Grand Portage National Monument

Wildland Fire Management Plan Environmental Assessment

Prepared by Border Waters Area Office and
Grand Portage National Monument Resource Division

Midwest Region
National Park Service

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FINDING OF NO SIGNIFICANT IMPACT

Wildland Fire Management Plan

Grand Portage National Monument, Minnesota

Background

Grand Portage National Monument is located in the northeastern corner of Minnesota within the Grand Portage Chippewa Reservation. The Monument was established in 1958 to preserve and protect an area with unique historical values associated with the fur trade and Native American heritage. All 710 acres of the Monument are designated as an historic district under its listing on the National Register of Historic Places. Significant sites within the Monument include the North West Company stockade area on Grand Portage Bay, the 8½ mile trail corridor, and the Fort Charlotte area on the Pigeon River. Within all these sites, preservation of known and unidentified, surface and subsurface archeological resources is a primary management goal.

The Monument and immediately adjacent Reservation lands are covered with trees typical of the near-boreal forest. Under natural conditions, wildland fires of varying size and intensity contributed to a mosaic of forest stands and maintained a dynamic ecosystem. Beginning in the late 1800s, commercial logging and settlement interests led to the suppression of forest fires throughout the region. Today the mixed hardwood-conifer stands are managed for forest production on Reservation lands. There is currently no active management of the forests within Monument boundaries, other than to provide safe conditions for visitors and staff. One goal of Monument management is to develop forest stands of mixed ages and composition to restore the historic scene as it may have been during the fur trade era, or approximately 200 years ago.

A wildland fire management plan (FMP) was last approved for Grand Portage National Monument on October 17, 1997. Under that plan, all naturally occurring fires are suppressed, non-fire treatments are approved, and prescribed fires are permitted along the Grand Portage and in the Fort Charlotte area of the Monument. The difficulty of limiting a prescribed fire to the 600 ft-wide trail corridor would place forest resources on adjacent Reservation lands at risk. It is now recognized that implementing prescribed fires within the Monument requires close cooperation with Grand Portage Band forestry managers to define mutually beneficial treatment areas across property boundaries. Resource management goals can also be achieved by appropriate control of naturally ignited fires. Such resource use fires would also require close collaboration with the Grand Portage Band.

Recent changes in the Federal Wildland Fire Management Policy necessitated an update to the 1997 FMP. This opportunity made it possible to use the latest knowledge derived from Monument-based research and region-wide analysis of natural communities. The action proposed by Grand Portage National Monument is a new Wildland Fire Management Plan responding to changes in the Federal fire policy and addressing emerging resource management priorities.

An environmental assessment (EA) was prepared to evaluate the environmental effects associated with the existing FMP (Alternative 1–No Action) and a proposed alternative (Alternative 2–Preferred Alternative) that emphasizes collaboration with the Grand Portage Band on prescribed and wildland fire use fires management activities.

Preferred Alternative

Alternative 2–Preferred Alternative is described in detail in the environmental assessment. This alternative reflects recent changes in NPS and Federal Fire Program policies and terminology. Alternative 2 complies with NPS Director's Order #18, Wildland Fire Management, and the Federal Wildland Fire Management Policy national standards.

Alternative 2 incorporates many elements of the existing, approved FMP, such as suppression of all human-caused and naturally-ignited fires starting inside Monument boundaries. Whenever fire management activities occur on adjacent Reservation lands, the Monument will fully cooperate to achieve the safest, most beneficial and desirable outcome for both entities. Such collaboration could include prescribed fires and wildland fire use. This difference from Alternative 1–No Action is subtle but not trivial, and will improve wildland fire and natural resource management within Grand Portage National Monument.

Both Alternative 1–No Action and Alternative 2-Preferred Alternative establish two fire management units (FMUs) within the Monument. The "Conditional FMU" and "Suppression FMU" of Alternative 1 are renamed "General Forest FMU" and "Wildland-Urban Interface (WUI) FMU" to correspond with the FMU designations used in the Grand Portage Reservation Strategic Wildland Fire Management Plan (1999). Use of prescribed fires solely by the NPS within Monument lands is removed from the General Forest FMU in Alternative 2. Use of prescribed fires in the WUI-FMU is retained to accommodate the traditional cultural practice of burning to maintain a historic meadow within the lakeshore portion of the Monument.

Environmental Preferred Alternative

Alternative 2–Preferred Alternative is also the environmentally preferred alternative when measured against the six criteria listed in Section 101 of the National Environmental Protection Act (NEPA):

1) *Fulfill the responsibilities of each generation as trustee of the environment for succeeding generations.*

2) *Assure for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings.*

3) *Attain the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences.*

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

5) *Achieve a balance between population and resource use that will permit high standards of living and a wide sharing of life's amenities.*

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

In brief, the environmentally preferred alternative "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" (NPS 2001).

Alternative 2–Preferred Alternative for the revised Grand Portage National Monument Wildland Fire Management Plan is able to meet goals 1, 2, 3, 4 and 6 above. The option of collaborating with Grand Portage Band fire activities will better protect human life and property, contribute to reduced hazardous fuel loadings, and simulate natural ecological processes. This alternative also preserves historic cultural practices, and contributes to maintaining the historic scene for future generations.

The Preferred Alternative and Significance Criteria

The intensity and severity of impacts from implementing the Preferred Alternative is determined by examining criteria established by the Council on Environmental Quality (CEQ) under NEPA, and codified in 40 CFR 1508.27.

Criterion 1. *Impacts that may be both beneficial and adverse. A significant effect may exist even if the Federal agency believes that on balance the effect will be beneficial.*

> Implementing Alternative 2 will result in a mixture of minor to moderate impacts. Positive, long-term effects would pertain to human health and safety, facilities and infrastructure, vegetation communities, cultural landscapes, wildlife, archeological and ethnographic resources, and visitor use and experience. Short-term minor adverse effects may be experienced in air quality, soils, water resources, human safety, and visitor use and experience. None of these effects, either adverse or beneficial, would rise to the level of significance, as defined by the CEQ.
>
> Returning fire to the near-boreal forest ecosystem through prescribed burns or wildland fire use would enhance the health of the forests in the Monument. It would also help restore the natural scene as it existed during the fur trade era. Until Grand Portage Band forestry practices include such fire use with which the Monument would collaborate, the Monument can approximate these benefits through mechanical and cultural means. In time, such actions could produce the desired beneficial effect of maintaining the natural ecosystem and enhancing visitor experience.

Criterion 2. *The degree to which the proposed action affects public health or safety.*

> Human health and safety is the first concern in every fire management action. Implementing Alternative 2 would provide a moderate long-term beneficial effect by reducing fuel loads in the Monument forests, and lessening the possibility of large-scale, high intensity fires. Prescribed burns and wildland fire use would be conducted under specified conditions that would minimize the risks to firefighters and the public from fire and smoke.

Criterion 3. *Unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critically areas.*

> Under Alternative 2, the WUI-FMU contains the reconstructed buildings and stockade, and many of the cultural landscapes of the Monument. Actions approved by Alternative 2

provide the highest degree of protection for these resources through mechanical fuel reduction and prescribed burns of a specific area. Cultural resources in the General Forest FMU include in-ground objects and human-modified surface features. Alternative 2 provides for protection of these resources by limiting the use of soil-disturbing fire management actions. Use of hand tools, wheeled vehicles, or earth-moving equipment to expose mineral soils is prohibited unless specifically approved by the Superintedent or designee. This limits initial attack strategies to water applications with methods that limit soil disturbance as much as possible. Application of foam or retardants should be minimized to the degree possible. Prescribed burns and wildland fire use fires are more likely to be used under specified conditions that would limit adverse effects on surface and subsurface cultural resources.

Criterion 4. *The degree to which the effects on the quality of the human environment are likely to be highly controversial.*

There were no controversial effects identified during the EA analysis or public review. No concerns or issues were raised during public scoping about the proposed action or its environmental impacts.

Criterion 5. *The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks.*

The EA analysis and public review identified no risks from the preferred alternative that are unique or unknown, nor effects from implementing Alternative 2 that are uncertain. It is not always possible to accurately predict the effect a wildland fire will have on vegetative communities and forest stands, but understanding the range of natural variability in the near-boreal forest ecosystem makes it easier foretell the possible outcome. Proposed fire effects monitoring of the prescribed fire area will help ensure that this vegetation community is not degraded through this practice.

Criterion 6. *The degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration.*

The preferred alternative neither establishes a National Park Service precedent for future actions with significant effects nor will it represent a decision in principle about a future consideration. This action is to develop a fire management plan and program that is consistent with current NPS and Federal Fire Program policies. It further recognizes the role that fire plays in management of the forest ecosystem of Grand Portage National Monument. It also minimizes the risk from fire management activities to cultural resources, both known and unknown within the Monument, and proposes the use of fire to enhance protection, understanding and enjoyment of these resources.

Criterion 7. *Whether the action is related to other actions with individually insignificant but cumulatively significant impacts. Significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment. Significance cannot be avoided by terming an action temporary or by breaking it down into small component parts.*

Allowance of prescribed and wildland fire use fires within Grand Portage National Monument, at such time as these are used by the Grand Portage Band, will restore fire to its natural role in the local ecosystem. It is expected that this will improve the health and diversity of the forests in the Monument and on surrounding Reservation lands.

Designation of the lakeshore area of the Monument as a Wildland/Urban Interface zone is consistent with the designation used by the Grand Portage Band for the surrounding Village of Grand Portage. The cumulative effect is to provide the highest degree of human health and property protection in the event of wildland fires.

Criterion 8. *The degree to which the action may adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources.*

Grand Portage National Monument is listed in its entirety on the National Register of Historic Places. Implementation of the preferred alternative provides for the best known means of protecting known and yet to be discovered historical resources by limiting ground disturbance in the performance of fire management actions, and by using mechanical methods to remove fuels near reconstructed buildings.

The Monument has complied with Section 106 of the National Historic Preservation Act by providing a copy of the EA and draft Wildland Fire Management Plan to the Minnesota State Historic Preservation Office (SHPO). In March 2004, the SHPO responded to their review with no comments on the FMP and EA.

Criterion 9. *The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973.*

In December 2003, the US Fish and Wildlife Service (FWS) issued a final biological opinion based on their review of the biological assessment for the General Management Plan for Grand Portage National Monument in accordance with Section 7 of the Endangered Species Act of 1973 (as amended, 16 USC 1531 et seq.). Informal communication with the FWS after this date indicated that review by that agency for the proposed action (implementing Alternative 2 as a new FMP) was not required since the actions is not likely to adversely affect federally threatened or endangered species, or critical habitat.

Criterion 10. *Whether the action threatens a violation of federal, state, or local law or requirements imposed for the protection of the environment.*

The preferred alternative violates no federal, state, or local environmental protection laws.

Impairment

The National Park Service has determined that implementation of the preferred alternative will not constitute an impairment to critical resources or values of Grand Portage National Monument. This conclusion is based on a thorough analysis of the environmental impacts described in the environmental assessment and the fire management plan, the fact that no public letters were received, relevant scientific studies, and the professional judgment of the decision-maker guided by the relevant sections of the National Park Service Management Policies.

Implementing Alternative 2 as the new FMP may result in short-term, minor adverse impacts on air quality, water resources, soils and vegetation. Overall, the implementation of the preferred alternative will result in benefits to park resources and values, increased public and staff safety,

and improved opportunities for visitor enjoyment of cultural and natural resources, and does not result in impairment of these resources.

Public Involvement and Consultation

Internal NPS and public scoping was conducted to obtain input and review alternatives for revision of the Wildland Fire Management Plan. A letter was sent to 18 local agencies and individuals, and news releases were submitted to the media on July 24, 2001, to solicit initial comments on issues to be addressed in the FMP revision. No responses were received. A 30-day public review period for the final EA and draft FMP was advertised by the same means on May 17, 2004. Copies were provided to the Grand Portage Band and made available at Monument headquarters. No written comments were received on these documents. Throughout the development of the EA and revision of the draft FMP, direct discussions were held with the Grand Portage Band forester to ensure that goals and methods proposed for fire management activities of the Monument were in concert with Grand Portage Band forestry practices.

Conclusion

The preferred alternative does not constitute an action that normally requires preparation of an environmental impact study (EIS). The preferred alternative will not have a significant effort on the human environment. Negative environmental impacts that could occur are short-term and negligible to minor intensity. There are no significant impacts on public health, public safety, threatened or endangered species, sites listed in the National Register of Historic Places, or other unique characteristics of the region. No highly uncertain or controversial impacts, unique or unknown risks, significant cumulative efforts, or elements of precedence were identified. Implementation of the action will not violate any federal, state, or local environmental law nor will it result in the impairment of park resources or values. Based on these conclusions, it has been determined that an environmental impact statement is not required for this project and one will not be prepared.

Recommended: Timothy Cochrane — Superintendent — Sept. 14, 2004 — Date

Approved: Ernest Quintana — Midwest Regional Director — 9-24-04 — Date

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1. INTRODUCTION

Grand Portage National Monument is located in the extreme northeastern corner of Minnesota and is entirely surrounded by the Grand Portage Chippewa Reservation (Figure 1). The primary interpretive site (79 acres) on Lake Superior contains the reconstructed stockade and buildings, visitor services and maintenance. On the western terminus of the Monument, the Fort Charlotte unit (101 acres) on the Pigeon River preserves archeological resources and provides a primitive campground. The 600-ft-wide Grand Portage trail corridor (550 acres) extends 8½ miles to connect the two. The trail corridor and undeveloped Fort Charlotte are covered with a mixed hardwood-conifer forest similar to surrounding Reservation lands.

In accordance with Public Law 85-910, approved on September 2, 1958 (72 Stat. 1751), the Grand Portage Band of Minnesota Chippewa relinquished certain lands to the United States, and the Secretary of the Interior-established Grand Portage National Monument on January 27, 1960. Grand Portage National Monument is listed in its entirety on the National Register of Historic Places; all 710 acres are part of an historic district designation. Specific significant sites include the North West Company stockade (or depot) area on Grand Portage Bay, the 8½ mile (13.6 kilometer) Grand Portage, and the site of the North West Company's Fort Charlotte and adjacent XY Company depot on the Pigeon River.

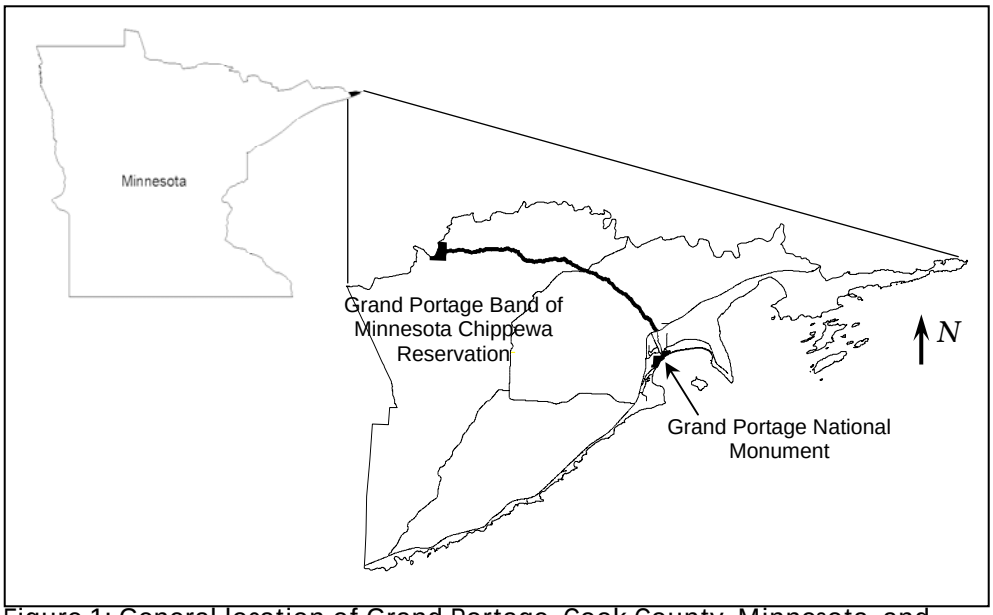

Figure 1: General location of Grand Portage, Cook County, Minnesota, and relative position of Grand Portage National Monument within the Grand Portage Reservation.

1.1. Purpose and Need for Federal Action

The Act establishing Grand Portage National Monument (72 Stat. 1751)-states is established "...for the purpose of preserving an area containing unique historical values...." The Act also states (Sec. 10) "...that the Secretary of the Interior shall administer, protect, and develop the Monument in accordance with the provisions of the Act entitled 'An Act to establish a National Park Service and for other purposes; approved August 25, 1916 (39 Sta. 535), as amended.'" Thus, the purpose of the Monument is also "...to conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of same...." Both the enabling legislation and Organic Act mandate that these values be maintained unimpaired for future generations.

The Grand Portage National Monument General Management Plan (GMP)(NPS 2003) describes the mission of the Monument as follows: "Grand Portage National Monument protects, commemorates, and interprets a reconstructed depot of the North West Company, a rendezvous site for international commerce, and canoe route for transcontinental exploration, Native heritage, *natural scene, and history of cross-cultural contact and accommodation* between traders, Ojibwa, and other participants in the fur trade [emphasis added]." Fire management is not addressed directly in the GMP or Resource Management Plan (RMP)(GRPO 2001a). However, fire management is a component of resource management, and the Draft GMP identifies the following mission goal: "Natural and cultural resources and associated values are protected, restored, and maintained in good condition and *managed within their broader ecosystem and cultural context* [emphasis added]." The RMP specifies three goals that relate to fire management:

- Protect and preserve cultural and natural resources and provide for visitor protection and safety.
- Perpetuate to the degree possible the landscape, vegetation, and the general setting that existed during the historically significant period and minimize the adverse effects of past and present human activities on these resources.
- Work closely and cooperatively with the Grand Portage Band of the Minnesota Chippewa and members of the public in preserving and interpreting the region's historical and natural resources.

Under Director's Order 18 (NPS Interim Order 17 Nov 2002), "each park with vegetation capable of burning" must prepare a fire management plan to assist with attaining resource management objectives of the park. The NPS Wildland Fire Management Guideline (RM-18) requires all parks which contain vegetation that can support fire to develop fire management plans and

programs reflecting NPS policies and relating to ecological characteristics specific to the area.

Grand Portage National Monument received approval of a Wildland Fire Management Plan (FMP) in October 1997. Recent clarification of the NPS and National Wildland Fire Management Policy require revision of the Monument FMP. Analysis of the forest history and cultural landscapes within the Monument provided new understanding of the landscape within the park. Revision of the FMP at this time allows park staff to incorporate these new interpretations into resource management activities. The National Environmental Policy Act (NEPA)(42 U.S.C. 4321, as amended) and the Council on Environmental Quality (CEQ) regulations (40 CFR 1500-1508) mandate Federal agencies to present and analyze alternatives to their proposed actions. The NPS NEPA guidance document (DO-12 Handbook)(NPS 2001) reinforces this mandate, directing examination of alternatives in an Environmental Impact Statement (EIS) or Environmental Assessment (EA). Accordingly, this EA develops and analyzes two alternatives for the revised Wildland Fire Management Plan (FMP) for Grand Portage National Monument.

1.2. Goals of Fire Management and Planning

The mixed hardwood-conifer communities of the near-boreal forests along Minnesota's North Shore were molded by infrequent disturbances of varying sizes and severities. Both wind and fire were key players in maintaining the forest mosaic. Stand-replacing fires tended to occur at intervals of 200-400 years, while wind events occurred at intervals of 1000-2000 years. Low intensity maintenance fires occurred frequently, about every 40 years (White and Host 2003). Aboriginal burning during the last 10,000 years also helped to shape the landscape that was integral to native cultures, the fur trade and early European settlers.

Loggers arrived in the 1890s to exploit the forests of pine and spruce created by fire, or the lack of it. Prior to establishment of the Monument in 1958, the Grand Portage Band of the Minnesota Chippewa Tribe suppressed all fires within the present Monument boundary. Since that time, the NPS has continued the practice of fire exclusion. In spite of effective fire suppression and prevention programs since the 1940s, the local ecosystem of the Grand Portage Reservation is not much altered from the pre-settlement condition. The most notable change is the deduced white and red pine component of the forest (White and Host 2003). Logging may have replaced fire as an important disturbance factor outside of Monument property. Within the Monument, it is important to allow wildland fires to create the occasional disturbance necessary for maintaining the mixed hardwood-conifer forests.

Excluding fire from the Monument ecosystem is incompatible with the Monument's purpose as defined in the GMP (2003): "...to perpetuate, to the degree possible, the forest vegetation and general setting that existed during the historically significant period and to minimize the adverse effects of past and present human activities on these resources." Resource use of wildland fires is needed to re-establish the natural role of fire in the maintenance of natural systems and prevent fires of a more serious nature. In particular, creation of canopy openings and exposure of mineral soil through low intensity ground fires will enhance the regeneration of pines.

Fire exclusion is also incompatible with NPS Management Policies (NPS 2000) which state that "Naturally ignited fire is a process that is part of many of the natural systems that are being sustained in parks." The NPS Director's Order 18 (NPS 2002a) requires that all parks which contain vegetation that can support fire will develop fire management plans and programs reflecting NPS policies and relating to ecological characteristics specific to the area.

The fire management goals of Grand Portage National Monument are:

- Make firefighter and public safety the highest priority of every fire management activity.
- Suppress all unwanted wildland fires regardless of ignition source to protect the public and protect the natural, cultural and historic resources of the Monument.
- Manage wildland fires so that cultural resources of the Monument are protected from damage by fire and suppression actions.
- Use wildland fires where appropriate as a tool to meet resource management objectives within the Monument. Maintain or restore, where possible, the primary natural resources of the forested landscape, and those ecological conditions that would prevail were it not for the advent of modern civilization.
- Use prescribed fires where appropriate as a tool to meet resource management objectives within the Monument. Maintain identified cultural landscapes significant to the history of the local community and residents.
- Modify wildland fire hazard around developed sites, in wildland-urban interface zone, and in conjunction with cultural and historic areas to reduce fire behavior to a manageable level to protect critical resources.
- Manage prescribed and wildland fires in concert with federal, state, and local air quality regulations.

1.2.1 Director's Order 18, Wildland Fire Management

Director's Order 18, Wildland Fire Management (NPS 1998) requires each park with vegetation capable of sustaining fire to develop a wildland fire management plan that will meet the specific resource management objectives for that park and to ensure that firefighter and public safety are not compromised. An approved FMP is required before a wildland fire management program can be fully implemented. The use of either prescribed fire or wildland fire or both for resource benefits is expressly not permissible without an approved FMP. The Superintendent approves the FMP and subsequent implementation plans for all fire use activities.

The purpose of this Federal action is to provide a long-range wildland fire management plan and program at Grand Portage National Monument using the benefits of fire to achieve desired natural resource conditions while protecting human lives, park resources and surrounding lands and property from unwanted wildland fire. National Park Service policy recommends an annual review of the FMP and a revision every five years.

1.3. Scoping Issues

Compliance under NEPA requires Federal agencies to invite public involvement prior to decision-making on proposed actions that may affect the environment. “Scoping” is the process of soliciting input from “stakeholders”–NPS staff, the public, and other agencies–at the outset of a NEPA analysis. Information from knowledgeable individuals, issues of public concern and opinions on whether an agency should proceed with a proposed action are obtained through this process. Input from scoping helps shape the direction that analysis takes, guiding planners and analysts who decide which issues merit consideration. Public input also helps in the development of alternatives to the proposed action, which is an integral part of NEPA.

1.4. Impact Topics Included in the EA

Impact topics are derived from park staff and public input during internal and external scoping. There were no responses to public scoping for the Grand Portage National Monument FMP. The following topics have been determined to merit consideration in this EA based on internal scoping among Monument and Border Waters Area Fire Management staff, and on impact topics addressed in the EIS for the GMP (NPS 2003).

Geology and soils
Water resources

Floodplains and wetlands
Air quality
Vegetation
Wildlife and fisheries
Threatened species and species of special concern
Cultural resources
Human health and safety
Public services
Visitor use and experience

1.5. Impact Topics Considered But Not Further Evaluated

The NEPA and CEQ regulations direct agencies to "avoid useless bulk…and concentrate effort and attention on important issues" (40 CFR 1502.15). Analysts must use their professional judgment in deciding which issues warrant consideration and to what extent.

Impact topics sometimes addressed in NEPA documents for other types of proposed actions will not be substantively affected by any of the FMP alternatives considered in this EA. These topics are briefly described below, with the rationale provided for not considering them in further detail.

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. None of the alternatives would result in disproportionate health or environmental effects on minorities or low-income populations as defined in the EPA Environmental Justice Guidance; therefore this topic is not further addressed in this EA. Executive Order 13045 requires Federal actions and policies to identify and address disproportionately adverse risks to the health and safety of children. Since none of the fire management alternatives involves disproportionate risks to the well-being of children, this topic is also excluded from additional analysis.

Indian Trust Resources: Grand Portage National Monument is within the Grand Portage Reservation, and most of its lands were donated by the Grand Portage Band of Minnesota Chippewa. Section 2 of the establishing legislation notes that the lands are to be held "… in trust by the United States of America for the said tribe or band …." The legislation recognizes the crucial part that was played by the Objibwe in the history of the fur trade and the importance of the relationship between the Monument and the Band. However, the Monument is public property managed by the NPS, and the Grand Portage Band did not retain any property rights that would constitute a legal trust

responsibility. The Band still has other rights to the land that are spelled out in the legislation establishing the Monument, and those rights will be honored.

Land Use: Current land use on areas adjacent to Grand Portage National Monument falls primarily into two categories established by the Grand Portage Band zoning regulations: residential and general forestry. In addition, the Grand Portage Band recognizes preservation zones as buffer strips along all waterways within the Reservation. These designated uses are in concert with the Monument wildland fire management goals, and with goals stated in the GMP (NPS 2003) and RMP (GRPO 2001a). None of the FMP alternatives is expected to have any significant impact on Grand Portage Band properties. Therefore, land use is not analyzed further in this EA.

Socioeconomics: National Environmental Protection Act compliance requires an analysis of impacts to the "human environment," which includes economic, social and demographic elements of the affected area. Wildland fire management and fire fighting activities may bring a short-term need for additional personnel in the park, but overall this increment would be minimal and would not affect the Reservation population, income or employment base (GP RTC 2002). Therefore, this impact topic is not included for further analysis in this EA.

Transportation: None of the FMP alternatives will substantively affect road, water-based, or aerial transportation in and around the Monument. One exception to this general rule is the possible temporary closure of roads during fire suppression activities or from heavy smoke emanating from wildland fires or prescribed fires. Over the long term, such closures would be infrequent and not significantly impinge on local transportation. Therefore, this topic is dismissed from further analysis.

Utilities: Projects 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 actions may exert a substantial or long-term demand on telephone and electrical services, water and sewage infrastructure, compromising existing service levels or causing a need for new facilities. None of the proposed FMP alternatives will cause such effects to any extent; therefore, utilities are eliminated from additional analysis.

Waste Management: None of the FMP alternatives will generate noteworthy quantities of either hazardous or solid wastes that need to be disposed of in hazardous waste or general sanitary landfills. Therefore this impact topic is dropped from additional consideration in this EA.

Wilderness: There is no wilderness or proposed wilderness within Grand Portage National Monument. Therefore, this topic is not considered further in this EA.

2. ALTERNATIVES CONSIDERED FOR THE PROPOSED ACTION

The Proposed Action is implementation of a revised Wildland Fire Management Plan for Grand Portage National Monument. This EA analyzes a range of reasonable long-range fire management program alternatives and their direct, indirect and cumulative impacts. Two alternatives are analyzed. The NPS-preferred alternative for the Proposed Action is Alternative 2 – Full Suppression, Apply Non-fire Treatments and Prescribed Fire, and Collaborate with Grand Portage Band Fire Management Activities. The preferred alternative identifies two Fire Management Units (FMU): a Wildland-Urban Interface FMU (WUI-FMU) and General Forest FMU (GF-FMU).

2.1. Alternative 1 – No Action (Continue Suppression and Apply Non-fire Treatments)

This alternative would continue current fire management practices at Grand Portage National Monument. Managers are currently operating under the 1997 FMP which provides for full suppression of all wildland fires, use of non-fire treatments, and application of prescribed fire in the Conditional Fire Management Unit. Under the No Action Alternative, the 1997 FMP would remain in effect, but this does not reflect current NPS and federal fire management policy. The Monument would continue with two Fire Management Units (FMUs): the Conditional FMU, north and west of MN Hwy 61, and the Suppression FMU, southeast of MN Hwy 61.

All wildland fires at the Monument would be routinely suppressed. A control strategy would be used in all suppression actions. Non-fire treatments would be used in both FMUs to reduce the risk to natural and cultural resources from wildland fire. A variety of media would be used to inform Monument visitors, neighbors, and employees about the role of fire in the Monument's ecosystems and about the need to prevent human-caused fires and to report all fires to Monument staff.

The 1997 FMP permitted application of prescribed fire in the Monument corridor area (Conditional FMU). In reality, it is impractical or impossible to control or contain a prescribed fire within a narrow strip of land, such as the trail corridor. In addition, construction of fire breaks sufficient to effectively control a prescribed fire would increase threats to cultural resources, especially archeological resources.

Alternative 1 - No Action maintains the possibility of prescribed fires in the Conditional FMU on paper, but the impracticality of fire control and a high priority for resource protection makes prescribed fire use unacceptable from a management standpoint.

Under Alternative 1 - No Action, the Monument would continue under existing management guidance (including the 1997 FMP), and manage resources without prescribed fires.

2.2. Alternative 2 – Preferred Alternative (Full Suppression, Apply Non-fire Treatments and Prescribed Fire, and Collaborate with Grand Portage Band Fire Management Activities)

Alternative 2 would replace the 1997 FMP to reflect changes in terminology and current NPS and federal fire management policy. The Monument would be divided into the same FMUs as Alternative 1, but they would be named to correspond with FMU designations used in the GP-Band Strategic Wildland Fire Management PLan (GP-Reservation Tribal Council 1999): Wildland-Urban Interface (WUI) FMU southeast of MN Hwy 61, and General Forest (GF) FMU north and west of MN Hwy 61. Alternative 2 is the NPS preferred alternative. It would modify current fire management practices at Grand Portage National Monument to allow use of prescribed fire in the WUI-FMU and exclude its use in the GF-FMU. However, the Monument will make every effort to collaborate with Grand Portage Band fire management activities, including prescribed and fire use fire, on lands adjacent to NPS property.

All wildland fires at the Monument would be routinely suppressed using an appropriate management response. Prescribed fire would be used within the WUI-FMU under specified weather, fuel moisture, and fire behavior parameters to simulate historic practices and to maintain a significant cultural landscape. A single prescribed fire unit is proposed, a 6 acre meadow in WUI-FMU on the lakeshore area of the Monument. Outside of this burn area, non-fire treatments would be used to reduce the risk to natural and cultural resources from wildland fire. If and when the Grand Portage Band conducts fire management activities on lands adjacent to NPS property, Monument staff will make every effort to collaborate in ways that are consistent with the policies and resource goals of the Monument. Grand Portage Band fire management activities could include appropriate management responses for fire suppression, prescribed fire, wildland fire use, and non-fire applications including hazard fuel reduction and ecosystem management. A variety of media would be used to inform Monument visitors, neighbors, and employees about the role of fire in the Monument's ecosystem and about the need to prevent human-caused fires and to report all fires to Monument staff.

2.3. Environmentally Preferred Alternative

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

- Fulfill the responsibilities of each generation as trustee of the environment for succeeding generations.
- Ensure for all Americans safe, healthful, productive, and esthetically and culturally pleasing surroundings.
- Attain the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences.
- 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.
- Achieve a balance between population and resource use that would permit high standards of living and a wide sharing of life's amenities.
- Enhance the quality of renewable resources and approach the maximum attainable recycling of non-renewable 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" (NPS 2001).

In this case, Alternative 2 – Preferred Alternative (Full Suppression, Apply Non-fire Treatments and Prescribed Fire, and Collaborate with Grand Portage Band Fire Management Activities) is the environmentally preferred alternative for the revised Wildland Fire Management Plan for Grand Portage National Monument. It best meets the NPS goals stated above. This alternative combines the widest range of fire management techniques to protect human life and property, reduce hazardous fuel conditions, perpetuate natural ecosystems, achieve resource management goals, and reduce the risk of wildland fires originating inside the park. Alternative 2 best protects and helps preserve the historic, cultural, and natural resources in the park for current and future generations.

2.4. Alternatives Considered but not Further Analyzed

Prescribed Fire, Non-fire Treatments, and Wildland Fire Use without Collaboration with Grand Portage Band Fire Management Activities

Wildland fire use (WFU) permits management of fires ignited by natural means (usually by lightning) under specific environmental conditions for natural resource benefits. Such an alternative would establish the same FMUs as Alternative 1 and would rename them as under Alternative 2 – WUI-FMU southeast of MN Hwy 61 and GF-FMU north and west of MN Hwy61. Wildland fire use would be allowed in GF-FMU, in addition to prescribed fire and non-fire treatments for controlling hazard fuels and achieving resource objectives.

This alternative was considered but not analyzed further in this EA because of its inherent risks and impracticality for the Monument. The narrow configuration of the property is such that fire containment within park boundaries and away from adjacent Grand Portage Band property would require extensive holding actions and would still carry a high risk of escaped fire. Park staff determined that the potential risks to human health and safety, cultural resources, and adjacent property under this alternative outweigh any possible resource benefits that would be obtained from independent use of WFU fire at the Monument.

Full Suppression, Prescribed Fire and Non-fire treatments without Collaboration with Grand Portage Band Fire Management Activities

This alternative would establish the same FMUs as Alternative 1 and would rename them as under Alternative 2 – WUI-FMU southeast of MN Hwy61 and GF-FMU north and west of MN Hwy 61. Such an alternative would allow prescribed fire in the WUI-FMU and non-fire treatments in both FMUs for controlling hazard fuels and achieving resource objectives. However, it would not include collaobration with Grand Portage Band fire management activities as in Alternative 2.

This alternative was considered but not analyzed further in this EA because it fails to meet the purpose and need identified for the FMP described in Section 1.1. Specifically, this alternative fails to continue a "*history of cross-cultural contact and accommodation*," to manage natural resources "within their broader ecosystem context", and to "*work closely and cooperatively with the Grand Portage Band of the Minnesota Chippewa … in preserving and interpreting the region's historical and natural resources*."

2.5. Mitigation Measures Common to All Alternatives

A number of mitigation measures are common to all the alternatives, except where specifically noted otherwise. These mitigation measures are described by resource area (impact topic).

Geology and Soils

Minimum impact suppression tactics (MIST) will be used during all fire management activities. Such tactics relevant to protecting soils include:

- Use natural barriers wherever possible for firelines. Firelines kept to minimum width necessary to allow backfiring or safe blackline creation.
- After approval by the superintendent or designee, waterbars constructed on handlines on steep slopes.
- After the fire emergency, transport of personnel, equipment, and trash out of the park will be consistent with Monument policies and resource management objectives.

Water Resources

Retardant and Foam (aerial delivery)

Water resources of the Monument are limited to short sections of three streams and the margin of a beaver pond. Restricting the use of aerially-applied retardant and foam suppressants on the Monument in order to protect these resources is difficult due to the narrow configuration of the property. Protecting, maintaining and enhancing water quality is a concern of the Grand Portage Reservation and received consideration during the development of the Reservation fire management plan (GP-Band 1999). Mitigation actions for the Monument will be consistent with limitations enforced by the Grand Portage Reservation, and will be addressed on a case by case basis, in consultation with Reservation staff.

- Use water instead of fire foam or retardant chemicals in aircraft to the degree practical, except as approved by the superintendent (or designee), in consultation with Grand Portage Band restrictions.

Retardant and foam (ground delivery with backpack pumps)

- No ground delivery retardant application unless approved by the superintendent or designee, except where human life or property is immediately threatened.

- No ground applied foam or retardant within 10 feet (3 m) of open water. All backpack pumps or other tanks will be filled a minimum of 10 feet (3 m) from open water. A separate, uncontaminated container must be used to transport water from the source. This container must be kept uncontaminated by concentrate.

Air Quality

- Fire managers will adhere to the Minnesota Smoke Management Plan guidelines.
- Prescribed fire plans will consider trajectory of the smoke plume, identification of smoke sensitive areas, fuel type, mixing of man-made pollutants with smoke from prescribed fires, and atmospheric stability.
- The Simple Approach Smoke Estimation Model (SASEM) or other emissions model will be used to estimate smoke emissions.
- Notify the local GP-Band Fire Department, nearby residents, adjacent landowners, and local communities of smoke-generating fire activities.
- Smoke dispersal will be monitored continuously during any prescribed fire. If smoke creates a hazard or nuisance which cannot be mitigated, the prescribed fire will be extinguished.

Cultural Resources

- The Monument Chief of Resource Management will be informed of wildland fires and suppression activities as soon as possible.
- The Monument Chief of Resource Management, or designee, will be "on-site" for all fire management activities, including suppression actions, prescribed fires, manual fuel reduction. This person will advise the Superintendent on appropriate methods for protecting specific sites and will provide information to fire incident commanders.
- No off-road vehicle use unless approved by the superintendent, or designee.
- No bulldozer or grader use unless approved by the superintendent, or designee.

- Wetlines, or environmental lines, used in lieu of handline construction.
- Firefighters informed of known archeological sites, minimize ground disturbance in these areas.
- Minimize ground disturbance with hand tools, to the degree practical. Removal of litter and duff layers is preferable to digging into mineral soil layers.
- Use handlines if a mineral soil line is necessary, when permitted by superintendent or designee.
- Minimize tree felling.
- Cold trail the fire edge with water when practical.
- Utilize soaker hoses or fogger nozzles in mop-up; avoid "boring" and hydraulic action on shallow soils.
- Use water for mop-up to extinguish smoldering roots and surface fuels, unless otherwise approved by Monument cultural resource advisor, superintendent or designee.
- Use natural barriers wherever possible for firelines. Firelines kept to minimum width necessary to allow backfiring or safe blackline creation.
- After approval by the superintendent or designee, waterbars constructed on handlines on steep slopes.
- Cultural resource specialist will evaluate sites before scattering or removal of debris.
- Surface survey for cultural sites will be made before rehabilitation of firelines, spike camps, or other disturbance.
- After the fire emergency, transport of personnel, equipment, and trash out of the park will be consistent with Monument policies and resource management objectives.
- Fire camp facilities, when practical, will be located outside of Monument property, or as approved by superintendent or designee.
- Surface survey for cultural sites and materials will be conducted following wildland and prescribed fires, to the degree practical.

- The Chief of Resource Management will consult with and seek advice from other cultural resource specialists as appropriate if cultural resources are threatened or destroyed during wildland fires.
- Prescribed fire plans will be developed in consultation with the Monument Chief of Resource Management. Ground surveys will be conducted prior to prescribed fires whenever possible.
- The Chief of Resource Management will provide information about known cultural resources in the proposed fire area and recommend protective measures to persons preparing prescribed fire plans.

Public Safety

Federal wildland fire policy requires all fire management activities consider safety of personnel and the public as the highest priority. Primary to this goal is informing local residents and Monument visitors of fire management actions, as appropriate to specific situations. Notification of the public is coordinated by the Monument Chief of Interpretation and may include any of the following.

- Initial attack or burn team members will determine the proximity of fires to trails or structures. They will inform visitors or reservation residents of the fire and potential hazards, and aid in their evacuation if necessary.
- The Grand Portage corridor may be closed if deemed necessary by the Incident Commander or Incident Management Team, and as approved by the superintendent.
- When a wildland fire is in progress, information stating the location, behavior, expected dangers, areas to avoid, and precautions will be posted at the ranger station, interpretive site and trail heads.
- During active fires, a Wildland Fire Status Summary will be kept by a designated dispatcher. This status summary will be distributed to park staff daily.
- Visitor use will be limited or prevented near wildland fires and potentially affected areas. National Park Service personnel will patrol fires to enforce visitor compliance with area closure orders.
- When the risk of wildland fire is very high or extreme, signs on trailheads may be used to indicate trail closures.

- The Prescribed Burn Boss will ensure that closure or informational signs on prescribed fires are properly posted.
- News releases may be provided to local news media.
- Burned areas will be posted at the trailhead if potential hazards exist. The trail corridor and Fort Charlotte area may be closed until hazard trees are removed. The public will be informed of hazards and appropriate safety precautions associated with traveling in burned-over areas.

Visitor Use and Experience

Many of the above measures (especially related to smoke and safety) will mitigate the impacts of the fire management program on visitor use and experience. In addition, the Monument will incorporate fire information into general operations as needed. The following guidelines will be followed:

- Information handouts explaining the wildland fire management and ecological concepts will be prepared and periodically updated. During active fires and when fire risk is high, these handouts will be distributed to visitors at park information boxes and by NPS personnel at the interpretive site.
- During ongoing fires, news releases and articles may be provided to local media.
- Annual seasonal training for NPS employees will include information on the Monument FMP. All NPS staff will be informed of conditions during on-going fires.
- The wildland fire management program will be discussed in informal contacts with the Grand Portage community and Monument visitors.

Non-fire Treatments

Both alternatives include non-fire treatments for mitigation of hazardous fuel conditions. Non-fire treatments include mechanical or horticultural treatment, such as crushing, piling, thinning, pruning, cutting, chipping or mulching of wildland fuels. Fuel reduction lessens the risk of damage to or loss of natural and cultural resources from wildland fire.

- Even in the absence of fire, use of MIST will reduce impacts to cultural and natural resources through fuel reduction activities.

- No motorized or wheeled vehicles will be used off designated road surfaces without the approval of the Superintendent.
- Each non-fire treatment project will require a Project Screening Form to document appropriate NEPA and NHPA compliance.
- Treatments that could disrupt visitor experience in any way, such as the use of chainsaws, will be conducted during periods of low visitation whenever possible.
- The Monument cultural specialist will survey the project area and specify mitigation prior to implementing fuel reduction treatments.
- Mitigation measures described above for soils, water resources, air quality, threatened and endangered species, and cultural resources will also apply to non-fire treatments.

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3. AFFECTED ENVIRONMENT

This section discusses resource areas that may be affected by the FMP alternative actions.

3.1. Natural Resources

3.1.1. Geology and Soils

The Grand Portage owes its location, and its historical importance, to the topography of the Grand Portage Highlands in northeast Minnesota. Shale and argillite layers of the Rove formation were intruded by molten magma about 1 billion years ago, which cooled slowly to form diabase dikes (vertical features) and sills (horizontal features). Differential resistance to erosion of these rocks resulted in the dramatic relief observed in the local landscape. As the Pigeon River approaches Lake Superior, the river flows over a series of sills, notably at the High Falls, which made navigation on the lower Pigeon impossible. The nearby Grand Portage Creek flows into Lake Superior through gaps in the highlands, which formed along a fault zone (USGS 2002). West of these gaps, the trail follows the crest of a dike to the Pigeon River, above the most dangerous falls. The Grand Portage route rises from an elevation of 602 feet at Lake Superior to about 1400 feet at its highest point.

Soils in the vicinity of the Monument are derived from deposits left by the Superior Lobe of the Wisconsinan Glacier and prehistoric lakes formed by the melting ice. Upland soils (Quetico Series) formed from glacial till and shallowly overlie bedrock on ridges. Low areas between ridges have deeper soils (Ontonagon Series) derived from lacustrine clays deposited by Lake Duluth. Soils are loam (Quetico) and sandy clay loam (Ontonagon), acidic, low in organic matter and infertile. The potential for erosion of both soil types increases with slope, ranging from slight on level ground to severe on slopes greater than 35 percent (SCS 1986).

3.1.2. Water Resources

Lake Superior and the Pigeon River are the most notable water resources of the Grand Portage area, but both lie outside the jurisdiction of the NPS. Other than noting their use as water sources for fire fighting purposes, these water bodies are not further addressed in this EA. Limited portions of Grand Portage, Poplar and Snow Creeks pass through Monument property. Grand Portage and Poplar Creeks, both in the Lower Portage corridor, arise from upland bogs or beaver ponds, and are subject to flash flood conditions following heavy rainfall. Snow Creek, located along the Upper Grand Portage corridor, flows sluggishly from a long-established

beaver pond/meadow complex, through a series of smaller beaver impoundments, eventually re-entering Monument property before emptying into the Pigeon River at Fort Charlotte.

The geological complexity of the area influences both surface and groundwater availability. Depressions in the bedrock are filled either with coarse glacial till (0-40 ft in depth) or shallow soils. Infiltration of surface water is inhibited by the impervious diabase bedrock layers, resulting in wet or boggy areas and poor aquifer recharge. Along the Grand Portage corridor, poor surface drainage produces frequently boggy soil conditions and scattered small, shallow woodland pools.

3.1.3. Floodplains and Wetlands

Executive Order (EO) 11988 on Floodplain Management requires all Federal agencies to take action to reduce the risk of flood loss, to restore and preserve the natural and beneficial values served by floodplains, and to minimize the impact of floods on human safety, health, and welfare. Because many wetlands are located in floodplains, EO 11988 has the secondary effect of protecting wetlands.

Executive Order 11990, Protection of Wetlands, states an overall wetlands policy for all agencies managing Federal lands, sponsoring Federal projects, or providing Federal funds to State or local projects. It requires Federal agencies to follow avoidance/mitigation/preservation procedures with public input before proposing projects.

Grand Portage National Monument is located in the North Shore Uplands, a region known for short, steep streams. Flash flooding after rains and high spring runoff tend to scour stream banks and beds, resulting in limited floodplain development. The current slackens in Grand Portage Creek as it approaches Lake Superior, leading to a small floodplain within the Village area of Grand Portage. Floodplain management in relation to fire activities is not an issue for the Monument.

Snow Creek is controlled by an extensive series of beaver dams from the trail boardwalk (5.5 miles from Lake Superior) almost to its confluence with the Pigeon River. The floodplain for this stream consists of a complex series of open water impoundments intermingled with marshy areas. Only a limited portion of this wetland complex is within Monument property, at the boardwalk and within the Fort. Charlotte area.

3.1.4. Air Quality

Grand Portage National Monument is a Class II air quality area; however, it is geographically positioned among several federally-designated Class I

areas, specifically Voyageurs National Park, the Boundary Waters Canoe Area Wilderness, and Isle Royale National Park. The pollutants most responsible for haze are ozone, organic carbon and elemental carbon. These compounds are generated by vehicle exhaust and pulp mills, among other industrial sources. Smoke from burning vegetation also contains these pollutants or has components from which they are derived. Therefore, prescribed fires are one of four emission sources regulated under the EPA's regional haze program.

3.1.5. Vegetation

Regional maps estimating pre-settlement and early settlement conditions suggest the current forests in the Grand Portage area are similar, in many respects, to the original vegetation (Heinselman 1974, USFS 2001a). Primary tree species in the mixed hardwood-conifer forests that dominate the Lower Portage are aspen (*Populus tremuloides*, a few *P. balsamifera*), birch (*Betula papyriferea*, *B. cordifolia*), balsam fir (*Abies balsamea*) and spruce (*Picea glauca*, a few *P. mariana*). White and red pine (*Pinus strobus*, *P. resinosa*) occur as scattered groups of large trees, and are more prevalent along the Upper Portage and at Fort Charlotte. Jack pine (*P. banksiana*) is limited to small stands on rock outcroppings along the Upper Portage, near MN Hwy 61, and atop Mount Rose. Northern white cedar (*Thuja occidentalis*) occurs on wet soils along streams and in water-retaining depressions on upland sites. Wet soils along stream margins support alders (*Alnus incana*, *A. viridis*), willows (*Salix* species) and a few ash (*Fraxinus nigra*). Shrubby and herbaceous understory plants are typical of northern forests, with a clear affiliation to boreal communities.

3.1.6. Wildlife and Fisheries

Twenty-six species of native mammals are currently known in the Monument, although several more species were present historically, such as caribou and wolverine. A 1995 study concluded the small mammal fauna of the area is characteristic of the northern mixed forest environment, and includes fisher, pine marten and snowshoe hare (Graetz *et al.* 1995). The most common species are red-backed voles, deer mice and red squirrels. The physical limitations of the 600-foot-wide Grand Portage corridor result in frequent, but not exclusive, use of Monument lands by the larger animals. Ample tracks, scats and foraging signs provide clear evidence that moose, gray wolves and black bear are common.

The few amphibian and reptile species that occur within the Monument are typical of the boreal forest habitat. Garter snakes are found throughout the property, as well as abundant wood frogs and American toads. Blue-

spotted and red-backed salamanders are limited to suitable upland sites within property, and chorus, mink, green, and leopard frogs are found in the few wetland areas.

The mixed hardwood-conifer forest that forms an almost unbroken band along the Grand Portage corridor provides bird nesting habitat that is becoming increasingly rare. Many neotropical migrant species require large patches of unbroken forest for nesting success. A nesting bird survey begun in 1997 indicates a large number of warbler species use this area. The most prevalent species are the northern parula warbler, ovenbird, and Nashville warbler. Some habitat diversity and associated differences in nesting species is found in the maintained landscape in the lakeshore unit, openings and grassy areas on Mount Rose and around the beaver pond (Graetz *et al*. 1995).

Although the aquatic resources of the Monument are limited, there are a few distinct habitats for fish species. Wetlands associated with Snow Creek host a variety of small, non-game fishes adapted for standing or slow moving waters. The moderate flow of Poplar Creek, in the mid part of the trail corridor, has additional species of common non-game fish. Grand Portage Creek is important throughout its length for coaster brook trout reintroduction efforts by the Grand Portage Band Trust Lands and Resources. The final reach which flows through the Monument lakeshore area and enters Lake Superior adjacent to the reconstructed stockade is prime spawning habitat. Band management includes regulating flow into this stream from upstream lakes to maintain cool water temperatures during summer months to enhance suitable spawning conditions. Adverse fire effects that would impact coaster reproduction include removal of canopy cover allowing stream temperatures to rise, and sedimentation obliterating spawning beds during critical periods.

3.1.7. Threatened and Endangered Species, and Species of Special Concern

Grand Portage National Monument is within the range of three species designated as threatened under the Endangered Species Act (ESA)(1973, as amended), the bald eagle, the gray wolf, and the Canada lynx. Two additional vertebrate species which may occur within the Monument are listed as species of special concern by the Minnesota Department of Natural Resources (MnDNR), the mountain lion and the least weasel. Home range requirements of these carnivores preclude the exclusive use of the Monument in supporting viable populations of these species. The least weasel is a possible exception to this, but this species has not been confirmed as occurring in the Monument. Bald eagle and gray wolf

populations have increased sufficiently that delisting is being considered. The recently listed lynx may occur sporadically along the Minnesota-Canadian border in response to high prey populations and/or severe winters (Hazard 1982). Several reports, including a sighting within the Monument, in 2002 confirm that lynx infrequently occur in Cook County (MnDNR, personal communication). Based on current knowledge of habits and habitat requirements, no restriction on fire management activities to protect any of the threatened vertebrate species is necessary.

Thirteen vascular plant species reported in the Monument are classified as threatened or of special concern by the MnDNR (1999)(Table 1). A species is considered of special concern if it is extremely uncommon in Minnesota, or has unique or highly specific habitat requirements. Species on the periphery of their range that are not listed as threatened may be categorized as special concern to indicate the need for monitoring. Most of these species occur as localized populations on Mount Rose in the lakeshore unit, with only three found along the Grand Portage corridor. For all but two of these species, location and population size has been recorded with a global positioning system (GPS) and mapped to the Arc/View™ geographic information system (GIS) coverages maintained by the resource division of the Monument. Site-specific restrictions and appropriate fire management response for each plant population needs to be developed and linked to GIS maps for use during fire management planning and activities.

Table 1: Vascular Plants Present in Grand Portage National Monument and Considered Threatened or of Special Concern by the Minnesota Department of Natural Resources

Scientific name	Common name	Status
Adoxa moschatellina	Moschatel	SC
Allium schoenoprasum var sibiricum	Wild chives	Thr
Botrychium simplex	Least moonwort	SC
Botrychium lunaria	Common moonwort	Thr
Crataegus douglasii	Black hawthorn	Thr
Deschampsia flexuosa	Wavy hairgrass	SC
Draba arabisans	Rock whitlow-grass	SC
Juniperus horizontalis	Creeping juniper	SC
Osmorhiza depauperata	Blunt-fruited sweet cicely	SC
Salix pellita	Satiny willow	SC
Stellaria longipes	Long-stalked chickweed	SC
Woodsia glabella	Smooth woodsia	Thr
Woodsia scopulina	Rocky Mountain woodsia	Thr

3.2. Cultural Resources

The Grand Portage National Monument is listed, in its entirety, on the National Register of Historic Places due to its association with events that made a significant contribution to broad patterns of our history (NPS 1975). Several types of cultural resources occur within Grand Portage National Monument: archeological resources, cultural landscapes and ethnographic resources. Each type has varying degrees of vulnerable to wildland fire and fire fighting activities.

3.2.1. Archeological Resources

Certain important research questions about human history can only be answered by the actual physical material of cultural resources. Archeological resources have the potential to answer, in whole or in part, such research questions. Protecting archeological resource means not only preserving objects directly, but also maintaining integrity of location, setting, feeling, and association.

Within Monument boundaries there are several nationally significant sites containing unique historical values. These include the North West Company stockade (or depot) area on Grand Portage Bay, the 8½ mile (13.6 kilometers) Grand Portage, and the North West Company's Fort Charlotte and adjacent XY Company fort on the Pigeon River.

Archeological excavations were performed at Grand Portage during the 1930s by the Indian Division of the Civilian Conservation Corps and Minnesota Historical Society (MHS)(Woolworth 1993). These investigations were instrumental in documenting the historic significance of the Grand Portage and associated sites, leading to designation of the area as a national historic site in 1951. Following designation as a national monument in 1958, further excavations were conducted in the 1960s by the National Park Service and MHS. Most of the rigorously studied areas are within the lakeshore unit: the stockade and building sites west of Grand Portage Creek, picnic grounds, military road and a portion of the former village site east of the creek. These areas, and additional unexcavated sites of the early 20th Century village area, lie within the lakeshore unit where fire response actions taken to protect life and property may adversely affect future archeological study.

Intensive archeological studies were completed at Fort Charlotte in the early 1970s, but these were restricted to submerged resources in the Pigeon River. Only non-invasive methods were used within terrestrial sites, preserving the in-ground materials for analysis by improved methods in the future. Risks to the cultural resources at Fort Charlotte arise from

several aspects of wildland fire management planning and implementation. An early description of Fort Charlotte indicates the area was free of trees during the fur trade era (historic journal notes, in Woolworth 1993). Photographs from the early to mid-20th Century suggest this condition was maintained by logging and forest fires. Suppression of wildland fires during the last 80 years permitted the growth of spruce, balsam fir and aspen over much of the site. Growth of roots through the soil potentially disrupts the relationship of in-ground archeological objects. This risk of information loss increases when trees are uprooted by winds or when dead trees fall. Currently, many spruce and balsam in the Fort Charlotte area are dead or declining due to past spruce budworm infestation. The resulting high fuel load increases the potential for uncontrolled wildland fires. Smoldering surface debris and root burn-out associated with uncontrolled fires present further threats to in-ground archeological resources.

The Grand Portage corridor between the lakeshore depot and Fort Charlotte is only partially surveyed for archeological resources. Work continues to identify significant features and '*pose*' (resting) sites used along the historic route during the fur-trade era.

3.2.2. Cultural Landscapes

Cultural landscapes are the result of long interaction between people and the land, the influence of human beliefs and actions over time upon the natural landscape. Shaped through time by historical land-use and management practices, as well as politics and property laws, levels of technology, and economic conditions, cultural landscapes provide a living record of an area's past, a visual chronicle of its history. The dynamic nature of modern human life contributes to the continual reshaping of cultural landscapes, making them a good source of information about specific times and places, but rendering their long-term preservation a challenge. Preserving a cultural landscape means retaining the integrity of patterns and features (spatial organization and land forms, topography, vegetation, circulation networks, water features, and structures, site furnishings or objects) necessary to convey its significance.

Landscapes modified through human use exist throughout Monument property. The mixed hardwood-conifer forests of the trail corridor and Fort Charlotte areas have been affected by logging during the 19th and 20th Centuries, and the suppression of fire for the last 80 years. In the lakeshore area of the Monument, grassy areas correspond to the early 20th Century village and are interspersed with CCC-era conifer plantations.

3.2.3. Ethnographic Resources

Certain important questions about human culture and history can only be answered by gathering information about the cultural content and context of cultural resources. Questions about contemporary peoples or groups, their identity, and heritage have the potential to be addressed through ethnographic resources. As defined by the National Park Service, an ethnographic resource is a site, structure, object, landscape, or natural resource feature assigned traditional, legendary, religious, subsistence, or other significance in the cultural system of a group traditionally associated with it.

Several plant species with apparent ethnographic significance are located in the Monument. Grassy areas in the lakeshore area contain several herbaceous species used in cultural practices by the local community. A stand of ancient cedars along the western portion of the trail corridor bear evidence of past human use, and may be associated with the local culture.

3.3. Social and Economic Environment

3.3.1. Human Health and Safety

The smoke, heat and flames from forest fires can threaten human lives and health, both of the public at large and firefighters in particular. Employees responsible for any wildland fire management action are advised to never subordinate human lives to other values. Ensuring visitor safety is the highest priority during all fire suppression and monitoring activities. When human life is endangered, all necessary means will be used to warn or evacuate visitors. Visitor access and use will be limited or prevented near wildland fires or potentially affected areas. Qualified personnel will patrol active fires to inform visitors and Reservation residents about the role of fire in a natural area, explain the risks associated with approaching a fire, and enforce visitor compliance with area closure orders.

3.3.2. Public Services

The Grand Portage Reservation Tribal Council provides most services to the Reservation, including wildland and structural fire fighting and emergency medical transport services. Cook County provides law enforcement, and search and rescue services. Agreements among the NPS, Grand Portage Tribal Council, Ontario Ministry of Natural Resources, MnDNR, and U.S. Forest Service provide for rapid mutual aid response to wildland fires.

3.4. Visitor Use and Experience

Annual visitation at Grand Portage National Monument is over 90,000, with most use focused around the reconstructed stockade and buildings as visits lasting a few minutes to several hours. The reconstructed depot area is staffed with costumed interpreters from around Memorial Day through early- to mid-October, and closed to public use for most of the remaining year. More than 60 percent of the annual visits occurs in July and August, including 2,000 to 4,000 visitors attending the annual Rendezvous held the second weekend in August. During the summer season, the Monument provides information, pre-visit orientation and parking for approximately 2,600 visitors departing for Isle Royale. In general, weekends have a slightly greater visitation rate than weekdays, with Fridays usually the slowest days.

The Grand Portage corridor and Fort Charlotte area are open for public use during daylight hours throughout the year. Authorized uses of the trail corridor include hiking, snow-shoeing, cross-country skiing, and dog-sledding, with group camping permitted within designated sites at Fort Charlotte. These areas are accessible for recreational use from several trail crossings within the Village of Grand Portage, four state, county and reservation road crossings, and by water along the Pigeon River. Registered use of the backcountry trail areas averages 300 persons per year, but this is considered a low estimate of actual use. During summer months, canoeists exiting the Boundary Waters Canoe Area Wilderness (BWCAW) use the trail as a portage to Lake Superior, as individuals or groups of up to 50.

4. ENVIRONMENTAL CONSEQUENCES (IMPACTS)

This section presents the potential environmental effects or consequences of implementing each of the fire management programs described in Section 2 of this EA for Grand Portage National Monument. It also presents the scientific and analytic basis for the comparisons of the alternatives. Analysis of impacts is based on the predicted ability of the alternatives to achieve the desired wildland fire management goals of the Monument. Each of the impact topics whose affected environment was described in Chapter 3 is addressed in this section.

4.1. Definitions

Potential impacts are described in terms of type, context, duration and intensity. For all impact topics analyzed in this EA, the following definitions for type, context and duration apply:

Type

Beneficial: A positive change in the condition or appearance of the resource or a change that moves the resource toward a desired condition.

Adverse: A change that moves the resource away from a desired condition or detracts from its appearance or condition.

Direct: An effect that is caused by a wildland or prescribed fire and occurs in the same time and place.

Indirect: An effect that is caused by actions to suppress, contain, or otherwise control fires. Also effects caused by wildland or prescribed fires or control actions that are later in time or removed in distance, but are still reasonably foreseeable.

Context

Context refers to the scale over which an impact is expressed. Because Grand Portage National Monument is located within the Grand Portage Band Reservation, context is defined as follows for this document:

Localized: Impact would affect the resource only at site of the fire, management action or suppression activity, or its immediate surroundings, and would not extend into the park at large, or the region outside the park.

Regional: Impact would affect the resource on a Reservation level, extending well past the immediate location of the fire, management action or suppression activity, and spreading into substantial portions of the park or areas beyond its boundary.

Duration

Duration refers to the time period over which an impact persists. For impact topics evaluated in this document, duration is defined as:

> *Temporary*: Impact would only occur simultaneous with the fire, management action or suppression activity; once the fire, action, or activity has ended, resource conditions are likely to return to pre-activity conditions.
>
> *Short-term*: An effect that within a short period of time following the fire or action would no longer be detectable as the resource is returned to its pre-activity condition or appearance, generally less than 5 years.
>
> *Long-term*: A change in a resource or its condition that does not return the resource to pre-activity condition or appearance, and for all practical purposes is considered permanent.

Intensity

Because definitions of intensity vary by impact topic, intensity definitions are provided separately for each impact topic analyzed in this EA (Table 2).

4.1.1. Impairment of Park Resources

National Park Service's *Management Policies, 2001* (2000) require analysis of potential impacts to determine whether or not actions would impair park resources. The fundamental purpose of the national park system, established by the Organic Act and reaffirmed by the General Authorities Act, as amended, begins with a mandate to conserve park resources and values. Although Congress has given National Park Service management the discretion to allow certain impacts within a park, that discretion is limited by the statutory requirement that the National Park Service must leave park resources and values unimpaired, unless a particular law directly and specifically provides otherwise. The prohibited impairment is an impact that, in the professional judgment of the responsible National Park Service manager, would harm the integrity of park resources or values. An impact to a Monument resource or value is most likely to constitute an impairment if it has a major or severe adverse effect upon a resource or value whose conservation is:

- necessary to fulfill specific purposes identified in the establishing legislation of the Monument;
- key to the cultural or natural integrity of the Monument; or
- identified as a goal in the Monument general management plan or resource management plan.

Table 2: Impact Threshold Definitions for Impact Topics Analyzed in the Grand Portage National Monument Wildland Fire Management Plan Environmental Assessment

Impact Topic	Negligible	Minor	Moderate	Major
Natural Resources				
Geological resources and soils	Resources would not be affected or the effects would be below or at the lower levels of detection.	Effects to resources would be detectable, but affecting a small area, or to a small degree. Mitigation to offset adverse effects would be relatively simple to implement and would likely be successful.	Effect on resources would be readily apparent, likely long-term, and result in a change to the resource character over a relatively wide area. Mitigation measures would probably be necessary to offset adverse effects and would likely be successful.	Effect on resources would be readily apparent, long-term, and substantially change the character of the resources over a large area in and out of the Monument. Mitigation measures to offset adverse effects would be needed, extensive, and their success could not be guaranteed.
Water quality	Chemical or physical changes to water quality would not be detectable, and would be within baseline water quality conditions.	Chemical or physical changes to water quality would be detectable, but would be within baseline water quality conditions.	Chemical or physical changes to water quality would be detectable but would be at or below water quality standards or criteria. Water quality would be altered on a short-term basis compared to historical baseline water quality conditions.	Chemical or physical changes to water quality would be detectable and frequently altered from baseline water quality conditions. Or chemical, physical, or biological water quality standards or criteria would be locally slightly and singularly exceeded on a short-term and temporary basis.
Floodplains and wetlands	Wetlands and floodplains would not be affected or the effects to the resource would be below or at the lower levels of detection. No long-term effects to wetlands or floodplains would occur and any detectable effects would be slight.	Effects to wetlands or floodplains would be detectable and relatively small in terms of area and the nature of the change. No long-term effects to wetlands or floodplains would occur.	Effects to wetlands or floodplains would be readily apparent, including a long-term effect on wetland vegetation. Wetland or floodplain functions would not be affected in the long-term.	Effects to wetlands or floodplains would be observable over a relatively large area and would be long-term. The character of the wetland or floodplain would be changed so that the functions typically provided by the wetland or floodplain would be substantially changed.
Air quality	No changes would occur or changes in air quality would be below or at the level of detection, and if detected, would have effects that would be considered slight and short-term.	Changes in air quality would be measurable, although the changes would be small, short-term, and the effects would be localized. No air quality mitigation measures would be necessary.	Changes in air quality would be measurable, would have consequences, although the effect would be relatively local. Air quality mitigation measures would be necessary and the measures would likely be successful.	Changes in air quality would be measurable, would have substantial consequences, and be noticed regionally. Air quality mitigation measures would be necessary and the success of the measures could not be guaranteed.

Impact Topic	Negligible	Minor	Moderate	Major
Vegetation	No native vegetation would be affected or some individual native plants could be affected as a result of the alternative, but there would be no effect on native species populations. The effects would be short-term and on a small scale.	Some individual native plants would be affected, but it would be a relatively minor portion of that species' population. Mitigation to offset adverse effects could be required and would be effective.	Some individual native plants would be affected and it would be a sizeable segment of the species' population, or the effects would be long-term and over a relatively large area. Mitigation to offset adverse effects could be extensive, but would likely be successful.	Effects on native plant populations would be long-term and affect a relatively large area in and out of the Monument. Mitigation measures to offset the adverse effects would be required, extensive, and success of the mitigation measures would not be guaranteed.
Wildlife and fisheries	No observable or measurable effects on native fish and wildlife species, their habitats, or the natural processes sustaining them. Impacts would be of short duration and well within the range of natural fluctuations.	Effects would be detectable, but would be within the natural range of variability and would have short-term effects on native species and their habitats. Population numbers, structure, genetic variability, and other factors may have small, short-term changes. Occasional responses to disturbance by some individuals could be expected, but without interference to feeding, reproduction, or other factors affecting population levels. Key ecosystem processes may have short-term disruptions that would be within natural variation. Sufficient habitat would remain functional to maintain viability of all species. Impacts would be outside of critical reproduction periods for sensitive species.	Animals are present during vulnerable life-stages; mortality or interference with activities necessary for survival can be expected occasionally, but is not expected to threaten existence of a species. Effects on native fish and wildlife, their habitats, or natural processes sustaining them would be detectable and may be outside the natural range of variability for short periods of time. Population numbers, structure, genetic variability, and other factors may have short-term changes, but would be expected to rebound and remain stable and viable in the long-term. Frequent response to disturbance by some individuals could be expected, with some negative impacts to feeding, reproduction, or other factors affecting short-term population levels. Sufficient habitat would remain functional to maintain variability of all native fish and wildlife species.	Effects to native species, their habitats, or the natural processes sustaining them would be detectable, and could be outside the natural range of variability for long periods of time or permanently. Population numbers, structure, genetic variability, and other factors might have large, short-term declines with long-term population numbers significantly depressed. Frequent responses to disturbance by some individuals would be expected, with negative impacts to feeding, reproduction, or other factors resulting in a long-term decrease in population levels. Key ecosystem processes might be disrupted in the long-term or permanently. Loss of habitat may affect the viability of at least some native species.

Impact Topic	Negligible	Minor	Moderate	Major
Threatened species and species of concern	There would be no effects on any individuals of a sensitive species or their habitat within the Monument.	Effects to a few individuals of sensitive species or very localized effects on their habitat within the Monument. The change would require considerable scientific effort to measure and have barely perceivable consequences to the species or habitat function.	Measurable effects on a relatively moderate number of individuals in a sensitive species population, or a relatively large habitat area or important habitat attributes within the Monument. A sensitive species population or habitat might deviate from normal levels under existing conditions, but would remain indefinitely viable.	Drastic and permanent consequences for a sensitive species population, or on almost all available critical or unique habitat area within the Monument. A sensitive species population or its habitat would be permanently altered from normal levels under existing conditions, and the species would be at risk of extirpation from the Monument.
Cultural Resources				
Archeological resources	Impacts are at the lowest levels of detection with neither adverse nor beneficial consequences. The determination of effect for §106 would be no adverse effect.	**Adverse:** disturbance of sites results in little, if any, loss of integrity. The determination of effect for §106 would be no adverse effect. **Beneficial:** maintenance and preservation of sites. The determination of effect for §106 would be no adverse effect.	**Adverse:** disturbance of sites results in loss of integrity. The determination of effect for §106 would be adverse effect. Measures identified to minimize or mitigate adverse impacts reduce the intensity of impact under NEPA from major to moderate. **Beneficial:** stabilization of a sites. The determination of effect for §106 would be no adverse effect.	**Adverse:** disturbance of sites results in loss of integrity. The determination of effect for §106 would be adverse effect. Measures to minimize or mitigate adverse impacts cannot be identified. **Beneficial:** active intervention to preserve sites. The determination of effect for §106 would be no adverse effect.
Cultural landscapes	Impacts are at the lowest levels of detection with neither adverse nor beneficial consequences. The determination of effect for §106 would be no adverse effect.	**Adverse:** alteration of patterns or features of the landscape would not diminish the overall integrity of the landscape. The determination of effect for §106 would be no adverse effect. **Beneficial:** preservation of landscape patterns and features in accordance with the Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes. The	**Adverse:** alteration of patterns or features of the landscape would diminish the overall integrity of the landscape. The determination of effect for §106 would be adverse effect. Measures identified to minimize or mitigate adverse impacts reduce the intensity of impact under NEPA from major to moderate. **Beneficial:** rehabilitation of a landscape or its patterns and features in accordance with the Standards for the Treatment of	**Adverse:** alteration of patterns or features of the landscape would diminish the overall integrity of the landscape. The determination of effect for §106 would be adverse effect. Measures to minimize or mitigate adverse impacts cannot be identified. **Beneficial:** restoration of a landscape or its patterns and features in accordance with the Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes. The determination of effect for §106 would be no adverse effect.

Impact Topic	Negligible	Minor	Moderate	Major
		determination of effect for §106 would be no adverse effect.	Historic Properties with Guidelines for the Treatment of Cultural Landscapes. The determination of effect for §106 would be no adverse effect.	
Ethnographic resources	Impacts would be barely perceivable and would neither alter resource conditions, such as access or site preservation, nor the relationship between the resource and the affiliated group's practices. The determination of effect for §106 would be no adverse effect.	**Adverse:** impacts would be slight but noticeable, and would not appreciably alter resource conditions, such as access or site preservation. The determination of effect for §106 would be no adverse effect. **Beneficial:** would allow access to and/or accommodate a group's practices. The determination of effect for §106 would be no adverse effect.	**Adverse:** impacts would be apparent and would alter resource conditions. Something would interfere with access or site preservation, although the affiliated group's practices would survive. The determination of effect for §106 would be adverse effect. **Beneficial:** would facilitate access or preserve the site. The determination of effect for §106 would be no adverse effect.	**Adverse:** impacts would alter resource conditions. Something would block or greatly affect access, site preservation, or the relationship between the resource and the affiliated group's practices to the extent that the survival of a group's practices would be jeopardized. The determination of effect for §106 would be adverse effect. **Beneficial:** would encourage traditional access or accommodate a group's practices. The determination of effect for §106 would be no adverse effect.
Social and economic environment				
Public health and safety	Public health and safety would not be affected, or the effects would be at low levels of detection and would not have an appreciable effect on public health or safety.	The effect would be detectable and would likely be short-term, and would not have an appreciable effect on public health and safety. If mitigation were needed, it would be relatively simple and would likely be successful.	The effects would be readily apparent and long-term, and would result in substantial, noticeable effects to public health and safety on a local scale. Mitigation measures would probably be necessary and would likely be successful.	The effects would be readily apparent and long-term, and would result in substantial, noticeable effects to public health and safety on a regional scale. Extensive mitigation measures would be needed, and their success would not be guaranteed.
Public Services	Public services would not be affected, or the effects would be at low levels of detection. There would be no appreciable effect on public access to services.	The effect would be detectable and would likely be short-term, but would not have an appreciable effect on public access to services. If mitigation were needed, it would be relatively simple and would likely be successful.	The effects would be readily apparent and long-term, and would result in substantial, noticeable effects to public access to services on a local scale. Mitigation measures would probably be necessary and would likely be successful.	The effects would be readily apparent and long-term, and would result in substantial, noticeable effects to public access to services on a regional scale. Extensive mitigation measures would be needed, and their success would not be guaranteed.

Impact Topic	Negligible	Minor	Moderate	Major
Visitor use and experience	Impacts would be below or near the level of detection. Visitors would likely not be aware of wildland or prescribed fires in the Monument.	Impacts would be detectable or distant from primary visitor use areas. Visitors would likely be aware of wildland or prescribed fires in the Monument. However, changes in visitor use and experience would be slight and likely short-term.	Impacts would be apparent and may limit access to affected visitor use areas. Visitors would be aware of the effects associated with wildland or prescribed fires in the Monument. Other areas would remain available for visitor experience and use, but visitor satisfaction may be measurably affected either positively or negatively.	Impacts would be apparent and would limit access to affected visitor use area on a long-term basis. Visitors would be highly aware of the effects associated with wildland or prescribed fires in the Monument. Changes in visitor use and experience would be readily apparent and long-term.

Impairment may result from Monument activities for managing the park, visitor activities, or activities undertaken by others operating in the park. A determination on impairment is made for the all impact topics in the following sections:

4.1.2. Cumulative Impacts

The Council on Environmental Quality (CEQ) regulations, which implement NEPA, require assessment of cumulative impacts in the decision-making process for federal actions. Cumulative impacts are defined as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions" (40 CFR 1508.7). Cumulative impacts are considered for both the no-action and preferred alternative.

For this analysis, it was necessary to identify other ongoing or reasonably foreseeable future projects at Grand Portage National Monument and within the Grand Portage Reservation. There are two primary areas in which future projects will contribute to the cumulative impact associated with implementing the preferred alternative: the general forestry area of the Reservation and the Village of Grand Portage. These areas are delineated, in a general way, by MN Hwy 61. Lands north and west of the highway are the primary forestry production area of the Reservation and the “back country” portion of the Monument. The residential and commercial areas of the Village lie to the east of the highway on the shore of Lake Superior.

Considerable development in and around the Village of Grand Portage is planned by both the Monument and the Reservation Tribal Council. A new tribal government office building, which is adjacent to the reconstructed depot site of the Monument was completed in 2004. A “gateway” complex is under construction about one-half mile west of the depot site, which will include a convenience store, post office and additional retail shops. Between these two developments, and within Monument property, the Monument will be constructing a Heritage Center in the next few years. Maintenance facilities for the Monument will be removed to Reservation lands in the future. All these projects are within a wildland-urban interface (WUI) zone for wildland fire management planning. As a result, the cumulative effects of this development is considered for all the impact topics analyzed in this EA.

Silviculture practices used by the Grand Portage Band forestry section contribute to the cumulative effects of implementing the preferred

alternative. Currently, the GP-Band makes limited use of fire in site preparation, for fuel reduction, or slash removal. These practices may change in the future to make wider use of prescribed fires and naturally occurring wildland fires. This possibility was considered in analyzing the cumulative effects for the impact topics.

4.1.3. Impacts to Cultural Resources and Section106 of the National Historic Preservation Act

In addition to analyzing potential impacts consistent with CEQ regulations, this assessment also complies with requirements of Section106 of the National Historic Preservation Act (NHPA). This constitutes an assessment of effect in accordance with Advisory Council on Historic Preservation regulations implementing Section 106 of NHPA (36 CFR Part 800, Protection of Historic Properties). Impacts to cultural resources were identified and evaluated by:

- Determining the area of potential effects.
- Identifying cultural resources present in the area of potential effects that are listed in the National Register of Historic Places.
- Applying the criteria of adverse effect to affected cultural resources listed in the National Register.
- Considering ways to avoid, minimize or mitigate adverse effects.

Under Advisory Council regulations a determination of either adverse effect or no adverse effect must be made for affected National Register eligible cultural resources. An adverse effect occurs whenever an impact alters, directly or indirectly, any characteristic of a cultural resource that qualify it for inclusion in the National Register, e.g. diminishing the integrity of the resource's location, setting, feeling, or association. Adverse effects also include reasonably foreseeable effects caused by the preferred alternative that would occur later in time, be farther removed in distance or be cumulative (36 CFR Part 800.5, Assessment of Adverse Effects). A determination of no adverse effect means there is an effect, but the effect would not diminish in any way the characteristics of the cultural resource that qualify it for inclusion in the National Register.

Council on Environmental Quality regulations and NPS Director's Order 12 call for a discussion of appropriate mitigation, and an analysis of how effective the mitigation would be in reducing the intensity of a potential impact, e.g. reducing the intensity of an impact from major to moderate or minor. Any reduction in intensity of impact due to mitigation is an estimate of the effectiveness of mitigation under NEPA only. It does not

suggest that the level of effect as defined by Section106 is similarly reduced. Although adverse effects under Section106 may be mitigated, the effect remains adverse.

A Section106 summary is included in the impact analysis sections for archeological resources, cultural landscapes, and ethnographic resources under the preferred alternative. The Section106 summary is an assessment of the effect of the undertaking (implementation of the alternative) on National Register listed cultural resources only, based upon the criterion of effect and criteria of adverse effect found in the Advisory Council's regulations.

4.2. Natural Resources

4.2.1. Geology and Soils

Information for analysis of impacts on geological resources and soils is based on a preliminary bedrock survey of the Monument conducted by the USGS, available soils information and a fire history of the Monument (USGS 2002, SCS 1973, White and Host 2003).

There are a few scattered bedrock outcroppings along the trail and at Fort Charlotte. Mount Rose is a small bluff with steep scree slopes facing Lake Superior in the lakeshore area of the Monument. These features are neither an impediment to fire fighting activities, nor likely to be disrupted by fire suppression actions.

Low intensity surface fires would have little measurable impact on soils in the park. Severe fires may burn into organic soils and sterilize soil by killing microbes and invertebrate organisms that break down plant litter. Certain soil nutrients are volatilized by fire or lost in small smoke particles. Removal of above-ground vegetation can contribute to increased runoff, which may remove soil particles and leach soluble nutrients, primarily nitrogen but also potassium, magnesium and calcium. Thin or disturbed soils on slopes are more vulnerable to runoff, so damage to soils and vegetation on these sites is longer-lasting. Suppression activities can cause ground disturbance that may increases erosion. Use of heavy equipment can lead to soil compaction. The use of fire retardant or foam would not be expected to result in measurable soil contamination. Fertilizers are an ingredient of fire retardant chemicals; their application is comparable to a light application of nitrogen (Hamilton *et al*. 1998). The addition of ash to the soil generally increases the availability of nutrients.

Alternative 1 – No Action (Continue Suppression and Apply Non-fire Treatments)

Alternative 1 would have a negligible impact on the park's geologic features and values. Existing bedrock exposures are unlikely to be altered by fire management actions. Scree slopes have limited vegetation and little fuel accumulation. Fire management activities may move surface rocks, but not perceivably alter or degrade these features.

Alternative 1 would likely have short-term, localized, negligible to minor impacts on soils in the park.

A limited amount of soil disturbance would be associated with wildland fires because they occur rarely in the Monument. Fire suppression techniques incorporating the use of Minimum Impact Suppression Tactics (MIST), as described in Section 2.5, would be used to further reduce disturbance of soils. In particular, the use of wheeled or motorized vehicles off designated roads would require the approval of the Superintendent.

Fire intensity would determine the effect on soil organic matter and nutrients. In the absence of fuel reduction through mechanical means or prescribed fire, the possibility of an intense wildland fire is greater. This might produce localized minor impacts to soils, but which are within the natural range of variation for the area. A forest history of the Monument indicates that fire occurrence was a common component of the ecosystem (White and Host 2003).

The use of prescribed fire would not have an impact on soils, because no prescribed fires would be planned under this alternative.

Non-fire treatments would not be expected to have an impact on soils. Project areas would be small relative to the size of the Monument, and treatments would be carefully planned to minimize adverse impacts using the mitigation measures described in Section 2.5.

Conclusions – Impacts from implementation of Alternative 1 would be within the range of natural variability for geological resources and soils in Grand Portage National Monument and not constitute an impairment of those resources. Increased use of fire in silviculture practices by the GP-Band forestry would not contribute to cumulative effects on geological resources and soils. Such possible actions would simulate the natural variability in the fire-adapted ecosystem of the region.

Alternative 2 – Preferred Alternative (Full Suppression, Apply Non-fire Treatments and Prescribed Fire, and Collaborate with Grand Portage Band Fire Management Activities)

Alternative 2 would have a negligible impact on the park's geologic features and values. Existing bedrock exposures are unlikely to be altered by fire management actions. Scree slopes have limited vegetation and little fuel accumulation. Fire management activities may move surface rocks, but not perceivably alter or degrade these features.

Alternative 2 would likely have short-term, localized, negligible to minor impacts on soils in the park.

Over the life of the FMP Alternative 2 would lead to a very limited amount of soil disturbance because wildland fires occur only rarely at the Monument. Fire suppression techniques incorporating the use of Minimum Impact Suppression Tactics (MIST), as described in Section 2.5, would be used to further reduce disturbance of soils. In particular, the use of wheeled or motorized vehicles off designated roads would require the approval of the Superintendent.

The use of prescribed fire in the meadow area of WUI-FMU would not be expected to have an impact on soils. Root development in grasslands generally provide resistance to soil erosion. The prescription will specify a low-intensity fire for the light surface fuels present on this site. It is a small area in relation to the Monument as a whole.

Unlike Alternative 1, collaboration with Grand Portage Band prescribed or wildland fire use fires could treat larger areas of the Monument. Prescribed fires must be carefully planned to minimize adverse impacts by using mitigation measures described in Section 2.5. Wildland fire use fires would be approved only when resource impacts are expected to be acceptable and holding actions would incorporate the mitigation measures described for suppression actions. In many cases it is possible to accomplish the same level of pre-planning and mitigation for wildland fire use fires as for prescribed fires. Prescribed fire and wildland fire use might result in beneficial effects of fire, such as nutrient cycling.

Non-fire treatments would be expected to have only a minor impact on soils. Slightly greater impacts from Alternative 2 than from Alternative 1 may result from larger treatment areas in relation to the size of the Monument through collaboration with the Grand Portage Band. Treatments would still be carefully planned to minimize adverse impacts using the mitigation measures described in Section 2.5.

Conclusions – Impacts from implementation of Alternative 2 would be within the range of natural variability for geological resources and soils in Grand Portage National Monument and not constitute an impairment of those resources. Increased use of fire in silviculture practices by GP-Band forestry would not contribute to adverse cumulative effects on geological resources and soils. Such possible actions would simulate the natural variability in the fire-adapted ecosystem of the region. The ability to plan prescribed fires would reduce impacts, such as soil degradation or disappearance over the short or long term.

4.2.2. Water Resources

Information for analysis of impacts on water resources is based on baseline water quality information for the Monument (GRPO 2002). The principal fire-related impacts to water quality stem from the influx of wind-blown or eroded materials, deposition of organic material from ash, and the toxic effects of fire retardant or foam.

Wildland fires could have a detrimental impact on the lower order streams, such as occur in the Monument, through increased deposition of eroded materials. Increased soil erosion can result from loss of vegetative cover during a fire as well as from ground crews engaged in suppression activities. These could lead to turbidity and sedimentation of surface water resources. This is of particular concern for Grand Portage Creek where reintroduced coaster brook trout spawn. Application of MIST and other mitigation measures described in Section 2.5 would minimize these impacts.

The use of fire retardant or foam could potentially cause significant temporary to short-term impacts to water quality and aquatic life if misapplied or mishandled (USDA 2000). Retardant contains ammonia and phosphate or sulfate ions, which can change the chemistry of a water body, thus making it temporarily lethal to fish and other aquatic organisms; the principal toxic component of retardant chemicals in aquatic systems is ammonia (Adams and Simmons 1999). Foam contains detergents that can interfere with the ability of fish gills to absorb oxygen. The degree of impact would depend on the volume of retardant or 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 would 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). The detailed mitigation measures described in Section 2.5 would minimize these impacts.

Alternative 1 – No Action (Continue Suppression and Apply Non-fire Treatments)

Alternative 1 would likely have short-term, localized, negligible to minor impacts on water resources in the park.

Over the life of the FMP, Alternative 1 would have negligible to minor impacts on water resources in the Monument because wildland fires occur only rarely. Fire suppression techniques incorporating the mitigation measures described in Section 2.5 would be used to minimize impacts to water resources.

The use of prescribed fire would not have an impact on water resources because no prescribed fires would be planned under this alternative.

Non-fire treatments would not be expected to have an impact on water resources, because project areas would be small relative to the size of the Monument and because treatments would be carefully planned to minimize adverse impacts using the mitigation measures described in Section 2.5.

Conclusions – Impacts from implementation of Alternative 1 on water resources of Grand Portage National Monument would be localized, short term and negligible to minor and not constitute and impairment of those resources. Increased use of fire in silviculture practices by GP-Band forestry might contribute to adverse cumulative effects on water resources if extensive areas of Reservation land were treated or erosion control measures were not implemented. Such possible actions might increase turbidity of streams over the short term.

Alternative 2 – Preferred Alternative (Full Suppression, Apply Non-fire Treatments and Prescribed Fire, and Collaborate with Grand Portage Band Fire Management Activities)

Alternative 2 would likely have short-term localized, negligible to minor impacts on water resources in the park.

Over the life of the FMP, Alternative 2 would have negligible to minor impacts on water resources in the Monument because wildland fires occur rarely. Fire suppression techniques incorporating the mitigation measures described in Section 2.5 would be used to minimize impacts to water resources.

Collaboration with Grand Portage Band on prescribed or wildland fire use fires could be used to treat large areas of the Monument. There would be only minor impacts on water resources. Prescribed fires would be carefully planned to minimize adverse impacts using the mitigation measures

described in Section 2.5. Wildland fire use fires would be approved only when resource impacts are expected to be acceptable, and when holding actions would incorporate the mitigation measures as described for suppression actions. In many cases, it would be possible to achieve the same level of pre-planning and mitigation for wildland fire use fires as for prescribed fires.

Non-fire treatments would not be expected to have an impact on water resources because project areas would still be small relative to the size of the Monument and because treatments would be carefully planned to minimize adverse impacts using the mitigation measures described in Section 2.5.

Conclusions – Impacts from implementation of Alternative 2 on water resources of Grand Portage National Monument would be localized, short term and negligible to minor and not constitute an impairment of those resources. Collaboration with GP-Band forestry in wildland fire use or prescribed fires would minimize the cumulative adverse effects on water resources by incorporating mitigation measures as described in Section 2.5.

4.2.3. Floodplains and Wetlands

Total floodplain and wetland area in Grand Portage National Monument, as defined in the National Wetland Inventory, is less than 18 acres (FWS 1981). Most watercourses that traverse Monument property have floodplains constrained by the rugged topography. A wetland-stream complex flows through the western end of Monument property. Two small wetlands are within the lakeshore area of the Monument (Schemmer Associates 1998).

Impacts on floodplains and wetlands are related to effects on soils and water resources. Fires, especially large intense fires, can increase runoff and erosion by removing vegetation that stabilizes soils. Increased volume and velocity of waters in streams during and following storm events may produce localized flooding, scouring, stream bank erosion, and sedimentation.

Alternative 1 – No Action (Continue Suppression and Apply Non-fire Treatments)

Alternative 1 would have negligible impacts on floodplains in the park. It would likely have short-term, localized, and negligible to minor impacts on wetlands.

Over the life of the FMP, Alternative 1 would have negligible or possibly minor impacts on wetlands in the Monument because wildland fires occur

rarely. Fire suppression techniques incorporating the mitigation measures described in Section 2.5 would be used to minimize impacts to wetlands.

The use of prescribed fire would have no impact on wetlands because no prescribed fires would be planned under this alternative.

Non-fire treatments would not be expected to have an impact on wetlands, because project areas would be small relative to the size of the Monument and most would not be near wetlands. Treatments would be carefully planned to minimize adverse impacts using the mitigation measures described in Section 2.5.

Conclusions – Impacts from implementation of Alternative 1 on floodplains and wetlands of Grand Portage National Monument would be localized, short term and negligible to minor and not constitute an impairment of those resources. There is no other foreseeable action that would contribute to cumulative impacts on floodplains and wetlands.

Alternative 2 – Preferred Alternative (Full Suppression, Apply Non-fire Treatments and Prescribed Fire, and Collaborate with Grand Portage Band Fire Management Activities)

Alternative 2 would have negligible impacts on floodplains in the Monument. It would likely have short-term localized negligible to minor impacts on wetlands.

Over the life of the FMP, Alternative 2 would have negligible or possibly minor impacts on wetlands in the Monument because wildland fires occur rarely in the Monument, and least frequently on areas with moist vegetation and soils, such as wetlands. Fire suppression techniques incorporating the mitigation measures described in Section 2.5 would be used to minimize impacts to wetlands.

Collaboration with Grand Portage Band on wildland fire use fires could treat large areas of the Monument. Impacts on wetlands would still be minor and within the range of natural variation. Wildland fire use fires would be approved only when resource impacts are expected to be acceptable, and when holding actions would incorporate the mitigation measures described for suppression actions. In many cases it is possible to accomplish the same level of pre-planning and mitigation for wildland fire use fires as for prescribed fires.

Prescribed fires would be carefully planned to minimize adverse impacts using the mitigation measures described in Section 2.5. This would be of particular concern for prescribed fires in the meadow of the lakeshore area, which is adjacent to a three acre wetland.

Non-fire treatments under Alternative 2 would not be expected to have an impact on wetlands because project areas would be small relative to the size of the Monument and not near wetlands. Treatments would be carefully planned to minimize adverse impacts using the mitigation measures described in Section 2.5.

Conclusions – Impacts from implementation of Alternative 2 on floodplains and wetlands in Grand Portage National Monument would be localized, short term and negligible to minor and not constitute an impairment of those resources. The Grand Portage Reservation Land Use Ordinance (GP-Band 1996) specifies a 100-ft buffer along many streams and wetlands in which tree clearing is prohibited. Enforcement of this buffer limits the cumulative effect of development along Grand Portage Creek near Monument property. There are no other reasonably foreseeable future actions affecting Monument floodplains or wetlands to which the impacts of these alternatives would be added. Implementation of Alternative 2 would not be likely to result in or contribute to adverse cumulative impacts, such as scouring or sedimentation, over the short or long term.

4.2.4. Air Quality

The air quality impacts of the various alternatives were assessed by considering the existing air quality levels and the air quality related values present. Information is based on a local visual monitoring (Midwest Hazecam: www.mwhazecam.net/grand.html), or from qualitative evidence such as personal observations and photographs.

Prescribed fires are a source of emissions regulated under the US EPA regional haze program. Wildland and prescribed fires produce or release a number of chemical compounds that effect visibility and human health, including nitrogen oxides (NOx), organic compounds, carbon monoxide, and particulate matter (PM) or small particles. Burning vegetation releases PM_{10}, $PM_{2.5}$ (particulate matter 10 and 2.5 microns in diameter), nitrates, organic carbon, and elemental carbon. About 90 percent of smoke particles from wildland and prescribed fires are PM_{10} and about 70 percent are $PM_{2.5}$ (MNICS 2001). Ozone, a corrosive constituent of “smog” or haze, is produced by chemical reactions between other combustion products (NOx and volatile organic compounds or VOCs). Dioxin is released in trace amounts by forest fires (USDA 1999). In humans, dioxin has been linked to heart disease, cancer, increased risk of diabetes, and endocrine disruption (EMS 2001, NIEHS 2001).

The Minnesota Smoke Management Plan lists procedures fire managers are to follow in order to minimize emissions of smoke, particulate matter,

and other air pollutants from prescribed and wildland fires (MNICS 2003). Additional mitigation measures are described in Section 2.5 of this EA. There may be times when the Monument determines that stronger requirements are necessary, such as fires ignited in the proximity of the school or elder housing within the Village of Grand Portage. These requirements would be part of the air quality mitigation for individual projects to which they pertain. The Monument will coordinate smoke-producing activities with adjacent agencies, especially Grand Portage Band and Grand Portage State Forest managers (MnDNR), to mitigate regional haze. Mitigation measures apply to all alternatives.

Alternative 1 – No Action (Continue Suppression and Apply Non-fire Treatments)

Over the life of the FMP, Alternative 1 would have short-term localized, minor impacts on air quality in the Monument because wildland fires occur only rarely and the area burned in the Monument is usually small.

The use of prescribed fire would not affect air quality because no prescribed fires would be planned under this alternative.

Non-fire treatments would not be expected to have a minor impact on air quality. Although most activities, such as clipping and pruning, do not generate emissions, the limited use of chainsaws will generate emissions.

Conclusions – Impacts from implementation of Alternative 1 on air quality in Grand Portage National Monument would be localized, short term and negligible to minor and not constitute an impairment of those resources. Increased use of fire in silviculture practices by the GP-Band may contribute to cumulative effects on air quality, but mitigation efforts and compliance with the Minnesota Smoke Management Plan would minimize the intensity of impacts.

Alternative 2 – Preferred Alternative (Full Suppression, Apply Non-fire Treatments and Prescribed Fire, and Collaborate with Grand Portage Band Fire Management Activities)

Alternative 2 would likely have short-term, localized to regional, minor impacts on air quality.

Collaboration with the Grand Portage Band on prescribed or wildland fire use fires could treat large areas of the Monument resulting in localized to regional impacts. Such impacts would be short-term and minor. Prescribed fires would be carefully planned to minimize adverse impacts using the mitigation measures described in the Minnesota Smoke Management Plan and in Section 2.5 of this EA. Wildland fire use fires

would be approved only when smoke impacts are expected to be acceptable. The Monument would coordinate smoke-producing activities with adjacent agencies, especially Grand Portage Band and Grand Portage State Forests managers, to mitigate regional haze.

Non-fire treatments under Alternative 2 would not have an impact on air quality because most activities, such as clipping, pruning, and brush removal, do not generate emissions.

Conclusions – Impacts from implementation of Alternative 2 on air quality in Grand Portage National Monument would be short-term, localized to regional, and minor and not constitute an impairment of air quality or related values. In the near future, increased prescribed fires on the Grand Portage Band Reservation could contribute additional smoke to the regional airshed. Prescribed fires within the Monument, through collaboration with the Grand Portage Band, could contribute to overall cumulative impacts. However, due to the small size and narrow configuration of the property, the Monument contribution to these impacts would be minor. In addition, Grand Portage National Monument and the Grand Portage Band would coordinate, communicate and cooperate to reduce the health and visibility impacts of smoke production. Collaboration with GP-Band forestry in wildland fire use or prescribed fires would minimize the cumulative adverse effects on air quality through compliance with the Minnesota Smoke Management Plan and by incorporating mitigation measures as described in Section 2.5.

4.2.5. Vegetation

Information for analysis of impacts on vegetation is based on complete floral and forest history studies of Monument lands (Walton 1999, White and Host 2003), and regional ecosystem descriptions (USFS 2001).

Impacts on vegetation generally result from changes in the successional stage of vegetation in the burned area, but may also be related to physical changes in vegetation structure. The near-boreal forests of the region are subject to windthrow events and spruce budworm outbreaks that alter the forest composition on a variety of scales. Fire is historically another factor in this disturbance-adapted landscape. Whether fire effects are adverse or beneficial depends on timing and intensity. Low-intensity ground fires reduce competition by shade tolerant species, enhance pine regeneration and release nutrients from the soil biomass. Fire sensitive species, such as northern white cedar, may be killed by low intensity fires, while severe fires will damage or kill fire-adapted pines. Severe, stand-replacing fires remove forest vegetation and restart the successional vegetation process.

Use of fire retardant during fire suppression may have short-term localized effects on vegetation due to the nitrogen-fertilizing properties of the retardant (Hamilton *et al.* 1998). If conditions are sufficiently moist, increased growth would likely occur during the growing season in which the chemical is applied, but this effect would not persist. Under drier conditions, there would likely be no increased growth or biomass production. Weedy or exotic species able to exploit the additional nitrogen more effectively may gain a temporary advantage at the expense of native plants, especially under moist conditions.

Alternative 1 – No Action (Continue Suppression and Apply Non-fire Treatments)

Alternative 1 would likely have short- to long-term, localized to widespread, minor to moderate impacts on vegetation in the Monument.

Wildland fires occur only rarely in the Grand Portage area and the area burned is usually small. The likelihood of a wildland fire on Monument property is small due to its size and configuration. Implementing Alternative 1 could have short- to long-term localized, minor impacts on specific vegetation communities in the Monument from wildland fires. Whether an impact is adverse or beneficial depends on the site-specific vegetation.

Alteration of vegetation composition and structure from changes in successional stage would have widespread long-term impacts. In the absence of wildland fires, the forests of the Monument will proceed toward a spruce-fir community, with an accompanying decline in the mixed hardwood-conifer woods now present. This may result in a loss of the natural mosaic of forest communities typical of the region. The continued presence of white and red pines on Monument property would be jeopardized. These shade-intolerant species require openings in the canopy for growth.

The use of prescribed fire would have no impact on vegetation because prescribed fires would not be used under this alternative.

Under Alternative 1, non-fire treatments would not be expected to have a significant impact on vegetation, because project areas would be small relative to the size of the Monument. Treatments would be carefully planned to minimize adverse impacts using the mitigation measures described in Section 2.5 and to maximize beneficial impacts such as reducing competition.

Conclusions – Impacts from implementation of Alternative 1 on vegetation in Grand Portage National Monument would be short- to long-

term, localized to widespread, and minor to moderate. Fire suppression removes a natural disturbance from the ecosystem which constitutes an impairment of the natural processes that mediate local vegetation communities. The cumulative effect of continued fire suppression under Alternative 1 would be a shift from early to late successional communities. Since is this counter to management goals stated in the Monument GMP and RMP, this would result in a widespread, moderate adverse impact.

Alternative 2 – Preferred Alternative (Full Suppression, Apply Non-fire Treatments and Prescribed Fire, and Collaborate with Grand Portage Band Fire Management Activities)

Over the life of the FMP, Alternative 2 could have short- to long-term, localized, minor adverse impacts on vegetation in the Monument from wildland fires. Changes in vegetation composition and structure resulting from changes in successional stage could have widespread long-term beneficial impacts. Wildland fires encourage the continued presence of the mixed hardwood-conifer woods of the Monument. White and red pines regeneration is encouraged by openings in the canopy. Wildland fires occur only rarely in the Grand Portage area and the area burned is usually small. The likelihood of a wildland fire on Monument property is small due to its size and configuration.

Collaboration with the Grand Portage Band on prescribed or wildland fire use fires could treat larger areas of the Monument than under Alternative 1, resulting in localized to regional, minor to moderate impacts. Impacts would be largely beneficial by maintaining a mosaic of plant communities of different successional stages. Prescribed fires would be carefully planned to minimize adverse impacts using the mitigation measures described in Section 2.5 and to maximize beneficial impacts such as reducing competition and recycling nutrients. Wildland fire use fires would be approved only when net impacts are expected to be beneficial.

Non-fire treatments would not be expected to have a significant impact on vegetation. Project areas would still be small relative to the size of the Monument and treatments would be carefully planned to minimize adverse impacts using the mitigation measures described in Section 2.5 and to maximize beneficial impacts, such as reducing competition.

Conclusions – Impacts from implementation of Alternative 2 on the vegetation of Grand Portage National Monument would be short- to long-term, localized to widespread, minor adverse to moderate beneficial. This would not constitute an impairment of the natural processes that mediate local vegetation communities in this fire-adapted ecosystem. Collaboration with GP- Band forestry management practices under Alternative 2 would

contribute to the cumulative largely beneficial impacts on the vegetation of the area.

4.2.6. Wildlife and Fisheries

Information for analysis of impacts on wildlife and fishery resources was derived from a wild vertebrate study of the Monument (Graetz, *et al.* 1995), reports of Reservation fish inventories (Newman 1999, Newman and Johnson 1996), and personal observations.

Direct effects of wildland fire on wildlife and fisheries are injury or mortality of individuals, which are both rare events and usually insignificant to species populations. Indirect effects are related to habitat alteration through changes in vegetation or water quality. Fish reproduction, especially for brook and other trout species, can be adversely affected by increased stream temperatures and sedimentation caused by deforestation of the watershed.

Effects of wildland fires could be both adverse and beneficial. Fire might decrease habitat for one species, while improving or creating habitat for another species. Fire has the potential to create and destroy habitats, such as turning live trees into snags, while burning existing snags. Disturbance, including fire, creates a mosaic of habitat composition, structure, and successional stages, which provides a variety of conditions suitable for a wide range of wildlife species.

In general, habitat changes would have little effect on the Monument wildlife and fisheries within the 600-foot-wide Grand Portage trail corridor and Fort Charlotte area. Land use activities on adjacent lands have a greater impact on area wildlife than activities within Monument property. The most significant stretch of Grand Portage Creek for coaster brook trout reproduction flows through the Village and enters Lake Superior in the lakeshore unit of the Monument. Habitat alteration southeast of MN Hwy 61 could severely effect the success of the Grand Portage Band program for reintroduction of this species.

Alternative 1 – No Action (Continue Suppression and Apply Non-fire Treatments)

Alternative 1 could have short- to long-term, localized, minor impacts on wildlife and fisheries.

Over the life of the FMP, Alternative 1 could have short- to long-term, localized, minor impacts on wildlife and fisheries in the Monument from wildland fires. In the absence of fire, the forests of the Monument will develop toward a spruce-fir community. This habitat alteration can have

widespread long-term impacts. The loss of the mixed hardwood-conifer forests and lack of habitat variety could reduce the number of nesting bird species. Wildland fires occur only rarely in the Grand Portage area and the area burned in the Monument is usually small.

The use of prescribed fire would have no impact on wildlife or fisheries because no prescribed fires would be planned under this alternative.

Under Alternative 1, non-fire treatments would not be expected to have a significant impact on wildlife and fisheries. Project areas would be small relative to the size of the Monument and treatments would be carefully planned to minimize adverse impacts using the mitigation measures described in Section 2.5.

Conclusions – Direct impacts from implementation of Alternative 1 on wildlife and fisheries of Grand Portage National Monument would be localized, short term and negligible to minor. Indirect effects of fire suppression, such as loss of a vegetative community mosaic,could have impacts that are minor to moderate and widespread. These impacts might constitute an impairment of the processes necessary to support wildlife and fisheries resources. Increased use of fire in silviculture practices by the GP-Band may contribute beneficial impacts to the cumulative effects under Alternative I, by increasing the habitat diversity on lands adjacent to Monument property. The Grand Portage Reservation Land Use Ordinance (GP-Band 1996) specifies a 100-ft buffer along many streams and wetlands in which tree clearing is prohibited. Enforcement of this buffer limits the cumulative effect of development along Grand Portage Creek near Monument property and any adverse impact on fisheries in this stream.

Alternative 2 - Preferred Alternative (Full Suppression, Apply Non-fire Treatments and Prescribed Fire, and Collaborate with Grand Portage Band Fire Management Activities)

Alternative 2 could have short- to long-term, localized, minor, adverse and beneficial impacts on wildlife and fisheries.

Over the life of the FMP, Alternative 2 could have short- to long-term, localized, minor impacts on wildlife and fisheries in the Monument from wildland fires. Degradation of stream conditions through indirect fire effects (i.e., increased erosion) could negatively affect fisheries on a localized level. Habitat alteration from changes in successional stage may have widespread long-term impacts. Occasional fires would contribute to maintaining a mosaic of forest habitat types, providing nesting sites for a

wide variety of bird species. Wildland fires occur only rarely in the Grand Portage area and the area burned in the Monument is small.

Collaboration with Grand Portage Band on prescribed or wildland fire use fires could treat large areas of the Monument, resulting in short- to long-term, localized to regional impacts. Impacts would be minor because of the limited area and narrow configuration of Monument property. Prescribed fires would be carefully planned to minimize adverse impacts using the mitigation measures described in Section 2.5, and to maximize beneficial impacts such as maintaining a diversity of habitats. Wildland fire use fires would be approved only when net impacts are expected to be beneficial.

Non-fire treatments under Alternative 2 would not be expected to have an impact on wildlife and fisheries. Project areas would be small relative to the size of the Monument and treatments would be carefully planned to minimize adverse impacts using the mitigation measures described in Section 2.5.

Conclusions – Direct impacts from implementation of Alternative 2 on wildlife and fisheries of Grand Portage National Monument would be localized, short term and negligible to minor and not constitute an impairment of those resources. Collaboration with GP-Band forestry in wildland fire use or prescribed fires would increase the opportunity for indirect effects that are localized to widespread, minor to moderate beneficial impacts. The Grand Portage Reservation Land Use Ordinance (GP-Band 1996) specifies a 100-ft buffer along many streams and wetlands in which tree clearing is prohibited. Enforcement of this buffer limits the cumulative effect of development along Grand Portage Creek near Monument property and any adverse impact on fisheries in this stream.

4.2.7. Threatened Species, and Species of Special Concern

Information for analysis of impacts on threatened species and species of concern was obtained through consultation with the Minnesota Department of Natural Resources and US Fish and Wildlife Service during development of the Monument GMP (2003). Monument specific information is found in a rare plant species report (Walton 2001).

Impacts on threatened or endangered wildlife species are similar to impacts on other wildlife and fisheries. Because of the long, narrow shape of the trail corridor, gray wolves, Canada lynx and bald eagles do not make exclusive use of Monument property. Land management activities outside the Monument will have a far greater impact on these species than activities within Monument property. The listed species would be

impacted by a wildland fire management program indirectly through changes in the habitat for prey species, many of which benefit from early successional stages or openings in vegetation. For example, increased openings would improve the snowshoe hare population, the primary prey of Canada lynx.

Impacts on threatened or endangered vascular plant species are similar to impacts on other vegetation. Most species of special concern in the Monument are herbaceous plants and are not fire dependent. The few species of concern occurring in the trail corridor are found in general mesic forests. Effects of wildland fire on these species are due to changes in the canopy cover and resulting light level at the ground surface. Species needing partial or full shade may be adversely effected by stand replacing fires, while a light-intensity maintenance fire may enhance their growth. A number of fern species considered of concern by the State of Minnesota occur in a small, specialized habitat within the lakeshore area of the Monument. This site is mostly exposed rock with limited build up of surface fuels where intense fires are not likely to occur. According to available historic photos, this site has been deforested in the past, suggesting that light level is not a critical factor to the presence of these fern species. The two woody species of special concern are concentrated in the floodplain of Grand Portage Creek near the stockade. In this area, the risk of effects from wildland fire or suppression actions is small.

Alternative 1 – No Action (Continue Suppression and Apply Non-fire Treatments)

Over the life of the FMP, Alternative 1 would have negligible impacts on threatened wildlife species in the Monument, due to the limited area and linear configuration of the trail corridor. Alternative 1 would be expected to have no effect on bald eagles, Canada lynx, or gray wolves within the Monument. Alternative 1 would be expected to have no effect on the plant species of special concern in the Monument.

Conclusions – Impacts from implementation of Alternative 1 on threatened species or species of concern in Grand Portage National Monument would be localized, short term and negligible to minor and not constitute an impairment to the continued existence of those species. There is no other reasonably foreseeable future actions that would affect threatened species or species of concern to which the impacts of Alternative 1 would be added.

Alternative 2 – Preferred Alternative (Full Suppression, Apply Non-fire Treatments and Prescribed Fire, and Collaborate with Grand Portage Band Fire Management Activities)

Over the life of the FMP, Alternative 2 would have negligible impacts on threatened wildlife species in the Monument, due to the limited area and linear configuration of the Monument trail corridor. Alternative 2 would be expected to have no effect on bald eagles, Canada lynx, or gray wolves within the Monument. Alternative 2 would be expected to have no effect on the plant species of special concern in the Monument.

Conclusions – Impacts from implementation of Alternative 2 on threatened species or species of concern in Grand Portage National Monument would be localized, short term and negligible to minor and not constitute an impairment to the continued existence of those species. Collaboration with Grand Portage Band fire management activities under Alternative 2 would contribute a small increment to the cumulative, but largely beneficial, impacts on threatened wildlife species within the Monument.

4.3. Cultural Resources

Cultural resources are limited, non-renewable, and often fragile. Over time, forces including corrosion, erosion, microbial action, weathering, rainfall, oxidation, and vandalism all take their toll on the continued existence and integrity of cultural resources. Fire and fire management activities have the ability to quickly and profoundly alter the information in cultural resources by destroying the objects, their setting or integrity of place.

4.3.1. Archeological Resources

Information used for the analysis of impacts on the archeological resources of Grand Portage National Monument is summarized in Woolworth (1993) and in the National Register of Historic Places nomination (NPS 1977).

Significant cultural resource sites within Grand Portage National Monument are associated with human-altered natural features or contain man-made items. Identified altered natural features include trees, surface pits and modified seepage areas. Artifacts collected during surveys include objects of metal, glass, fabric, ceramics, bone and other materials. Due to the shallow soils in the Grand Portage area such artifacts range from being on the soil surface, to only 2 to 6 cm below duff and litter layers. This narrow archeological profile and the human-altered natural features are at risk from both wildland fires and fire suppression activities.

There is evidence of previous fires in the Grand Portage area, although the location or extent of fires is uncertain, except for those within the last 75 years when suppression was the primary fire management response. The presence of charcoal fragments scattered over the ground surface in many areas of the Monument suggests that much of the property has burned at some time. A recent forest history study of the Monument identified areas of old-growth forests, indicating that some areas have been spared from fires for more than 300 years (White and Host 2003). This information suggests that cultural resources from the historic period may or may not have been affected by wildland fires, depending on their particular location.

Limited documentation of fire effects on cultural resources in the Great Lakes Region exists. The majority of research has been concentrated in the southwest region of the U.S. (Lissoway and Propper 1988, Kelly and Mayberry 1980). Besides being directly consumed by fire, artifacts can be chemically or physically altered by heat. Several current dating techniques are also invalidated by exposure to even relatively low intensity fires.

The amount of surface and subsurface heating has a direct impact on cultural resources in the soil. Three major factors are involved in determining the nature and extent of fire damage to cultural resources: 1) fire intensity; 2) duration of heat; and 3) heat penetration into the soil (Traylor 1981). Fuel loading, fuel moisture content, and weather are considered to be the most important influences on fire intensity. On several documented wildland fires in the southwest, the severity of burning at sites seemed to correspond closely to the density of the fuel load adjacent to and on the site (Traylor 1981). Research with in-ground artifacts during prescribed fires in Minnesota state parks indicates that depth of heat penetration is related to soil texture and moisture. Soil heating occurred to a greater depth on sandy and rocky soils, while soils high in clay had limited heating (Radford, personal communication). Most areas of the Monument have rocky soils with minimum fine particle components. Unintentional wildland fires are more likely to occur during periods of severe regional drought when the normally wet soils have dried. Under such conditions, heat penetration into subsurface soil layers is apt to extend through the cultural layer.

Wildland fires in the trail corridor and at Fort Charlotte could create threats to unknown resources, or provide improved opportunities for site identification. Surface surveys prior to fuel reduction treatments, prescribed fires and following any wildland fire may yield important clues to archeological resource location.

The most dramatic, predictable and preventable effects of fire activities on cultural resources result from the use of heavy equipment, fireline explosives and hand tools in fireline construction, burn area preparation, or rehabilitation work. Fire suppression activities can have a greater effect on archeological sites than the actual fire itself (Pilles 1982).

Alternative 1 – No Action (Continue Suppression and Apply Non-fire Treatments)

Over the lifetime of this FMP under Alternative 1, wildland fires could have localized, negligible to moderate impacts on archeological resources in the Monument. Wildland fires are rare on Monument property and the area burned is usually small relative to the size of the Monument. Whether impacts are negligible or moderate is site and fire specific, related to the susceptibility of the resource to damage, previous exposure to fire, and severity of wildland fires. Although resources could be permanently damaged or lost from direct effects of fire, mitigation measures described in Section 2.5 would be used to prevent adverse impacts from indirect effects.

There would be no impacts from the use of prescribed fire because no prescribed fires would be planned under this alternative.

Impacts from non-fire applications would be negligible because treatments and treatment areas would be carefully planned, and would include mitigation measures described in Section 2.5, to prevent adverse impacts.

Conclusions – Impacts from implementation of Alternative 1 on archeological resources of Grand Portage National Monument would be localized, negligible to moderate adverse direct effects and may not constitute an impairment of those resources. Indirect loss of archeological resources would be reduced through use of mitigation measures as described in Section 2.5. Future wildland fires under Alternative 1 will contribute to the cumulative impacts on cultural resources.

Section 106 assessment – Destruction of archeological resources by wildland fire or fire suppression activities as implemented under Alternative 1 would be an adverse effect. Negligible disturbance of sites, or exposure and location of new archeological resources as a result of fire or suppression activities would be no adverse effect.

Alternative 2 – Preferred Alternative (Full Suppression, Apply Non-fire Treatments and Prescribed Fire, and Collaborate with Grand Portage Band Fire Management Activities)

Alternative 2 would likely have long-term, localized, minor to moderate, largely beneficial but occasionally adverse impacts on cultural resources in

the Monument. In order to protect cultural resources and human-altered natural features on Monument property, use of motorized equipment and digging of firelines is prohibited under Alternative 2, unless specifically approved by the Superintendent for each fire incident.

Over the lifetime of this FMP under Alternative 2, wildland fires would have a negligible impact on cultural resources in the Monument. Wildland fires are rare on Monument property and the area burned is usually small relative to the size of the Monument. Although resources could be permanently damaged or lost, mitigation measures described in Section 2.5 would be used to prevent adverse impacts.

Collaboration with Grand Portage Band on prescribed or wildland fire use fires could treat large areas of the Monument, resulting in short- to long-term, localized, minor to moderate impacts. However, impacts could be largely beneficial. Prescribed fires would be carefully planned to minimize adverse impacts using the mitigation measures described in Section 2.5, and to maximize beneficial impacts such as exposure of unknown archaeological sites and reduction of fuel loads. Prescribed fires when burn severity can be controlled and monitored can actually enhance the ability to protect cultural resources by reducing fire intensity and size through fuel reductions and decreased vegetation/fuel continuity. Use of prescribed fire in the meadow in the FMU1-WUI would simulate a traditional technique to manage a cultural landscape of significance to the local community, and would be consistent with the purpose for which the Monument was formed. Wildland fire use fires would be approved by the Superintendent only when net impacts are expected to be beneficial.

Impacts from non-fire treatments would be negligible to minor because treatments and treatment areas would be carefully planned, and would include mitigation measures described in Section 2.5 to minimize adverse impacts. Non-fire treatments may also have beneficial impacts on cultural resources by reducing fuel loads, by maintaining historic scenes and cultural landscapes, and by exposing previously unknown archaeological sites.

Conclusions – Impacts from implementation of Alternative 2 on archeological resources of Grand Portage National Monument would be localized, negligible to minor adverse direct effects and would not constitute an impairment of those resources. Indirect loss of archeological resources would be reduced through use of mitigation measures as described in Section 2.5. The ability to better manage future wildland fires in collaboration with GP-Band under Alternative 2 will contribute a negligible amount to the cumulative adverse impacts on cultural resources.

Section 106 assessment – Destruction of archeological resources by wildland fire or fire suppression activities as implemented under Alternative 2 would be an adverse effect. Negligible disturbance of sites, or exposure and location of new archeological resources as a result of fire or suppression activities would be no adverse effect.

4.3.2. Cultural Landscapes

A cultural landscape inventory (NPS 2002b) has been completed and provides the basis for this analysis of impacts on cultural landscapes within Grand Portage National Monument.

The most apparent cultural landscapes occur in the lakeshore area of the Monument. Historic photos provide a record of past use and changes over the last century. Currently, maturing conifer plantations dating from the 1930s are found within the former village site lying east of Grand Portage Creek. Maintaining and interpreting the early 20th Century history of the local culture is one goal of Monument management. Uncontrolled wildland fire could damage or destroy these plantations, while having little effect on the grass communities in which the plantations are found. A former meadow in this area has been traditionally maintained with fire prior to NPS acquiring the land.

The forest communities along the trail corridor are cultural landscapes influenced both by fur trade use in the 17th and 18th Centuries, and by logging during the late 19th and early 20th Centuries. Impacts to the cultural landscape integrity is similar to the effects described under vegetation. Maintaining the historic scene through the retention of a mixed hardwood-conifer forest is a management goal supported by the Monument GMP and RMP.

The loss of vegetation as a direct effect of fire in cultural landscapes would not result in a loss of integrity for the resource. Ground disturbance from fire management actions, especially major soil disturbance, would be an adverse impact. Such effects can be minimized through the use of mitigation actions as described in Section 2.5.

Alternative 1 – No Action (Continue Suppression and Apply Non-fire Treatments)

Over the lifetime of this FMP under Alternative 1, wildland fires could have localized, negligible impacts on cultural landscapes in the Monument. Wildland fires are rare on Monument property and the area burned is usually small relative to the size of the Monument. Site integrity of landscapes could be permanently damaged or lost from indirect effects of

fire management activities; the intensity of such impact could be mitigated by use of measures described in Section 2.5.

There would be no impacts from the use of prescribed fire because no prescribed fires would be planned under this alternative.

Impacts from non-fire applications would be negligible because treatments and treatment areas would be carefully planned, and would include mitigation measures described in Section 2.5, to prevent adverse impacts.

Conclusions – Direct impacts from implementation of Alternative 1 on cultural landscapes in Grand Portage National Monument would be localized, negligible adverse direct effects and would not constitute an impairment of those resources. Indirect loss of integrity to cultural landscapes would be reduced through use of mitigation measures as described in Section 2.5. Future wildland fires under Alternative 1 will contribute a small increment to the cumulative impacts on cultural landscapes.

Section 106 assessment – Negligible disturbance of cultural landscapes, directly or through mitigated indirect effects, would be no adverse effect.

Alternative 2 – Preferred Alternative (Full Suppression, Apply Non-fire Treatments and Prescribed Fire, and Collaborate with Grand Portage Band Fire Management Activities)

Implementation of Alternative 2 could have localized, negligible impacts on cultural landscapes in the Monument. Collaboration with the GP-Band on wildland fire use and prescribed fires could have localized to widespread, negligible to moderate beneficial effects. Wildland fire use actions could be used to maintain the mixed hardwood-conifer forest and the natural mosaic of plant communities within it. Use of mitigation measures as described in Section 2.5 could minimize ground disturbance and resulting loss of site integrity.

Use of prescribed fire to maintain grass meadows and similar habitats would continue the cultural practices used by the local community on these landscapes. Adverse effects from prescribed fire use would be unlikely to occur in areas repeatedly burned in the past. A return to burning after years of intermittent annual mowing may provide expected beneficial effects to the plant communities present by stimulating fire-tolerant species.

Impacts from non-fire applications would be negligible because treatments and treatment areas would be carefully planned, and would include mitigation measures described in Section 2.5, to prevent adverse impacts.

Conclusions – Direct impacts from implementation of Alternative 2 on cultural landscapes in Grand Portage National Monument would be localized, negligible adverse direct effects and would not constitute an impairment of those resources. Indirect loss of integrity to cultural landscapes would be reduced through use of mitigation measures as described in Section 2.5. Future wildland fires under Alternative 2 could contribute a small to moderate beneficial increment to the cumulative impacts on cultural landscapes.

Section 106 assessment –Negligible disturbance of cultural landscapes, directly or through mitigated indirect effects, would be no adverse effect.

4.3.3. Ethnographic Resources

Information used for this analysis of effects on ethnographic resources is based on a summary prepared for Grand Portage National Monument (GRPO 2001b) and the Monument forest history study (White and Host 2003).

Several plant species found within the lakeshore area of Grand Portage National Monument have been used by the local Native American community for ceremonial and consumptive purposes. It is the policy of the Monument to provide access to these resources to local community members, while protecting them from public harvest. Most of the plants of ethnological significance are native species common in the area and region of the state.

The effect of wildland or prescribed fires on these plants varies by individual species tolerance to fire. Herbaceous species may be tolerant of or even adapted to fire. Individuals of the few woody species may be adversely affected or killed by fire, but this would have limited impact on the species population in the local area.

Information suggests a stand of cedar trees in the western portion of the trail corridor may be associated with previous cultural use. Direct connection with the local culture is yet to be made. Loss of these trees through wildland or prescribed fires would be a direct major adverse impact. However, these trees may fall prey to other factors, regardless of efforts to protect them from fire. These trees are several centuries old, have rotted centers, and are already declining. Their location along a ridge top also makes them susceptible to wind storms.

Alternative 1 – No Action (Continue Suppression and Apply Non-fire Treatments)

Over the lifetime of this FMP under Alternative 1, wildland fires could have localized, negligible impacts on ethnographic resources in the Monument.

Wildland fires are rare on Monument property and the area burned is usually small relative to the size of the Monument and distant from the species of ethnographic significance.

There would be no impacts from the use of prescribed fire because no prescribed fires would be planned under this alternative.

Impacts from non-fire applications would be negligible because treatments and treatment areas would be carefully planned, and would include mitigation measures described in Section 2.5, to prevent adverse impacts.

Conclusions – Impacts from implementation of Alternative 1 on ethnographic resources in Grand Portage National Monument would be localized, negligible adverse direct effects and would not constitute an impairment of those resources. There are no reasonably foreseeable future actions that would contribute to the cumulative impacts on ethnographic resources.

Section 106 assessment – Implementation of Alternative 1 would not affect the continued occurrence of plant species of ethnographic significance, or access to these resources by local community members. Under Section 106, this is a finding of no adverse effect.

Alternative 2 – Preferred Alternative (Full Suppression, Apply Non-fire Treatments and Prescribed Fire, and Collaborate with Grand Portage Band Fire Management Activities)

Implementation of Alternative 2 could have localized, negligible impacts on ethnographic resources in the Monument. Collaboration with the GP-Band on wildland fire use and prescribed fires could have localized to widespread, negligible to moderate beneficial effects.

Prescribed fires could be used to maintain the grass meadow area where a species of ethnographic use occurs. Adverse effects from prescribed fire use would be unlikely to occur in this area repeatedly burned in the past. A return to burning after years of intermittent annual mowing may provide expected beneficial effects to the plant species by stimulating growth.

Management of wildland fire use fires could mitigate the effect on individuals of woody species of ethnographic significance. In particular, a low-intensity controlled fire may be able to preserve the fire-sensitive white cedar stand.

Impacts from non-fire applications would be negligible because treatments and treatment areas would be carefully planned, and would include mitigation measures described in Section 2.5, to prevent adverse impacts.

Conclusions – Direct impacts from implementation of Alternative 2 on ethnographic resources in Grand Portage National Monument would be localized, negligible adverse direct effects and would not constitute an impairment of those resources. Future prescribed fires under Alternative 2 could contribute a small to minor beneficial increment to the cumulative impacts on individual species of ethnographic significance.

Section 106 assessment – Implementation of Alternative 2 would not affect the continued occurrence of plant species of ethnographic significance, or access to these resources by local community members. Under Section 106, this is a finding of no adverse effect.

4.4. Social and Economic Environment

4.4.1. Human Health and Safety

Wildland fires can pose risks to human health and safety, both from the fire itself and from smoke generated by the fire. Fire suppression and hazard fuel reduction functions of wildland fire management confer safety benefits to park visitors, Monument staff and to nearby residents by reducing the risks to health and safety. The health impacts of smoke are addressed in Section 4.2.4 Air Quality.

In spite of efforts to inform Monument visitors and Reservation residents, situations may develop that create risks to public safety. Limited vehicle access to portions of the trail corridor and Fort Charlotte may limit the opportunities to escape large, fast moving fire. Some individuals may approach a prescribed fire or wildland fire out of curiosity, or may even attempt suppression action. Visitors may ignore warnings, be unaware of potential dangers from fire, and wander through burning or burned areas, thus putting themselves at risk.

Alternative 1 – No Action (Continue Suppression and Apply Non-fire Treatments)

Alternative 1 would have negligible impacts on human health and safety. The few wildland fires that might occur would be suppressed promptly while giving first priority to the safety of firefighters, park visitors, Reservation residents and Monument staff. There would be no impacts from prescribed fires because no prescribed fires would be planned under this alternative. Careful planning and mitigation of personal safety hazards would minimize risks from non-fire treatments. Over the life of this FMP the small area of treatment would not confer any significant benefits on human health and safety.

Conclusions – Impacts from implementation of Alternative 1 on human health and safety would be localized, short term and negligible to minor. There is no reasonably foreseeable future action that would contribute to adverse cumulative impacts.

Alternative 2 – Preferred Alternative (Full Suppression, Apply Non-fire Treatments and Prescribed Fire, and Collaborate with Grand Portage Band Fire Management Activities)

Alternative 2 would likely have short-term, localized, minor beneficial impacts on human health and safety, and short-term, localized, minor to moderate adverse impacts. The few wildland fires that might occur would be suppressed promptly while giving first priority to the safety of firefighters, park visitors, Reservation residents and Monument staff. Smoke generated by fires might present a short-term adverse effect for firefighters and others.

Collaboration with Grand Portage Band on prescribed or wildland fire use fires could treat large areas of the Monument resulting in short- to long-term, localized, minor to moderate impacts on human health and safety. Impacts could be largely beneficial by reduction of hazard fuel conditions. Prescribed fires would be carefully planned to minimize health and safety hazards by using the mitigation measures described in Section 2.5. Wildland fire use fires would be approved by the Superintendent only when net impacts are expected to be acceptable.

Careful planning and mitigation of hazards would minimize the risks from non-fire treatments. Collaboration with Grand Portage Band fire management activities might treat larger areas than under Alternative 1, conferring some benefits to human health and safety, such as reduction of potential wildland fire size, intensity, and risk.

Conclusions – Impacts from implementation of Alternative 2 on human health and safety in Grand Portage National Monument would be localized, short term and negligible to minor. If the Grand Portage Band increases prescribed fire activities in the future, there is a chance that smoke and emissions from these activities would combine with the Monument's activities to create less healthy conditions, particularly when the Monument is collaborating with Grand Portage Band activities. Grand Portage National Monument and the Grand Portage Band would coordinate, communicate, and cooperate to reduce the threat of these emissions to public health and safety.

4.4.2. Public Services

Local public services that could be affected by wildland fire include wildland and structural fire fighting services, law enforcement, and emergency medical care. Impacts would occur when local public services would be called upon to assist in suppression and support actions on wildland fires.

Alternative 1 – No Action (Continue Suppression and Apply Non-fire Treatments)

Alternative 1 would likely have short-term, localized, minor impacts on public services. Wildland fires are uncommon on the Monument and rarely burn large areas. There would be no prescribed fires under this alternative, and non-fire applications would not place any additional burden on public services.

Conclusions – Impacts from implementation of Alternative 1 on public services in Grand Portage would be localized, short term and negligible to minor. There is no reasonably foreseeable future action that would contribute to cumulative impacts on public services.

Alternative 2 – Preferred Alternative (Full Suppression, Apply Non-fire Treatments and Prescribed Fire, and Collaborate with Grand Portage Band Fire Management Activities)

Alternative 2 would likely have short-term, localized, minor impacts on public services. Wildland fires are uncommon on the Monument and rarely burn large areas. Except in the unlikely event of an escaped fire, prescribed fire and wildland fire use operations in the Monument would not place any additional burden on public services. Non-fire applications would not place any additional burden on public services.

Conclusions – Impacts from implementation of Alternative 2 on public services in Grand Portage would be localized, short term and negligible to minor. Collaboration with GP-Band forestry for prescribed fires would minimize the cumulative adverse effects on public services by providing additional services within the scope of the prescribed fire plan.

4.5. Visitor Use and Experience

Visitor use and experience could be impacted by temporary closures and use restrictions, by the perception of burned areas, and by the opportunity to see and learn about natural processes in ecosystems.

Alternative 1 – No Action (Continue Suppression and Apply Non-fire Treatments)

Alternative 1 would have negligible impacts on visitor use and experience in the Monument. Wildland fires are rare and usually small, there would be no prescribed fires, and non-fire treatments would appear no different to the visiting public than normal maintenance.

Conclusions – Impacts from implementation of Alternative 1 on visitor use and experience of Grand Portage National Monument would be localized, short term and negligible to minor and not constitute an impairment of that experience. There is no reasonable foreseeable future action that would contribute to cumulative impacts on visitor use and experience.

Alternative 2 – Preferred Alternative (Full Suppression, Apply Non-fire Treatments and Prescribed Fire, and Collaborate with Grand Portage Band Fire Management Activities)

Alternative 2 could have short-term, localized, minor beneficial impacts on visitor use and experience in the Monument. Wildland fires are rare in the Grand Portage area and usually small in size. Collaboration with Grand Portage Band could treat larger areas of the Monument with prescribed or wildland fire use fire, creating more opportunities for visitors to notice burned areas or encounter area closures. There would be greater opportunities for visitors to see natural processes at work and to learn about the natural role of fire in the ecosystem.

Alternative 2 could have short-term, localized, minor adverse and beneficial impacts on visitor use and experience during collaboration with Grand Portage Band. Additional burdens could be placed upon interpretive staff to develop and distribute public information, produce suitable media information, and handle increased interest in the Monument during active prescribed or wildland fire use fires. This would result in a complementary decrease in the routine interpretive services available for visitors.

Non-fire treatments would appear no different to visitors than normal maintenance.

Conclusions – Impacts from implementation of Alternative 2 on visitor use and experience of Grand Portage National Monument would be localized, short term and negligible to minor and not constitute an impairment of that experience. There are no other reasonably foreseeable actions that would combine with actions under Alternative 2 to contribute to cumulative impacts on visitor use or experience.

4.6. Comparison of Potential Impacts of the Alternatives

Table 3: Potential impacts from Alternative 1 - No Action (Continue Suppression and Apply Non-fire Treatments) and Alternative 2 – Preferred Alternative (Full Suppression, Apply Non-fire Treatments and Prescribed Fire, and Collaborate with Grand Portage Band Fire Management Activities) as Analyzed for NEPA.

Impact Topic	Alternative 1 – No Action	Alternative 2 – Preferred Alternative
Geology	Negligible*	Negligible
Soils	Short-term, localized, and minor	Short-term, localized, and minor
Water resources	Short-term, localized, and minor	Short-term, localized, and minor
Floodplains and wetlands	Floodplains – negligible Wetlands – short-term, localized, and minor	Floodplains – negligible Wetlands – short-term, localized, and minor
Air quality	Short-term, localized, and minor	Short-term, localized to regional, and minor
Vegetation	Long-term, localized, and minor to moderate	Long-term, localized, minor to moderate; both adverse and beneficial
Wildlife	Short- to long-term, localized, and minor	Short- to long-term, localized, minor; both adverse and beneficial
Threatened/ endangered species	Negligible	Negligible
Archeological resources	Long-term, localized, negligible to moderate	Long-term, localized, negligible to moderate
Cultural landscapes	Short- to long-term, localized and negligible	Short- to long-term, localized and negligible
Ethnographic resources	Short- to long-term, localized and negligible	Short- to long-term, localized and negligible
Human health and safety	Short term, localized and negligible	Long-term, localized, minor beneficial; short term, localized, minor to moderate adverse
Public services	Short-term, localized, and minor	Short-term, localized, and minor
Visitor use and experience	Short-term, localized, and negligible to minor	Short-term, localized, minor, both adverse and beneficial

* Terms in this table defined in Table 2. Impacts are adverse, unless otherwise indicated

5. COORDINATION AND CONSULTATION

This section summarizes internal and public scoping and other coordination and consultation conducted in conjunction with development of the Fire Management Plan (FMP) and Environmental Assessment (EA) for Grand Portage National Monument. It also provides a list of preparers.

5.1. Public Scoping

Grand Portage National Monument staff began planning a revision of the 1997 Fire Management Plan in July 2000. Public scoping officially began on 24 July, 2001, with the distribution of a letter and media release. Interested parties were requested to respond before 7 September, 2001. No responses were received.

5.1.1. Scoping Letter

A scoping letter (Figure 2) summarizing the need for revision of the existing FMP, stating the goals of Grand Portage National Monument in the revision, and soliciting issues of concern from interested parties was sent on 24 July, 2001.

5.1.2. Scoping Letter Mailing List

The list of recipients for the scoping letter was generated from local, state and federal agencies with mutual wildland fire concerns; Reservation government, resource employees and residents; and the Friends of Grand Portage organization.

Bureau of Indian Affairs, Midwest Regional Office, Fire Management Officer
Cook County (Minnesota) Soil and Water Conservation District
Grand Portage Band of Minnesota Chippewa, Reservation Tribal Council
Grand Portage Band of Minnesota Chippewa, Trust Lands and Resources
Ontario Ministry of Natural Resources, Pigeon River Provincial Park
Minnesota Department of Natural Resources, County Biological Survey
Minnesota Department of Natural Resources, Division of Ecological Services
Minnesota Department of Natural Resources, Grand Marais Area Forestry Office
Minnesota Department of Natural Resources, Grand Marais Area Wildlife Office
Minnesota Department of Natural Resources, Grand Portage State Park
Minnesota Department of Natural Resources, Judge Magney State Park
National Park Service, Apostle Islands National Lakeshore
National Park Service, Isle Royale National Park
National Park Service, Saint Croix National Scenic Riverway
National Park Service, Voyageurs National Park
US Dep't of Agriculture, Forest Service, Gunflint District Office
US Dep't of the Interior, Fish and Wildlife Service, Twin Cities Field Office
Joanne Hart

Figure 2: Scoping letter sent on 24 July 2001.

Dear Interested Party:

Grand Portage National Monument is preparing an Environmental Assessment (EA) as the first step in updating the park's Wildland Fire Management Plan (FMP) approved on 17 October 1997. National Park Service (NPS) policy requires periodic updates of fire management plans. This EA will explore the various ways in which NPS and park policy can be carried out and will analyze the impacts associated with a variety of fire management actions. The park is soliciting public input to develop alternative actions to consider in the Wildland Fire Management Plan EA.

The NPS mission is to protect and preserve the resources it manages -- and the ecological processes that support them -- for the enjoyment of future generations. Guided by this mandate, the Service's fire management program focuses on restoring and maintaining natural processes associated with fire, while protecting human life and property. To help achieve these long-term goals, the NPS has a comprehensive fire management program including hazardous fuels reduction, prescribed fire, wildland fire for resource benefit, and wildland fire suppression.

All NPS units with vegetation that can sustain fire must have a Fire Management Plan. The Fire Management Plan is a detailed program of action for park management to implement NPS and Grand Portage National Monument fire management policies and objectives. The plan is the primary guide for all wildland fire management actions within the Monument, including response to wildland fire (lightning and human caused fires) and using prescribed fires. The revised plan will define levels of protection necessary to ensure human safety, protection of personal and park property, facilities and resources. It will minimize undesirable environmental impacts of fire management, and will define levels of fire use to restore and perpetuate natural processes given current understanding of the complex relationships in natural ecosystems. Although the plan provides specific direction for implementing a fire management program at Grand Portage National Monument, it is also a flexible document that will change in response to increased knowledge of fire behavior and effects in the park's ecosystem.

The park's Draft General Management Plan (GMP) proposes a broader range of resource management objectives, including the restoration of the forest through which the Grand Portage Trail passes to the condition it may have been in during the fur trade era. Under the Draft GMP, natural fire regimes would be restored as a means of reaching this resource objective. Our staff is trying to identify issues that need to be addressed and we are asking for your input. Issues include concerns regarding natural and cultural resources as well as socio-economic impacts which may arise from prescribed fire use or fire fighting activities within Grand Portage National Monument. Once these issues are identified, the appropriate level of compliance with the National Environmental Policy Act and National Historic Preservation Act will be determined.

Both NPS policy and the unique conformation of Grand Portage National Monument require the coordination of the Wildland Fire Management Plan with neighboring land management entities. Although the park's areas on the shore of Lake Superior and along the

Pigeon River each comprise about 100 acres, most of the Monument land stretches as a 600-ft wide corridor through the forests of the Grand Portage Band of Minnesota Chippewa Reservation. Fire management planning to mutually benefit resource goals and provide for mutual response to wildland fires is an essential part of revising the Grand Portage National Monument FMP.

Fire has been a major factor in shaping the ecosystem of Grand Portage National Monument. The exclusion of fire from the fire-adapted plant communities is gradually shifting the composition and structure of the park's forest away from red and white pine, black spruce, aspen and paper birch dominated communities to balsam fir and aspen dominated communities. Historically, periodic lightning-caused fires in combination with human use of forest resources created openings in the forest canopy, exposed mineral soil and increased light and nutrient availability that favored the regeneration and growth of pines, black spruce, aspen and birch. In the 1890's timber harvest increased the proportion of aspen-birch forest by removing large quantities of red and white pine, spruce and fir, thus reducing a significant proportion of the seed sources for these fire-adapted species. Effective fire suppression and prevention programs since the 1940's have dramatically altered the terrestrial ecosystem from its original pre-European conditions. Forest fuel accumulations, spruce budworm outbreaks, blowdowns, and other disturbances since the last fire or logging increases the probability that old stands will burn.

The Wildland Fire Management Plan must directly relate to the Grand Portage National Monument Resource Management Plan (RMP) and help achieve resource management objectives. The present goals for wildland fire management at Grand Portage National Monument are to: (1) establish fire as an ecological process that will restore natural biotic systems within the Monument, (2) reduce the fuel load through prescribed fire and thus reducing the opportunity for wildland fire threats to human life and cultural resources in the site and on the surrounding Grand Portage Reservation, (3) protect and conserve the natural and historic resources associated with the Grand Portage trail by setting the policies associated with fire suppression and prescribed fire.

The National Park Service will consider public input to develop several alternatives for Grand Portage National Monument's Wildland Fire Management Plan Environmental Assessment. Written comments should be postmarked no later than September 7, 2001 and should be addressed to Superintendent, Tim Cochrane, P.O. Box 668, Grand Marais, MN 55604. Written comments may also be submitted via the Internet to:
GRPO_Superintendent@nps.gov

Should you have any questions, please contact the Resource Management staff of Grand Portage National Monument at 218-387-2788.

Sincerely,

Tim Cochrane

Superintendent

5.1.3. Public Scoping Media Release

A media release summarizing the information in the scoping letter and inviting comments from a wider public was released on 24 July, 2001.

Cook County (Minnesota) Star
Cook County News Herald
WTIP (local public radio)
Duluth News Tribune
St. Paul Pioneer Press

Figure 3: Media release sent on 24 July 2001.

Grand Portage NM Seeks Input on Fire Plan

Grand Portage National Monument is preparing an Environmental Assessment as part of updating the park's Wildland Fire Management Plan, last approved in 1997. All National Park Service areas with vegetation that can sustain fire must have a Fire Management Plan to guide all wildland fire actions in parks, including response to lightning or human caused fires, and using prescribed fires. The resource management staff is identifying issues to be addressed in revising the plan and asks for your input. Issues include concerns about natural and cultural resources as well as socio-economic impacts which may arise from prescribed fire use or fire fighting activities within Grand Portage National Monument. Once these issues are identified, the appropriate level of compliance needed under the National Environmental Policy Act and National Historic Preservation Act will be determined.

The goals for wildland fire management at Grand Portage National Monument are to: (1) use fire as an ecological process to restore the forests along the 8-1/2 mile trail corridor to fur trade era conditions, (2) reduce the fuel load through prescribed fire, thus reducing the risk of wildland fire threats to human life and cultural resources in the site and on the surrounding Grand Portage Reservation, (3) protect and conserve the natural and historic resources associated with the Grand Portage trail. The revised Wildland Fire Management Plan will set policies for fire suppression and prescribed fires to ensure safety, protection of property and park resources.

The National Park Service will consider public input to develop alternatives for Grand Portage National Monument's Wildland Fire Management Plan Environmental Assessment. Written comments should be postmarked no later than September 7, 2001 and should be addressed to Superintendent, Tim Cochrane, P.O. Box 668, Grand Marais, MN 55604. For more information, contact the Grand Portage National Monument resource management staff at 218-387-2788.

- NPS -

5.2. Consultation

5.2.1. Endangered Species Act Compliance

The U.S. Fish and Wildlife Service (FWS) issued a biological opinion for the Grand Portage General Management Plan on December 23, 2003. This opinion was the result of a formal consultation regarding the impact on Canada lynx of implementing the GMP. The opinion concluded that implementing the GMP will not jeopardize the continued existence of Canada lynx or gray wolf.

As a subordinate plan, the Grand Portage National Monument Fire Management plan implements the goals expressed in the GMP. The recent opinion and familiarity of the FWS with issues at the Monument led to an informal concurrence with the no effect determination in the fire plan Environmental Assessment in February 2004. There is no need to formalize the consultation further. Records documenting these discussions are held at Grand Portage National Monument and will be considered an unattached appendix to the wildland fire management plan.

5.2.2. National Historic Preservation Act Compliance

Required documents have been reviewed by the State Historic Preservation Office. A response dated March 11, 2004, supporting the preferred alternative described in the Environmental Assessment was received and will be considered an unattached appendix to the wildland fire management plan.

5.2.3. Contributors

In addition to the scoping letter that was sent to the Reservation Tribal Council and the Trust Lands and Natural Resources, formal consultation with the Grand Portage Band of Minnesota Chippewa began on 7 November, 2001, with a meeting including Monument resources staff, the Monument Superintendent, and Grand Portage Band Trust Lands and Natural Resources staff. Additional informal meetings were held between Monument resource staff and the Grand Portage Reservation forester on 9 January, and 12 June, 2002, in addition to numerous telephone discussions. Key contributors from Grand Portage Band are Curtis Gagnon, Administrator, Trust Lands and Resources Division; Rick Novitsky, (former) Natural Resources Director, and Tim Miller, Reservation Forester.

During the preparation of this EA, consultation and technical input was solicited and incorporated from a variety of people and agencies.

- Chel Anderson, Minnesota DNR, County Biological Survey, Hovland, MN
- Fred Bird, Regional Fire Management Officer, NPS Midwest Regional Office, Omaha, NE
- Jim DeCoster, Regional Fire Ecologist, NPS Midwest Regional Office, Omaha, NE
- KellyAnn Gorman, Great Lakes Ecoregion Fire Ecologist, , Voyageurs National Park, International Falls, MN
- George Host, Associate Professor, Natural Resource Research Institute, University of Minnesota, Duluth, MN
- Dave Soleim, Area Fire Management Officer, Voyageurs National Park, International Falls, MN
- Mark White, Research Associate, Natural Resource Research Institute, University of Minnesota, Duluth, MN

5.3. Preparers

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APPENDIX A: REFERENCES CITED

Adams, R and D Simmons, 1999. Proceedings of Australian Bushfire Conference. http://life.csu.edu.au/bushfire99/papers/adams/. Accessed July 1999.

Environmental Media Services (EMS), 2001. Dioxin Fast Facts. http://www.ems.org/dioxin/shub2_dioxin.html.

Graetz, JL, RA Garrott, and SR Craven, January 25, 1995. Terrestrial vertebrates of Grand Portage National Monument, Minnesota. *In* Graetz, JL, RA Garrott, and SR Craven, "Faunal Surveys of Agate Fossil Beds and Grand Portage National Monument." Interagency Agreement No. CA6000-2-8024, University of Wisconsin, Madison, Madison, WI, USA. 106 p.

Grand Portage National Monument (GRPO), 2001a. Grand Portage National Monument Resource Management Plan. Midwest Region, US DOI, National Park Service, Grand Marais, MN, USA.

_____, 2001b. The Ethnographic Significance of Grand Portage Plants with Supplemental Source Materials. US DOI, National Park Service, Grand Marais, MN, USA.

_____, 2002. Grand Portage National Monument, Level I Water Quality Survey, 2000. Midwest Region, US DOI, National Park Service, Grand Marais, MN, USA.

_____, 2003. Grand Portage National Monument General Management Plan. NPS Denver Service Center, Denver, CO, USA. 167 p.

Grand Portage Reservation Tribal Council (GP RTC), 1996. Land Use Ordinance, as amended June 26, 1996.

_____, 1999. Strategic Wildland Fire Management Plan and Environmental Assessment. Minnesota Chippewa Tribe, Cass Lake, MN, USA.

_____, 2002. Grand Portage Community Profile. Grand Portage, MN, USA.

Hamilton, S, D Larson, S Finger, B Poulton, N Vyas, and E Hill. Ecological effects of fire retardant chemicals and fire suppressant foams. USGS Northern Prairie Wildlife Research Center. http://www.npwrc.usgs.gov/resource/othrdata/fireweb/fireweb.htm. Accessed March 1998.

Hazard, EB, 1982. The Mammals of Minnesota. University of Minnesota Press, Minneapolis, MN, USA. 280 p.

Heinselman, MI, 1974. Interpretation of Francis J. Marschner's Map of the original vegetation of Minnesota. USDA Forest Service, North Central Forest Experimental Station, St. Paul, MN, USA. (map)

Kelly, RE and J Mayberry, 1980. Trial by fire: effects NPS burn programs upon archeological resources. Pages 603-610 *in* Proceedings Second Conference on Scientific Research in the National Parks, Vol. 1. US DOI, NPS, Western Region, San Francisco, CA, USA.

Lissoway, J and J Propper, 1988. Effects of fire on cultural resources. *In* Proceedings Effects of Fire Management of Southwestern Natural Resources Symposium, 14-17 November 1988. Tucson, AZ, USA.

Minnesota Department of Natural Resources (MnDNR), 1999. Minnesota's list of endangered, threatened, and special concern species. State of Minnesota, Department of Natural Resources, St. Paul, MN, USA. http://www.dnr.state.mn.us/ecological_services/ets.html. Accessed June 2001.

Minnesota Incident Command System (MNICS), 2003. Minnesota Smoke Management Plan. Prescribed Fire Working Team, Minnesota Incident Command System, St. Paul, MN, USA.

National Institute of Environmental Health Sciences (NIEHS), 2001. Dioxin research at the National Institute of Environmental Health Sciences. http://www.niehs.nih.gov/oc.factshees/dioxin.htm. Accessed 2001.

National Park Service (NPS), 1977. National Register of Historic Places Inventory/Nomination Form for Grand Portage National Monument. Midwest Regional Office, Omaha, NE, USA.

_____, 1998. Director's Order #18: Wildland Fire Management. Washington, DC, USA.

_____, 1999. Reference Manual 18: Wildland Fire Management. Washington, DC, USA.

_____, 2000. Management Policies 2001. NPS D1416 December 2000. Washington, DC, USA.

_____, 2001a. Handbook for Environmental Impact Analysis. January 2001. Washington, DC, USA.

_____, 2001b. Wildland Fire Monitoring Handbook. National Interagency Fire Center, Boise, ID, USA.

_____, 2002a. Director's Interim Order #18: Wildland Fire Management. Washington, DC, USA.

_____, 2002b. (Draft) Cultural Landscape Inventory, Grand Portage National Monument, 2000. Midwest Region, National Park Service, Omaha, NE, USA. (database format)

Newman, L, 3 December 1999. Letter report to Grand Portage National Monument Resource Management Division. US FWS, Fishery Resource Office, Ashland, WI, USA.

Newman, L and J Johnson, 1996. Development of a Reintroduced, Anadromous Brook Trout Population at Grand Portage, Minnesota, 1991-1996. Grand Portage (Tribal) Natural Resources Department and US FWS. 15 p. and figures.

Pilles, PJ, 1982. Prescribed Fire Management and Cultural Resource Management. USDA, Forest Service, Southwest Region, Flagstaff, AZ, USA. 11 p.

Schemmer Associates, 1998. Letter report: Wetland Delineation (Lakeshore Area of Grand Portage National Monument). Omaha, NE, USA.

Soil Conservation Service (SCS), 1973. Coastal Management Plan. USDA Soil Conservation Service.

_____, 1986. General Soils Map of Cook Co., MN, USA. 22 p.

Traylor, D, 1981. Effects of the La Mesa Fire on Bandolier's cultural resources. Pages 97-102 *in* La Mesa Fire Symposium. US DOE, Los Alamos National Lab, Los Alamos, NM, USA.

US Department of Agriculture (USDA), 1999. Dioxin advisories and guidance, general scientific information. Food Safety and Inspection Service. http://www.fsis.usda.gov/OA/topics/ dioxmenu.htm. Accessed 2001.

_____, 2000. Briefing paper: Fire and Aviation Management. US Forest Service. http://www.fs.fed.us/fire/aviation/retardant/Retardant_Briefing_Paper.htm. Accessed 2001.

_____, 6 June 2001. Wildland Fire Suppression Chemicals Toxicity and Environmental Issues and Concerns. http://www.fs.fed.us/rm/fire/The_Environment.html accessed June 2001.

US Forest Service (USFS), 2001. Great Lakes Ecological Assessment, Section 212 in Minnesota. USFS North Central Research Station, Rhinelander, WI, USA. http://www.ncrs.fs.fed.us/gla, accessed on 15 March 2001.

US Fish and Wildlife Service, 1981. National Wetlands Inventory map: Grand Portage and Mineral Center, MN (scale 1:24,000). U.S. Department of the Interior, Washington, DC, USA.

US Geological Survey (USGS), 2002. Preliminary Report; Geological Observations in the Grand Portage National Monument, Minnesota. U.S. Dept. of the Interior, USGS, Eastern Region, Reston, VA, USA. CD-ROM of GIS coverages and tables.

Walton, GB, 1999. DRAFT 1997 and 1998 Floristic Survey of Grand Portage National Monument. Grand Portage National Monument, Grand Marais, MN, USA.

_____, 2000. Rare Plant Species of Grand Portage National Monument. Grand Portage National Monument, Grand Marais, MN, USA. 37 p.

White, MA and GE Host, 2003. Historic Disturbance Regimes and Natural Variability of Grand Portage National Monument Forest Ecosystems. Grand Portage National Monument, Grand Marais, MN, USA. 19 p.

Woolworth, AR, 1993. *Grand Portage National Monument: An Historical Overview and Inventory of Cultural Resources*. Minnesota Historical Society, St. Paul, MN, USA.

APPENDIX B: ACRONYMS AND ABBREVIATIONS

ARPA	Archeological Resources Protection Act
BWCAW	Boundary Waters Canoe Area Wilderness, Superior National Forest
CFR	Code of Federal Regulations
DO	Director's Order, usually followed by a number indicating which Director's Order
DOI	Department of the Interior
EA	Environmental Assessment
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
EO	Executive Order, usually followed by a number indicating which Executive Order
ESA	Endangered Species Act, 1973, as amended
FMP	Fire Management Plan
FMU	Fire Management Unit
FWS	United States Fish and Wildlife Service
GF	General Forest, referring to the General Forest Fire Management Unit
GIS	Geographic information system
GMP	General Management Plan
GPS	Global positioning system
MIST	Minimum impact suppression tactics
MnDNR	Department of Natural Resources of the state of Minnesota
MNICS	Minnesota Interagency Command System
NEPA	National Environmental Policy Act
NHPA	National Historical Preservation Act
NPS	National Park Service
PL	Public Law, usually followed by a number indicating which Public Law
RM	Reference Manual, usually followed by a number indicating which Reference Manual
RMP	Resource Management Plan
USDA	United States Department of Agriculture
USGS	United States Geological Survey
WUI	Wildland-urban interface

APPENDIX C: GLOSSARY

Appropriate Management Response – the response to a wildland fire is based on an evaluation of risks to firefighter and public safety and on the circumstances under which the fire occurs, including weather and fuel conditions, natural and cultural resource management objectives, protection priorities, and values to the protected. The evaluation must also include an analysis of the context of the specific fire within the overall local, geographic area, or national wildland fire situation.

Confine - the strategy employed in appropriate management responses where a fire perimeter is managed by a combination of direct and indirect actions and use of natural topographic features, fuel, and weather factors.

Escaped fire – a fire which has exceeded or is expected to exceed initial attack capabilities or prescription.

Fire intensity – the amount of heat generated by a wildland fire while it is burning, measured in BTUs per unit area per unit of time; directly related to flame length.

Fire severity – the amount of damage caused by a wildland fire, usually measured subjectively according to the amount of above-ground vegetation that is removed or the depth the heat of the fire penetrates into the soil.

Fire Management Unit - any land management area definable by objectives, topographic features, access, values to be protected, political boundaries, fuel types, or major fire regimes, etc., that sets it apart from management characteristics of an adjacent unit. FMUs are delineated in Fire Management Plans (FMP). These units may have dominant management objectives and pre-selected strategies assigned to accomplish these objectives.

Fire monitoring - the act of observing a fire to obtain information about its environment, behavior, and effects for the purpose of evaluating the fire and its prescription.

Fire prescription - a written statement defining the objectives to be attained, and the conditions of weather, fuels conditions, and other parameters, under which a prescribed fire may be ignited or a wildland use fire allowed to burn. Generally expressed as an acceptable range of the various indices, and the limit of the geographic area to be covered.

Fire use – the combination of wildland fire use and prescribed fire application to meet resource objectives.

Hazard fuels – live and/or dead wildland fuel accumulations or arrangement (either natural or created) having the potential for the occurrence of wildland fire that would put resources (natural, cultural, or contemporary) at risk.

Holding actions - planned actions required to achieve wildland and prescribed fire management objectives. For prescribed fires, these actions are developed to restrict the fire inside the planned burn unit. For suppression actions, holding actions may be implemented to prohibit the fire from crossing containment boundaries.

Preparedness - Activities that lead to a safe, efficient, and cost-effective fire management program in support of land and resource management objectives through appropriate planning and coordination. This term replaces presuppression.

Natural ignition – a wildland fire ignited by a natural event such as lighting or volcanic event.

Prescription – a set of measurable criteria that guides the selection of appropriate management strategies and actions. Prescriptions criteria may include safety, economic, public health, environmental, geographic , administrative, social, or legal considerations.

Prescribed fire – any fire ignited by management actions to meet specific objectives. Prescribed fires are conducted in accordance with prescribed fire plans.

Prescribed fire plan – a plan required for each prescribed fire. Plans are documents prepared by qualified personnel and approved by the agency administrator, and include criteria for the conditions under which the fire will be conducted (prescription).

Wildfire – an unwanted wildland fire. This term is no longer in use but is included to clarify terminology and usage.

Wildland fire – any non structure fire that occurs in wildland fuels.

Wildland Fire Use – the management of naturally ignited wildland fires to accomplish specific pre-stated resource management objectives in predefined geographic areas outlined in fire management plans.

Wildland fire management - all activities related to the prevention, control or use of fire burning through vegetation under specific prescriptions for the purpose of achieving fire management objectives.