impact air quality within the Memorial and surrounding region. In addition, cars and buses that transport people to and nearby the Memorial also produce emissions that may impact local air quality. Therefore, air quality impacts are analyzed in this EA.

Noise: Noise is defined as unwanted sound. Fire suppression efforts can involve the use of noise-generating mechanical tools and devices with engines, such as chain saws, trucks, helicopters, and airplanes. Each of these devices, in particular helicopters and chain saws at close range, are quite loud (in excess of 100 decibels). In addition, fireworks can have loud concussion blasts. While there are few "sensitive receptors" (schools, churches, elderly homes) in the areas surrounding the Memorial, a designated wilderness area lies on the western border of the Memorial and would be exposed to elevated noise levels from a fireworks program. Therefore, this impact topic is analyzed further in this EA.

Visitor Use and Experience: The 1916 NPS Organic Act directs the Service to provide for public enjoyment of the scenery, wildlife and natural and historic resources of national parks "in such a manner and by such means as will leave them unimpaired for the enjoyment of future generations." A fireworks program can affect the visitor use and experience of the Memorial. Therefore, impacts on visitor use and experience are addressed in this EA.

Socio-economics: NEPA requires an analysis of impacts to the "human environment" which includes economic, social and demographic elements in the affected area. A fireworks program can benefit the local and regional economies, and can positively affect the "quality of life" of residents and visitors alike. Therefore, this impact topic is included for further analysis in this EA.

Human Health and Safety: Wildfires can be extremely hazardous, even life-threatening, to humans, and a fireworks program at the Memorial may result in the ignition of wildfires during the course of the program. In addition, firefighters that must suppress any wildfires resulting from the fireworks program must initially do so in step terrain and at night. Injuries to the wildland firefighters have been documented during suppression of wildfires that were started by fireworks at the Memorial. Therefore, impacts to human health and safety are addressed in this EA.

Cultural Resources: Section 106 of the National Historic Preservation Act of 1966 provides the framework for Federal review and protection of cultural resources, and ensures that they are considered during Federal project planning and execution. Mount Rushmore National Memorial is listed on the National Register of Historic Places. In addition, numerous designations for historic protection of the memorial have been made such as the Hall of Records, the Sculptor's Studio, the residence, the Borglum View Terrace and other affiliated facilities from the time of the creation of the sculpture. These cultural resources may be affected both by wildfire, fire suppression activities, fireworks, and fireworks debris, thus potential impacts to cultural resources are addressed in this EA.

Park Operations: Severe wildfires can potentially affect operations at national parks, especially in more developed sites like visitor centers, campgrounds, administrative and maintenance facilities. These impacts can occur directly from the threat to facilities of an approaching fire, and more indirectly from smoke and the diversion of personnel to firefighting. In addition, an annual fireworks program at the Memorial requires months of planning and personnel to oversee the event. Thus, the potential effects of the alternatives on park operations will be considered in this EA under Visitor Use and Experience.

Transportation: Past fireworks on the July 4th Holiday have created traffic congestion as thousands of people flock to the Memorial and surrounding areas to view the program. Following a fireworks event, it can take up to 2-2 ½ hours for traffic to disperse. Therefore, this topic will be addressed in this analysis.

Wilderness: According to National Park Service Management Policies (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 Mount Rushmore is bordered by the Black Elk Wilderness Area, wilderness impacts are evaluated further in this EA.

1.5.4 *Impact Topics Considered but dropped from Further Analysis*

NEPA and the CEQ Regulations direct agencies to "avoid useless bulk…and concentrate effort and attention on important issues" (40 CFR 1502.15). Certain impact topics that are sometimes addressed in NEPA documents on other kinds of proposed actions or projects have been judged to not be substantively affected by any of the alternatives considered in this EA. These topics are listed and briefly described below, and the rationale provided for considering them, but dropping them from further analysis.

Threatened and Endangered Species: The Federal Endangered Species Act prohibits harm to any species of fauna or flora listed by the U. S. Fish and Wildlife Service (USFWS) as being either threatened or endangered. Such harm includes not only direct injury or mortality, but also disrupting the habitat on which these species depend. There are no known threatened or endangered species that reside within Mount Rushmore National Memorial, nor is there any critical habitat. Therefore, this impact topic is not included for further analysis in this EA.

Floodplains: Presidential Executive Orders mandate floodplain management and protection of wetlands. The Memorial does not contain any floodplains, and therefore impacts are not analyzed further in this EA.

Utilities: Generally speaking, some kinds of projects, especially those involving construction, may temporarily impact above and below-ground telephone, electrical, natural gas, water, and sewer lines and cables, potentially disrupting service to customers. Other proposed actions may exert a substantial, long-term demand on telephone, electrical, natural gas, water, and sewage infrastructure, sources, and service, thereby compromising existing service levels or causing a need for new facilities to be constructed. None of the alternatives will cause any of these effects to any extent, and therefore utilities are eliminated from any additional analysis.

Waste Management: During any fireworks program, the Memorial would install several port-o-lets and additional trash receptacles to help supplement its existing waste management infrastructure. Therefore this impact topic is not further addressed in this EA.

Land Use: Land use of the Memorial and surrounding area would not be directly impacted by the fireworks program. It is not reasonably foreseeable that the city of Keystone or other areas within the vicinity of the Memorial would be impacted by catastrophic wildfire as a result of fireworks; therefore land use is not further addressed in this EA.

Environmental Justice / Protection of Children: Presidential Executive Order 12898 requires Federal agencies to identify and address disproportionate impacts of their programs, policies and activities on minority and low-income populations. Executive Order 13045 requires Federal actions and policies to identify and address disproportionately adverse risks to the health and safety of children. None of the alternatives would have disproportionate health or environmental effects on minorities or low-income populations as defined in the Environmental Protection Agency's Environmental Justice Guidance; therefore, these topics are not further addressed in this EA.

Prime and Unique Agricultural Lands: Prime farmland has the best combination of physical and chemical characteristics for producing food, fed, forage, fiber, and oilseed crops. Unique land is land other than prime farmland that is used for production of specific high-value food and fiber crops. Both categories require that the land is available for farming uses. Lands within Mount Rushmore National Memorial are not available for farming and, therefore, do not meet these definitions. This impact topic is not evaluated further in this EA.

Indian Trust Resources: Indian trust assets are owned by Native Americans but held in trust by the United States. Indian trust assets do not occur within Mount Rushmore National Memorial and, therefore, are not evaluated further in this EA.

Resource Conservation, Including Energy, and Pollution Prevention: The National Park Service's *Guiding Principles of Sustainable Design* provides a basis for achieving sustainability in facility planning and design, emphasizes the importance of biodiversity, and encourages responsible decisions. The guidebook articulates principles to be used such as resource conservation and recycling. The alternatives would not minimize or add to resource conservation or pollution prevention on the Memorial and, therefore, this impact topic is not evaluated further in this EA.

Table 1-1 Impact Topics for Mount Rushmore National Memorial July 4th Holiday Fireworks Program Environmental Assessment

Impact Topic	Retained or Dismissed from Further Evaluation	Relevant Regulations or Policies
Soils	Retained	NPS *Management Policies 2001*
Water Resources	Retained	Clean Water Act; Executive Order 12088; NPS *Management Policies*
Wetlands	Retained	Executive Order 11988; Executive Order 11990; Rivers and Harbors Act; Clean Water Act; NPS *Management Policies*
Vegetation	Retained	NPS *Management Policies*
Wildlife	Retained	NPS *Management Policies*
Air Quality	Retained	Federal Clean Air Act (CAA); CAA Amendments of 1990; NPS *Management Policies*
Noise	Retained	NPS *Management Policies*
Visitor Use and Experience	Retained	NPS *Management Policies*
Human Health & Safety	Retained	NPS *Management Policies*
Cultural Resources	Retained	Section 106; National Historic Preservation Act; 36 CFR 800; NEPA; Executive Order 13007; Director's Order #28; NPS *Management Policies*
Socio-economics	Retained	40 CFR Regulations for Implementing NEPA; NPS *Management Policies*
Park Operations	Retained	NPS *Management Policies*
Transportation	Retained	NPS *Management Policies*
Wilderness	Retained	The Wilderness Act; Director's Order #41; NPS *Management Policies*

Threatened and Endangered Species and their Habitats	Dismissed	Endangered Species Act; NPS *Management Policies*
Utilities	Dismissed	NPS *Management Policies*
Waste Management	Dismissed	NPS *Management Policies*
Land Use	Dismissed	NPS *Management Policies*
Environmental Justice	Dismissed	Executive Order 12898
Prime and Unique Agricultural Lands	Dismissed	Council on Environmental Quality 1980 memorandum on prime and unique farmlands
Indian Trust Resources	Dismissed	Department of the Interior Secretarial Orders No. 3206 and No. 3175
Resource Conservation, Including Energy, and Pollution Prevention	Dismissed	NEPA; NPS *Guiding Principles of Sustainable Design*; NPS *Management Policies*

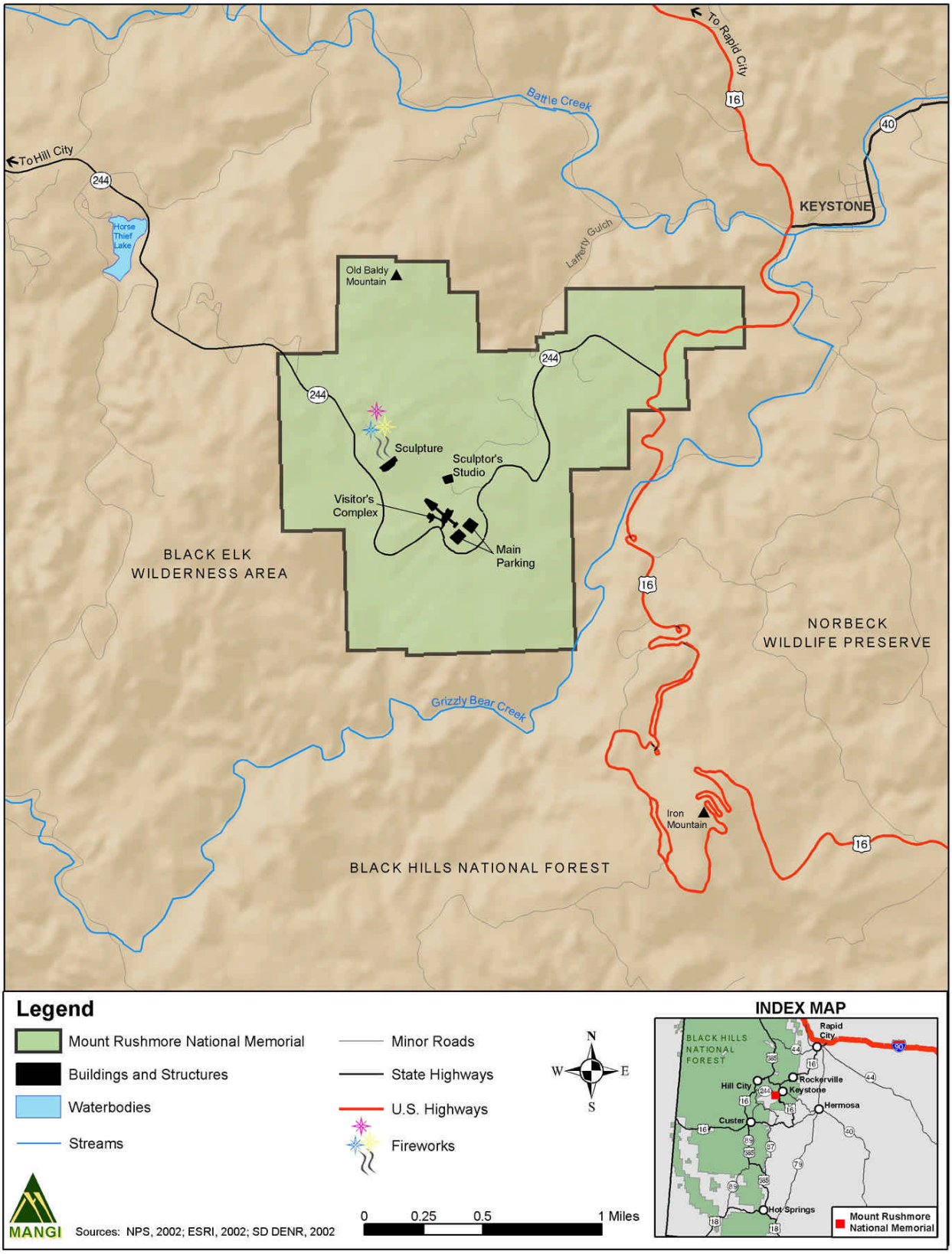


Figure 1-1 Mount Rushmore National Memorial Vicinity

Chapter 2 - Issues and Alternatives

This Chapter describes the range of alternatives, including the Proposed Action and No Action Alternatives, formulated to address the purpose of and need for the proposed project. These alternatives were developed through evaluation of the comments provided by individuals, organizations, governmental agencies, and the Interdisciplinary Team (IDT).

2.1 ALTERNATIVES CONSIDERED AND ANALYZED IN THIS EA

2.1.1 *Alternative 1 (No Action Alternative) – July 4th Holiday Celebrations at Mount Rushmore National Memorial without a Marquee Program*

Under the No Action Alternative, the Memorial would continue its regular July 4th Holiday celebrations, which typically include educational and entertainment programs (e.g. musical performances, lighting ceremony) between July 3rd and July 5th; however, these celebrations would not include a marquee event such as fireworks.

2.1.2 *Alternative 2 (Proposed Action) – July 4th Holiday Celebrations to include a Fireworks Program*

Under the Proposed Action, the Memorial would continue its fireworks program as a part of the July 4th Holiday celebrations. The fireworks program would be conducted on July 3rd and would include approximately 2,500 fireworks and would last 24-27 minutes.

Several days prior to the event, the fireworks and launch equipment would be transported by helicopter to the Hall of Records valley behind the sculptures. Preparation of the staging area and launch site would not involve any excavation in the valley. During the actual fireworks program, memorial staff and visitors would not be allowed within 1,000 feet of the launch site as a majority of the fallout from the display would land in this buffer. This temporary restriction would result in the closure of the Presidential Trail on the Memorial. In the morning of the following day, all the fireworks equipment from the staging and launch site would be transported from the valley by helicopter, and the 1,000-foot restricted area would be re-opened to the public. Shortly after the July 4th Holiday, Memorial staff and, if possible, volunteer groups would then traverse the fallout area to pick up the litter generated from the exploding firework shells.

In the months leading up to the fireworks program, Memorial staff would prepare management plans for traffic, visitor services, security, fire protection, and visitor and employee safety. Each of these topics is included in the "Incident Plan" prepared by the Memorial for the fireworks program. In order to safely manage traffic and protect human health and safety during the event, the Memorial would work cooperatively with local, state, and other federal law enforcement and fire management personnel, and would temporarily supplement its own staff with National Park Service personnel from nearby park units. In 2001, over 100 local, state, and federal law enforcement and fire management personnel were on site to manage traffic and fire protection. Fire protection measures that will be in place during the celebration are described in detail in

Appendix A of this EA. Figure A-1 (see Appendix A) shows the location of these fire protection measures in relation to the launch site.

2.1.3 *Alternative 3 – July 4th Holiday Celebrations to Include a Laser Light Show*

In response to public comment about potential human health and safety issues surrounding a fireworks program, this alternative would include a laser light show to replace the fireworks program during the July 4th Celebrations. The laser light show would be choreographed to patriotic music with either taped or live entertainment and would complement readings about the presidents. The laser show would last approximately 24-30 minutes.

The majority of the laser show equipment would be located in the grandview terrace and the theatre complex. A reflector unit would likely be placed on the top of the sculptures, however, it would not be permanently mounted into the granite, and it would not require any construction into the rock. A large generator would be placed nearby the grandview terrace to help power the laser show.

2.1.4 *Environmentally Preferred Alternative*

The National Park Service is required to identify the environmentally preferred alternative(s) for any of its proposed projects. That alternative is the alternative that will promote the national environmental policy expressed in NEPA (Section 101 (b)). This includes alternatives that:

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

2) ensure for all Americans safe, healthful, productive, and esthetically 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; and

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

In essence, the environmentally preferred alternative would be the one(s) that "causes the least damage to the biological and physical environment; it also means the alternative which best protects, preserves, and enhances historic, cultural, and natural resources" (DOI, 2001a).

In this case, Alternative 1 is the environmentally preferred alternative for Mount Rushmore National Memorial since it best meets goals 1, 2, 3, and 4 described above. This alternative best protects and helps preserve the historic, cultural, and natural resources in the Memorial for current and future generations because it would constitute a more typical day at the memorial and would not require the preparation or witness the visitation experienced with a fireworks or laser show.

2.3 IMPACT DEFINITIONS

Table 2-1 depicts the impact definitions used in this Environmental Assessment. Significant impact thresholds for the various key resources were determined in light of compliance with existing state and federal laws, compliance with existing Mount Rushmore National Memorial planning documents.

Table 2-1 Impact Definitions

	"Minor" Impact	"Major" or "Significant" Impact
Key Resources		
Soils	Minor damage to or loss of the litter/humus layers that causes minor localized increases in soil loss from erosion; fire severe enough to cause minor harm to soil community; minor, temporary surface sterilization of soils that does not cause long term loss of soil productivity that would alter or destroy vegetation community; short-term and localized compaction of soils that does not prohibit re-vegetation	Damage to or loss of the litter/ humus layers that would increase soil loss from erosion; fire severe enough to damage soil community; substantial surface sterilization of soils that may cause long term loss of soil productivity and that may alter or destroy a portion of the vegetation community; long-term and widespread soil compaction that affects a large number of acres and prohibits re-vegetation
Water Resources (Including Wetlands)	Minor damage to or loss of the litter/humus layers that increases sedimentation on no more than 0.1% of a subwatershed; localized and indirect riparian impact that does not substantively increase stream temperatures or affect stream habitats; no alteration of natural hydrology of wetlands	Damage to or loss of the litter/ humus layers that increases sedimentation on greater than 0.1% of a subwatershed; localized and indirect riparian impact that may substantively increase stream temperatures or affect stream habitats; alteration of natural hydrology of wetlands
Vegetation	Short-term changes in plant species composition and/or structure, consistent with expected successional pathways of a given plant community from a natural disturbance event	Violation of the Endangered Species Act of 1973; loss of numerous old growth trees in Starling Basin
Wildlife	Temporary displacement of a few localized individuals or groups of animals; mortality of individuals of species not afforded special protection by state and/or federal law; mortality of individuals that would not impact population trends	Violation of the Endangered Species Act of 1973; mortality of species that jeopardize the resident population
Air Quality	Minimal to negligible air emissions and temporary smoke accumulation; temporary and limited smoke exposure to sensitive resources	Violation of state and federal air quality standards; violation of Class II air quality standards; prolonged smoke exposure to sensitive receptors
Noise	<65 dBA at sensitive receptors; temporary noise levels <90 dBA	>65 dBA noise level at sensitive receptors (schools, nursing homes, etc.); continued

		exposure to noise levels > 90 dBA for workers and/or the general public
Visitor Use & Experience	Temporary displacement of recreationists or closure of trails, and recreation areas; temporary or short-term alteration of the vista, or temporary presence of equipment/structures in localized area; temporary smoke accumulation	Permanent closure of trails and recreation areas; long-term change in scenic integrity of the vista; substantive smoke accumulation during peak recreation use
Human Health & Safety	Minor injuries to any worker (e.g. minor cuts or bruises); limited exposure to hazardous compounds or smoke particulates at concentrations below health-based levels	Serious injury to any worker or member of the public (life-threatening injury or major disability); exposure to hazardous compounds or smoke particulates at concentrations above health-based levels.
Cultural Resources	Temporary, non-adverse effects to registered cultural resource sites, eligible cultural resource sites, sites with an undetermined eligibility, and traditional cultural properties	Temporary or long-term adverse impacts to registered cultural resource sites, eligible cultural resource sites, sites with an undetermined eligibility, and traditional cultural properties
Park Operations	Temporary suspension of non-critical memorial operations; negligible impact to memorial buildings and structures	Prolonged suspension of all memorial operations; adverse impacts to memorial buildings and structures
Socioeconomics	Potential to alter the social setting, limit access to necessary services; disrupt resident or user populations or change economic characteristics that is localized, infrequent, of relatively short duration, and narrow in scope.	Longer term or permanent, alteration of the social setting and character that is extensive and readily observable and extended over a larger community or socioeconomic region; or a change in the levels of employment or business activity sufficient to substantially affect the income of local residents.
Transportation	Temporary traffic increase that exceeds the level of service for a particular road network	Extended increase in traffic that exceeds the level of service of a particular road network
Wilderness	Any impact that does not conflict with wilderness values	Temporary or long-term, local or regional adverse impact to wilderness values – violation of the Wilderness Act

2.4 MITIGATION MEASURES AND MONITORING

Mitigation measures are prescribed to prevent and/or mitigate adverse environmental impacts that may occur from fire management activities. Mitigation measures are common to all alternatives.

2.4.1 *Fire Management Activities*

- All suppression guidelines will follow Minimum Impact Suppression Tactics (MIST) guidelines. These include:
  - Keep fire engines or slip-on units on existing roads;
  - Restrict the use of heavy equipment such as bulldozers or plows for constructing fire lines. A tractor with box blade or disc will be used for fire line construction only in extreme situations when high value resources are at risk, and then only with the authorization of the superintendent or designee;

- Prohibit the use of fire line explosives;
- Use existing natural fuel breaks and human-made barriers, wet line, or cold trailing the fire edge in lieu of handline construction whenever possible;
- Keep fire line widths as narrow as possible when they must be constructed;
- Avoid ground disturbance within known natural (e.g. cedar glade habitat, T&E species) and archeological/cultural/historic resource locations. When fire line construction is necessary in proximity to these resource locations, it will involve as little ground disturbance as possible and be located as far outside of resource boundaries as possible;
- Use water instead of fire retardant. If retardant must be used, use a non-fugitive type, and avoid surface water resources;
- Use soaker hose, sprinklers or foggers in mop-up; avoid boring and hydraulic action;
- Minimize the cutting of trees;
- Scatter or remove debris as prescribed by the incident commander; and
- Protect air and water quality by complying with the Clean Air Act, the Clean Water Act, and all other applicable federal, state, and local laws and requirements.

- Erosion control methods will be used on slopes exceeding 10% where handline construction took place; and
- All sites where improvements are made or obstructions removed will be rehabilitated to pre-fire conditions, to the extent practicable.

2.4.2 *Soil and Water Resources (Including Wetlands)*

- Stream crossings would be limited to set and existing locations;
- Fire line construction and fire retardant and foam suppression use would not be permitted in wetlands; and
- Fire lines would be located outside of highly erosive areas, steep slopes, and other sensitive areas. Following fire suppression activities, fire lines would be re-contoured, water barred, and possibly seeded (with native plant species)

2.4.3 *Cultural Resources*

- Prior to all firework program activities, cultural resources would be identified and avoided. Fire suppression units would be positioned at Sculptor's Studio and Residence II for fire protection; and
- No excavation would be permitted in the Hall of Records valley.

2.5 COMPARISON OF ALTERNATIVES

Table 2-2 briefly summarizes the environmental effects of the various alternatives. It provides a quick comparison of how well the alternatives respond to the project need, objectives, important issues and key resources. Chapter 3 discusses the environmental consequences of the proposed alternatives in detail.

Table 2-2 Comparison of Potential Impacts of the Alternatives			
Key Resources	**Alternative 1 - No Action**	**Alternative 2 - Proposed Action**	**Alternative 3 – Laser Light Show**
Soils	No soil impacts	Potential minor short-term soil erosion and compaction impacts resulting from fire suppression activities. Some localized minor benefits may also be observed at these sites.	No soil impacts
Water Resources (including wetlands)	No water resources impacts	Potential short- and long-term impacts to water resources from the mishandling or misapplication of fire retardants or foams	No water resources impacts
Vegetation	No impacts to vegetation	Potential minor and temporary impacts to vegetation resulting from wildfire and fire suppression activities. Some localized minor benefits may also be observed at these sites.	Plant habitat and diversity degraded in the absence of prescribed fire; continued spread of noxious weeds at the expense of native grasses and forbs
Wildlife	Minor and temporary disturbance to wildlife; potential increase in road kill resulting from increased traffic volumes	Temporary displacement of some wildlife species; potential risk of individual mortality as a result of wildfire; no impact on T&E or Sensitive species; potential increase in road kill resulting from increased traffic volumes	Minor and temporary disturbance to wildlife; potential increase in road kill resulting from increased traffic volumes
Air Quality	Negligible impacts from increased traffic volumes	Potential temporary impacts from firework smoke, small wildfire smoke, increased traffic volumes.	Negligible impacts from increased traffic volumes
Noise	No significant noise impacts on sensitive receptors (wilderness area, state and federal listed species)	Temporary increases in noise above the normally acceptable level will be anticipated as a result of the fireworks display. Some temporary impacts (disruption, dispersion) to wildlife will likely occur. No significant noise impacts are anticipated on sensitive receptors, however (wilderness area, state and federal listed species)	No significant noise impacts on sensitive receptors (wilderness area, state and federal listed species)
Visitor Use and Experience (including Park Operations)	Minor and short-term beneficial impact on visitor use and experience; park operations would benefit from a decrease in costs and labor associated with preparing and organizing for the event	Beneficial long-term impacts on local and regional visitor use and experience; minor impact on park operation	Short-term beneficial impacts on visitor use and experience; park operations would benefit from a decrease in costs and labor associated with preparing and organizing for the event
Socio-economics	Community experiences minor impact resulting from the loss of a valued recreational	Minor benefit to the local community associated with enhanced sense of community and patriotism, and increased visibility of local region.	Effects essentially similar to those for Alternative 2, but potentially diminished by the smaller number

Table 2-2 Comparison of Potential Impacts of the Alternatives			
Key Resources	**Alternative 1 - No Action**	**Alternative 2 - Proposed Action**	**Alternative 3 – Laser Light Show**
	experience and the beneficial economic effect of direct spending by additional visitors to the memorial. Temporary inconvenience and potential damage associated with additional visitors eliminated.	Local economy benefits from direct and induced impact of spending by visitors. Potential to alter community setting or inconvenience local residents is temporary and minor.	of visitors anticipated. Minor effect associated with absence of traditional "Fireworks on the Fourth" celebration. Potential for controversy associated with fireworks display minimized.
Human Health & Safety	Very minor and temporary impact on human health and safety	Minor short-term impacts during preparation, and launching of fireworks; potential for injury from fire suppression activities in case of wildland fire	Very minor and temporary impact on human health and safety
Cultural Resources	No impact to known cultural resources	No impact to known cultural resources	No impact to known cultural resources
Transportation	Minor and short-term impact resulting from increased traffic volume	Minor and short-term impact resulting from increased traffic volume	Minor and short-term impact resulting from increased traffic volume
Wilderness	No wilderness impacts	Temporary noise disturbance to wilderness users; potential impacts from catastrophic fire	No wilderness impacts

Chapter 3 – Environmental Analysis

This chapter summarizes the existing environmental conditions and the probable environmental consequences (effects) of implementing the action and No-Action alternatives. This chapter also provides the scientific and analytical basis for comparing the alternatives. The probable environmental effects are quantified where possible; where not possible, qualitative descriptions are provided.

3.1 SOILS

3.1.1 *Affected Environment*

Soils in the memorial generally consist of a 1-2 foot layer of mixed organic matter and decomposed granite resting on bedrock. In the lower elevations, soils are deeper and of a finer texture, allowing for the growth of hardwoods and grasses. Development of visitor use facilities and social trail development from backcountry activities such as recreational rock climbing plus the steep slopes have resulted in soil erosion, compaction, and loss of vegetative cover.

3.1.2 *Environmental Consequences*

3.1.2.1 Alternative 1 – No Action

Under the No Action alternative, the July 4th celebration event at the Memorial would continue in a manner similar to celebrations prior to initiation of the fireworks program in 1998, without a marquee event such as fireworks or laser light show. The celebration would include educational and entertainment programs that would not impact soil resources at the Memorial.

3.1.2.2 Alternative 2 – Proposed Action

No impacts to soils are anticipated as a result of preparation for fireworks activities for the 4th of July celebration. Launch equipment and the fireworks will be airlifted into and out of position, and no excavation activities will be required for launch preparation. Shortly after the July 4th Holiday, memorial staff and, if possible, volunteer groups would traverse the fallout area to pick up litter from exploding firework shells. These activities are not anticipated to have any effects on soil resources.

Firework induced wildfires and activities associated with their control are the primary source of potential impacts to soils under this alternative. Since 1988, the 4th of July holiday fireworks program has resulted in 18 small wildfires. All of these wildfires were actively suppressed and, in sum, have burned less than 2 acres of the National Monument lands. One major reason for fire suppression success from these activities has been that ignition sites occurred within a limited distance of the firework launch site providing for efficient deployment of suppression equipment and personnel. For example, of the 17 fireworks related ignitions that occurred in 2000 and 2001, 16 occurred within 1000 feet of the launch site (the 17th occurred within approximately 1100 feet). Weather constraints under the "Go/No go" policy of the firework

program are designed to ensure that any potential ignitions are generally within this range of the launch area.

Ignition frequency and suppression efforts are further aided by characteristics of the site itself, as greater than 1/3rd of the area within 1000 feet of the fireworks launch site consists of granite rock outcrops with little to no organic soil and no burnable fuel for wildfire ignition. This characteristic, in combination with fire prevention measures (See Appendix A), allows for the high probability of containing the small wildfires caused by the fireworks program, and reduces the potential for wildfire related impacts to soils.

Nationally, the initial attack success rate for all wildfire suppression operations is 97 - 98% (Bahr 2002), and in the Black Hills this rate increases to 99%. Arguably, most of the fires that have escaped suppression occur during high-risk conditions such as drought. For this reason, fireworks would only be launched under low risk environmental conditions, and fire suppression equipment and personnel would be in place prior to firework launch.

Very minor and localized soil compaction would occur from wildfire suppression activities, and vehicle use would be restricted to existing roads. Fire line construction during wildfire suppression and prescribed fire would result in soil disturbance and could lead to increased erosion, especially in steeply sloped areas within the memorial. To avoid these potential impacts, fire lines would be located outside of highly erosive areas, steep slopes, and other sensitive areas. Following fire suppression activities, fire lines would be re-contoured, water barred, and possibly seeded (with native plant species).

Based on the small amount of total burned acreage that has occurred over the last 14 years, strategic placement of fire suppression equipment and personnel prior to firework launch (Appendix A), and climate and environmental restrictions outlined in the "Go/No-go" implementation of the fireworks program, it is not reasonably foreseeable that significant adverse effects to soil resources from wildfire would occur under this alternative.

Although unintentional, some minor benefits to soil resources may occur in those sites where small spot fires occur from fallout ignition. Under restricted climatic conditions, spot fires that occur from fallout would not be anticipated to result in high intensity or "hot" fires. Instead, spot fires would more likely resemble that of the low intensity burns that occur under prescribed burning operations. As a result, in these small spots, fire would release nutrients into the soil and the fertilization effects of ash would provide some nutrients for vegetation in the area. In addition to increasing nitrification of the soils and increasing minerals and salt concentrations 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, better able to retain water, and less compact while increasing needed sites and surface areas for essential microorganisms, mycorrhizae, and roots (Vogl, 1979; Wright and Bailey, 1980).

3.1.2.3 Alternative 3 – July 4th Holiday Celebrations to Include a Laser Light Show

Under Alternative 3, a laser light show would replace the fireworks display for the July 4th celebration and would not be anticipated to have any impact on soil resources at the Memorial.

3.2 WATER RESOURCES (INCLUDING WETLANDS)

3.2.1 *Affected Environment*

The Memorial contains several intermittent streams that flow after storms, heavy snowmelt, and/or high precipitation seasons, as well as a series of springs. Approximately 34 acres of wetlands occur in the southwest part of the Memorial within Starling Basin. No floodplains exist within the Memorial.

3.2.2 *Environmental Consequences*

3.2.2.1 Alternative 1 – No Action

Under the No Action alternative, the July 4th celebration event at the Memorial would continue in a manner similar to celebrations prior to initiation of the fireworks program in 1998, without a marquee event such as fireworks or laser light show. The celebration would include educational and entertainment programs that would not impact water resources at the Memorial.

3.2.2.2 Alternative 2 – Proposed Action

Under Alternative 2, activities with the potential to impact water resources include fire suppression (i.e., fire line construction and fire retardant and foam suppression) that may result from the fireworks program. However, in light of the mitigation measures employed during fire suppression activities and the location of past ignitions, there would not be any direct impacts on surface water resources on the Memorial as a result of fireworks. Stream crossings would be limited to set and existing locations; fire line construction and fire retardant and foam use would not be permitted in wetlands; and fire lines would be located outside highly erosive areas, steep slopes, and other sensitive areas. In addition, fire lines would be re-contoured, water barred, and seeded following fire suppression activities to minimize potential erosion and protect water quality.

The use of fire retardants or foams could potentially cause short and long-term impacts to water resources if misapplied or mishandled. Retardants contain ammonia and phosphate or sulfate ions, which can change the chemistry of a water body, thus making it lethal to fish and other aquatic organisms. Foams contain detergents that can interfere with the ability of fish gills to absorb oxygen. The degree of impact would depend on the volume of retardant/foam dropped into the water body, the size of the water body, and the volume of flow in the stream or river. For example, if a 800-gallon drop is made into a fast flowing river, it is likely that the lethal effects to aquatic resources will be short-lived as dilution below the toxic level is quickly achieved. On the other hand, a 3,000-gallon drop in a stagnant pond would likely cause toxic levels to persist for some time (USDA, 2001).

3.2.2.3 Alternative 3 – July 4th Holiday Celebrations to Include a Laser Light Show

Under Alternative 3, a laser light show would replace the fireworks display for the July 4th celebration and would not impact water resources at the Memorial.

3.3 VEGETATION

3.3.1 *Affected Environment*

Ponderosa pine (*Pinus ponderosa*) of varying age is the dominant vegetation type in the memorial. Starling Basin in the southwest corner of the memorial contains one of the largest stands of old growth ponderosa pine in the Black Hills. The stands in this basin are considered an example of a habitat that is rare in the Black Hills, and worth protecting. Additional intermingled trees include Black Hills spruce (*Picea glauca*), quaking aspen (*Populus tremuloides*), paper birch (*Betula papyrifera*), burr oak (*Quercus macrocarpa*), and Rocky Mountain Juniper (*Juniperus scopulorum*). Shrubs and groundcover on the memorial consist primarily of chokecherry (*Prunus virginiana*), pin cherry (*Prunus pensylvanica*), kinnikinnick (*Arctostaphylos uva-ursi*), grasses and sedges.

Many of the ponderosa pine stands in the memorial and surrounding areas contain high densities of trees. These stands are currently a fire hazard for the National Park (USDA, 2002), and a fire management program, including activities such as thinning and prescribed burning, is being implemented (USDA, 2002)

Noxious weeds in the memorial are found in several areas, especially former construction zones, and the memorial has a program in place to control their spread. Some of the more prevalent plant species include Canada thistle (*Cirsium arvense*), field bindweed (*Convolvulus arvensis*), common mullein (*Verbascum thapsus*), and hound's tongue (*Cynoglossum officinale*).

Mount Rushmore National Memorial does not contain any plant species that are protected under the Endangered Species Act.

3.3.2 *Environmental Consequences*

3.3.2.1 Alternative 1 – No Action

Under the No Action alternative, the July 4th celebration event at the Memorial would continue in a manner similar to celebrations prior to initiation of the fireworks program in 1998, without a marquee event such as fireworks or laser light show. The celebration would include educational and entertainment programs that would not be anticipated to effect vegetation at the Memorial.

3.3.2.2 Alternative 2 – Proposed Action

No impacts to vegetation are anticipated as a result of preparation for fireworks activities for the 4th of July celebration. Launch equipment and the fireworks will be airlifted into and out of position, and no vegetation clearing activities will be required for launch preparation.

Firework induced wildfires and activities associated with their control are the primary source of potential impacts to vegetation under this alternative. As described above, hazardous fuels loading in the areas surrounding Mount Rushmore are a current concern for the planning and implementation of operations during the 4th of July celebration. As with any fire adapted forest community, small low intensity fires do not adversely affect vegetation health and viability. Indeed, the effects of these small-scale, low intensity fires are most often beneficial, and can improve the growth and health of a naturally fire-adapted forest community. The exception to this would be in the event that a wildfire burns the crowns of the trees in a stand. Under these conditions, significant damage and mortality of a forest stand may occur. For this reason, the planning and implementation proposal for the 4th of July celebration has been developed to take into account the effects of 4th of July activities of the past, and implement mitigation measures and procedures that respond to and prevent the possibility of large scale crown fires.

As described in Section 3.1.1.2 (Soils, Alternative 2), the 4th of July events have lead to several small spot fires at Mount Rushmore since 1988. All of these fires have been successfully extinguished, and in total, have not burned more than 2 acres of forest. This high success rate can be attributed to: the predictable and localized nature of the ignition sites, presence of low fire risk areas within the zone that most spent fireworks fall (bedrock outcrops with little or no vegetative fuel), pre-firework placement of fire suppression equipment and personnel, and close adherence to the "Go/No-Go" criteria for fireworks show implementation. Based on these factors, the possibility of large-scale crown fires from the Fireworks display is not reasonably foreseeable.

In the event that small spot fires do occur, some limited mortality to shrubs, seedlings, and small trees is possible. Larger trees will not likely be adversely effected, and grasses and forbs will re-sprout from roots and rhizomes soon after the fire, since the majority of these species are fire adapted at the memorial.

Starling Basin in the southwest corner of the memorial is of specific concern for fire protection since it contains one of the largest stands of old growth ponderosa pine in the Black Hills. This stand is approximately 2,600 feet to the south-southwest of the fireworks launch site. At this distance, it is not anticipated that spot ignitions from fireworks fallout will occur since wind speed restrictions in the "Go/No-Go" fireworks implementation plan would be designed to keep fallout within 900 feet of the launch site. The possibility that this site may burn as a result of wildfire spreading from an ignition near the launch site is not reasonably foreseeable due to the presence of a fire lookout post (Riordan's Rock), two fire engines, and fire crew in the immediate vicinity (less than ¾ of a mile) of the basin which allows for the rapid location and suppression of any spot ignitions. In addition, the majority of the area over which ignition fallout is most likely (within 900 feet) is on the opposite side of a major highway which would used as a control line for preventing the spread of any wildfire into the south and southwestern portions of the monument. However, as described above and in Section 3.1.1.2 (Soils, Alternative 2), the potential for a spreading wildfire is not reasonably foreseeable.

Suppression activities that resulted in soil disturbance (fire lines) would make those disturbed areas more susceptible to noxious weed infestation. Disturbed areas would be seeded with native

grasses to reduce the possibility of invasive species development or further encroachment at the sites.

3.3.2.3 Alternative 3 – July 4th Holiday Celebrations to Include a Laser Light Show

Under Alternative 3, a laser light show would replace the fireworks display for the July 4th celebration and would not be anticipated to have any impact on vegetation resources at the Memorial.

3.4 WILDLIFE

3.4.1 *Affected Environment*

A variety of wildlife resources inhabit the forests and grasslands of Mount Rushmore National Memorial including ungulates, small mammals, birds, reptiles, amphibians, and invertebrates. Some common species include mountain lion (*Felis concolor*), mule deer (*Odocoileus hemionus*), elk (*Cervus elaphus*), porcupine (*Erethizon dorsatum*), white-tailed jackrabbit (*Lepus townsendii*), mountain goat (*Oreamnos americanus*) and yellow-bellied marmot (*Marmota flaviventrus*). The memorial is currently conducting an inventory of all wildlife species on the memorial. There are no known federally listed wildlife species that reside within the memorial. No critical habitat is known to exist within the memorial.

NPS Management Policies state, *"the National Park Service will inventory, monitor, and manage state and locally listed species in a manner similar to its treatment of federally listed species, to the greatest extent possible*." There are 13 species of animals that are listed by the State of South Dakota as endangered. They are peregrine falcon (*Falco peregrinus*), whooping crane, eskimo curlew (*Numenius borealis*), bald eagle (*Haliaeetus leucocephalus*), interior least tern (*Sterna antillarum*), black-footed ferret (*Mustela nigripes*), lined snake (*Tropidoclonion lineatum*), Blanding's turtle (*Emydoidea blandingii*), pallid sturgeon (*Scaphirhynchus albus*), finescale dace (*Phoxinus eos*), central mudminnow (*Umbra limi*), blacknose shiner (*Notropis heterolepis*), and banded killifish (*Fundulus diaphanus*). Of these species, the peregrine falcon is the most likely to be sighted within the memorial during migration (Ode, 2002).

At the present time, there are 15 species of animals that are listed by the State of South Dakota as threatened. They are: American dipper (*Cinclus mexicanus*), osprey (*Pandion haliaetus*), piping plover (*Charadrius melodus*), black bear (*Ursus americanus*), mountain lion (*Felis concolor*), swift fox (*Vulpes velox*), river otter (*Lutra canadensis*), false map turtle (*Graptemys pseeudogeographica*), Eastern hognose snake (*Heterodon platirhinos*), trout-perch (*Percopsis omiscomaycus*), sturgeon chub (*Machrhybopsis gelida*), sicklefin chub (*Machrhybopsis meeki*), northern redbelly dace (*Phoxinus eos*), pearl dace (*Semotilus margarita*), and longnose sucker (*Catostomus catostomus*). Of these species, only the mountain lion is known to frequent the memorial, however, a sighting of black bear was recently reported in the Black Hills region (Ode, 2002).

3.4.2 *Environmental Consequences*

3.4.2.1 Alternative 1 – No Action

Under the No Action alternative, the July 4th celebration event at the Memorial would continue in a manner similar to celebrations prior to initiation of the fireworks program in 1998, without a marquee event such as fireworks or laser light show. The celebration would include educational and entertainment programs that would have negligible impacts to wildlife at the Memorial. The noise associated with the celebration would cause a temporary disturbance to wildlife at the Memorial. Road kill incidents may increase due to increased traffic volumes associated with the celebration.

3.4.2.2 Alternative 2 – Proposed Action

Under Alternative 2, proposed activities with the potential to impact wildlife include fireworks and fire suppression. Indirectly, wildfire resulting from fireworks ignition would also have the potential to impact wildlife.

Concussion blasts from the fireworks could temporarily displace wildlife within hearing range over a 24 to 27 minute period. Other noises associated with the celebration would also disturb wildlife. Fire suppression activities could also result in the temporary displacement of wildlife.

The impacts to wildlife from both fire and smoke as a result of a wildfire would depend on fire severity. The small wildfires that have occurred in the past as a result of fireworks would have minimal affects on wildlife species in the vicinity of the Memorial. Large animals would not be expected to suffer mortality since they would avoid fires. Some small animals such as field mice may be caught by fire but mortality is not expected to be substantial. The exception would be during a catastrophic fire where large and small mammals are generally more affected by fire and could suffer individual mortality. However the risk of a catastrophic fire is minimal based on the fire suppression measures in place during the fireworks program (Appendix A), initial attack success rates, and other factors influencing fire as described under Section 3.1.2.2 Soils. The loss of individuals of a non-threatened or endangered species, would not jeopardize the viability of the populations on and adjacent to the memorial.

There would be no impacts to federally or state listed species from fireworks or fire suppression activities under this alternative.

3.4.2.3 Alternative 3 – July 4th Holiday Celebrations to Include a Laser Light Show

General wildlife impacts under Alternative 3 would be similar to those described under the No Action alternative.

3.5 AIR QUALITY

3.5.1 *Affected Environment*

Under the terms of the 1990 Clean Air Act amendments, the memorial is designated as a Class II quality area. By definition, Class II areas of the country are set aside under the Clean Air Act, but identified for somewhat less stringent protection from air pollution damage than Class I areas. The primary means by which the protection and enhancement of air quality is accomplished is through implementation of National Ambient Air Quality Standards (NAAQS). These standards address six pollutants known to harm human health including ozone, carbon monoxide, particulate matter, sulfur dioxide, lead, and nitrogen oxides (USDA, 2000a).

Historically, the memorial's air quality has been considered excellent. Several major sources of air pollution (sources that emit more than 100 tons/year of one or more regulated pollutants) are nearby the memorial. These include coal-fired power plants in Rapid City and Lead, South Dakota, and Osage, Wyoming; three cement plants in Rapid City; and a refinery and a natural gas pipeline compressor station in Newcastle, Wyoming. A number of minor sources are also located in the vicinity of the memorial, including sawmills in the areas of Pringle and Custer, South Dakota, and Newcastle, Wyoming and a feldspar mill in Custer.

Air quality and visibility monitoring have been conducted in the Black Hills for many years. There are several monitors in Rapid City, approximately 40 air miles northeast of the memorial, which measure total suspended particulates (TSP), fine particles, sulfur dioxide and nitrogen dioxide. Air quality monitoring stations for particulate matter 2.5 and 10 microns (PM2.5 and PM10) are located at Badlands National Park and Wind Cave National Park. Monitoring of particulate matter at Wind Cave National Park reveals that air quality is excellent, with PM2.5 and PM10 registering at background levels (Schultz, 2002).

3.5.2 *Environmental Consequences*

3.5.2.1 Alternative 1 – No Action

Under the No Action alternative, the July 4th celebration event at the Memorial would continue in a manner similar to celebrations prior to initiation of the fireworks program in 1998, without a marquee event such as fireworks or laser light show. The celebration would include educational and entertainment programs that would not impact air quality concerns beyond that produced by the increase in traffic to and from the Memorial. Based on current excellent air quality conditions in the memorial's airshed, and the anticipated traffic increase, it is not likely that any air quality standards would be exceeded as a result of activities under this alternative.

3.5.2.2 Alternative 2 – Proposed Action

No impacts to air quality are anticipated as a result of preparation for fireworks activities for the 4th of July celebration, or as a result of the temporary increase in traffic as a result of the program activities. Although firework displays can increase particulate matter quantity in the air, these

impacts are normally considered minor and temporary, and are generally not considered a significant contributor to this type of air pollution (USEPA, 1997).

The potential for firework induced wildfires (See Section 3.1.1.2 Alternative 2), and more specifically, the smoke generated from these wildfires would be the primary source of potential impacts to air quality under this alternative. Smoke consists of dispersed airborne solids and liquid particles, called particulates, which could remain suspended in the atmosphere for a few days to several months in the event of a fire. Particulates can reduce visibility and contribute to respiratory problems. Very small particulates can travel great distances and add to regional haze problems. Regional haze can sometimes result from larger wildfires.

As described previously, all fires associated with the 4th of July fireworks program have been successfully extinguished, and in total, have not burned more than 2 acres of forest. In the event that small spot fires at this scale occur, some temporary localized increases in particulate concentrations would likely be observed. However, it is not reasonably foreseeable that wildfires at this scale would have adverse effects on overall air quality within the monument's airshed. In the unlikely event that these fires escape suppression and become large-scale wildfires, air quality impacts such as increases in regional haze, increased particulate matter, and associated health risks would be observed.

3.5.2.3 Alternative 3 – July 4th Holiday Celebrations to Include a Laser Light Show

Under Alternative 3, a laser light show would replace the fireworks display for the July 4th celebration and would not be anticipated to have any additional impacts above and beyond that describe under the No Action alternative.

3.6 NOISE

The loudest sounds that can be detected comfortably by the human ear have intensities that are 1 trillion (1,000,000,000,000) times larger than those of sounds that can just be detected. Because of this vast range, any attempt to represent the intensity of sound using a linear scale becomes very unwieldy. As a result, a logarithmic unit known as the decibel (dB) is used to represent the intensity of a sound. Such a representation is called a sound level.

Although the dB scale accurately reflects the sound pressure level of a given sound, it does not accurately reflect the sound exposure levels heard by a human observer. The human ear is progressively reduced in sensitivity to sounds in the lower and upper ranges of our audible frequency spectrum. To more accurately assess the loudness of sounds as heard by the human ear, sound levels are measured on the A-weighted decibel (dBA) scale. This sound level scale is progressively reduced in sensitivity to very low and very high-pitched sounds. This method of sound measurement mimics our own sense of hearing, and therefore more accurately assesses the effects of different sound levels on a human observer.

Normal speech has a sound level of approximately 60 dBA. Sound levels above about 120 dBA begin to be felt inside the human ear as discomfort and eventually pain at still higher levels (DOD, 1978). Sound level examples can be found in Table 3-1.

Table 3-1 Common Noise Levels and Their Effects on the Human Ear		
Source	**Decibel Level (dBA)**	**Exposure Concern**
Soft Whisper	30	Normal safe levels.
Quiet Office	40	
Average Home	50	
Conversational Speech	60	
Busy Traffic	75	May affect hearing in some individuals depending on sensitivity, exposure length, etc.
Noisy Restaurant	80	
Average Factory	80-90	
Pneumatic Drill	100	Continued exposure to noise over 90 dBA may eventually cause hearing impairment
Automobile Horn	120	

(DOD, 1978)

To accurately assess the impacts of noise exposure on an entire community, dBA sound levels are commonly expressed with a measure that describes the cumulative effects of noise levels over time. The most commonly employed cumulative noise measure for environmental analysis is the Day-Night Sound Level (Ldn). This measure (expressed in dBA) describes the cumulative noise exposure expected from all major noise sources over a 24-hour period. Using the Ldn system, 10 dB is added to the assessment of sound produced by activities occurring between 10 PM and 7 AM. This addition places greater weight on the noise produced by nighttime activities due to the higher sensitivity of communities to noise during these hours.

Certain facilities, communities, and land uses are more sensitive to a given level of noise than others. Such "sensitive receptors" include schools, churches, hospitals, retirement homes, campgrounds, wilderness areas, hiking trails, and species of threatened or endangered wildlife. Impacts from noise production are generally assessed with respect to changes in noise levels experienced at sensitive receptors. Different types of sensitive receptors vary in their acceptance of noise disturbance. As a result, noise impacts for different receptors are often assessed using different noise level standards. Recommended land use and associated noise levels are illustrated in Table 3-2.

Table 3-2 Recommended Land Use Noise Levels				
Land Use Category	**Noise Levels (Ldn)**			
	Clearly Acceptable	**Normally Acceptable**	**Normally Unacceptable**	**Clearly Unacceptable**
Residential	< 60	60-65	65-75	> 75
Commercial, Retail	< 65	65-75	75-80	> 85
Commercial, Wholesale	< 70	70-80	80-85	> 85
Manufacturing	< 55	55-70	70-80	> 80
Agricultural, Animal Breeding	< 60	60-75	75-80	> 80
Natural Recreation Areas	< 60	60-75	65-75	> 75
Hospitals	< 60	60-65	65-75	> 75
Schools	< 60	60-65	65-75	> 75
Libraries	< 60	60-65	65-75	> 75
Churches	< 60	60-65	65-75	> 75
Nursing Homes	< 60	60-65	65-75	> 75
Playgrounds	< 55	55-65	65-75	> 75

(HUD, 1991)

3.6.1 *Affected Environment*

In general, noise levels at Mount Rushmore National Memorial are typical for a natural recreation area (50-60 dB), with normal noise production occurring as a result of visitor use and vehicle traffic along transecting highways.

While Mount Rushmore National Memorial does not contain proposed or designated wilderness, the Black Elk Wilderness Area, a sensitive receptor, lies on the western border of the memorial. The Norbeck Wildlife Preserve is also an area of special concern.

3.6.2 *Environmental Consequences*

Noise levels were quantitatively determined using the Inverse-Square Law, the law by which the mean-square sound pressure level varies inversely as the square of the distance from the source (Traux, 1999). All noise level calculations were performed assuming that obstructions that may impede the propagation of sound (buildings, vegetation, etc.) were not present, and that the land between the source of the sound and the receiver was flat. Thus the noise level calculations should be considered a "worst case" measure. Noise impacts were then assessed with respect to the location of sensitive receptors.

3.6.2.1 Alternative 1 – No Action

Under the No Action alternative, the July 4th celebration event at the Memorial would continue in a manner similar to celebrations prior to initiation of the fireworks program in 1998, without a marquee event such as fireworks or laser light show. The celebration would include educational and entertainment programs that would result in an increase in noise levels and noise produced by increased visitor use. However, these effects would be temporary, lasting only as long as the 4th of July celebration activities. Based on the types of activities normally planned, it is not anticipated that noise levels would exceed that considered normally acceptable in a natural recreation area.

3.6.2.2 Alternative 2 – Proposed Action

Potential noise sources associated with the fireworks program are related to the fireworks launch, high volume of visitors, and noise generated by the fire crews during fire suppression activities of potential spot fires.

Noise levels experienced at the memorial during the fireworks program will most certainly exceed the normally accepted levels for natural recreation areas. However, unlike nuisance noise, this noise source is anticipated as part of the 4th of July celebration itself. To ensure the protection of human health and prevent damage to visitor hearing, fireworks planners follow the National Fire Protection Agency's guidance on the construction, handling, and use of fireworks intended for outdoor fireworks displays and the general conduct and operation of the display (*NFPA Guidance 1123*). Following these guidelines, it is not likely that any adverse effects to the public would occur as a result of the fireworks program itself. Moreover, if disturbance were

to occur to some members of the public in the nearby area, this disturbance would be transient, lasting no more than the anticipated 25 to 27 minutes of the fireworks program. Noise from the fireworks may degrade the wilderness experience of people recreating in the Black Elk Wilderness Area. However, the disturbance would be temporary.

Noise generated from fireworks would temporarily disturb and/or startle wildlife within and adjacent to the memorial, and could cause the temporary displacement of these species. However, since the fireworks display would only last for a short duration, any displaced wildlife would be expected to return to the area upon completion of the program.

The potential for firework induced wildfires (See Section 3.1.1.2 Alternative 2), and more specifically, the noise generated from their suppression, may result in additional noise in and around the fireworks launch site. As described previously, these spot fires would be highly localized, and thus noise sources as a result of fire suppression would largely be confined to the immediate vicinity of the launch site (primarily within 900 feet) and along the roads approaching the launch site. Noise generated from the use of heavy equipment would temporarily disturb and/or startle wildlife within and adjacent to the area where ignition from fallout would likely occur. The Black Elk Wilderness Area and Norbeck Wildlife Preserve are outside of the range at which fire suppression operations would have a noticeable effect.

3.6.2.3 Alternative 3 – July 4th Holiday Celebrations to Include a Laser Light Show

General noise impacts under Alternative 3 would be similar to those described under the No Action Alternative.

3.7 VISITOR USE AND EXPERIENCE (INCLUDING PARK OPERATIONS)

3.7.1 *Affected Environment*

Most visitors spend short-day periods at Mount Rushmore. Visitor use is highest during the months of May through September, with July as the most popular month. The July 4th holiday fireworks show has become widely popular. This nationally televised event attracts an attendance of over 30,000 people on site and reaches millions of people throughout the nation.

The Memorial offers a variety of interpretive programs, musical performance, guided walks, afternoon children's activities, studio talks, and lighting ceremony held nightly from May to September in the park's amphitheater.

Visitor use and experience is overwhelmingly dominated by the sculpture of the busts of four U.S. Presidents: George Washington, Thomas Jefferson, Abraham Lincoln, and Theodore Roosevelt. In addition, visitors have access to a visitor's center and dining hall, as well as several other attractions such as the Sculptor's Studio. The memorial contains a viewing platform and nature trail that offer views of the sculpture and scenery of the Memorial.

3.7.2 *Environmental Consequences*

3.7.2.1 Alternative 1 – No Action

Under the No Action alternative, the July 4th celebration event at the Memorial would continue in a manner similar to celebrations prior to initiation of the fireworks program in 1998, without a marquee event such as fireworks or laser light show. Although visitors would continue to experience educational and entertainment programs, their experience would be diminished by the lack of a fireworks display or laser light show. Fireworks provide a powerful emotional experience for visitors that symbolize American patriotism and independence.

Visitor use would most likely decrease to levels similar to those experienced in 1997 or prior years before the inception of the fireworks program as discussed in Section 3.8.1.1 Socioeconomics. It is also reasonable to assume that long-term visitor use throughout the year may decrease due to the absence of free advertisement on a local, national, and international scale provided by media coverage of the fireworks program.

Park operations would benefit from a decrease in costs and labor associated with preparing and organizing for the event.

3.7.2.2 Alternative 2 – Proposed Action

Throughout its history, Mount Rushmore National Memorial has celebrated the national history and spirit of democracy during the July 4th Holiday. The addition of the fireworks program in 1998 resulted in a substantial increase in the number of visitors to the Memorial and surrounding area. The fireworks program is a patriotic event that celebrates the best of America and provides an emotional experience for all those who attend or view it through the media. The program has a beneficial effect not only on the Memorial, but also on the image of South Dakota and the Black Hills. The fireworks program attracts out of state visitors who might not otherwise consider the Black Hills area for celebrating July 4th. Visitation to the Black Hills region benefits from valuable free advertising from local, national, and international news coverage of the fireworks event.

The fireworks program requires intensive labor effort of park personnel, long-term planning, and considerable financial resources that could be invested in other, more pressing park operations. However, the fireworks program meets the Mount Rushmore National Memorial's mission to " preserve and protect [the Memorial] while providing for the education and enjoyment of the public." Park operations could also be impacted by damage to facilities including utilities. In the past, fireworks caused damage to electrical cables that hampered park operations.

In the unlikely event of a severe wildfire as a result of the fireworks, park operations could be impacted by damage or destruction of facilities followed by short or long-term park closure. However, as described in Section 3.1.2.2 Soils this scenario is not reasonably foreseeable.

3.7.2.3 Alternative 3 – July 4th Holiday Celebrations to include a Laser Light Show

Under Alternative 3, a laser light show would replace the fireworks display for the July 4th celebration. This alternative would also be used as a fallback event under Alternative 2 if the fire conditions would prevent a fireworks display. Although the laser light show, choreographed to music would approach the same entertainment value as a fireworks display, it would not provide the same traditional patriotic experience associated with fireworks on the 4th of July.

As evidenced by attendance estimates for the year 2002, when the laser show was substituted for fireworks, the program would attract substantially larger numbers of visitors to the memorial and surrounding area than if no marquee event was staged. However, the number of visitors would be slightly less than are drawn by the fireworks display.

It is expected that the laser light show would require similar labor efforts and would incur similar costs as the fireworks program for planning and implementation. However, fire prevention measures and personnel would not be necessary resulting in a savings of labor and financial resources.

3.8 SOCIOECONOMICS

The analysis of socioeconomic impacts identifies those elements of the affected social community that are susceptible to changes that may result from the proposed program or any of its alternatives. Specifically, the assessment considers how these alternatives might affect individuals, institutions, neighborhoods, and the larger social and economic systems of the potentially affected community.

The intent of the analysis is to develop a meaningful characterization of the neighborhood, or communities within, adjacent, or immediately surrounding the site of the proposed program in order to identify those aspects that are sensitive to the actions under consideration and that may be altered as a consequence of the proposed action. This characterization provides the basis for the description of the affected environment against which, any changes resulting from the proposed action may be evaluated. The magnitude and extent of any potential consequences to the social environment resulting from the project can then be described.

3.8.1 Affected Environment

The description of the affected environment for socioeconomic resources incorporates statistical and other descriptive data to provide an overview of the relevant conditions of the study area. The study area for this assessment is defined geographically by the residential settlements, smaller communities and urbanized areas located within a fifty mile radius of the site of the proposed Mount Rushmore July 4th Holiday Celebration.

For purposes of this assessment, this geographic area will be represented by entire counties that are contained, either in whole or in part, within the artificial boundary created by the 50-mile radius. Included is the South Dakota County of Pennington, where the Mount Rushmore National Memorial is located, as well as the counties of Custer, Lawrence, Meade, and Fall

River, in South Dakota and Weston County in the State of Wyoming. These six counties constitute the affected environment for the assessment of socioeconomic resources.

In order to more completely identify any effects that may be experienced in the immediate area of the proposed program site, a sub-level of analysis has been defined to include those populated areas that border the actual program site or lie along the access roads that would be used by program attendees and participants to gain access to the site. These would be the most likely areas to experience any direct physical effects associated with the program. This sublevel of analysis is represented geographically by 37 census tracts within the six county-affected environment that contain a resident population.

Demographic and Community Characteristics

The site of the proposed July 4th program is located in southwestern South Dakota, in Pennington County. This hilly region lies in the Black Hills, a heavily forested area covering approximately 2 million acres of southwestern South Dakota and northern Wyoming. The area is sparsely populated, with an approximate density of 9.9 people per square mile (South Dakota), and is essentially rural in character. More than 40 percent of its population are living outside urbanized communities (Census, 2000). Major communities in the defined study area include Rapid City, located 23 miles to northeast of the Mount Rushmore National Memorial, Keystone, bordering the northeast corner of the memorial, Hill City, Rockerville, Custer, Hermosa, and Hot Springs.

The affected environment includes portions of two States, South Dakota and Wyoming. For both states, minority populations constitute a substantially smaller percentage of total population than the 24.9 percent that is characteristic of the nation as a whole. Similarly, both states show a level of poverty is below the national level of 12.4 percent in 1999 (Census, 2000). Total Gross State Product (GSP) for South Dakota was $23,192 million in 2000. By comparison with the year 1998 this is an increase of $2,622 million. The Wyoming GSP for 2000 was $19,294 million in 2000, an increase of 2,874 million dollars since over the 1998 figure (BEA, 2002). Table 3-3 presents states selected population characteristics for South Dakota and Wyoming.

Table 3-3 Population Characteristics by State

	Population			Poverty of individuals %	GSP (Millions of $)
	Total	Rural %	Minority %		
South Dakota	754, 844	48.14	11.3	9.4	23,192
Wyoming	493,782	34.92	7.92	11.4	19,294

Source: Census, 2000; BEA, 2002

The potentially affected environment includes six counties with a combined total population of 155,992. For the regional population as a whole, an estimated 11.36 percent were living at or below poverty level. This is slightly lower than the poverty average rate for the State of South Dakota, which has an estimated 11.4 percent of its population living at or below the poverty level. Within the region, Pennington County represents the largest county by population with a total of 88,565 residents, of which 13.3 percent are represented as minority. This is slightly higher than State minority population percentage of 11.3.

In 2000, the population of the study area was living in a total of 61,048 households, with an average household size of 2.41 persons. More than half of all households in the six county affected environment are located in Pennington County. For the year 2000 Meade County had the highest median household income in the region, $39,992. Per capita income is highest in Pennington County, $18,938; followed by Custer County, $17,945 and Meade County $7,680 dollars (Census, 2000). Thee socioeconomic characteristics of the region are summarized in Tables 3-4 and 3-5.

Table 3-4 Population Characteristics by County

	Population Total	Percent Minority	Percent Poverty	Total Household	Household-Avg. Size
Custer County, SD	7,275	5.8	9.4	2,970	2.35
Fall River County, SD	7,453	9.5	13.16	3,127	2.23
Lawrence County, SD	21,802	4.2	14.8	8,881	2.33
Meade County, SD	24,253	7.3	9.4	8,805	2.66
Pennington County, SD	88,565	13.3	11.5	34,641	2.49
Weston County, WY	6,644	4.1	9.9	2,624	2.42
Total Counties	155,992	7.4	11.36	61,048	2.41

Source: Census, 2000

Table 3-5 Income Characteristics by County

	Median Household Income (dollars)	Per capita income (dollars)
Custer County, SD	39,303	17,945
Fall River County, SD	29,631	17,048
Lawrence County, SD	31,755	17,048
Meade County, SD	39,992	17,680
Pennington County, SD	37,485	18,938
Weston County, WY	32,348	17,366

Source: Census, 2000

The portion of the affected environment that would experience the most direct effect of the program is represented by an aggregate of 37 census tracts that represent the immediate site level. This area contains a total population of 155,992. The actual site of the proposed program is located within the boundaries of census tract 011003, which contains a total population 7,107 people. These residents would be expected to be the most susceptible to any changes in the physical environment resulting from the temporary increase in the number of visitors to the memorial, or from traffic, noise, congestion, or alterations of the visual landscape resulting from the proposed program.

The estimated minority population within the area immediately affected by the program is 19,500, which represents approximately 12.5 percent of the total population of the immediate site level. For census tract 011003, minority populations account for 5.43 percent of the population. In 1999, the total number of individuals living at or below the poverty level in the area bordered by the 37 census tracts was 11.57 percent; a figure slightly lower than national average of 12.4 percent. For census tract 011003, where the proposed action is taking place, poverty populations account for approximately 4.2 percent of the population (Census, 2000).

In 2000 there were total of 61,048 households with an average 2.41 persons per household. Within the boundaries of census tract 011003 there were 2,569 households with an average household size of 2.74 persons.

Economic Characteristics

The primary industries within the affected environment include retail trade, which contributes $125,286,000 to personal income in the six counties, and accommodation and food service, which contributes $21,357,000 (Census, 1997). Education, health, and social services are the leading industries in terms of total employment, accounting for approximately 13.94 percent of the employed civilian population 16 years and over in 2002. The art, entertainment, recreation, accommodation and food service sectors of the economy employed approximately 7.21 percent of the total workforce during the same period.

Aggregate income for all six counties in the affected environment for the population 15 years of age and over was $2,853,898,700 in 1999 (Census, 2000). Pennington County leads the region with an aggregate income of $1,677,226,300, approximately 14 times greater than that for Weston County in Wyoming, which has the lowest aggregate income of the six counties in the region, approximately $115,377,700.

Visitor spending for lodging, food and beverages, attractions, and miscellaneous retail items accounted for a substantial portion of gross sales in the Black Hills region of south Dakota and in the six counties that comprise the affected environment for this analysis. In 2001, visitor spending in the Black Hills Badlands & Lakes region of the State accounted for $326,512,090 or 54.3 percent of the total visitor spending in the State of South Dakota (Madden, 2002). This represents a 7.2 percent decline from the prior year's total of $351,672,278.

For the five South Dakota counties included as part of the affected environment, visitor expenditures in 2001 declined 8.8 percent, dropping from $325,645,781 in 2000 to 300,401,226 in 2001. Only Fall River County experienced an increase (2.7 percent) over this period. For Pennington County, the actual site location of the monument, visitor expenditures declined 9.1 percent from $166,883,452 in 2000 to $151,685,199 in 2001.

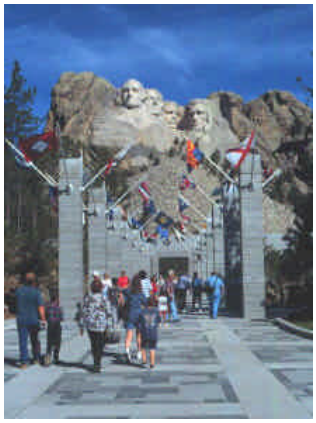
The six counties that make up the affected environment had a total workforce of 120,622 in 2000. The highest rates of unemployment, 6.0 percent, occurred in Lawrence County. This is almost twice as much as the national rate of 3.7 percent and the state rate of 3.0 percent for the same period (see Table 3-6).

Table 3-6 Employment Characteristics by County			
	Workforce size	Employed %	Unemployed %
Custer County, SD	5,929	57.5	2.0
Fall River County, SD	5,988	52.9	3.9
Lawrence County, SD	17,551	59.8	6.0
Meade County, SD	18,138	61.6	2.5
Pennington County, SD	67,712	65.5	3.1
Weston County, WY	5,304	56.6	3.3
	120,622		

Source: Census, 2000

Estimates for the year 2000 indicate that for South Dakota approximately 30,860 jobs were directly or indirectly generated by the State's travel and tourism industries. (Madden, 2002). About 75 percent of these jobs are created in employment sectors directly affected by visitor spending, such as retail trade, food and beverage service, and lodging and amusements. Estimates for 2001 employment reflect a loss of approximately 2000 jobs, a 2 percent decline.

The Mount Rushmore National Memorial



The Mount Rushmore National Monument includes an area of approximately 1,238 acres in Pennington County. The memorial is located on land owned by the Federal government and managed by the U.S. National Park Service. The site of the memorial is bordered to the northeast by the town of Keystone (population 311), in Pennington County. Other major landholdings in the area of the memorial are primarily Federal lands managed by the National Park Service, the Forest Service, and the Fish and Wildlife Service. State lands include Custer State Park. Interspersed between these Federal holdings are small pockets of private land ownership. Major concentrations of population in the nearby area include Custer -population 1,860, Rapid City - population 59, 607, Hot Springs - population 4,129, Hermosa - population 315, and Hill City - population 780 (Census, 2002). All are within the State of South Dakota.

The memorial offers a variety of interpretive programs, exhibits guided walks, afternoon children's activities, studio talks and an evening lighting ceremony, held nightly from May through September in the park's amphitheater. Throughout 1998, Mount Rushmore National Memorial celebrated the completion of improved visitor facilities at the memorial. As part of this celebration, a Fireworks program was added to the July 4th celebration. Subsequent displays were presented over the next three years, but were cancelled in 2002 due to dry weather conditions. A laser light show was substituted during that year.

In addition to providing an educational, patriotic and recreational experience for visitors, the memorial also contributes directly to the economies of the county, region and the State of South Dakota. Estimates prepared for an economic impact study of the Mount Rushmore Memorial prepared by the National Park Service (DOI, No Date) indicate that the memorial contributes as

much as $219,890,000 in direct income to the state economy through sales by local vendors of such items as lodging, food, gifts, film, gasoline, car services, etc. In addition, approximately $329,830,000 in secondary income is generated through vendor sales to the local businesses that provide products or services to visitors. Mount Rushmore visitors also contribute as much as $19,789,862 to the overall tax base and account for approximately 10,520 jobs in the state economy (DOI, No Date).

3.8.2 *Environmental Consequences*

The socioeconomic characteristics and resources of a community can be impacted through a variety of activities that may temporarily alter the structure and patterns of social life in the community or change the income, revenue, or business base of the local or the larger regional and State economies. The purpose of this section is to identify potential sources of any impact resulting from the proposed alternatives, isolate those elements of the social environment that may be affected, and describe the magnitude and extent of any potential changes

Socioeconomic effects are evaluated through the use of a comparative method (Burdge, 1995; ICGPSA, 1995). The potential for impact is based on the comparison of existing social conditions with those that are reasonably expected to occur following implementation of each alternative. That is, the likely changes that may be caused by the proposed action, or alternatives, are compared with the social setting as it currently exists, prior to the onset of any project-related activity. An impact is defined as a change (either quantitative or qualitative) in some aspect or characteristic of the socioeconomic environment. Any resulting impacts identified are then evaluated as to whether they may have a significant adverse or beneficial consequence for the local community.

The primary sources of impact associated with the proposed July 4th Holiday celebration at the Mount Rushmore National Memorial include changes in:

- Enhanced recreational experience for both outside visitors and local residents of the area;
- Temporary increases in visitor populations to the memorial and surrounding region;
- Increased spending in the local community and corresponding increases in employment, business income and tax revenue; and
- Potential for alteration of the physical character and setting of natural and community resources.

The public perception of the beneficial and adverse qualities of the proposed program with respect to lifestyle factors is addressed on the basis of public comments during the scoping process.

3.8.2.1 Alternative 1 – No Action

Under the No Action alternative, the July 4th holiday event at the Mount Rushmore National Monument would continue in a manner similar to celebrations that occurred prior to 1998, without the additional attraction of a highlight such as a fireworks or other special evening display. Visitors to the memorial during the holiday period would continue to experience

educational and other entertainment programs, as well as the regularly performed lighting ceremony. Fireworks displays would be available in communities surrounding the Memorial, specifically in the communities of Rapid City (three separate events), Custer and Lead (Popovich, 2002).

Community Impacts

In general, the overall impact to the affected communities from discontinuation of the program would be generally mixed. The program has been very popular, as evidenced by participation in past years and comments received during the public scoping period (see scoping report). However, the program has also been controversial (Daly, 2002), especially with respect to the potential fire hazard and the local residents perception that the program and its associated temporary influx of visitors to the memorial have the potential to alter or damage the memorial or its natural setting.

In the absence of the program enhancement feature represented by either a fireworks display or a laser light show, the holiday experience for both outside visitors to the memorial and for local residents would be substantially diminished. Statistics for visitation to the memorial indicate that since 1998 when the first fireworks display was presented, attendance at the event has fluctuated somewhat, but continued a general and substantial increase, from 34,462 in 1998 to 37,772 in 2001 (Popovich, 2002a). This represents an increase in visitors that is almost double the 1997 figure for the July 3rd date and an 80 percent increase over the day immediately prior to presentation of the program. (See Table 3-7 below for more detailed information on visitor attendance during the Fourth of July celebration).

Table 3-7 Visitor Statistics for the Mount Rushmore National Memorial (July 2-5)

	July 2	July 3	July 4	July 5
1997	20,303	18,824	25,078	24,362
1998	19,125	34,462	29842	33,012
1999	19,408	32,050	30,554	33,925
2000	31,129	37,992	29,437	22,920
2001	30,415	37,722	28,653	25,914
2002	30,011	31,482	27,271	30,627

Source: Popovich, 2002a

Increased visitation figures for the years in which the program has been presented indicate the popularity of the program as well as the ability of the program to influence memorial visitation on the days immediately preceding and following the July 4th celebration.

In addition to the immediate loss of a valued recreational experience, the community would also be expected to experience a minor and indirect impact from the loss of an organizing event around which various community groups participate as volunteers. Participation in the Fourth of July Celebration contributes to a sense of cohesion among the members of these groups and also, through contributions of portions of the proceeds from the event, helps to fund other group activities. As noted in the scoping comments received, the program also helps to promote

partnerships between the NPS, the Mount Rushmore Society and numerous independent tourism groups in the area. The absence of the program could be considered to have a potentially adverse impact on these relationships.

If the fireworks or laser light show were discontinued, it could reasonably be assumed that the number of visitors to the memorial would return to levels similar to those experienced in 1997 or prior years before the inception of the Fireworks program. The corresponding reduction of the impact resulting from increased traffic and visitation to the memorial would potentially be reduced. Although this effect is normally temporary and confined to the evening of the program, some traffic congestion and disruption to local resident's routine activity could be expected. Also reduced would be the potential for damage to areas along access roads to the memorial where overflow attendees normally park.

Because the program is somewhat controversial, elimination of the program would reduce local resident's concerns for the potential fire hazard or other objections to the program. The program has also been cited as a source of rift or cleavage in the community between individuals and groups that support or oppose its continuation.

However, during the five years in which the program has been presented, the local community has benefited from an enhanced visibility as the result of increased publicity and higher levels of visitation to the memorial and the surrounding area. Additionally, a number of residents have indicated the positive and beneficial "patriotic nature" of the program. If the program were now to be discontinued, it is questionable whether the current level of controversy would diminish.

Economic Impacts

Direct spending by vacation travelers or other visitors to the Mount Rushmore National Memorial not only benefits the local community through increases in the demand for goods and services in most sectors of the economy, but also has the potential to increase local employment, income and tax revenue. Although the increases in memorial attendance and associated visitor spending are temporary, the potential beneficial effects of the increase would be expected to ripple through the local economy as income, wages, and profits earned during the holiday celebration are spent and respent in the local economy. Repeated cycles of spending and respending produce a "multiplier effect" in which the potential effect of the initial tourist dollar spent is magnified through multiple, successive rounds of spending.

The discontinuation of the fireworks or other special program associated with the July 4th celebration could potentially be expected to have an impact on both the local economy, and to a lesser extent, the regional and State economy. As noted in Table 3-7 above visitation levels for the memorial almost doubled during the July 4th holiday celebration when the Fireworks show was presented.

Diminished levels of visitor spending could be expected to directly affect income and employment in the food and beverage service, lodging and accommodation and other recreation based sectors of the economy, as well as in certain retail trade outlets. Also lost would be the potential increase in revenues acquired from sales and other taxes. To the extent that local

tourism and associated business enterprises benefit from enhanced awareness and image of the region through advertising associated with the event, these benefits would also be lost if the fireworks or other special program were discontinued.

The potential for lost income and revenue could be partially compensated by decreases in costs associated with presentation of the program; although to some these expenses may be funded from federal rather than local sources. Discontinuation of the program would also be expected to have some relatively minor economic benefit associated with the reduction in risk to economic or other resources that may result from a catastrophic fire.

3.8.2.2 Alternative 2 – Proposed Action

Since 1998, the presentation of a fireworks program, or other light show, as a part of the Mount Rushmore July 4th holiday celebration has resulted in a substantial increase in the number of visitors to the memorial, and subsequently to other locations in the Black Hills region of South Dakota. In addition to media reports and letters of support from public officials, a number of public comments received during the scoping period cited both the value of the program as an emotional, patriotic event for visitors and local residents, as well as its beneficial role in enhancing the region's image, economy, and local tourism. Because the proposed action would continue the current fireworks program these perceived benefits to the local community would be expected to continue. However, continuation of the program has the potential to increase the level of controversy in the community between proponents of the event and its detractors. Some potential for a growing rift or cleavage within the community has been cited, particularly with respect to the potential for conflict between program participating agencies such as the NPS, the Mount Rushmore Society and local civic and other groups.

Community Impacts

The Mount Rushmore National Monument has historically celebrated the July 4th holiday with a special program intended to provide an enjoyable, inspirational and educational experience for memorial visitors during the holiday period. Since 1998, this program has been enhanced with the addition of an evening fireworks display. The popularity of the display, initially a one-time event to celebrate the opening of new visitor facilities, has led to the continuation of the program in subsequent years.

The program has provided substantial benefit to the local community, despite its relatively short life span. Both visitors and participants cite the program as a beneficial contribution to the local community and as an emotional experience that enhances the sense of community and patriotism experienced by program attendees. In this sense, the program represents a unifying event for the local community.

In general, the program has had a beneficial effect on the local community. Along with providing a meaningful experience for local residents, the program serves to attract visitors to the area who might not otherwise consider the Black Hills region. The program is perceived to have a beneficial effect through the enhancement of the overall image and attractiveness of the region.

Although other fireworks displays are presented in the region on July 4th, attendance at the Memorial display on July 3rd would not be expected to influence participation at these events.

Participation in the program also has had a beneficial and longer-term effect in building a sense of community and participation for local residents and volunteer community groups, as well. These groups organize throughout the year to provide support and services to the program. Several also use the July 4th celebration as a venue for group activities, such as annual picnics or other functions. As a result, the program contributes to a general sense of cohesion among community groups. Participating community groups also receive financial support by volunteering to run food booths at the event, and receive donations of up to 20 percent of the gross receipts in return. The memorial's contract vendor also donates an additional $10,000 to $20,000 to the memorial society each year (Jobman, 2002).

Because the fireworks program is essentially a one-day event, most of the direct physical effects experienced by populations living near the site or along access roads are temporary and relatively minor. On the day of the program an estimated 15,000 vehicles will travel access roads to the memorial site. Although visitor arrivals at the memorial will be distributed throughout the day, departures will be concentrated in the hours immediately following the conclusion of the program. Some degree of traffic congestion and disruption of the normal activity of local residents using these roads may be anticipated. The populations most directly affected would be those located in the immediate vicinity of the site of the fireworks display and along nearby access roads.

Based on the resident population of the Census tract 011003, the tract which actually contains the site of the fireworks, an estimated 7.107 individuals living in 2,569 households would be susceptible to at least some temporary disruption as a the result of traffic and increased visitor populations (see Section 3.11). It should be noted, however that only a small portion of this population actually live in the immediate vicinity of the fireworks site or along the access roads. The potential for impact would be substantially reduced for other residents of this area.

Public safety and volunteer personnel are employed to assist with the movement of traffic and vehicle parking at the site, thereby minimizing any potential traffic disruptions. Parking for approximately 11,000 vehicles is available at the memorial grounds. An additional 4,000 vehicles will be expected to park along access roads near the memorial entrance just prior on the evening for the event.

Although a potential for a minor adverse impact may be anticipated along the access routes to the memorial, traffic is normally cleared from the site within a few hours following the fireworks event and flows return to normal. Some minor damage may occur to roadside areas where overflow parking has occurred. Otherwise, any potential for adverse impacts to the local community setting and character associated with increase visitor populations and associated traffic would be considered minor and temporary.

The potential for controversy and therefore potential conflict and cleavage associated with the program is primarily concerned with the risk of damage to the natural setting and environment of the memorial from an escaped or catastrophic fire. Based on the current fire management plan,

the risk of an escaped fire causing sufficient damage to alter the user experience is less than 1 percent (see Section 3.1.2.2 Soils). The potential for adverse impacts from a catastrophic fire are minimal and substantially less than one percent. However, some continuing effect on the local community as a result of differences over the value and safety of the program may be anticipated. Such conflicts are not expected to have more than a minor effect on the overall life of the community and would not be expected to significantly alter the patterns of community life in the region.

Economic Effects

Presentation of the fireworks display as a part of the July 4th celebration at the Mount Rushmore has had a generally beneficial impact on the local and regional economies of the Black Hills region and has indirectly contributed revenue to both local and State government budgets. Average July 3rd visitor attendance at the memorial for the four year period (1998-2001) during which the display has been presented indicate an increase of approximately 95 percent, or approximately 17,300 additional visitors each year. Attendance figures have been rising steadily for each year in which the program has been presented. Visitor attendance on the days immediately preceding and following the July 3 fireworks display also show higher attendance at the memorial for the 1998 to 2001 period (see Table 3-5).

For 2001 the last year the fireworks were presented, attendance estimates reached 37,722 (Popovich, 2002a) or approximately 19,524 individuals more than attended in 1997, the year immediately prior to the first fireworks display. Assuming that 97 percent of the additional visitors to the memorial are non-local (DOI, No Date) and based on an estimated average daily spending per party of $220.72 and an average visitor party size of 4.2 (Madden, 2002a), additional visitor attendance at the memorial on July 3rd made a direct contribution to the local economy of $996,153. Successive rounds of spending based on a multiplier of 2.5 (Madden, 2002) indicate a total direct, indirect and induced stimulus to the local economy of $2,490,038.

Direct expenditures by visitors to the memorial include on-site concessions, as well as off-site food and beverage, lodging and accommodation, and retail spending during the course of an average stay. Statistics provided by Xanterra Parks and Resorts, the memorial's concession operator (Jobman, 2002), show sales figures for concessions at the memorial have steadily increased over the 1997 base for each year in which the fireworks display was presented (see Table 3-8 below). Only the 2001 celebration showed a decline from the previous year and this figure was still more than double the 1997 sales total for the same day. On average, total sales for the memorial concessions increased $ 62,793, or approximately 96 percent per year for the four-year period during which the fireworks were presented. Sales for the following day also show substantial increases over the base year of 1997, the last year before the fireworks presentation was added to the celebration.

Table 3-8 Xanterra Parks and Resorts July 3rd and 4th Sales

	1997	1998	1999	2000	2001	2002
July 3	$65,417	$96,436	$111,734	$159,235	$145,433	$134,430
July 4	$79,030	$82,495	$108,816	$118,103	$109,373	$109,437

Source: Jobman, 2002

In addition to direct sales at the memorial itself, the economies of the surrounding region also benefit from spending by visitors to the July 4th memorial celebration. Lodging occupancy surveys indicate that for the years 1999 and 2000, hotels and motels in the region showed full occupancy (3492 rooms) on July 3rd (RCHA, No Date). Occupancy status for the days immediately preceding or following the 3rd also show substantially higher occupancy rates.

The region also benefits indirectly from the attention and free advertising provided by the fireworks display. In 1999, the State Department of tourism established the first nationwide satellite feed of the fireworks event. Subsequent tracking of the number of outlets across the country accepting the program and the number of media outlets served showed that in 2000, 115 outlets in 23 markets took the program. For 2001, a total of 180 outlets with an estimated audience of 10.2 million was estimated. The estimated value of the associated free advertising for the local region was $47,790 (Gerpen, 2002).

Expenditures by visitors, especially those traveling from outside the region also contribute to the State revenue base. Most spending by visitors would be subject to state sales taxes; exceptions would be spending for state licenses, user fees and gasoline purchases (Madden, 2002). Using the estimated total direct spending by the additional visitors attracted to the memorial on July 3rd as a high end estimate, visitor spending associated with the fireworks display could potentially generate as much as $39,846 in sales tax revenue, based on the 4 percent rate for the Sate of South Dakota. However, this figure does not consider the portion of the total direct expenditures that would go to non-taxed sectors noted above. The final estimate of the beneficial impact to State revenues from sales taxes would actually be somewhat less than this high-end estimate.

By comparison with the income generated in the local economy by the fireworks presentation, the total costs to stage the event each year have also increased, from $60,129 in 1999 to $84,427 in 2001 (BHAG, 1999; BHAG, 2000;BHAG 2001). These costs included personal services, travel and the purchase of supplies and other services such as a helicopter and safety equipment, shuttle buses, public safety and sanitation necessary to stage the event.

During the course of the four years in which the fireworks event was presented (1998 thru 2001), eighteen wildfires have been started on the Memorial grounds as a result of the fireworks program. Each of the fires was quickly suppressed and the total acreage burned by all eighteen fires was less than two acres. One example is presented by the 2000 “I” campfire, which resulted in a total expense of $21,064 (BHAG, 2000). The costs of fire personnel to suppress these fires represent a minor, but potentially adverse expense associated with the fireworks event. With an average of 4.5 fires per year for each of the four years of the fireworks event, these costs must be considered on balance when evaluation the overall beneficial impact to the local economy associated with the July 4th fireworks event.

3.8.2.3 Alternative 3 – Laser Light Show

Under Alternative 3, a laser light show would replace the fireworks display as a part of the annual Mount Rushmore Memorial July 4th holiday celebration. This option would also be considered as a fall back event under Alternative 2 in any year (such as was the case in

2002) that fire conditions in the Black Hills region would prevent a fireworks display. The entertainment value of the laser light show, choreographed to music, has the potential to approach the drama normally associated with a fireworks display. However, it lacks the traditional values normally associated with 'Fireworks on the Fourth' celebrations. Other fireworks displays normally staged in the region on July 4th, the day after the memorial event would potentially substitute for this missing element, however.

Community Impacts

The potential benefits to the local community associated with this alternative would be similar to those identified for the staging of a fireworks event. Both local and non-local visitors to the memorial would benefit from the presentation of an inspirational and educational program. Preparation and organization of the event would also continue to serve as a unifying and organizing event for local residents. As evidenced by attendance estimates for the year 2002, when the laser show was substituted for fireworks, the program would attract substantially larger numbers of visitors to the memorial and surrounding area. Although based on 2002 statistics, a slightly smaller number than are drawn by the fireworks display, 2002 attendance figures remained almost 73 percent higher than for 1997 base year when no 'Marquee' event was staged.

The direct physical effects of the presentation of the program would also be similar to that indicated under Alternative 2. Based on 2002 statistics, however, the total number of visitors and the total vehicles involved would be reduced by approximately 17 percent or about 6000 attendees. The potential changes in the overall effect are considered to be minor and would in all likelihood not be perceptible to most residents of the immediately surrounding area. As with Alternative 2, any associated physical impacts would be temporary in nature and therefore would not become significant for consideration in this analysis.

However, this estimate is based on only a single year. As noted earlier, attendance at the memorial during the July 4th holiday has been steadily increasing over the base year 1997, the year immediately preceding the first fireworks display. Although attendance levels for 2002 were slightly lower that for the proceeding year, in which a fireworks display was staged, this does not necessarily indicate that the trend toward higher visitation levels of the past four years has been reversed. As the laser light show becomes established as a traditional part of the Mount Rushmore holiday celebration and visitors come to expect the performance, attendance at the event could be expected to continue at levels substantially higher than those experienced in 1997 and prior years.

With the elimination of the fireworks display, the potential fire hazard and correspondingly the local controversies surrounding the fireworks display could be eliminated. Although this controversy is not considered to have the potential for more than a minor impact on the local community, its elimination could be considered as a beneficial effect of the introduction of the laser light show. The potential for rifts between local organizations and individuals and the creation of serious cleavages within the community is essentially eliminated.

Economic Effects

Because Alternative 3 would essentially contain the same elements as Alternative 2, with the single exception that a laser light show is substituted for the fireworks display as the 'Marquee' event for the holiday celebration, economic effects associated with implementation of alternative 3 would be essentially similar to those identified for alternative 2. On the basis of attendance estimated for the 2002 celebration, some reduction in visitor attendance and therefore in visitor spending levels could be anticipated. The overall impact of this change is expected to be relatively minor.

As noted above, visitor attendance for 2002 was approximately 17 percent lower than for 2001. In addition to the substitution of the laser light show for the fireworks display in this year, several other factors may have contributed to a reduced attendance in 2002. Among these is a general reduction in travel by American tourists following the September 11, 2001 attack on the World Trade Center. Conversely, a number of attendees in 2002 may have originally planned their trip to South Dakota and the Mount Rushmore memorial anticipating a fireworks display and simply did not alter those plans when the laser light display was substituted. These individuals may in future years plan other activities in the event that the laser light show becomes a permanent part of the Mount Rushmore celebration.

As a result, it is difficult to calculate, based on figures from the single year, 2002, what the potential change in attendance and subsequent visitor spending would be if the laser light show were continued. However, using 2002 as the only base year available for comparison, visitor spending attributable to the event could be reduced by as much as 17 percent or approximately $170,000. Other contributions to the local economy would be similarly reduced. No estimates of the cost of a laser light show as compared with fireworks display were available for this analysis. However, it can be assumed that costs associated with fire safety and suppression would be substantially reduced under this alternative.

3.9 HUMAN HEALTH AND SAFETY

3.9.1 *Affected Environment*

Mount Rushmore National Memorial is dedicated to ensuring the safety of all visitors, residents and employees within the Memorial. There is an added responsibility to protect property and people adjacent to the Memorial boundary. Assuring this safety takes priority over all other activities occurring within the Memorial.

Limited access to and through the Memorial coupled with the heavy visitation (25,000-30,000 visitors daily in the summer) creates a potential safety problem in the event of an emergency. All the necessary means will be used to evacuate and warn visitors and employees when public safety is at risk. Adjacent landowners will also be warned and if necessary provided assistance to evacuate the area.

3.9.2 *Environmental Consequences*

3.9.2.1 Alternative 1 – No Action

Under the No Action alternative, the July 4th celebration event at the Memorial would continue in a manner similar to celebrations prior to initiation of the fireworks program in 1998, without a marquee event such as fireworks or laser light show. Exclusion of the fireworks program would eliminate the possibility of a potential wildfire ignition as a result of the fireworks decreasing potential public safety problems. The number of visitors would likely return to years prior to the fireworks or laser light show programs alleviating traffic congestion and concentrations of people at the Memorial. These factors would decrease potential safety problems in the event of an emergency.

Potential impacts to human health and safety would most likely be associated with traffic accidents and possible incidents along the access road to the Memorial where visitors park.

3.9.2.2 Alternative 2 – Proposed Action

The potential impacts to human health and safety under the proposed action are associated with the preparation, setting, and launching of fireworks and potential wildfire. During the fireworks program, memorial staff and visitors would not be allowed within 1,000 feet of the launch site as a majority of the fallout from the display would land within this buffer. Eighteen wildfires have started on the Memorial as a result of the fireworks program, however all of the fires were quickly suppressed and, in total, burned no more than 2 acres. Wildfires pose a risk to human health and safety particularly in extreme cases where wildfire escapes suppression and causes a catastrophic fire. In order to reduce potential risk from catastrophic wildfire, the Memorial recently approved its revised and updated Fire Management Plan (December 2002). This plan calls for suppression of all naturally ignited and man-made wildfires, and allows for proactive efforts to help reduce the fire risk to the Memorial and surrounding communities.
As discussed in Appendix A, fire protection measures would be in place during the fireworks program. Months prior to July 4th, Memorial staff would prepare management plans for traffic, visitor services, security, fire protection in case of fire danger, and visitor and employee safety as part of the Memorial's "Incident Plan" prepared for the fireworks program. On the scheduled day of the July 4th celebration, the Memorial superintendent will make the decision whether or not to proceed with the fireworks program. The decision will depend on whether fireworks launch criteria (Go – No/Go criteria) are met and that all variable fire-related criteria are acceptable for the event. In addition to the above criteria, the Memorial would also consider fire management criteria such as, fire prescription parameters and fire behavior.

Factors most likely to adversely impact firefighter health and safety include activities associated with wildland fire suppression efforts (accidental spills, injuries from the use of fire-fighting equipment, smoke inhalation, and, in severe cases, injuries from wildland fires). Impacts to the public could include smoke inhalation, in severe cases injuries from wildland fires, and drain of law enforcement and firefighters personnel from adjacent communities.

Accidental spills of fire retardants and foams are the most likely to adversely impact human health and safety. Fire retardants used in controlling or extinguishing fires contain about 85% water, 10% fertilizer, and 5% minor ingredients such as corrosion inhibitors and bactericides. Fire suppressant foams are more than 99% water. The remaining 1% contains surfactants, foaming agents, corrosion inhibitors, and dispersants. These qualified and approved wildland fire chemicals have been tested and meet specific requirements with regard to mammalian toxicity as determined by acute oral and dermal toxicity testing as well as skin and eye irritation tests (USDA, 2001). However, they are strong detergents, and can be extremely drying to skin. All currently approved foam concentrates are irritating to the eyes as well. Application of a topical cream or lotion can alleviate the effects of a retardant, and protective goggles can prevent any injury to the eyes when using foams.

Fuel break construction can pose safety risks to firefighters. Injuries can occur from the use of equipment as well as from traveling overland to targeted areas for firefighting efforts during suppression efforts. Potential for injuries is even higher because of the fact that the suppression activities would take place at night in extremely steep and rocky terrain. Two injuries to firefighters were reported during the fireworks program as a result of fire suppression. While each of the crew is trained in the use of firefighting equipment, accidental injuries may occur from time to time. Strict adherence to guidelines concerning firefighter accreditation, and equipment and procedure safety guidelines would minimize accidents.

Smoke inhalation can also pose a threat to human health and safety. Smoke from wildland fires is composed of hundreds of chemicals in gaseous, liquid, and solid forms. The chief inhalation hazard appears to be carbon monoxide (CO), aldehydes, respirable particulate matter with a median diameter of 2.5 micrometers (PM2.5), and total suspended particulate (TSP). Adverse health effects of smoke exposure begin with acute, instantaneous eye and respiratory irritation and shortness of breath, but can develop into headaches, dizziness, and nausea lasting up to several hours. Based on a recent study of firefighter smoke exposure, most smoke exposures were not considered hazardous, but a small percentage routinely exceeded recommended exposure limits for carbon monoxide and respiratory irritants (USDA, 2000b).

Statistics for visitation to the memorial indicate that on July 3rd more than 30,000 visitors will be present to watch the fireworks. Because of the high concentration of general public, very limited access, and congested traffic condition there is an increase potential impact to human health and safety. In order to safely manage traffic and protect human health and safety during the event, the Memorial would work cooperatively with local, state, and other federal law enforcement and fire management personnel, and would temporarily supplement its own staff with National Park Service personnel from nearby park units. Management plans for traffic, visitor services, security, fire protection, and visitor and employee safety will be addressed in the "Incident Plan" prepared by the Memorial for the fireworks program.

There is a finite number of fire management and law enforcement personnel in the Black Hills region. Since most, if not all of these personnel are required at the Mount Rushmore fireworks program, other parts of the region are temporarily at greater risk should an emergency occur that requires the attention of these same personnel.

There is a very small potential of catastrophic fire as described in Section 3.1.2.2 Soils. In case of catastrophic fire, nearby towns, such as Keystone and private property are in jeopardy. However, firefighting crews are on-site during the fireworks program and initiate suppression actions as soon as fire ignitions are detected.

3.9.2.3 Alternative 3 – *July 4th Holiday Celebrations to Include a Laser Light Show*

The general impacts to human health and safety under Alternative 3 would be similar to those described under the No Action alternative. Potential impacts will depend on the number of visitors attending the laser light show, which is expected to be 73 percent higher than under No Action alternative (for detail analysis on visitation statistics refer to Section 3.8.2 Socioeconomics). The higher number of visitors would result in higher risk associated with traffic congestion and incidents along the access road.

3.10 CULTURAL RESOURCES

Section 106 of the National Historic Preservation Act (NHPA) requires federal agencies to consider the effects of their proposals on historic properties, and to provide state historic preservation officers, tribal historic preservation officers, and, as necessary, the Advisory Council on Historic Preservation a reasonable opportunity to review and comment on these actions.

3.10.1 *Affected Environment*

Mount Rushmore National Memorial is listed on the National Register of Historic Places. In 1966 it was registered on the basis of the carving of the faces; recognizing that the carving itself was an event of historical significance. The Memorial has engineering, historical and architectural importance. The remainder of the land within Rushmore's boundaries is used for scenic protection and administrative facilities.

Numerous designations for additional historic protection of individual sights within the memorial have been made. These include the establishment of the historic sub-zone for the Visitor Services Area for management purposes, and creation of a historic district for an area including the sculpture, the uncompleted Hall of Records, the Sculptors Studio, the residence, the Borglum View Terrace, and other affiliated facilities from the time of the creation of the sculpture, including the lift platform, the compressor, the water reservoir, a stairway, and remnants of railroad tracks, winches and pulleys. There are no known archeological sites in the memorial.

Protection measures for sites are keyed to determinations of each site's eligibility for inclusion in the National Register of Historic Places. In accordance with section 110 of NHP, NPS is conducting a thorough inventory of historic properties in the Memorial. Several structures are currently listed as classified structures. These include: the Historic Residence, the Sculptor's Studio, the Hall of Records, the Water Reservoir, the Historic Compressor,

Cultural Landscape
A geographic area (including both cultural and natural resources and the wildlife or domestic animals therein), associated with a historic event, activity, or person or exhibiting other cultural or aesthetic values.
Source: NPS, 2002

the Shrine of Democracy Sculpture, the Historic Stairway, and the Lift Platform. Several other features have been deemed ineligible for listing, but are managed as a resource by the Memorial. These include: the Borglum Memorial View Terrace, the Doane Mountain Commemorative Plaque, the Historic Culverts, and the Historic Retaining Walls.

An important feature of the Memorial is the sculpture's historic natural setting. While there has not been any individual cultural landscapes officially identified outside of the sculpture itself, it is reasonable to state that the natural characteristics of the landscape is integral to the historical context of the Memorial.

Officially listed cultural resource sites and sites determined eligible or with an undetermined eligibility are of concern. Ineligible sites are dropped from management concerns unless otherwise noted, and determinations of effect on these properties are not addressed in this analysis.

3.10.2 *Environmental Consequences*

Cultural resource impacts were qualitatively assessed through a presence/absence determination of significant cultural resources and mitigation measures to be employed.

3.10.2.1 Alternative 1 – No Action

Under the No Action alternative, the July 4th celebration event at the Memorial would continue in a manner similar to celebrations prior to initiation of the fireworks program in 1998, without a marquee event such as fireworks or laser light show. The celebration would include educational and entertainment programs that would have no impacts to cultural resources at the Memorial.

3.10.2.2 Alternative 2 – Proposed Action

Under Alternative 2, proposed activities with the potential to impact cultural resources include fireworks and fire suppression. Indirectly, wildfire resulting from fireworks ignition would also have the potential to impact known cultural resources.

The fireworks staging area and launch site would be located behind the sculptures in the Hall of Records valley. There would not be any excavation in the valley in association with this activity. Shortly after the event, litter from the used fireworks shells would be picked up from the debris zone resulting in a minimal and temporary impact on the cultural landscape.

The impacts to cultural resources and the cultural landscape from both fire and smoke as a result of a wildfire would depend on fire severity. Fire engines strategically located near structures, including the Sculptor's Studio minimize fire risk. If a wildfire were to occur, Minimum Impact Suppression Tactics (MIST) guidelines would be followed. Under these guidelines, cultural resources are avoided during fire line construction when possible. If fire line construction is necessary in the proximity of cultural/historic locations, a minimal amount of ground disturbance is directed. MIST guidelines are discussed in detail in Section 2.4 Mitigation Measures. The risk of a catastrophic fire is minimal based on the fire suppression measures in place during the

fireworks program (Appendix A), initial attack success rates, and other factors influencing fire as described under Section 3.1.2.2 Soils.

The sculpture itself has shown no indications of instabilities over the last 33 months (RESPEC July 2002). NPS has monitored the sculpture for any movement as part of its maintenance procedures. Data will continue to be gathered and analyzed in order to measure and predict firework impacts over time.

3.10.2.3 Alternative 3 – July 4th Holiday Celebrations to Include a Laser Light Show

Similar to the No Action Alternative, no impacts to cultural resources are anticipated as a result of Alternative 3.

Conclusion

The implementation of any of the alternatives would not impair cultural resources or values that are (1) necessary to fulfill specific purposes identified in the enabling legislation of the memorial, (2) key to the natural or cultural integrity of the memorial or opportunities for enjoyment of the memorial, and (3) identified as a goal in the memorial's general management plan or other Park Service planning documents.

3.11 TRANSPORTATION

3.11.1 *Affected Environment*

Mount Rushmore National Memorial is located 25 miles southwest of Rapid City and 3 miles from Keystone. The primary access to the Memorial is from Keystone via US Highway 16A and South Dakota Highway 244 and from Highway 385 connecting to South Dakota Highway 244. Parking for approximately 11,000 is available at the Memorial grounds. Highway 244 is the only road leading directly to the Memorial. During the July 4th celebration, vehicles will be allowed to park along Highway 244, leaving only one lane open for one-way traffic.

3.11.2 *Environmental Consequences*

3.11.2.1 Alternative 1 – No Action

General transportation impacts under Alternative 1 would be similar to those described under Alternative 2. Impacts would be reduced by a decrease in the number of visitors expected to attend and total vehicles involved.

3.11.2.2 Alternative 2 – Proposed Action

On the day of the fireworks program, an estimated 15,000 vehicles will travel access roads to the Memorial site. Four thousand vehicles will be expected to park along the access road near the Memorial entrance just prior to the evening for the event. Although visitor arrivals at the Memorial will be distributed throughout the day, departures will be concentrated in the hours

immediately following the conclusion of the program. Some degree of traffic congestion and disruption of the normal activity of local residents using these roads may be expected.

Public safety and volunteer personnel are employed to assist with the movement of traffic and vehicle parking at the site, thereby minimizing any potential traffic disruptions. Traffic is normally cleared from the site within a few hours following the fireworks event and flows return to normal. Because the fireworks program is a one-day event, most of the traffic impacts are temporary and relatively minor.

3.11.2.3 Alternative 3 – July 4th Holiday Celebrations to include a Laser Light Show

General transportation impacts under Alternative 3 would be similar to those described under Alternative 2. Impacts would be reduced by a decrease in the number of visitors expected to attend and total vehicles involved.

3.12 WILDERNESS

3.12.1 *Affected Environment*

While Mount Rushmore National Memorial does not contain proposed or designated wilderness, the Black Elk Wilderness Area, lies on the western border of the memorial.

The Wilderness Act of 1964 established a National Wilderness Preservation System to be composed of federally owned areas designated by Congress as "wilderness areas". By law, these wilderness areas “shall be administered for the use and enjoyment of the American people in such manner as will leave them unimpaired for future use and enjoyment as wilderness, and so as to provide for the protection of these areas, the preservation of their wilderness character, and for the gathering and dissemination of information regarding their use and enjoyment as wilderness” (16 USC 1131).

The Wilderness Act defined and described a wilderness area as area:

- where the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain
- of undeveloped federal land retaining its primeval character and influence, without permanent improvements or human habitation
- which generally appears to have been affected primarily by the forces of nature, with the imprint of man’s work substantially unnoticeable
- which is protected and managed so as to preserve its natural conditions
- which has outstanding opportunities for solitude or a primitive and unconfined type of recreation
- which has at least five thousand acres of land or is of sufficient size to make practicable its preservation and use in an unimpaired condition
- which may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value.

These attributes serve both as standards for studying areas and evaluating their suitability for inclusion in the national wilderness preservation system and as objectives to guide National Park Service actions pertaining to the preservation and use of wilderness areas (DOI, 1999; DOI, 2001b).

3.12.2 *Environmental Consequences*

3.12.2.1 Alternative 1 – No Action

No impacts to wilderness are anticipated as a result of the No Action alternative.

3.12.2.2 Alternative 2 – Proposed Action

Temporary impacts to the wilderness are anticipated as a result of the Proposed Action. Noise from the concussion blasts of the fireworks may degrade the wilderness experience of people recreating in the Black Elk Wilderness Area. However, the noise would be temporary lasting 24 to 27 minutes during one day of the year.

The Black Elk Wilderness Area is potentially at risk from catastrophic fire as a result of accidental fire ignitions resulting from the fireworks program. A catastrophic fire that spread to the wilderness area would cause significant tree mortality impairing the wilderness over the short and long-term. However the risk of a catastrophic fire is minimal based on the fire suppression measures in place during the fireworks program (Appendix A), initial attack success rates, and other factors influencing fire as described under Section 3.1.2.2 Soils.

3.12.2.3 Alternative 3 – July 4th Holiday Celebrations to include a Laser Light Show

No impacts to wilderness are anticipated as a result of Alternative 3.

3.13 CUMULATIVE EFFECTS

The cumulative effects analysis for the July 4th Holiday Fireworks Program environmental assessment considers the past, present, and reasonably foreseeable future actions on land uses that could add to (intensify) or offset (compensate for) the effects on the resources and that may be affected by the alternatives. Cumulative effects vary by resource and the geographic areas considered here are generally the memorial and areas adjacent to the memorial. In some instances, activities may result in both negative and positive impacts when considering the short and long-terms. As a result, some resource categories in Table 3-9 show both positive and negative impacts resulting from a particular activity. The information provided in Table 3-9 is the basis for the cumulative effects described in Table 3-10.

Table 3-9 Positive and negative impacts resulting from activities at Mount Rushmore National Memorial												
	Soils	**Water Resources**	**Vegetation**	**Wildlife**	**Air Quality**	**Noise**	**Visitor Use & Experience**	**Human Health & Safety**	**Socio-economics**	**Cultural Resources**	**Transportation**	**Wilderness**
Past July 4th Fireworks Programs	+ -	-	-	-	-	-	+	-	+	-	-	-
Past prescribed fires and thinning on the memorial	+ -	-	+ -	+ -	-	-	+ -	+ -		+ -	+ -	+ -
Future fire management operations (prescribed fires and thinning on the memorial)	+ -	-	+ -	+ -	-	-	+ -	+ -		+ -	+ -	+ -
Lightning & human-caused wildfires	+ -	-	+ -	+ -	-		+ -	+ -		-	+	+ -
Wildfire suppression past, present, future	-		-	+ -	+	-	+ -	+		+	+ -	+ -
Effluent Irrigation implementation	+ -	+	+ -	+ -		-	+ -	+ -		-	-	+ -
Visitation on the memorial	-	-	-	-	-	-	+	+ -	+	+ -	+ -	-
Improvements to memorial visitor center complex	-	-	-	-	-	-	+	+	+	-	+	-
Development outside the memorial boundary	-	-	-	-	-	-	+ -	+ -	+	-	+ -	-
Designation of Black Elk Wilderness and Norbeck Wildlife Preserve	+	+	+	+	+	+	+			+		+

DIRECT/INDIRECT EFFECTS KEY: (+) Positive/beneficial; (-) Negative/detrimental; (Blank) Neutral/no effect

Table 3-10 Cumulative Effects by Resource Area				
Resource	**Past and Present Actions**	**Proposed Actions**	**Future Actions**	**Cumulative Effects**
Soils	Adverse soil impacts (soil erosion or loss) from past roads, memorial buildings and improvements, wildland fires and suppression efforts, and prescribed burns; Beneficial soil impacts from past fires (nutrification of soils).	Fireworks (fireworks induced wildland fires) could have temporary and minor adverse effects on soils (soil erosion and compaction) in a limited area, but also potential localized beneficial effects (soil development and soil nutrification)	Increased development in areas adjacent to the memorial will impact soils; Wildland fires and suppression could adversely impact soils (compaction, erosion from firebreaks, etc.)	Soils inside of the memorial would improve over time with soil development and nutrification from prescribed fires; The fireworks program would not result in significant cumulative impacts; the Proposed Action Alternatives would contribute the most to soil cumulative impacts, while the No Action Alternative and Alternative 3 would contribute the least
Water Resources	Minimal impacts to water resources from past wildfires and suppression efforts; designation of wilderness and preserve helps protect water resources from development (timber, roads, mineral extraction, etc.)	Fireworks program would have no direct impacts on water resources	Increased development in areas adjacent to the memorial would likely indirectly impact water resources, depending on its location; designation of wilderness and preserve helps protect water resources from development (timber, roads, mineral extraction, etc.)	Minor effect on water resources; Fireworks program would not result in cumulative impacts; all alternatives would result in similar water resources impacts
Vegetation	Natural fuel loading increased in absence of historic low-severity, high frequency fire regime; native plant habitat and diversity declined; increased infestation of noxious weeds	The fireworks program would have minimal temporary impacts on vegetation in those areas where spot fires occurred, however, vegetation at these sites would quickly replenish; some minimal vegetation impacts would also be observed as a result of suppression activities; localized increases in grass and forb production at spot fire sites may be observed	Thinning and prescribed fire efforts in the Black Hills National Forest would reduce fuel loadings and help restore historic fire regime to ponderosa pine stands; Potential for irrigation system development would improve wildland fire control	Ponderosa pine habitat and diversity would continue to improve; noxious weeds would continue to decline; decreased fuel loadings would reduce fire danger; Fireworks program would not result in significant cumulative impacts; potential for irrigation system development may improve vegetative growth near the memorial; the Proposed Action Alternatives would contribute the most to vegetation cumulative impacts, while the No Action Alternative and Alternative 3 would contribute the least

Table 3-10 Cumulative Effects by Resource Area				
Resource	**Past and Present Actions**	**Proposed Actions**	**Future Actions**	**Cumulative Effects**
Wildlife	Fire suppression efforts within the memorial degraded wildlife habitat and diversity; memorial building and improvements temporarily affect wildlife species	Concussion blasts and potential fire suppression activities from the fireworks would result in minor, short-term disturbance and displacement of wildlife	Thinning and prescribed fire efforts in the Black Hills National Forest would help restore historic fire regime to ponderosa pine stands and benefit habitat and species diversity; increased development in adjacent areas would fragment habitat	Wildlife habitat and diversity increases; Fireworks program does not result in significant cumulative impacts; the Proposed Action Alternatives would contribute the most to wildlife cumulative impacts, while No Action Alternative and Alternative 3 would contribute the least
Air Quality	Industry and agricultural practices emit pollutants and particulate matter; automobiles, past wildland and prescribed fires, fireworks program contribute to some temporary deterioration in air quality and visibility	Fireworks and emissions from increased traffic would result in very minor, short-term air quality impacts	Future wildland fires, prescribed fires, and fireworks programs would contribute to temporary deterioration in air quality and visibility	Class II air quality standards would not be violated; Fireworks program would not result in significant cumulative impacts; the Proposed Action Alternative would contribute the most to air quality cumulative impacts, while No Action Alternative and Alternative 3 would contribute the least
Noise	Past development and improvements resulted in short-term noise impacts; traffic associated with visitation of the memorial continues to produce sustained and long-term source of noise; past fireworks program results in temporary noise impacts	Fireworks program and potential fire suppression activities would result in temporary increased noise levels; some short-term disturbance and displacement of wildlife will likely occur; No significant impacts would be observed at sensitive receptors	Traffic associated with visitation of the memorial continues to produce sustained and long-term source of noise; thinning and prescribed fires would provide additional temporary noise impacts, potential for development of an irrigation system would also likely result in temporary noise impacts	Noise sources and levels in the memorial would be increased during the Fireworks program, however, cumulative noise levels would not be effected; Fireworks program would not result in significant cumulative impacts; the Proposed Action would contribute the most to cumulative noise impacts, while No Action Alternative and Alternative 3 would contribute the least
Visitor Use and Experience (including Park Operations)	Establishment of the memorial, improved roads and trails provided access for recreation opportunities; increased population growth resulted in increased recreational use; scenic integrity compromised in the short-term as a result of improvements of the sculpture;	Beneficial long-term and short term effects on visitor use and experience resulting from fireworks celebration	Increased recreation use as population grows; Thinning, prescribed fire, and potential development of an irrigation system would temporarily reduce visitor use and experience, Fireworks program continues to be key recreation event	Long-term enhancement of recreation resources and opportunities offsets short-term recreation inconveniences from fire management activities; Fireworks program continues to attract visitors providing long term cumulative benefits; the Proposed Action Alternative would contribute the most to cumulative impacts, while

Table 3-10 Cumulative Effects by Resource Area				
Resource	**Past and Present Actions**	**Proposed Actions**	**Future Actions**	**Cumulative Effects**
	fireworks program established as a key recreation event			No Action Alternative and Alternative 3 would contribute the least
Human Health & Safety	Past suppression efforts protected memorial staff and visitors; fireworks program increased safety risks to general public observing fireworks display	Fireworks program would increase safety risk to general public observing the fireworks and firefighters in case of wildland fire; short-term impacts on human health & safety	Similar effects as described in Past and Present Actions	Human health and safety would improve over time with thinning and prescribed fire activities, and with the development of an irrigation system; fireworks program risks would decline; fireworks would not result in significant cumulative impacts; the Proposed Action would contribute the most to human health and safety cumulative impacts, while No Action Alternative and Alternative 3 would contribute the least
Socio – economics	Previous fireworks programs have enhanced community experience and provided a temporary stimulus to local economy; peak visitor levels at memorial result in fuller utilization of other local tourism, recreation and visitor accommodations; local controversy is generated over fire risk versus program benefit	Community would continue to experience beneficial effects of increased visitor levels during the holiday weekend; Proposed program supports local participating organizations and enhances regional visibility; Local controversy over potential fire risk and effects of large tourist influx is unresolved	Effects similar to those described under the proposed actions; Program would be expected to continue to benefit local community and the regional economy; controversial nature of program continues for some local residents.	The proposed program provides enhanced visibility for the region and other available recreational opportunities. Increased visitor spending has a substantial immediate benefit on local employment and income as well as longer-term benefit through induced spending in a region that accounts for approximately 54 percent of the total visitor spending in the state; The proposed program would not be expected to conflict with other, similar holiday programs in the region; The potential economic benefit to the region is strongest under the proposed action; with similar but slightly diminished benefits anticipated for Alternative 3; The No Action alternative would reduce the potential for controversy over the program, but also eliminate the economic and social benefits associated with the other

Table 3-10 Cumulative Effects by Resource Area				
Resource	**Past and Present Actions**	**Proposed Actions**	**Future Actions**	**Cumulative Effects**
				alternatives.
Cultural Resources	Establishment of the memorial helped protect cultural resources	Concussion blasts from fireworks could result in impacts to the sculptures; fire suppression activities could result in impacts to recorded cultural resources	Similar effects as described in Past and Present Actions	Cultural resources continue to be protected; fireworks program could contribute to the cumulative impact on cultural resources; the Proposed Action would contribute the most to cultural resources cumulative impacts, while No Action and Alternative 3 would contribute the least
Transportation	Past fireworks, memorial and fire management activities resulted in minor and temporary impact on transportation	Fireworks program would result in temporary minor impact to transportation resulting from traffic congestion	Similar effects as described in Past and Present Actions	Traffic flow and transportation would remain relatively instant; fireworks program would not result in significant cumulative impacts on transportation; the Proposed Action Alternative and Alternative 3 would contribute the most to transportation cumulative impacts, while No Action3 would contribute the least
Wilderness	Fire suppression efforts, past fireworks, and noise from memorial operations have potentially affected the current wilderness area	Temporary minor impacts to the wilderness as a result of the noise from the concussion blasts of the fireworks and fireworks related activities	Similar effects as described in Past and Present Actions	Wilderness will continue to be managed as such. Fireworks program would not result in significant cumulative impacts; the Proposed Action Alternatives would contribute the most to air quality cumulative impacts, while No Action Alternative and Alternative 3 would contribute the least

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