

National Park Service
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Grand Portage National Monument
Grand Portage, Minnesota

Grand Portage National Monument

Final Wildland Fire Management Plan and Environmental Assessment



Grand Portage National Monument



Final Wildland Fire Management Plan and Environmental Assessment

Prepared by Resource Management Division
Grand Portage National Monument
Grand Marais, MN

Midwest Region
National Park Service

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TABLE OF CONTENTS

I.	INTRODUCTION	1
A.	REASONS FOR DEVELOPING THIS PLAN	1
B.	CONTRIBUTIONS TO FMP DEVELOPMENT AND IMPLEMENTATION	1
C.	IMPLEMENTATION OF NATIONAL AND NPS FIRE MANAGEMENT POLICIES	3
D.	COMPLIANCE	4
E.	AUTHORITIES FOR IMPLEMENTING THIS PLAN	4
II.	FMP RELATIONSHIP TO NPS POLICY AND MONUMENT PLANS	6
A.	NPS MANAGEMENT POLICIES CONCERNING FIRE	6
B.	ENABLING LEGISLATION AND PURPOSE OF GRAND PORTAGE NATIONAL MONUMENT	6
C.	GENERAL MANAGEMENT PLAN AS IT RELATES TO WILDLAND FIRE	7
D.	RESOURCE MANAGEMENT PLAN AS IT RELATES TO WILDLAND FIRE	7
E.	HOW THE WILDLAND FMP MEETS GMP, RMP AND STRATEGIC PLAN GOALS	8
III.	WILDLAND FIRE MANAGEMENT STRATEGIES	10
A.	GENERAL MANAGEMENT CONSIDERATIONS	10
B.	MONUMENT WILDLAND FIRE MANAGEMENT GOALS	11
C.	FIRE MANAGEMENT OPTIONS	12
	Wildland Fire Suppression	12
	Wildland Fire Use	13
	Prescribed Fire	13
	Non-Fire Applications	14
D.	MONUMENT FIRE MANAGEMENT UNITS (FMUs)	15
	1. General Forest Fire Management Unit (GF-FMU)	18
	2. Wildland-Urban Interface Fire Management Unit (WUI-FMU)	43
IV.	WILDLAND FIRE MANAGEMENT PROGRAM	57
A.	GENERAL FIRE IMPLEMENTATION PROCEDURES	57
B.	WILDLAND FIRE SUPPRESSION	58
	1. Potential Range of Fire Behavior	58
	2. Wildland Fire Preparedness	59
	3. Pre-attack	63
	4. Initial Attack	65
	5. Extended Attack and Large Fire Suppression	68
	6. Wildland Fire Situation Analysis	69
	7. Minimum Impact Suppression Tactics	69
	8. Short and Long-term Rehabilitation	71
	9. Required records and reports	71
C.	WILDLAND FIRE USE	72
D.	PRESCRIBED FIRE	72
	1. Planning	73
	2. Exceeding Prescribed Fire Plan	75
	3. Cultural Resources	76
	4. Air Quality and Smoke Management	76
E.	NON-FIRE FUEL APPLICATIONS	77
F.	BURNED AREA REHABILITATION AND RESTORATION	79

V. MONUMENT FIRE PROGRAM ORGANIZATION AND BUDGETING 80

- A. MONUMENT WILDLAND FIRE STAFF 80
- B. FIREPRO FUNDING 81
- C. FIRE MANAGEMENT COMMITTEE 82
- D. SUPERINTENDENT RESPONSIBILITIES 82
- E. INTERAGENCY AGREEMENTS 82
- F. MNICS 83
- G. OTHER AGENCY AGREEMENTS 83

VI. MONITORING AND EVALUATION 85

VII. FIRE RESEARCH 86

- A. GRAND PORTAGE NATIONAL MONUMENT FIRE RESEARCH 86
- B. RESEARCH NEEDS 87

VIII. PUBLIC SAFETY 88

- A. ISSUES AND CONCERNS 88
- B. MITIGATION ACTIONS 88

IX. PUBLIC INFORMATION AND EDUCATION 90

- A. PUBLIC INFORMATION NEEDS 90
- B. PUBLIC INFORMATION 'STEP-UP' PLAN 90

X. PROTECTION OF SENSITIVE RESOURCES 92

- A. CULTURAL RESOURCES 92
- B. NATURAL RESOURCES 94
- C. RECONSTRUCTED BUILDINGS AND INFRASTRUCTURE 94

XI. FIRE CRITIQUES AND ANNUAL PLAN REVIEW 96

XII. CONSULTATION AND COORDINATION 97

XIII. APPENDICES

- APPENDIX A: REFERENCES CITED
- APPENDIX B: DEFINITIONS USED IN THIS FMP
- APPENDIX C: SPECIES LISTS
- APPENDIX D: COMPLIANCE DOCUMENTS
- APPENDIX E: ANNUALLY REVISED DOCUMENTS
- APPENDIX F: WILDLAND AND PRESCRIBED FIRE MONITORING PLAN
- APPENDIX G: SAMPLE DELEGATION OF AUTHORITY
- APPENDIX H: LONG-TERM PRESCRIBED FIRE AND HAZARD FUEL REDUCTION PLAN
- APPENDIX I: DRAFT FIRE PREVENTION PLAN

List of Tables

TABLE 1: RELATIONSHIP BETWEEN ADMINISTRATIVE MANAGEMENT ZONES AND FIRE MANAGEMENT UNITS IN GRAND PORTAGE NATIONAL MONUMENT (GMP 2003).	17
TABLE 2: THEORETICAL RANGE OF NATURAL VARIABILITY FOR BIRCH-ASPEN-SPRUCE-FIR AND WHITE AND RED PINE COMMUNITY TYPES.	37
TABLE 3: TEN-YEAR AVERAGE FIRE FREQUENCY AND SIZE ON THE GRAND PORTAGE BAND OF MINNESOTA CHIPPEWA RESERVATION.	38
TABLE 4: NFDRS FUEL MODELS FOR GRAND PORTAGE AREA, COOK COUNTY, MINNESOTA.	41
TABLE 5: FUEL LOADS FOR PRIMARY FUEL MODELS	42
TABLE 6: REAL PROPERTY VALUES AT RISK IN FMU1/WUI, GRAND PORTAGE NATIONAL MONUMENT.	47
TABLE 7: CATALOG INFORMATION FOR REMOTE AUTOMATED WEATHER STATIONS (RAWS)	62
TABLE C-1. VASCULAR PLANT SPECIES REPORTED AS COMMON OR ABUNDANT	C-1
TABLE C-2. VERTEBRATE SPECIES CONFIRMED TO OCCUR IN GRAND PORTAGE NATIONAL MONUMENT	C-4
TABLE C-3: WILDLIFE SPECIES LISTED AS THREATENED OR OF SPECIAL CONCERN	C-8
TABLE H-1: GENERAL ACTION ITEMS FOR THE MONUMENT FIRE PREVENTION PROGRAM	I-4
TABLE H-2: SPECIFIC RATING AND ACTIONS ITEMS FOR MONUMENT FIRE PREVENTION ZONES.	I-6

List of Figures

FIGURE 1. GENERAL LOCATION OF GRAND PORTAGE, COOK COUNTY, MINNESOTA.	2
FIGURE 2: MANAGEMENT ZONE PRESCRIPTIONS OF PREFERRED ALTERNATIVE IN GENERAL MANAGEMENT PLAN FOR GRAND PORTAGE NATIONAL MONUMENT.	16
FIGURE 3: GENERAL FOREST FIRE MANAGEMENT UNIT.	18
FIGURE 4: AVERAGE TEMPERATURE AND PRECIPITATION FOR VILLAGE OF GRAND PORTAGE	20
FIGURE 5: ECOLOGICAL CLASSIFICATION FOR THE ARROWHEAD AREA OF NORTHEAST MINNESOTA.	34
FIGURE 6: ECS LANDTYPE ASSOCIATIONS IN THE GRAND PORTAGE, MINNESOTA, AREA.	35
FIGURE 7: HISTORIC MEADOW IN LAKESHORE AREA OF GRAND PORTAGE NATIONAL MONUMENT.	53
FIGURE H-1: PRESCRIBED FIRE AREA IN LAKESHORE OF GRAND PORTAGE NATIONAL MONUMENT.	H-2

I. INTRODUCTION

A. Reasons for Developing This Plan

This Wildland Fire Management Plan (FMP) outlines actions that will be taken by Grand Portage National Monument (the Monument) in meeting the fire management goals for the park. This plan satisfies the requirement asserted in Director's Order 18 (NPS 1998) that "each park with vegetation capable of burning will prepare a fire management plan to guide a fire management program that is responsive to the park's natural and cultural resource objectives and to safety considerations for park visitors, employees, and developed facilities." It serves as a detailed program of action by providing specific guidance and procedures for accomplishing wildland fire management objectives. It addresses suppression of wildland fires where protection of structures, natural and cultural resources, and neighboring properties is paramount, and management of prescribed fire to meet cultural and natural resource management objectives. The plan allows the Monument to manage resources in the most effective and efficient manner.

B. Contributions to FMP Development and Implementation

The Grand Portage National Monument General Management Plan (GMP)(2003) states the underlying goals for all other management plans and programs of the park. The process used in developing the GMP provided repeated opportunity for public review of the several interpretive themes and management level alternatives considered. Beginning in 1999, public meetings in Grand Portage, Grand Marais and St. Paul, MN provided forums for public comments regarding the overall direction of the Monument for the next 20 years. The location and configuration of the Monument made input from the Grand Portage Band of Minnesota Chippewa (GP-Band) especially important (Figure 1). The park unit consists of roughly 80 acres within the Village of Grand Portage on the shore of Lake Superior connected to a 100-acre area on the banks of the Pigeon River (Fort Charlotte) by a trail corridor 600-ft wide and 8-1/2 miles long. This strip of land bisects the Grand Portage Reservation. National Park Service (NPS) development of the lakeshore area must be consistent with the village landscape; and management of the Fort Charlotte area and trail corridor must be compatible with forestry use of surrounding reservation lands. To ensure the long term goals stated in the Monument GMP are in concert with the goals of the GP-Band, a tribal government representative participated in formulation of the GMP, and the Reservation Tribal Council (RTC) was frequently consulted.

Collaboration with the GP-Band is essential in all fire issues the Monument faces. The GP-Band volunteer fire department provides structural fire protection for reconstructed and support buildings in the lakeshore area of the Monument, a

wildland-urban interface (WUI) area. Several permanent Monument staff persons are trained wildland firefighters, but the GP-Band fire department and trained Trust Lands and Resources Division (TLR) staff provide the most immediate additional personnel for wildland fire response. Input was solicited in July 2001 from the GP-Band RTC and TLR, and from other interested parties, state and federal agencies and the public, regarding issues addressed in this revised FMP. In November 2001, the Monument Superintendent and Resource Management staff met with GP-Band TLR staff to discuss wildland fire issues of mutual concern. Follow-up discussions between Monument resource staff and the TLR forester explored potential wildland fire use for resource benefits along suitable portions of the trail corridor.

The GP-Band RTC and TLR have reviewed and commented on the Environmental Assessment and Draft Grand Portage National Monument FMP. During the time this FMP is in effect, all naturally ignited and human-caused wildland fires will be suppressed using approved methods within Monument boundaries. Currently (2003) GP-Band TLR forestry practices do not include fire for seed bed preparation following logging. Therefore, Monument use of prescribed fires along the trail corridor depends on future inclusion of this practice in forest management by the TLR. Limited prescribed fires within the WUI require a Prescribed Fire Plan approved by the GP-Band fire management officer, in addition to other required approvals.

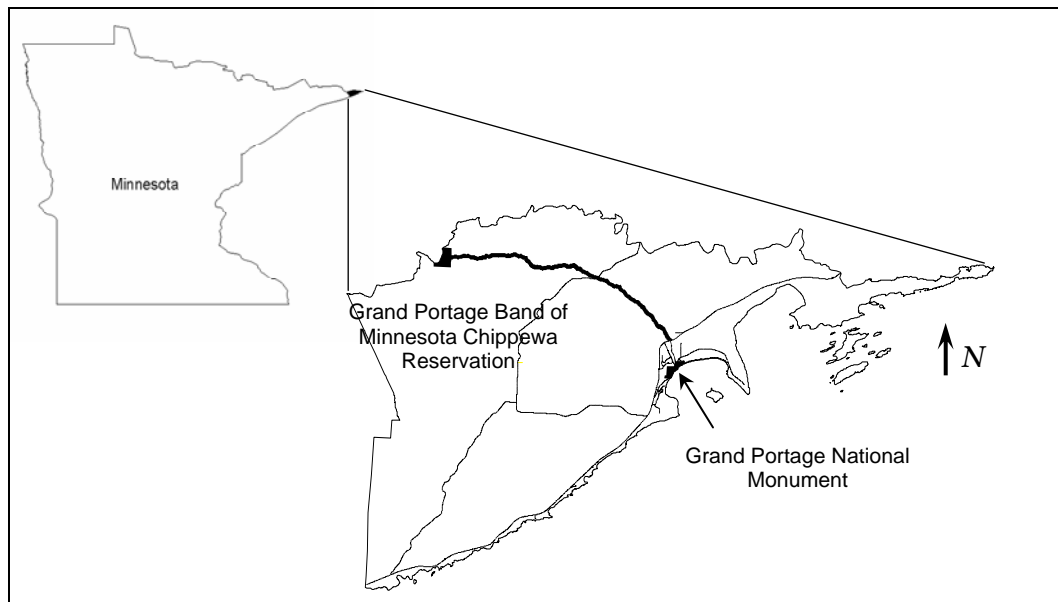


Figure 1. General location of Grand Portage, Cook County, Minnesota, and relative position of Grand Portage National Monument within the Grand Portage Reservation.

C. Implementation of National and NPS Fire Management Policies

It is National Parks Service (NPS) policy to allow natural processes to occur to the extent practical while meeting park unit management objectives. This overall goal guides the use of wildland fires in parks with significant natural resources. As stated in the Executive Summary of Wildland Fire Management (RM-18 1999):

“All ignitions occurring in wildland areas are classified as wildland fires or prescribed fires. Prescribed fires are authorized by approved resource and fire management plans and contribute specifically to a park's resource management objectives. Wildland fires are managed with the appropriate management response as directed by the park's fire management plan and analysis of the specific situation. These fires can be managed entirely or in any part for resource benefits or receive suppression actions to minimize burned area due to high values to be protected, threats to life or property, or other social, political, and economic considerations that outweigh potential environmental benefits. For all fires, if the initial strategy does not accomplish the desired objectives, the Wildland Fire Situation Analysis (WFSa) process will be utilized to develop and select new strategic alternatives.”

The Federal Wildland Fire Management Policy and Program Review of 1995 (2001) established the underlying direction for NPS fire management programs. Implementation of the Federal Wildland Fire Management Policy is further defined and described in:

- Managing Impacts of Wildfires on Communities and the Environment (2001)
- Protecting People and Sustaining Resources in Fire Adapted Ecosystems- a Cohesive Strategy (2000)
- A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment: 10-Year Comprehensive Strategy Implementation Plan (2002)

As stipulated in NPS Reference Manual-18 (RM-18 1999), paramount considerations of the Grand Portage National Monument fire management program include:

- Protection of life, both employee and public
- Protection of facilities and cultural resources
- Perpetuation of natural resources and their associated processes
- Perpetuation of cultural and historic scenes

D. Compliance

This document complies with National Environmental Protection Act (NEPA) and requirements of the Minnesota State Historic Preservation Office (SHPO). The development and preparation of an environmental assessment (EA) document, which is included as Appendix D-1, serves as the NEPA compliance for this plan. State Historic Preservation Office compliance is documented in Appendix D-2, and meets National Historical Preservation Act (NHPA) requirements. Federal Endangered Species Act (ESA, 1977, as amended) Section 7 compliance is summarized in Appendix D-3.

Prescribed fires will have additional site-specific compliance work completed prior to project implementation as part of a burn prescription. This will include biological assessments and cultural/historical site surveys as appropriate. Compliance with the Minnesota Smoke Management Plan (MnDNR 2003) will be documented in the development and implementation of prescribed burns.

E. Authorities for Implementing this Plan

The Organic Act of the National Park Service (August 25, 1916, Section 102) provides the authority for implementation of this plan. This act states that the primary goal of the NPS is to preserve and protect the natural and cultural resources found on lands under its management in such manner as will leave them unimpaired for future generations.

The NPS service-wide fire management policy is expressed in the current revisions of the Director's Order (DO-18 1998) and attendant Reference Manual 18 (RM-18 1999). Grand Portage National Monument's fire management objectives conform to the policy and guidelines in these documents, which are included herein by reference.

Statutes cited below authorize and provide the means for managing wildland fire on lands under the jurisdiction of the Department of the Interior, or lands adjacent thereto.

- National Park Service Acts as amended (67 Stat. 495; 16 U.S.C. 1b)
- Federal Property and Administrative Service Act of 1949 (40 U.S.C. 471; et seq.)
- Reciprocal Fire Protection Act of May 27, 1955 (69 Stat. 66; 42 U.S.C. 1856a)
- Federal Fire Prevention and Control Act of October 29, 1974 (88 Stat. 1535; 15 U.S.C. 2201)
- Federal Land Policy and Management Act of 1976 (90 Stat. 2743)

- Wildfire Suppression Assistance Act of 1989 (P.L. 100428, as amended by P.L. 101-11, April 7, 1989)
- National Indian Forest Resources Management Act (P. L. 101-630 November 28, 1990)
- Tribal Self-Governance Act of 1994 (P.L. 103413)
- Department of the Interior and Related Agencies Appropriations Act (P.L. 103-32)

II. FMP RELATIONSHIP TO NPS POLICY AND MONUMENT PLANS

A. NPS Management Policies Concerning Fire

The goal of wildland fire management in the NPS system is to restore fire to park ecosystems where appropriate and possible in support of resource management objectives (RM-18 1999). Managers may consider a full range of strategies as long as firefighter and public safety are not compromised, values at risk are protected, and benefits are achieved through cost-effective means. The fire management plan for each park unit directs the response to unwanted, potentially environmentally damaging wildland fires. Approved fire management activities may be as a natural process or as a resource management tool. Fire management objectives are addressed in a park's Resource Management Plan (RMP), in a general way, and specifically within a Wildland Fire Management Plan (FMP)(see Chapter III). Such objectives are based on individual park resources and management goals, and include, but are not limited to: restoring, mimicking, or replacing the ecological influences of natural fire, maintaining historic scenes, reducing hazardous fuels, eliminating exotic/alien species, disposal of vegetative waste and debris, and preserving endangered species (RM-18 1999).

The sub-boreal forests of the Grand Portage area of northeast Minnesota are fire-adapted communities (USFS 2001). Forest use along the Grand Portage route by both prehistoric and historic cultures altered the composition of the forests and influenced fire frequency. In particular logging and fire suppression during the 20th Century led to less diversity in forest types and stand ages. Restoration of fire as an ecological process and as a management tool to restore the historic scene within the Monument is permitted by current NPS fire policy.

B. Enabling Legislation and Purpose of Grand Portage National Monument

1. The purpose of the Monument is stated in legislation enacted by the Congress of the United States authorizing the establishment of Grand Portage National Monument on September 2, 1958 (72 Stat. 1751). The Act states that Grand Portage National Monument was 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.

In accordance with the 1958 Act (PL 85-910), the Grand Portage Band of the Minnesota Chippewa Tribe relinquished certain lands to the United States and the Secretary of the Interior established the area as Grand Portage National Monument on January 27, 1960.

2. 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 kilometers) Grand Portage, and the North West Company's Fort Charlotte and adjacent XY Company fort on the Pigeon River.

C. General Management Plan as It Relates to Wildland Fire

The General Management Plan (GMP)(NPS 2003) identifies the strategies, programs, and actions necessary to manage visitation and best protect Monument resources. This document describes resource conditions and visitor experiences to be achieved in the park. Requirements are based on the park's purposes, significance, administrative commitments, and the body of laws and policies directing the management of the national park system.

Fire management goals are addressed generally in the GMP. The document states that the Monument will manage resources to maintain the historic appearance of the forested environment in support of the cultural emphasis of the site. As responsible stewards, NPS will manage these resources to a level that meets all applicable laws, policies, and NPS standards, while being a good neighbor to the surrounding Grand Portage Reservation. In meeting these goals, visitors will be offered the opportunity to experience an environment along the Grand Portage similar to that experienced by the voyageurs during the fur trade era.

D. Resource Management Plan as It Relates to Wildland Fire

The Resource Management Plan (RMP)(GRPO 2001) nests within the authority of the GMP and relates directly to resource management on the site. Based on the legislative mandate that established the park unit, the purpose of the Monument, as amplified in the RMP, is "...to preserve the historic Grand Portage and the various fur trade depot sites and their associated archeological resources, natural resources, and cultural landscapes." The Monument RMP addresses the importance of wildland fire management for meeting these goals in a general manner. This specific wildland fire management plan implements fire related actions from the RMP.

To achieve this purpose, the following goals are recognized for the management and development of Grand Portage National Monument:

- Protect and preserve cultural and natural resources and provide for visitor protection and safety. Educate visitors and all others with interest in Grand Portage National Monument in resource preservation and protection.
- 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.
- Protect all floral and faunal species indigenous to the area, including all those listed federally or by the State of Minnesota as threatened, endangered, or of special concern.
- Conduct archeological investigations to locate sites and contribute to our understanding of Grand Portage's prehistory and history.
- Establish as nearly as possible the historic scene based on documented research.
- 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 and in minimizing the effects of human activities, especially development in the Monument's vicinity, on Monument resources, Monument management, and the experience of Monument visitors.
- Be actively involved in community and regional planning processes to promote harmonious land use and development patterns.

Although the RMP addresses fire use as a tool in resource management, the RMP and GMP do not make specific reference to wildland fire management planning.

E. How the Wildland FMP Meets GMP, RMP and Strategic Plan Goals

The Wildland Fire Management Plan for Grand Portage National Monument is a detailed program of action to carry out wildland fire management policies and objectives. It specifies wildland fire strategies and actions that may be used to protect both the cultural and natural resources of the park unit, and identifies which actions may be used only with the approval of the superintendent.

Implementation of the FMP supports the goals of the Monument GMP and RMP by:

- Protecting and conserving the natural and historic resources associated with the Grand Portage by setting the policies associated with fire suppression,

- Reducing wildland fire threats to human life and cultural resources along the Grand Portage trail corridor and around the lakeshore developed site by managing fuel loads with manual methods,
- Using prescribed fire to reduce fuel hazards and maintain cultural landscapes within the WUI.

Implementation of the FMP also contributes to meeting goals specified in the Strategic Plan for Grand Portage National Monument (GRPO 2000), as part of the requirements of the Government Performance and Results Act (GPRA). Mission Category I addresses identification and preservation of cultural landscapes and archeological sites, with specific actions identified in Goals Ia7 (cultural landscapes) and Ia8 (archeological sites). Visitor safety, enjoyment and understanding are addressed in Mission Category II, with specific actions identified in Goal IIa1 (visitor experience) and IIa2 (safety).

III. WILDLAND FIRE MANAGEMENT STRATEGIES

A. General Management Considerations and Relationship to Grand Portage Band Strategic Wildland Fire Management Plan

This Wildland Fire Management Plan (FMP) prescribes actions necessary to implement service-wide NPS fire management policies (DO-18 1998) using the core principles developed by the Federal Wildland Fire Management Policy Working Group. The framework for implementing a comprehensive strategy at local, regional, national and international levels is set forth in "A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment: 10-Year Comprehensive Strategy Implementation Plan" (DOI, USDA 2002). The key to achieving Monument resource management objectives is collaboration with GP-Band Reservation Tribal Council and Trust Lands Division at the park level. Regional collaboration with the US Forest Service, Minnesota Department of Natural Resources (MnDNR) and Bureau of Indian Affairs (BIA) Minnesota Agency is coordinated through the NPS Border Waters Fire Management Office located at Voyageurs National Park. The NPS Midwest Regional Fire Management staff is responsible for national and international fire management program collaboration. At each level of this organization, priorities are set by the parties accountable for the outcome of fire-related activities.

The Grand Portage National Monument FMP addresses issues at the local level, with reference to the Border Waters Fire Management Office, which provides technical and administrative support for the fire management program at the Monument.

The linear configuration, limited area and geographic setting of the Monument make the development of a park unit specific wildland fire management plan challenging, and probably unrealistic (Figure 1). However, the location of the Monument wholly within the Grand Portage Reservation provides a unique opportunity for cooperation with a single autonomous neighbor for the benefit of both entities. The Strategic Wildland Fire Management Plan and related Environmental Assessment for the Grand Portage Band of Minnesota Chippewa (1999) define the use of suppression tactics and of fire use for resource benefits on the Reservation. The GP-Band currently uses prescribed fires to stimulate berry production and to reduce hazard fuels.

Use of fire can be an important management tool for protecting natural and cultural resources, maintaining cultural landscapes, and restoring the natural fire-adapted forests of the Grand Portage area. Carefully planned and managed prescribed fires, or wildland use fires, would promote red and white pine regeneration, a desirable outcome for both Monument interpretive objectives and GP-Band forestry purposes. At this time (2003), the Grand Portage Trust

Lands and Resources (TLR) forestry program uses fire on a limited basis for silviculture practices. As the TLR moves toward greater use of fire in site preparation following timber harvests, the Monument could develop collateral fire management plans that permit managed fires to cross park unit boundaries. Desirable results from collaborative efforts include cost benefits from use of natural breaks in the landscape for holding lines, instead of property boundaries; and restoration of a habitat mosaic similar to the forests that existed during the fur trade era.

B. Monument Wildland Fire Management Goals

The National Park Service Fire Management Program is dedicated to protecting lives, property and resources while restoring and maintaining healthy ecosystems (NPS 2003). This NPS mission is consistent with national wildland fire goals, as described in the 10-Year Comprehensive Strategy Implementation Plan (DOI, USDA 2002):

- Improve Fire Prevention and Suppression
- Reduce Hazardous Fuels
- Restore Fire-Adapted Ecosystems
- Promote Community Assistance

The Grand Portage National Monument FMP implements Federal wildland fire policy by establishing goals consistent with this policy which reflect local environmental conditions, public concerns and interagency cooperation. Guided by the Monument GMP and RMP, the following goals are established for the Monument wildland fire program:

- Make firefighter and public safety the highest priority of every fire management activity.
- Suppress all unwanted and undesirable wildland fires regardless of ignition source to protect the public and protect the natural, cultural and historic resources of the park.
- Manage wildland fires so that Monument cultural resources are protected from damage by fire and suppression actions.
- Employ wildland fire use 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 areas, within the wildland-urban interface zone and in conjunction with cultural and historic sites to reduce fire behavior to a manageable level in order to protect critical resources.
- Manage prescribed and wildland fires in concert with federal, state, and local air quality regulations.
- Facilitate reciprocal fire management activities through the development and maintenance of cooperative agreements and working relationships with pertinent fire management entities.

C. Fire Management Options

Under the current Monument FMP (this document), the following practices are authorized to achieve the Monument's fire management goals. The policies of the NPS, as set forth in DO-18 (1998) and described in RM-18 (2001), and of the Department of the Interior will determine the specific practices used in managing a wildland or prescribed fire.

Wildland Fire Suppression

Grand Portage National Monument will suppress all wildland fires from natural or human-caused ignitions originating within the Monument. Any escaped prescribed fire will be suppressed. Wildland fires and escaped prescribed fires will be suppressed using an appropriate management response (AMR). The appropriate management response will vary from fire to fire, and may vary along the perimeter of a single fire.

Unwanted wildland fires will be suppressed using initial attack actions. Appropriate management responses to specific wildland fires will be determined through evaluation of public and firefighter safety, fire behavior, values at risk, potential suppression damage, and availability of fire management resources. All available park and local fire fighting resources will be utilized as necessary to limit damage to values at risk, protect private and public lands outside the park boundary, and provide for the health and safety of firefighters and the public. Appropriate management response options range from monitoring with minimal on-the-ground disturbance to intense suppression actions on all perimeters of the fire.

Wildland Fire Use

Wildland fire use is a strategy for allowing naturally ignited wildland fires to burn as long as the fire meets pre-stated resource management objectives within a predefined Maximum Manageable Area and conditions continue to meet predetermined prescriptive parameters. A “wildland fire use” fire that fails to meet resource management objectives will be suppressed using the appropriate management response. Current national fire policy allows a single fire to be managed under a fire use strategy and an appropriate suppression response strategy along different portions of its perimeter.

The GP-Band TLR does not have a current wildland fire use program. Should they develop one in the future, wildland fires used for resource purposes could be acceptable in the General Forest Fire Management Unit (GF-FMU) of the Monument to reduce fuel loads and restore or maintain the fire-adapted forest ecosystem.

In conjunction with mechanical methods, wildland fires can be used to maintain and restore plant communities, maintain plant diversity, and develop the appearance of the historic forest landscape. Intermittent low-intensity and occasional high-intensity fires are necessary to maintain red and white pine communities in the near-boreal forests of northern Minnesota (Frelich 1998). Treatment sites must be carefully chosen to maximize the benefit of existing mature pines. Concurrently, managers must consider the needs of sensitive plant communities and wildlife that may be affected by wildland fire used to benefit other resources.

Prescribed Fire

Prescribed fires are intentionally ignited under predetermined weather and fuel-moisture conditions allowing managers to exert substantial influence over the spread and intensity of the fire. Managers use prescribed fires to accomplish natural or cultural resource management objectives or to reduce hazard fuels to an acceptable level. For each prescribed fire conducted, all prescription parameters, acceptable ranges, and objectives are clearly stated in a Prescribed Fire Burn Plan developed by the NPS Border Waters Fire Management Officer (FMO) or designee in consultation with GP-Band forestry personnel.

Resource managers may use prescribed fire for cultural landscape maintenance in Wildland-Urban Interface Fire Management Unit (WUI-FMU) of the Monument. Fire is the traditional method for maintaining a grass-sedge meadow near the shore of Lake Superior. Continuing this local cultural practice will retain the early 20th Century character of this area, and control invasive herbaceous and woody plants.

Use of prescribed fires is not a current GP-Band TLR silviculture practice. There is a possibility that fire may be used for site preparation following harvest or for stand improvement in the future by TLR forestry. At such time, incorporation of complementary fire management practices by the NPS along the Grand Portage corridor is encouraged to benefit the goals of both entities and reduce the cost of fire management and fire suppression actions.

When it is impractical or infeasible to mechanically remove wildland fuels generated by maintenance activities, hazard tree removal or construction, NPS policy permits the use of fire for disposal purposes (RM-18 2001, Chapter 10). Such materials must be removed to a non-wildland fuel environment (parking lot, gravel pit, etc.) and burned in accordance with applicable state and local regulations. Debris fires must meet specific conditions (RM-18 2001) to be exempted from prescribed fire planning and reporting regulations. The most significant of these conditions, in regard to the Monument, is the lack of threat to surrounding cultural or natural resources, and the absence of need for follow-up monitoring of environmental impacts.

Occasional maintenance of non-forested areas, such as meadows and lawns, generates dry herbaceous fuels. Burning such fuels in place qualifies as a prescribed fire, and must meet planning and reporting requirements. When all the conditions are met for debris disposal, such fuels may be removed to and burned in a non-wildland area (RM-18 2001).

Non-Fire Applications

The range of NPS-approved non-fire treatments includes manual, mechanical, chemical or biological methods, either alone or in combination, to reduce fuels and the probability of large-scale, high intensity fires. Such activities are most important in WUI zones where personal safety and values at risk are of the greatest concern. Practical non-fire treatments for the Monument include manual and limited mechanical means for the removal of dense surface, understory and ladder fuels in the aspen-birch-spruce-fir forests, or for removing cured vegetation from open, grass-covered areas.

Mechanical methods can also be used to create and maintain defensible wildland fire boundaries taking advantage of natural barriers wherever possible. To do so will require collaboration with the GP-Band TLR staff. Defining manageable areas requires using landscape features that extend beyond Monument boundaries.

Each non-fire treatment project requires a Project Screening Form to document appropriate NEPA and NHPA compliance. The Monument cultural specialist will survey project areas prior to treatment and specify mitigation actions. Treatments which could disrupt visitor experience, such as the use of chainsaws will be conducted during periods of low visitation.

D. Monument Fire Management Units (FMUs)

The GMP defines six types of management zones within the Monument: Interpretive Historic, Visitor Services, Park Operations, Recreational, Primitive Trail, and Resources Trust Zones (NPS 2003)(Figure 2). Approved public use of all zones is restricted to low-impact activities, such as hiking, picnicking, snowshoeing and other non-mechanized activities. Although the GMP prescriptions for these administratively defined zones provide direction for appropriate management responses to wildland fire, the 710 acres of the park unit is more suitably divided into two fire management units (FMUs) for wildland fire planning purposes (Table 1).

The lakeshore area of Grand Portage National Monument is an irregular block of 70.4 acres (Figure 2a) immediately adjacent to Lake Superior. This is the primary site experienced by visitors and offers the broadest range of interpretive resources. Four buildings and enclosing stockade are reconstructed on the original site of the North West Company headquarters and partially recreate the scene of the 1790s fur trade era. Mount Rose rises 325 feet above the lakeshore directly inland from the stockade. Overlooks from the hard surfaced trail that ascends this small bluff offer views of Grand Portage Bay and Island, the stockade and buildings, cultural landscapes from the early 20th Century village and Civilian Conservation Corps eras, the contemporary Village of Grand Portage, and the gap through which the Grand Portage trail corridor passes. Maintenance buildings, equipment storage areas and housing facilities are also within this area of the Monument.

At the western end of the Grand Portage, 64 acres along the Pigeon River form the Fort Charlotte area of the Monument (Figure 2b). Currently undeveloped, except for two primitive group campsites and a latrine, this site preserves subsurface remains of North West Company and other fur trade company depots. The archeologically significant portion of this area is especially vulnerable to any fire management activities that disturb the soil.

The remaining 575.6 acres of Monument property is distributed as a narrow corridor along the historic route of the Grand Portage. Between the lakeshore area and MN Hwy 61, the first 0.6 mile of trail lies within a 100-ft wide buffer. This section follows the narrow floodplain of Grand Portage Creek through the Village of Grand Portage, then ascends onto rocky ridges just before intersecting with MN Hwy 61. Beyond the state highway, the trail corridor widens to 600 ft in width for 7.4 miles to connect with the Fort Charlotte area. Old Hwy 61 (Co. Rd. 89) intersects the trail corridor, conveniently demarcating the hilly eastern half of the Grand Portage trail from the western portion that traverses an upland ridge before descending slightly to the Pigeon River.

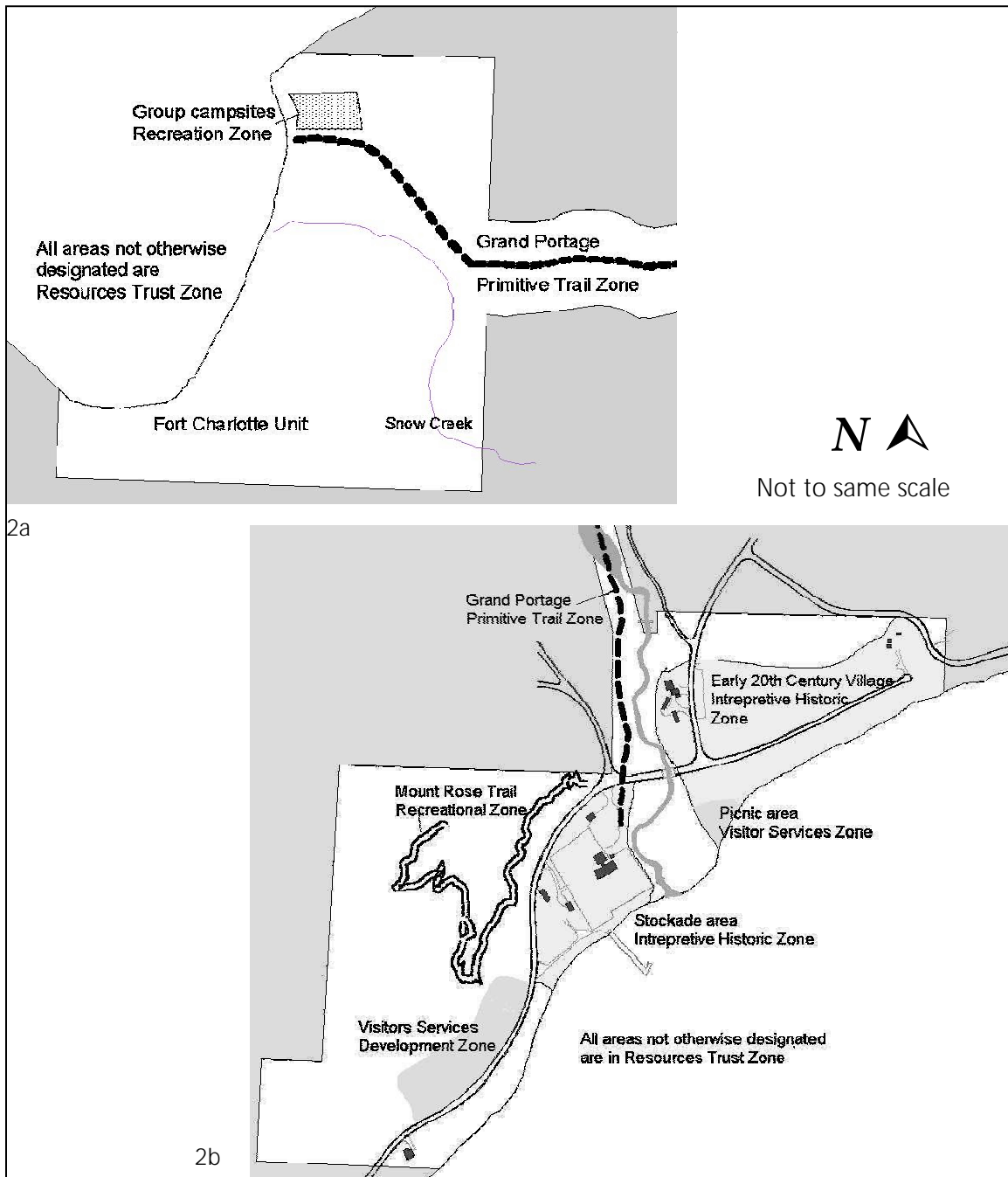


Figure 2: Management Zone Prescriptions of Preferred Alternative in General Management Plan for Grand Portage National Monument (NPS 2003). 2a) Fort Charlotte area at western terminus of Grand Portage trail corridor, and 2b) depot area on southeast end of trail, on shores of Lake Superior. The treadway of the Grand Portage is defined as a primitive trail, with all other property along the trail corridor in Resources Trust to protect cultural and natural resources, both known and yet to be discovered.

Table 1: Relationship Between Administrative Management Zones and Fire Management Units in Grand Portage National Monument (GMP 2003).

Management Zone	Area of Grand Portage National Monument	FMU¹	Values at Risk
Historic Interpretation	Most of lakeshore area, stockade and surrounding grounds, dock, CCC plantations	WUI-FMU	Archeological resources, historic cultural sites, reconstructed buildings, cultural landscapes, sensitive plant communities
Park Operations	Lakeshore area: maintenance buildings and 'boneyard' storage area, ranger residence	WUI-FMU	Structures, equipment
Visitor Services	Lakeshore area: ranger station, parking areas, picnic grounds, restrooms	WUI-FMU	Structures, equipment, visitor services
Resources Trust	Non-trail areas of Mount Rose, trail corridor and Fort Charlotte area	WUI-FMU, GF-FMU	Archeological resources, near-boreal forest community, sensitive plant communities
Primitive Trail	Treadway of Grand Portage corridor from lakeshore area to Pigeon River	WUI-FMU, GF-FMU	Archeological resources, near-boreal forest community, sensitive plant communities
Recreational	Developed trail on Mount Rose, 1.5 acre primitive campsite in Fort Charlotte area	GF-FMU	Visitor services, cultural landscapes

¹ WUI-FMU = Wildland Urban Interface Fire Management Unit, GF-FMU = General Forest Fire Management Unit

The General Forest Fire Management Unit (GF-FMU) comprises all Grand Portage National Monument lands west of MN Hwy 61, including Fort Charlotte and the 600-ft-wide portion of the trail corridor. All Monument land east and south of MN Hwy 61 within the Village of Grand Portage (lakeshore area and 100-ft-wide portion of trail corridor) constitutes the Wildland-Urban Interface Fire Management Unit (WUI-FMU). The descriptive names for the FMUs corresponds with land use on adjacent Reservation lands. This differs from the designation used for Monument lands in the GP Band Strategic Wildland Fire Plan (1999). That plan placed all Monument property within a WUI zone, which implies wildland fire response that may be counter to desirable resource use goals developed under the Monument FMP (this document) for the GF-FMU.

1. General Forest Fire Management Unit (GF-FMU)

a. Description

All Grand Portage National Monument lands lying north and west of MN Hwy 61 are in GF-FMU (Figure 3). National Monument property is described as lying within 100 yards and on both sides of the Grand Portage treadway, as currently established, resulting in a 600-ft-wide corridor, terminating with the Fort Charlotte area on the Pigeon River (Figure 2b). All of GF-FMU is considered ‘backcountry’ area because of restricted public and staff access.

Topography, Geology and Soils

In the 2.75 miles between MN Hwy 61 and Old Hwy 61, the trail corridor passes through low gaps in a series of diabase dikes. These gaps developed along a fault which arcs from the mouth of Grand Portage Creek on Lake

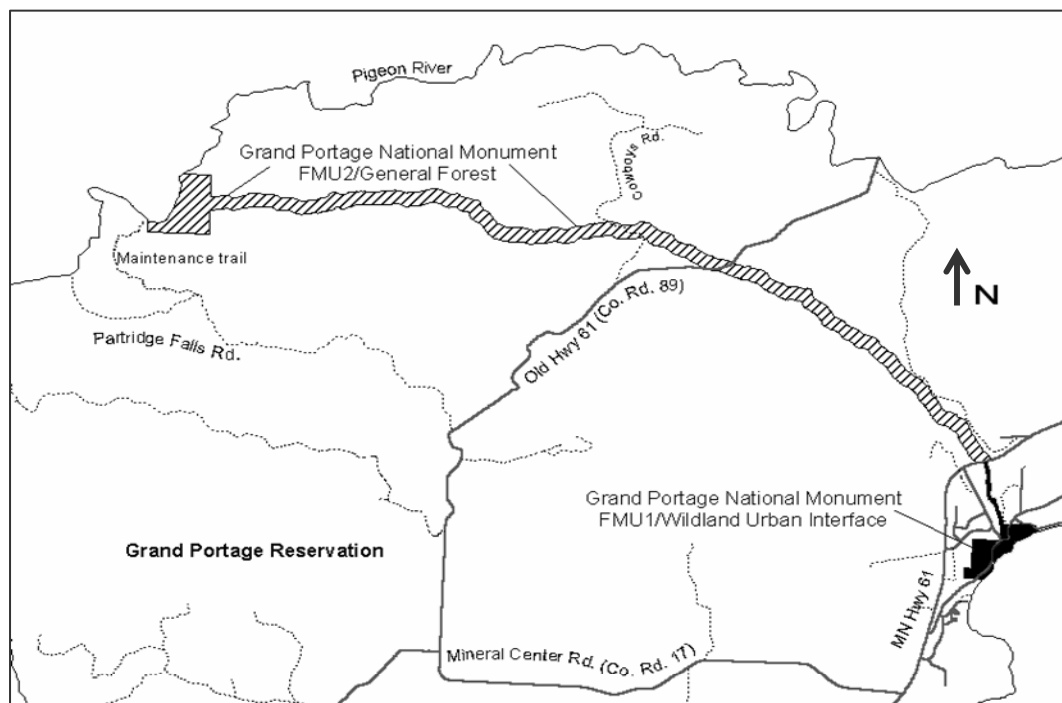


Figure 3: General Forest Fire Management Unit (GF-FMU) in Grand Portage National Monument consists of the Fort Charlotte area and the entire Grand Portage trail corridor northwest of MN Hwy 61. All Grand Portage Reservation lands surrounding these areas are designated as General Forest Use in the GP-Band Strategic Wildland Fire Management Plan (1999). Old Hwy 61 is an all-weather asphalt and gravel road which nearly bisects the trail corridor. Partridge Falls, Cowboys and Poplar Creek Roads are reservation roads negotiable with high clearance vehicles during the summer and groomed for snowmobile use in the winter. Several minor logging and all-terrain vehicle trails parallel a few sections of the trail corridor.

Superior, to the mouth of Poplar Creek on the Pigeon River (USGS 2001). As a result, this portion of trail climbs through, into and out of the steep-sided valleys of these small, fast-running streams. The trail ascends another dike between Old Hwy 61 and Cowboys Rd (0.75 mile), then follows its ridge for a mile. The final 3 miles of trail winds along the middle of a shallow watershed between upland ridges, ending near the mouth of the slow moving Snow Creek which issues from an extensive series of beaver meadows.

Soils are poorly developed and shallow to bedrock wherever the trail crosses or follows diabase dikes. Notable rock outcrops occur at MN Hwy 61, west of Cowboys Rd., and at Fort Charlotte. Elsewhere along the corridor, erosion of clay soils on steep slopes, or as a result of foot traffic, exposes bedrock or ancient beach cobble. On level terrain, the shallow soils over impervious bedrock are saturated or wet in all but the driest conditions.

Climate

The continental climate of the Upper Midwest (i.e., hot summers/cold winters) is greatly moderated by Lake Superior and the northern location of Grand Portage. Monthly temperature and precipitation means for Grand Portage are illustrated in Figure 4. Mean annual temperature is between 36°F and 38°F with seasonal extremes ranging from -40°F to nearly 100°F. Although most precipitation falls during summer months, monthly totals are highly variable, especially in August when it can range from less than an inch to nearly six inches. Snow accumulation averages between 64 and 68 inches during the long winters.

Although Lake Superior may moderate climatic conditions up to 20 miles inland, the intervening highlands of the Grand Portage area may reduce its impact on the western portion of the trail corridor. Based on staff observations, more extreme temperatures and generally drier conditions appear to prevail from the beaver pond area to Fort Charlotte. Warmer, drier conditions increase the probability of naturally ignited wildland fires in this area.

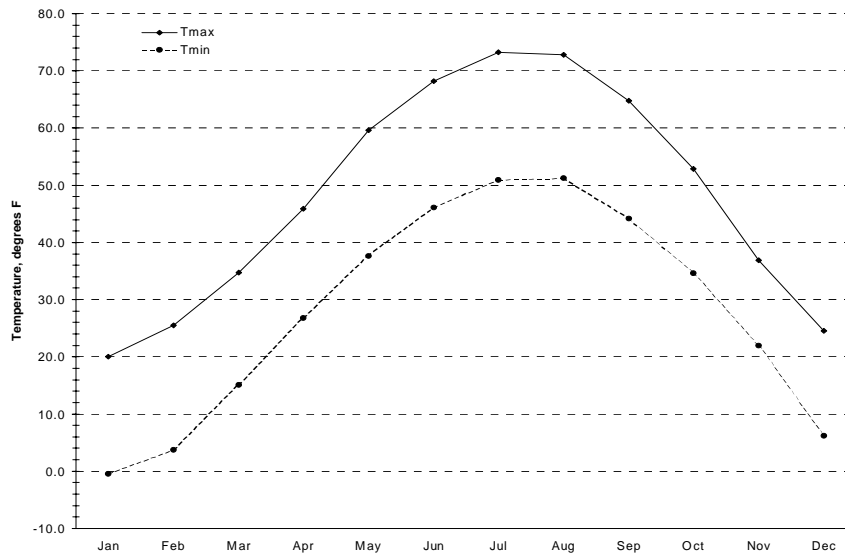


Figure 4a Monthly Maximum and Minimum Temperatures for Grand Portage, Cook County, Minnesota.

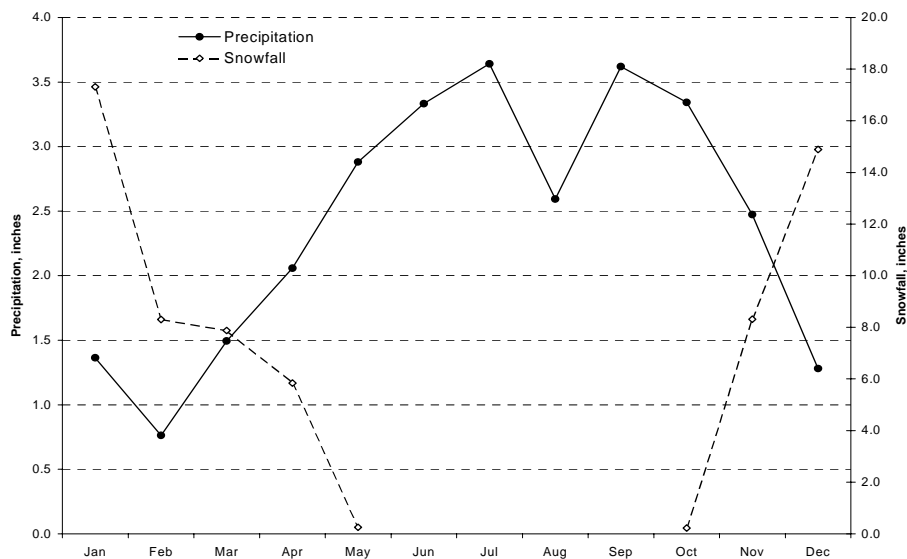


Figure 4b: Monthly Precipitation and Snowfall for Grand Portage, Cook County, Minnesota.

Figure 4: Average values derived from monthly records from station #213296 at T35N R6E S26, located in Village of Grand Portage, between 1971 and 2000 and reported to National Weather Service. Averages represent between 15 and 16 years of information because of gaps in record (i.e., no records between November 1978 and October 1988). Data source: State Climatology Office, Division of Waters, Minnesota Department of Natural Resources (2002).

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, Boundary Waters Canoe Area Wilderness and Isle Royale National Park. The EPA has determined that all 156 mandatory Class I areas across the nation demonstrate impaired visibility based on Interagency Monitoring of Protected Visual Environments (IMPROVE) data. Ozone, organic carbon and elemental carbon are found in smoke from burning vegetation or are derived from components of smoke. These are among the pollutants most responsible for haze; therefore, prescribed fires are one of four emission sources regulated under the EPA's regional haze program.

An interagency Smoke Management Plan was developed to address regulatory issues related to smoke generated by wildland and prescribed fires within the State on a region-wide basis. As a signatory agency, all NPS park units in Minnesota must comply with the guidance set forth in this plan. There are currently no local sources of emissions that present air quality concerns in GF-FMU. Smoke management for Monument prescribed or wildland fires must consider additive effects from distant wildland fires.

Water Resources/Water Quality

The Pigeon River forms the western border of the Fort Charlotte area in the GF-FMU, but it is considered outside the jurisdiction of the Monument. Limited portions of Grand Portage, Poplar and Snow Creeks pass through the GF-FMU. 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.

A Level I Water Quality Survey (GRPO, 2002) found that Grand Portage and Poplar Creeks are apparently unimpaired by management practices within the Monument or on surrounding Reservation lands. The GP-Band TLR wildlife program regulates flow into Grand Portage Creek from an impoundment upstream of the GF-FMU. This succeeds in suppressing the mid-summer water temperature, a key goal for coaster brook trout reintroduction efforts. Snow Creek's route through an extensive series of beaver ponds is reflected in its reduced water quality. It frequently has limited flow, accompanied by increased turbidity, reduced oxygen levels,

high chlorophyll levels, and transient presence of coliform bacteria. These conditions apparently result from the large, active beaver population of the area.

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 frequent mucky soil conditions and scattered small, shallow woodland pools.

Vegetation

Regional maps estimating pre-settlement and early settlement conditions suggest the current forests in the GF-FMU are similar, in many respects, to the original vegetation (Heinselman 1974; USFS 2001). Primary tree species in the mixed hardwood-conifer forests that dominate the Lower Portage are aspen (*Populus tremuloides*, a few *P. balsamifera*), birch (*Betula papyrifera*, *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. Within the GF-FMU, jack pine (*P. banksiana*) is limited to small stands on rock outcroppings along the Upper Portage, and near MN Hwy 61. 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*, *F. pennsylvanica*). Shrubby and herbaceous understory plants are typical of northern forests, with a clear affiliation to boreal communities.

A recent study of the vegetation and fire history of the Monument suggests that white and red pine were more prevalent in past centuries than currently (White and Host 2003). Pine restoration could be enhanced by re-introduction of disturbance, such as low-intensity fires, that exposes mineral soils and removes shade-tolerant competition.

Nearly 400 species of vascular plants grow within the Monument, with a significant number of species introduced by earlier settlers or through recent invasions (Walton, Draft 1999). A list of the most common species appears in Appendix C (Table C-1).

Fauna

Over 300 vertebrate animals have been documented within the Monument, most of which can be found in the General Forest Fire Management Unit. A complete list with common and scientific names appears in Appendix C (Table C-2).

Thirty-one species of native mammals presently occur within the Monument, although several more species were present historically, such as caribou and wolverine. A 1992-1994 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 larger animals. Ample tracks, scats and foraging signs provide clear evidence that moose, gray wolves and black bear are common.

Only a single snake species and two turtle species have been recorded for Cook County (Oldfield and Moriarty 1994). Garter snakes are common, but turtles have not been reliably recorded within Monument boundaries.

The few amphibian species that occur within the Monument are typical of the boreal forest habitat. American toads, spring peepers and wood frogs are common along all portions of the corridor throughout the summer. Large frogs (green, leopard, and mink frogs) are associated with wetlands along slow reaches of streams and the beaver pond. A few individuals of striped chorus frogs and gray treefrogs are heard near the beaver pond each spring. Scattered upland basins along the corridor provide the necessary breeding habitat for blue-spotted salamanders. Red-backed salamanders are abundant in appropriate habitat.

Aquatic resources are limited in the GF-FMU, but several distinct habitats are present for a variety of fish communities. Shiners, minnows and daces associated with small streams occur in the reaches of Poplar Creek and Grand Portage Creek within Monument property. Fish preferring standing or sluggish waters, such as sticklebacks and mudminnows, have been documented in the beaver pond over which the Grand Portage passes.

The mixed hardwood-conifer forest that forms an almost unbroken band along the Grand Portage corridor provides 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 around the beaver pond (Graetz et al. 1995).

Endangered Species and Species of Concern

Grand Portage National Monument is within the range of three Federally designated threatened species (Endangered Species Act of 1973, as amended): bald eagle (*Haliaeetus leucocephala*), gray wolf (*Canis lupus*) and Canada lynx (*Lynx canadensis*) (Appendix C, Table C-3). The Minnesota DNR lists mountain lion (*Felis concolor*) and least weasel (*Mustela nivalis*) as species of concern. 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 of special concern to indicate the need for monitoring.

Bald eagle and gray wolf populations have increased sufficiently that delisting is under consideration. No current nest sites for eagles are known within or in proximity to Monument property. Tracks, scat and other evidence of wolf presence are common within the Reservation, and frequent along the Grand Portage. Canada lynx 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 lakeshore area in 2002, confirm that lynx presently occur in Cook County (D. Ingebritson, MnDNR; B. Whiting, GP-TLR, personal communications). Mountain lions are occasionally reported in Cook County and on the GP Reservation, but evidence confirming their presence within the Monument is lacking. As a much smaller carnivore, least weasels are more likely to meet their needs within the confines of the GF-FMU, but their presence in the Monument has not been confirmed.

Based on current knowledge of habits and habitat requirements, no restriction on fire management activities to protect any of the threatened or special concern vertebrate species is necessary within the GF-FMU. Home range requirements of all these carnivores preclude the exclusive use of the Monument in supporting viable populations of these species. Fire use or suppression practices within the narrow trail corridor would have no appreciable effect on critical resources for these species, due to the presence of similar resources in the surrounding Reservation. However, should an active eagle nest site be found within or adjacent to the Monument, appropriate fire management actions will be required to avoid disrupting the nest during critical periods, and to protect the nest site in event of a wildland fire.

Three vascular plant species reported from the GF-FMU are classified as of special concern by the MnDNR (1999)(Table C-3): creeping juniper (*Juniperus horizontalis*), blunt-fruited sweet cicely (*Osmorhiza depauperata*), and long-stalked chickweed (*Stellaria longipes*). Location and population size of these plant species have been recorded with a global positioning system (GPS) and mapped to the Arc/View™ geographic information system (GIS) coverages maintained by Monument resource staff. Site-specific restrictions and appropriate fire management response for each plant population needs to be developed and linked to GIS maps for use by wildland fire incident commanders.

A single colony of creeping juniper is found within the Monument on an exposed rock outcrop, accompanied by scattered jack pine and abundant ground lichen growth. It appears that prolonged absence of fire allowed a single individual of creeping juniper to form the extensive colony. Although this site has limited surface fuels, these fuels dry more quickly than the surrounding mesic aspen-birch-spruce-fir forests, increasing the risk of fire starts. Location of this site adjacent to MN Hwy 61 on the eastern end of GF-FMU also increases the potential for human-ignited fires. Burning, under any circumstances, would probably eliminate this species from the Monument. Site-specific vegetation and fuel management actions should be developed for this site to protect it from burning as a result of wildland or prescribed fires.

The other vascular plant species of concern in GF-FMU (blunt-fruited sweet cicely and long-stalked chickweed) are herbaceous perennials found in mixed hardwood-conifer forests. Their distribution in the Monument is spotty and not associated with specialized habitats. Specific fire management actions are not required to protect these species.

Cultural Resources

Grand Portage National Monument is listed in its entirety on the National Register of Historic Places. All of the GF-FMU is in the designated historic district because of the key role the portage had in development of the fur trade. Limited archeological studies have been done in this portion of the Monument, making protection of potential in-ground cultural resources a major concern during any fire management actions. The types of cultural resources that occur in the GF-FMU could be adversely affected by wildland fire or fire management activities.

Archeology

Depending on fire history and fire behavior, the impacts on archeological resources from wildland fire management could be both adverse and beneficial. Suppression of wildland fires during the last 80 years permitted

the growth of dense spruce, balsam fir and aspen over much of the Monument. 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, disrupting soil layers and moving objects. Smoldering surface debris and root burn-out associated with uncontrolled fires present different threats to in-ground archeological resources. Objects made of organic materials can be directly consumed by fire, while metal items can be irretrievably altered by heat. Some dating methods for pottery and other hard materials produce inaccurate estimates after heating by wildland fires. Suppression actions that disrupt soil layers or increase the potential for erosion present additional risks to surface and in-ground cultural materials. In contrast, removal of surface vegetation by prescribed or managed wildland fires could improve 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 Grand Portage trail corridor between MN Hwy 61 and Fort Charlotte is only partially surveyed for archeological resources. Field work continues to identify significant features and ‘*pose*’ (resting) sites dating from the fur-trade era. These surveys reveal that cultural materials are within a few inches of the surface. This thin historical layer has the highest risk of adverse effects from wildland fires and fire management activities. In particular, fire fighting actions that disturb soils layers should be avoided unless there is immediate threats to human lives.

The Fort Charlotte area of the Monument is considered a resource trust zone, except for the primitive camping sites, in order to protect all sub-surface archeological information. Only non-invasive methods have been used to study terrestrial cultural resources, preserving the in-ground materials for analysis by improved methods in the future. A 1970s archeological investigation in the Pigeon River at Fort Charlotte recovered extensive submerged evidence of fur trade activity.

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. In recent years, absence of fire has permitted the growth of trees throughout the site. 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.

Historic sites

The Grand Portage trail corridor may have 16 or more resting sites (*poses*) used by voyageurs, which were spaced about one-half mile apart or associated with water features. Such sites may be more archeologically rich than other sections of the trail, and should be especially protected during fire management activities. Recent surveys have identified a few potential sites, but most of the trail corridor remains unstudied. Cultural artifacts, when present, are within a few inches of the surface. This restricts the construction of fire breaks or holding lines, especially with wheeled or tracked equipment. If such measures are necessary, a surface survey should precede such actions, whenever possible, and always be conducted afterward.

The actual Fort Charlotte site contains the remains of North West Company and XY Company depot sites on the banks of the Pigeon River. Terrestrial investigations of this area have been limited to non-invasive methods in order to preserve the in-ground resources. Preservation of this site is a major concern during any fire management actions. No wheeled or tracked vehicles should operate in or traverse the site, except as approved by the Monument superintendent. Disturbance of the soil by construction of fire breaks or holding lines, or by falling trees (either uprooting trees or limb penetration of soil) and root burnout should be minimized in the core historic area. Removal of hazard trees and fuels should be a primary fire management strategy for the Fort Charlotte area.

Cultural Landscapes

The landscape along the Grand Portage trail corridor is primarily forested. Logging during the late 19th to early 20th Century focused first on the native pine stands of the sub-boreal forest. Harvest was restricted to allotment lands during the 1910-1930 period (GP-Band 1999). Commercial harvest of aspen and birch for cordwood, fiber production and saw timber on reservation trust lands developed slowly between 1942 and 1963, when the first timber inventory and Timber Management Plan were completed (GP-Band 1999). Current harvest areas are generally 200 acres or less, as a means of enhancing small and large game production in suitable areas of the Reservation (GP-TLR forester, personal communication). This practice provides a semblance of the landscape mosaic typical of the fire-adapted near-boreal forest of the Northern Superior Uplands (Frelich 1995, 1998, 1999).

Within the Grand Portage trail corridor, only windfalls or spruce budworm infestations create forest gaps, resulting in a more-or-less continuous forest of senescing birch-aspen with a maturing spruce-

balsam fir second growth. In addition to developing high fuel loads, fire suppression during the last 80 years has limited the regeneration of pines. Occasional openings in areas where wind or fire disturbances would have been frequent (i.e., rocky areas and ridge tops), would provide today's visitors with views of the landscape similar to the pre-historic and early historic periods. Historic forest restoration could be achieved through a combination of fuel reduction treatments, prescribed fires, wildland fires managed for resource uses, and/or mechanical vegetation management.

Ethnographic Resources

The enabling legislation that created Grand Portage National Monument stipulated the continued access by Grand Portage Band members in pursuit of traditional cultural practices. This has been interpreted to include transport across the Grand Portage at specified points by traditional or modern means. Designated crossings along the outer trail corridor include previously existing county roads and logging access trails negotiated over the years. These designated cross trails provide natural fire breaks and additional access points for fire management actions.

Continuing dialog with community members and tribal elders is providing useful information to Monument staff on the cultural significance of particular plants. Management and protection strategies for ethnographically-related species are under development. It is likely that such management will be affected by fire management considerations. In particular, culturally-modified trees in an old-growth cedar stand along the outer trail corridor should be protected from both fires and some types of fire fighting actions.

Human Uses

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 in its traditional role as a portage to Lake Superior, as individuals or groups of up to 50.

Current land use on areas adjacent to the GF-FMU is classified as general forestry as established by the Grand Portage Band zoning regulations. In

addition, the GP-Band recognizes preservation zones as buffer strips along all waterways within the Reservation. These designated uses are in concert with the goals established by the Monument for the GF-FMU, and as stated in the GMP (2003) and RMP (2001).

b. General Forest FMU Fire Management Objectives and Strategies

Specific objectives for the General Forest Fire Management Unit are guided by the Grand Portage National Monument GMP (NPS 2003) and based on the programmatic goals set forth in section III. B. of this document.

Objective: Ensure all wildland fire, prescribed fire and mechanical operations sustain no injuries to members of the public or to firefighters.

Protection of human life is reaffirmed as the first priority in wildland fire management. Property and natural/cultural resources jointly become the second priority, with protection decisions based on values to be protected and other considerations.

Strategies:

- Qualified individuals will carry out fire management operations with the safe and skillful application of fire management strategies and techniques, consistent with DO-18 requirements.
- All personnel involved in fire management operations will receive a safety briefing describing known hazards and mitigating actions based on Lookouts, Communication, Escape Routes, Safety Zones (LCES); current fire season conditions; and current and predicted fire weather and behavior.
- Only properly trained and certified personnel will be working on a fire. Other personnel will contribute with crowd control, smoke detection, weather condition assessment, and other aspects that can be accomplished in specified safe areas.
- Monument neighbors, visitors, and the local residents will be notified of all planned and, when possible, unplanned fire management activities that have the potential to affect them. A comprehensive list of contacts to be made prior to prescribed fire will be included with each prescribed fire plan.
- All or portions of the Monument will be closed to the public when fire activity poses a threat to human safety (at the discretion of the superintendent). Safe areas will be established for visitors during prescribed fires. Should the situation warrant, safe areas will be closed

to visitors and visitors will be removed from any potentially dangerous locations.

Objective: Appropriate Management Response (AMR) strategies for unwanted wildland fire are successful 97 percent of the time.

Strategies:

- Prioritize suppression actions on fires or portions of fires that threaten to damage public property.
- Ensure that park staff is trained in wildland fire operations.
- Ensure that park staff responsible for fire operations understands fire policy.

Objective: Ensure wildland fire and fire management activities do not destroy nor incur damage to any cultural resource or cultural landscape.

Direct effects on in-ground archeological objects depend on the interactions of fire behavior (intensity, severity, residence time, fuel burnout). Fire suppression actions are additional hazards to in-ground and surface cultural resources. Construction of hand or bulldozer fire lines can destroy objects and disrupt important contextual information. Removal of vegetative cover from soil surfaces increases the potential for erosion and looting. Specific stands of trees within the GF-FMU are historically significant. Loss or damage directly by fire or through suppression actions is to be avoided. Due to the irreplaceable nature of cultural resources, discretionary use of some suppression actions is restricted within the Monument unless approved by the superintendent. The ability to approve some suppression actions may be assigned to a fire incident commander through a limited delegation of authority (Appendix G).

Strategies:

- Ensure fire operations personnel, including firefighters from cooperating agencies, are briefed on Grand Portage National Monument resources and potential damage from fire and suppression actions.
- Ensure wildland fire suppression operations employ Minimum Impact Suppression Tactics (MIST) as defined in the Wildland Fire Management Manual, RM-18 (NPS, 2001) Chapter 9, Exhibit 5.
- No off road vehicle use along the Grand Portage corridor or within the Fort Charlotte area unless approved by the superintendent.

- No bulldozer or grader use along the Grand Portage corridor or within the Fort Charlotte area unless approved by the superintendent.
- Minimize use of chainsaws and all use will be consistent with MIST standards.
- No ground delivery of retardant or foam in the GF-FMU unless approved by the superintendent or designee, except where human life or property is immediately threatened. Aerial delivery of retardant or foam is to be minimized, to the degree possible.
- Ensure that a cultural resource advisor is present on all suppression actions.

Objective: Manage forests to reflect the community structure believed to have existed 200 years ago during the fur trade era by restoring pine communities to 15 percent of the Monument property.

Restoration of the trail corridor landscape to the conditions believed to exist during the fur trade era could be achieved by selective removal of the aspen-birch-spruce-fir woods and understory growth to encourage pine regeneration where the few mature pines still occur.

Strategies:

- Where applicable, restore fuel loads and plant community structure comparable to fur trade era. Specifically:
 - Delineate and treat areas amenable to thinning and understory removal in order to stimulate regeneration of pine species.
 - Reduce hazard fuels in areas of windthrow and spruce budworm killed trees with manual means to reduce intensity of any subsequent unwanted wildland fires.
- Use firefighters trained in managing wildland use fires consistent with RM-18 requirements.

Objective: Ensure air quality issues related to fire use activities are compliant with the Minnesota Smoke Management Plan.

Strategies:

- Smoke impact mitigation measures will be implemented for prescribed fire and all wildland fire actions.
- Air quality objectives will be incorporated in each prescribed fire plan.
- Impacts to air quality will be considered as a part of the GO/NO GO decision in the prescribed fire plan and throughout the duration of any prescribed fire.

- Air quality impacts will be addressed as a part of the alternative development and selection in the Wildland Fire Situation Analysis.

Objective: Review and modify as necessary agreements with the organizations listed below by April 30 each year.

Strategies:

- Coordinate with the following entities:
 - Grand Portage Reservation Tribal Council, Fire Department
 - Grand Portage TLR Forestry Unit
 - U.S. Department of the Interior, Bureau of Indian Affairs Minnesota Agency
 - Minnesota Department of Natural Resources, Division of Forestry
 - U.S. Forest Service, Superior National Forest, Gunflint District
 - Cook County Sheriff
 - Ontario Ministry of Natural Resources
- Maintain good working relationship with the Grand Portage Fire Management Program operated by the GP-Band Trust Lands and Resources.
- Cooperate with adjacent landowners to prevent wildfire on adjacent lands.

Objective: Cooperatively manage wildland and prescribed fires across mutual boundaries with the Grand Portage Band TLR whenever possible.

Strategy:

- In collaboration with the Grand Portage Band TLR, use wildland fires for resource benefits across mutual boundaries.
- Provide opportunities for public understanding of fire ecology principles, smoke management, and wildland fire use program objectives.
- Monitor and evaluate the effectiveness of wildland fires managed for resource benefits.

c. General Forest FMU Fire Management Considerations

- Naturally or human-ignited fires within the GF-FMU have a great risk of escaping Monument property due to potential delay in detection and firefighter response.
- Interagency agreements must be reviewed/renewed annually to ensure mutual aid is available when and where needed.

- Existing roads and trails may be used as fire breaks for controlling the spread of fire, but are insufficient for protecting the entire trail corridor.
- In cooperation with GP-Band forestry and wildland fire staff, identify wildland fire use maximum management areas, using natural features for fire area boundaries.
- Coordinate historic forest restoration efforts along the trail corridor with GP-Band forestry management activities on adjacent lands.

d. Fire Ecology of the General Forest FMU

The Ecological Classification System (ECS) delineates areas with similar geologic history, climate, vegetation, natural fire regime and patterns of use (USFS 2001, MnDNR 2001, MFRC 2002). Correlations of these inter-related factors at various scales are used to describe environments from the regional landscape (i.e., Laurentian Mixed Forest Province) down to the local landtype association (lta)(i.e., Swamp River Till Plain, North Shore Till Plain)(MnDNR 2001). The descriptive ECS hierarchy for the Grand Portage area is illustrated in Figures 6 and 7 (MnDNR 2001). Along the Grand Portage trail corridor, the transition from the North Shore Highlands to the Border Lakes Subsections occurs between Old Hwy 61 (Co. Rd. 89) and a reservation logging road (Cowboys Rd.) Differences between the North Shore Till Plain (cooler, moister) and Swamp Lake Till Plain (warmer, drier) ltas are subtle, but significant, in the effects on the environments found east and west of this area. The resulting difference in soils, weather regimes, and moisture conditions has implications for wildland fire management within the context of this FMP, and for future planning to accommodate wildland fires managed for resource benefits.

Forest Communities

Of the eight types of forests found within the Northern Superior Uplands Section, only the mesic birch-aspens-spruce-fir woods is well represented within the Monument (Frelich, 1999). This community type dominates the landscape on the North Shore Till Plain lta section of the trail corridor. A few scattered pines occur through this area, but are more prevalent and form distinct white pine communities on the Swamp Lake Till Plain lta west of Old Hwy 61. This limited forest diversity may be due to the historic use of the Grand Portage. The trail corridor proceeds from Lake Superior through several gaps in the uplands, then follows the crest of a ridge, by-passing marshy or swampy areas as much as possible. Other near-boreal community types are present on the Grand Portage Reservation, but are uncommon and of limited size within the Monument.

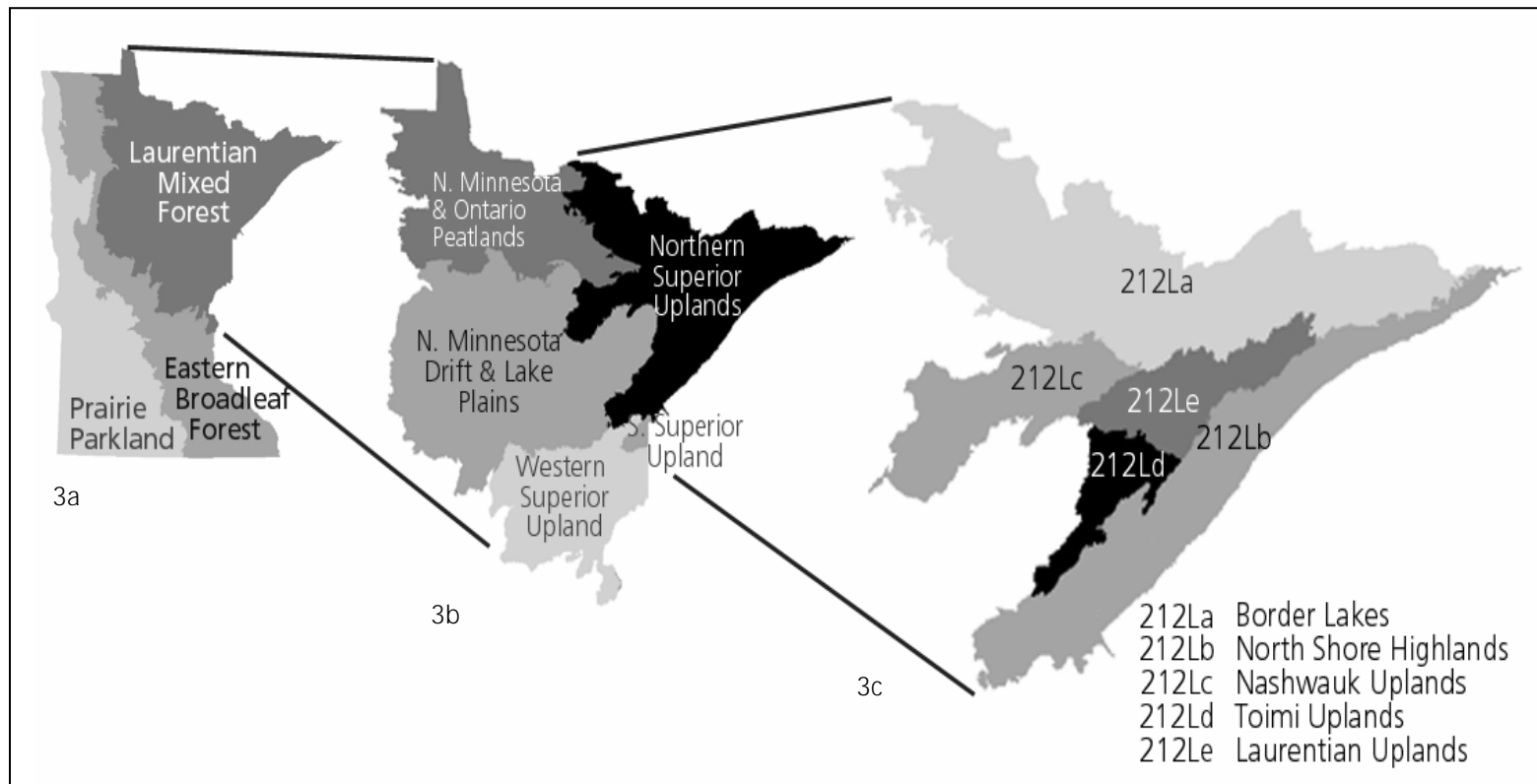


Figure 5: Ecological Classification for the Arrowhead Area of Northeast Minnesota. 3a) The Laurentian Mixed Forest Province (212) varies from hardwood forests in the south, through mixed woods across northern Minnesota, to continuous conifer stands in Canada. 3b) The Northern Superior Uplands Section (212L) is underlain with ancient bedrock formations. 3c) The major difference between the interior Border Lakes (212La) and North Shore Highlands (212Lb) Subsections is the moderating influence Lake Superior has on both summer and winter weather. (Source: MnDNR, 2001. http://www.dnr.state.mn.us/ecological_services/ecs/)

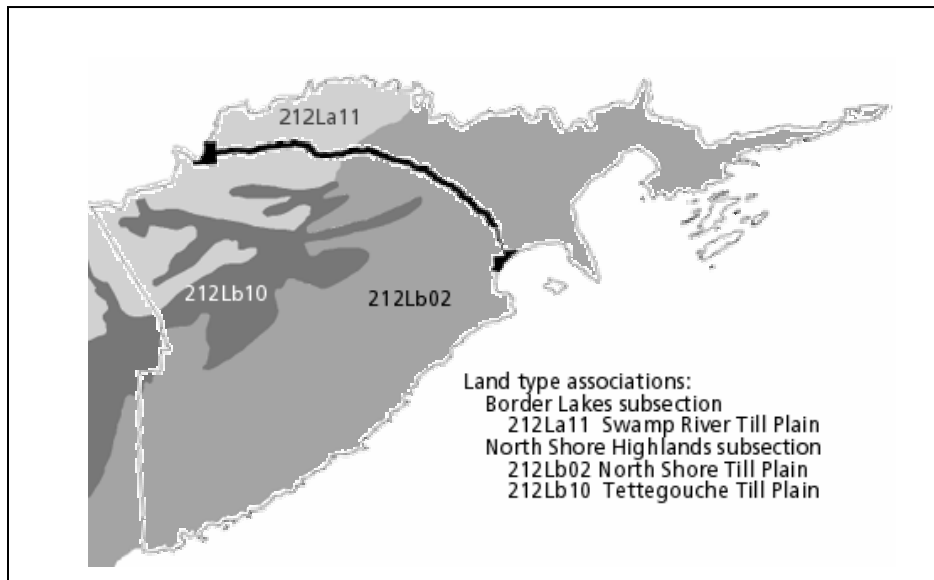


Figure 6: ECS Landtype Associations in the Grand Portage, Minnesota, Area. Characteristic Border Lakes environments are found in the Boundary Waters Canoe Area Wilderness (BWCAW) to the west of Grand Portage, with only the Swamp River Till Plain (212La11) landtype association (lta) of this subsection extending along the Pigeon River. Two ltas of the North Shore Highlands Subsection occur in the Reservation: the North Shore Till Plain (212Lb02) following the shore and on lower elevation ridges, with the Tettegouche Till Plain (212Lb10) restricted to the higher peaks and ridges.

Birch-aspen-spruce-fir forests

Dense mixed stands of aspen, birch, balsam fir and white spruce are typical of areas with fine-textured, moisture-retaining soils. Paper birch and aspen growth is favored after stand replacing fires, with fir and spruce slowly invading between disturbance events (Table 2). These shade tolerant, but fire intolerant conifers attain dominance of the community in 80 to 100 years (Frelich 1998), and in the absence of surface fires, form uneven-aged stands. Early successional stands burn infrequently because fuel loadings from birch and aspen are relatively light and the canopy cannot sustain a crown fire (Dickmann and Cleland 2001). Mature fir and spruce are able to carry crown fires as readily as jack pine forests, but their growth in mesic environments reduces the frequency of fires (Frelich 1998).

White and red pine forests

White and red pines stands occur on a small portion of the landscape, both locally and historically. During the pre-settlement period, only about 13 percent of Minnesota's forests were white and red pine (Frelich 1998).

The intensity and frequency of disturbance is critical for establishing and maintaining pine forests (Table 2). Following a stand replacing event, birch grows more quickly than pine, but pines can reinvade if a seed source is near enough. Such reinvansion requires several to many decades, with the pines dominating the canopy after nearly a century of growth (Frelich 1998). Low-intensity surface fires suppress invasion by fir and spruce, but will kill immature pines as easily. Shade-intolerant pine seedlings cannot grow in the absence of surface fires or other disturbance that permits light to reach the soil. When crown fires are not too frequent, white and red pine can maintain multi-aged stands for several centuries (Frelich 1998). When mature pines are killed, the site may revert to a birch-aspen-fir-spruce community (Frelich 1998).

Natural Fire Regime

Fire frequency at individual sites is highly dependent on soil, geological, climatic and vegetation conditions. The clay-rich soils in the Grand Portage area have a high water-holding capacity, and shallowly overlay bedrock with slow infiltration rates. Therefore, the ground surface is moist to wet during all but the most severe droughts. Weather conditions are moderated by Lake Superior along the Lower Grand Portage, keeping summer conditions cool and moist in the North Shore Till Plain lta. In contrast, the Swamp River Till Plain is shielded from the lake effect by the intervening Grand Portage Highlands, resulting in warmer and drier conditions during the summer along the Outer Portage and at Fort Charlotte. This difference is reflected in the estimated return intervals for stand replacing fires for these areas: very long (250 to 1,000 years) for the lake influenced North Shore Highlands, and moderate (100 to 250 years) for the Swamp River Till Plain with moderately frequent forest maintenance surface fires (25 to 100 years)(Shadis 1998, Dickmann and Cleland 2001).

Fire History

Assessment of tree cores and cross-sections from downed trees reveals a forest history consistent with the fire regimes described above. A few living and standing dead white pines are, or were, more than 200 years of age (White and Host, 2003). A group of northern white cedar which occurs on an upland ridge probably established following a stand-replacing event between 250 and 300 years ago. This is also supported by limited age information for stands adjacent to Monument boundaries provided by the GP-Band TLR GIS unit. The birch-aspen-spruce-fir forests are roughly 80 to 100 years of age, with many mature trees senescing. A spruce-fir understory is well developed or dominates the

Table 2: Theoretical Range of Natural Variability for Birch-aspen-spruce-fir and White and Red Pine Community Types. Pre-settlement forest conditions were used as the starting condition in a box and arrow simulation model. The disturbance regime included stand-leveling winds (1000-2000 year return interval), stand-killing fires (birch-aspen-spruce-fire, 100-200 years; white and red pine, 150-300 years) and ground fires (white and red pine, 40 years)(after Frelch 1999; Brown and White 2002). Note: models assumed an infinitely large landscape; percentages should not be construed to reflect current forest conditions within the limited size of Grand Portage National Monument.

Mesic birch-aspen-spruce-fir			Mesic white and red pine		
Years since last disturbance	Vegetation growth stage	% of landscape	Years since last disturbance	Vegetation growth stage	% of landscape
0-10	sapling birch	4.8-9.2	0-10	sapling birch	3.2-6.3
11-50	pole-mature birch	15.0-26.1	11-50	pole-mature birch	11.3-19.8
51-80	mature birch-conifer	10.3-26.1	51-80	mature birch-pine	9.7-12.2
81	multi-aged conifer	46.9-66.6	81-120	mature white pine	9.2-13.1
0-50	sapling-pole conifer	1.6-2.1	121-200	multi-aged pine-spruce-fir	11.8-12.4
51-80	pole-mature conifer	0.1-0.8	201	multi-aged spruce-fir	23.5-44.3
			0-50	sapling-pole pine	0.6-1.3
			0-50	sapling-pole spruce-fir	1.2-1.4
			121	multi-aged white pine	9.9-10.7

canopy in many areas. Historical records and photographs further support this interpretation.

Little is known of fire occurrence during the 19th Century in the Grand Portage area, and few details are available even for fires during the 20th Century. Three fires of unknown size occurred in 1908, and several small fires burned in 1912. During a period of regional drought, fires burned over 10,100 acres of the Grand Portage Reservation in 1917. The original stands included balsam fir, jack pine, cedar, spruce and a scattering of red and white pine . The most recent landscape-scale fire occurred in 1936, when much of the Reservation forests burned, nearly reaching the Village of Grand Portage (White and Host, 2003).

Recent fires have been limited in extent; a lightning-ignited fire burned about 23 acres along the Pigeon River southwest of Fort Charlotte (T64N, R5E, Section 29) in 1969. Another lightning started fire burned 21 acres in Section 28, T64N, R5E during 1988, with less than nine acres of this within the NPS boundary. In 1990, the GP-Band began using fire for blueberry enhancement with a 32 acre prescribed fire. GP-Band forestry continues this practice when seasonal conditions permit, along with prescribed fires for fuel reduction in spruce budworm killed balsam fir. Table 3 summarizes recent information from the Fire Planning Analysis and Annual Report (BIA, Minnesota Agency, 1997a, 1997b; excerpted from Strategic Wildland Fire Management Plan, 1999) regarding contemporary wildland fire frequency, causes and size for the Grand Portage Reservation.

Table 3: Ten-year Average Fire Frequency and Size on the Grand Portage Band of Minnesota Chippewa Reservation. Information summarized in Grand Portage Wildland Fire Management Plan (1999) from Fire Planning Analysis and Annual Report (BIA, Minnesota Agency, 1997a, 1997b).

Ignition sources:	Number of fires:	Acres:
Lightning	2	8.1
Campfire	1	2.0
Smoking	1	0.5
Debris burning	7	10.0
Children	2	0.5
Miscellaneous	2	2.0
Total	15	23.1

e. Wildland Fire Management Situation for the General Forest FMU

1) *Historical weather analysis*

Historic accounts indicate that fires swept across large portions of northern Minnesota during periods of regional drought. Localized or seasonal droughts can also provide optimal conditions for wildland fires. In the Grand Portage area, weather-related fuel conditions are modified by its proximity to Lake Superior. Cool onshore breezes can penetrate five to 10 miles inland, resulting in as much as 30 to 40 degrees temperature difference between protected inland areas and the waterfront. These cooler temperatures, along with higher relative humidity, can dramatically change fire weather conditions near Lake Superior. This lake effect combined with the linear configuration of the Monument may result in very different fire weather conditions between the developed portion of the Monument and the Fort Charlotte area.

The GP-Band forestry program plans to install a weather station on the Reservation for acquiring the required parameters for fire danger rating calculations (NFDRS or Canadian Indices) during 2005. Until that time, the nearest source for historic and current weather data is operated by the NPS at Windigo on Isle Royale, about 23 miles offshore of Grand Portage. The US Forest Service operates a station at Seagull Guard Station which is more than 48 miles west of the Fort Charlotte area. In spite of this distance, GP-Band forestry currently uses the indices obtained from the Seagull station as a conservative estimate for fire planning purposes. This is acceptable for wildland fire suppression preparedness, but may not be adequate for prescribed fire planning.

2) *Fire season*

Under suitable weather conditions, wildland fires may occur in northern Minnesota whenever the ground is free of frost and snow cover. Two features of the local climate limit the length of the potential fire season in the Grand Portage area. The ground is typically snow-covered for four to six months during the normally cold winters, and most of the annual precipitation occurs during summer months. The critical combination of low fuel moisture in 'cured' vegetation occurs during brief periods of spring and fall during normal years. Spring burning conditions may occur between mid-April and early June. Fall burning conditions can develop early in September or even in late August in exceptionally dry years. Most naturally ignited wildland fires occur in late summer, when fuel is dry from summer heat and herbaceous growth is senescing.

3) *Fuel characteristics*

Three broad categories of wildland fuels are found in the GF-FMU: mixed conifer/hardwoods, hardwoods, and grass/shrub meadows. Flammable live fuel is generally limited to conifer species which may spread fire by torching, spotting, and crowning. Fires are normally carried by small dead fuels on or near the surface. Litter, duff, small woody branches, and cured grasses and herbs are more important to fire spread than overstory vegetation. Such fuels are more available during spring and fall when cured grasses and leaf litter are abundant.

Mixed conifer/hardwoods include any combination of aspen, birch, spruce and fir. Surface and crown fires occur in any of these forest types. Spruce-fir areas provide ladder fuels with low hanging branches, and birch bark provides the ideal vehicle for spotting long distances. Periodic insect infestations create jackpots of dead aerial and ground fuels. Mop-up efforts can be hampered by the heavy fuels and soil conditions.

Hardwoods, such as aspen-birch stands, are generally fire resistant during summer months when leaf shading of surface fuels results in higher fuel moisture. After leaf fall, loosely compacted litter dries faster under the increased solar radiation and unrestricted wind movement. Winter snows compact hardwood leaf litter, making it less likely to burn in the spring.

Grass/shrub meadows include grassy openings, sedge meadows and lowland brush. Cured grasses and grass-like plants can support running fire during spring and fall. Summer fires are rare in these fuels, unless excessive drying during droughty conditions allows surface fires in fine fuels.

The GP-Band Strategic Wildland Fire Management Plan (1999) describes two fuel models for Reservation lands. The desire to define small burn areas based on localized plant communities may permit the use of additional fuel models for GRPO lands (Table 4).

Fuel model E (hardwoods, leaf off) (NFFL Fuel Model 9) typically has low to moderate heat intensity with flame lengths of 1 to 3 feet. Direct attack can usually contain fires. When 'jack pots' of conifer fuels are present, heat intensities will be higher and rate of spread increase, with intermittent torching in the crowns of individual trees. Under these conditions, direct attack may still be sufficient to contain the fire, but it may require longer (GP-Band, 1999).

Table 4: NFDRS Fuel Models for Grand Portage Area, Cook County, Minnesota. Acreage for the Monument derived from FirePro Base Analysis Report for FY2002 (NPS, 2002) and Monument GIS maps. Information for GP-Band Reservation from Strategic Wildland Fire Management Plan (GP-Band, 1999).

Fuel Model	Plant community	Fuel component	Distribution	
			Monument	Reservation
E	Hardwoods	Uncompacted leaf litter	65 percent (460 acres)	60 percent
G	Mixed hardwood-conifers	Litter, needles, heavy blowdown	28 percent (200 acres)	30 percent
H	Lowland conifer or upland spruce-fir	Compacted needles	approximately 2 percent	–
N	Grass-shrub meadows	Fine fuel litter	approximately 1 percent	–

Fuel model G (mixed hardwood-conifers)(NFFL Fuel Model 10) can develop heavy surface fuels in some sites as a result of disturbance events, such as blowdown and insect infestation. These areas burn with greater heat intensities, spread rapidly, and may produce spot ignitions ahead of the fire front. Containment of such fires may be difficult, requiring substantial commitment of resources during initial attack (GP-Band 1999).

Fuel model N (grasses)(NFFL Fuel Model 3) is able to sustain fire only during brief periods of the year in the Grand Portage area. When the duff is dry enough to burn, spread rates are highly dependent on wind speed and direction. Heat intensities may be moderate, producing flame lengths of 4 to 8 feet, or more. Direct attack may be limited by flame length and spread rate.

The fuel load within GF-FMU has not been assessed. Table 5 displays the fuel loads reported for forested lands of the Grand Portage Reservation (GP-Band 1999). These estimates can serve as a useful guide to the fuel conditions within the Monument, but differences in management for the last half century must be considered. Absence of logging within Monument properties results in generally older forests, with higher surface fuels due to senescing trees, disease and insect infestations, windthrow and other physical damage.

Table 5: Fuel Loads for Primary Fuel Models Representative of the Forested Lands of the Grand Portage Reservation, Cook County, Minnesota (GP-Band, 1999).

Fuel Model	Tons per acre	Percent in fuel diameter size class:		
		0-¼ inch	¼-1 inch	1-3 inch
E, Hardwoods	3.5	83	11	4
G, Mixed hardwood-conifers	12	30	20	50

4) *Fire regime alteration*

Use of forests along the Grand Portage by native cultures, both before and after European contact, could have altered natural composition of the forests and influenced fire frequency. Descriptions from early journals describe the Grand Portage landscape of 200 years ago; although generally consisting of a forested landscape, there were occasional grassy meadows along streams and vistas of distant hills.

After logging of the original pine forests (ca. 1880-1920), fire suppression throughout this region led to less diversity in forest types and stand ages. In some areas, regeneration of pine forests has been suppressed by this practice. Logging of aspen and birch since the 1920s perpetuated the growth of these pioneer species in place of more diverse forests. Commercial forestry practices used on the Reservation have been a significant influence on the forests during the 20th Century. As a result, the forests that currently exist in this area result from the combined effects of natural and cultural factors.

No formal study has been done to classify the condition class of the current GF-FMU vegetation. Based on the above considerations, it is most likely Condition Class 2. This class is defined as moderately altered from the historic fire regime due to either an increased or decreased prevalence of fire activity. There is also a moderate risk that key components of the vegetation community could be lost as a result of these changes in fire frequency. Use of wildland or prescribed fires would help restore normal fire intervals and encourage the growth of a more diverse forest in the GF-FMU.

5) *Control problems*

The geological history of the Grand Portage area produced the most dramatic landscape in Minnesota, with steep-sided highlands dissecting the terrain in various directions. One consequence of this is limited access to some areas of the Monument trail corridor, which could delay both

wildland fire detection and response times. Reliable passenger car access to trail heads is limited to MN Hwy 61 near the lakeshore area, and Old Hwy 61 (Co. Rd. 89) at about the mid-point of the trail corridor. Four-wheel drive or off-road vehicles are needed to traverse most Reservation roads and logging trails that cross or parallel portions of the trail corridor.

This rugged landscape also affects the spread of fire in the mixed hardwood-conifer fuels of the region, with wind-driven fires rapidly spreading up hillsides. For example, the Sag Corridor fire in August 1995, spread six miles in only six hours (GP-Band 1999).

6) *Fire environment*

As defined in the Monument RMP (GRPO, 2001), the goal of vegetation management in the GF-FMU is complementary to the forestry uses of surrounding Grand Portage Reservation lands. Through collaborative planning, wildland fires (and potentially prescribed fires) may be managed to meet the needs of both Grand Portage Band forestry and Monument resource management. The major distinction between fire management activities on Monument lands compared to Reservation trust lands is the need to protect surface and subsurface cultural resources.

2. Wildland-Urban Interface Fire Management Unit (WUI-FMU)

a. Description

All Monument lands south and east of MN Hwy 61, comprising the 79.59 acre lakeshore area and the 100-ft wide trail corridor extending to Hwy 61 (Figure 4), are designated as WUI-FMU. This includes the Monument's historic core, picnic area, other visitor services, Mount Rose with its hard-surfaced interpretive trail, and maintenance facilities located between Lake Superior and the Village of Grand Portage.

Topography and soils

The stockade, picnic area and former village site rest on abandoned beaches of post-glacial lakes, where soil formation has been poor, and the water table is shallow. Mount Rose rises 300 feet above Lake Superior immediately inland from the stockade. The core of this ridge is a diabase dike, with smaller, older dikes evident along the foot of the bluff adjacent to Co. Rd. 17 (Mile Creek Rd.). Argillite outcroppings are the conspicuous feature of Mount Rose, and only thinly covered where soil managed to develop.

The trail corridor follows the narrow floodplain of Grand Portage Creek along the first half mile through mesic birch-aspen-spruce-fir woods, and climbs over exposed bedrock just before reaching MN Hwy 61.

Climate

The average temperature and precipitation is similar to the GF-FMU (page 20), but is greatly modified by the effects of Lake Superior. Regular on-shore winds provide the WUI-FMU with more frequent fog, and notably cooler summer and warmer winter temperatures than inland areas.

Water resources/ water quality

Grand Portage Creek flows through the middle of the lakeshore area, emptying into Lake Superior within a few feet of the stockade. This is a characteristic North Shore stream: short, swift and flowing over gravel and cobble kept cleared of sediments by its flashy response to rain and snowmelt. Fish entering the mouth to feed or spawn are a major component of the species diversity recorded for the Monument. The unimpaired condition of this stream contributes to the success of the coaster brook trout reintroduction program of the GP-Band TLR and U.S. Fish and Wildlife Service (FWS).

Air Quality

See the air quality description under the GF-FMU (page 21).

Vegetation

A list of plants commonly occurring in Grand Portage National Monument, and which may be found in the WUI-FMU, appears in Appendix C (Table C-1). A brief description of the native forest community found along the 100-ft-wide trail corridor and lower portions of Mount Rose is found under the GF-FMU (page 22). Alders, willows and hawthorn form thickets along the Grand Portage Creek floodplain, and in low-lying areas east of the creek. Naturally occurring jack pines are found on the rocky exposures of Mount Rose, especially near the summit. A grassy meadow, with numerous introduced species, is a significant component of the historic village cultural landscape east of Grand Portage Creek. Conifer plantations dating from the 1930s form maturing stands near the lakeshore and at the Grand Portage trailhead. The Interpretive Historic Zone (stockade and related sites) and picnic area are maintained as a turf lawn.

Wildlife

The general list of vertebrates reported for Grand Portage National Monument appears in Appendix C (Table C-2). Most of these species occur in the WUI-FMU due to the habitat diversity provided by the maintained lawns, grassy meadow and open areas on Mount Rose (Graetz *et al.* 1995). Even large mammal species, such as bear and gray wolf, occasionally enter the WUI-FMU and surrounding Village of Grand Portage.

Fish species restricted to beaver pond habitats are not found in the WUI-FMU. However, lake species, such as smelt and burbot, occasionally enter the mouth and lower reaches of Grand Portage Creek during times of flood or for spawning (Newman 1999). This habit is particularly important for the success of a coaster brook trout reintroduction program jointly managed by the GP-Band Trust Lands (TLR) and U.S. FWS (Newman and Johnson 1996).

Migrant and winter resident species represent a considerable portion of the bird list compiled for the Monument. This includes species that frequent the lakeshore, such as gull and waterfowl species, and raptors that require large hunting territories and specific nesting sites, such as peregrine falcons that nest on nearby Mount Josephine.

Endangered Species and Species of Concern

Vertebrate species listed as threatened under the ESA and species of concern in Minnesota are discussed under the GF-FMU (page 24). Habitat sufficient to support these mammals does not occur within the WUI-FMU, although individuals may occasionally traverse the area. Such presence would not affect fire management activities.

Most of the Monument plant species of management concern occur within WUI-FMU (Appendix C, Table 3). Many of the uncommon fern species and rock whitlow-grass are found on the lower slopes of Mount Rose, either on loose high-angle scree or on fragile outcrops of argillite. Slender hairgrass occurs in a grassy opening near the summit. Black-fruited hawthorn and satiny willow occur mostly in the shrub thickets near the mouth of Grand Portage Creek. Wild chives are known from isolated spots within the lakeshore area. The presence of moschatel along the narrow trail corridor in WUI-FMU needs to be confirmed.

Location and population size of these plant species have been recorded with a global positioning system (GPS) and mapped to the Arc/View™ geographic information system (GIS) coverages maintained by Monument resource staff. Site-specific restrictions and appropriate fire

management response for each plant population needs to be developed and linked to GIS maps for use by wildland fire incident commanders.

Cultural resources

Archeology

Grand Portage National Monument is listed in its entirety on the National Register of Historic Places. All of the WUI-FMU is in the designated historic district because of the unique historic value of the site. The shore of Lake Superior near the mouth of Grand Portage Creek is the site most clearly associated with human occupation before, during and following the fur-trade era.

Archeological excavations were performed at Grand Portage during the 1930s by the Indian Division of the Civilian Conservation and the Minnesotat Historical Society (MHS)(Woolworth 1993). Prehistoric and 18th to early 20th Century sites were identified in the area east of Grand Portage Creek (Woolworth 1993). West of the stream, the North West Company building and stockade sites were intensively excavated (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 WUI-FMU is in a Resource Trust management area under the Monument GMP to protect in-ground archeological and cultural information (NPS 2003). Many identified cultural sites in the WUI-FMU have not been fully studied; other suspected sites have not been satisfactorily located. Fire management activities and fire response actions taken to protect life and property have the potential to adversely affect future archeological study.

Historic structures

No historic structures remain standing from the fur trade era at the Grand Portage site, only archeological remains are preserved. However, the white cedar stockade, Great Hall, Kitchen and Warehouse are listed on the National Register of Historic Places. As reconstructed depictions of the historic scene, they are crucial components of the interpretive mission of the Monument. Any structure lost to wildland fire would be irreplaceable (Table 6). Loss of an earlier reconstructed Great Hall through a lightning-ignited fire emphasizes the potential hazard of

Table 6: Real Property Values at Risk in FMU1/WUI, Grand Portage National Monument. Except for the planned Heritage Center, values are current replacement values (CRVs) as listed in FMSS for Grand Portage National Monument in FY2004.

Building	Description	Value
Canoe Warehouse	Public, interpretation	\$ 625,000
Gatehouse and palisade walls	2, Public, interpretation	\$ 485,000
Great Hall	Public, interpretation	\$ 1,280,000
Heritage Center (in planning)	Public, interpretation	\$ 8,000,000 (2002 estimate)
Kitchen	Public, interpretation	\$ 425,000
Maintenance facilities	3, services	\$ 85,000
Public restroom	Public, services	\$ 172,000
Ranger residence	Staff service	\$ 245,000
Ranger station	Public, services	\$ 15,000
Total value at risk		\$11,332,000

structural fires. Fire suppression systems exist for the interior of the Great Hall, Kitchen and Warehouse.

Other features associated with the stockade area include: a wooden dock, gate house, outdoor bake oven, flag pole, fur presses, canoe building bed and reconstructed Ojibwe village. All reconstructed buildings and related features are within the WUI-FMU.

Cultural landscapes

Unlike the forests in the GF-FMU, the cultural landscapes in the WUI-FMU reflect considerable change during the last 200 years (NPS 2002). The reconstructed elements of the 1790s fur trade depot sit amidst 1930s CCC-era conifer plantings. Brushy clusters of willow and alder harbor the remains of a 19th century reservation village and fishing community. Remnant vegetation, structures, and foundations from several periods of history intermingle east of Grand Portage Creek. Fire management activities for these landscapes are directed by their location within the

WUI-FMU. Protection of human life and property is the first priority within this zone, but actions should also prevent loss of archeological and cultural information within these landscapes. Prescribed burning of the historic meadow may better reflect local cultural practices and provide proper maintenance for the cultural landscape. Mechanical means should be used when fuel reduction is necessary for areas adjacent to existing reconstructed or modern buildings.

Ethnographic resources

The enabling legislation that created Grand Portage National Monument stipulated the continued access by Grand Portage Band members in pursuit of traditional cultural practices. This has been interpreted to include transport across the Grand Portage at specified points by traditional or modern means. Several heavily used crossings in the WUI-FMU serve community needs within the Village of Grand Portage. Pedestrian and motorized recreational vehicle use of these crossings introduces an increased potential of accidental fire starts when dry conditions prevail. The proximity of these sites to the Village also increases the likelihood that accidental wildland fires would be readily detected and immediate response possible.

Continuing dialog with community members and tribal elders is providing useful information to Monument staff on the cultural significance of particular plants. Management and protection strategies for ethnographically-related species are under development. It is likely that such management will be affected by fire management considerations. Significant herbaceous species in the lakeshore meadow would likely benefit from prescribed fires.

Objects

Objects significant to Grand Portage history range from fur trade era metal construction items to 1930s traditional craft goods. A limited number of original objects are displayed seasonal in the Great Hall in the WUI-FMU. Other than structural fire concerns, recovered archeological objects are not generally affected by wildfire management actions.

Infrastructure

Maintenance buildings, staff housing and a ranger station are currently located within WUI-FMU. The GMP calls for the construction of a Heritage Center to provide year-round visitor orientation services, exhibits, museum storage and administrative space. Establishing defensible space around current and planned structures is assisted, in part, by the presence of roadways, footpaths, hard-surfaced parking areas,

and maintained turf. Several county roads and a utility right-of-way cut through several areas of WUI-FMU providing ready-made firebreaks.

Human Uses

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

Current land use on areas adjacent to the WUI-FMU is classified as residential under the Grand Portage Band zoning regulations. In addition, the GP-Band recognizes preservation zones as buffer strips along all waterways within the Reservation. These designated uses are in concert with the goals established by the Monument for WUI-FMU, and as stated in the GMP (2003) and RMP (2001).

b. Wildland-Urban Interface FMU Fire Management Objectives and Strategies

Specific objectives for the Wildland-Urban Interface Fire Management Unit are guided by the Grand Portage National Monument GMP (NPS 2003) and based on the programmatic goals set forth in section III. B. of this document.

Objective: Ensure all wildland fire, prescribed fire and mechanical operations sustain no injuries to members of the public or to firefighters.

Protection of human life is reaffirmed as the first priority in wildland fire management. Property and natural/cultural resources jointly become the second priority, with protection decisions based on values to be protected and other considerations.

Strategies:

- Qualified individuals will carry out fire management operations with the safe and skillful application of fire management strategies and techniques, consistent with RM-18 requirements.

- All personnel involved in fire management operations will receive a safety briefing describing known hazards and mitigating actions based on Lookouts, Communication, Escape Routes, Safety Zones (LCES); current fire season conditions; and current and predicted fire weather and behavior.
- Only properly trained and certified personnel will be working on a fire. Other personnel will contribute with crowd control, smoke detection, weather condition assessment, and other aspects that can be accomplished in specified safe areas.
- Monument neighbors, visitors, and the local residents will be notified of all planned and, when possible, unplanned fire management activities that have the potential to affect them. A comprehensive list of contacts to be made prior to prescribed fire will be included with each prescribed fire plan.
- All or portions of the Monument will be closed to the public when fire activity poses a threat to human safety (at the discretion of the superintendent). Safe areas will be established for visitors during prescribed fires. Should the situation warrant, safe areas will be closed to visitors and visitors will be removed from any potentially dangerous locations.

Objective: Appropriate Management Response (AMR) strategies for unwanted wildland fire are successful 97 percent of the time.

Strategies:

- Prioritize suppression actions on fires or portions of fires that threaten to damage public property.
- Ensure that park staff is trained in wildland fire operations.
- Ensure that park staff responsible for fire operations understands fire policy.

Objective: Ensure wildland fire does not destroy any administrative or reconstructed buildings, nor wildland fire activities incur damage to any cultural resource or cultural landscape.

Direct effects on in-ground archeological objects depend on the interactions of fire behavior (intensity, severity, residence time, fuel burnout). Fire suppression actions are additional hazards to in-ground and surface cultural resources. Construction of hand or bulldozer fire lines can destroy objects and disrupt important contextual information. Removal of vegetative cover from soil surfaces increases the potential for erosion and looting. Due to the irreplaceable nature of cultural resources,

discretionary use of some suppression actions is restricted within the Monument unless approved by the superintendent. The ability to approve some suppression actions may be assigned to a fire incident commander through a limited delegation of authority (Appendix G).

Strategies:

- Retain defensible space around reconstructed buildings, visitor services and maintenance facilities in the WUI-FMU by routine lawn maintenance and hazard fuel reduction activities.
- Identify potential sources of unwanted fire on the park and take steps to mitigate their potential impacts.
- Ensure fire operations personnel, including firefighters from cooperating agencies, are briefed on Grand Portage National Monument resources and potential damage from fire and suppression actions.
- Ensure wildland fire suppression operations employ Minimum Impact Suppression Tactics (MIST) as defined in the Wildland Fire Management Manual, RM-18 (NPS, 2001) Chapter 9, Exhibit 5.
- No off road vehicle use within the WUI-FMU unless approved by the superintendent.
- No bulldozer or grader use within the WUI-FMU unless approved by the superintendent.
- Minimize use of chainsaws and all use will be consistent with MIST standards.
- No ground delivery of retardant or foam in the WUI-FMU unless approved by the superintendent or designee, except where human life or property is immediately threatened. Aerial application of retardant or foam should be minimized to the degree practical.
- Ensure that a cultural resource advisor is present on all suppression actions and during prescribed fires.

Objective: Use prescribed fires for maintaining specific cultural landscape of the WUI-FMU 50 percent of the time.

Strategies:

- Develop annual prescribed fire plan for the meadow area. Be prepared for implementation whenever proper fire weather conditions prevail and fire fighting resources are available.
- Develop fire effects monitoring program for meadow area.

Objective: Ensure wildland fire and fire management activities do not adversely affect plant species of concern on Mount Rose.

Strategies:

- Ensure fire operations personnel, including firefighters from cooperating agencies, are briefed on resources and potential damage from fire and suppression actions.
- Make site locations available to incident commanders when situation requires.

Objective: Wildland fire response and all prescribed fires will comply with requirements of the Minnesota Smoke Management Plan.

Strategies:

- Air quality objectives will be incorporated in each prescribed fire plan.
- Impacts to air quality will be considered as a part of the GO/NO GO decision in the prescribed fire plan and throughout the duration of any prescribed fire.
- Fire control responses, other than full suppression, will include consideration of smoke generation and dispersal characteristics, as described in the MN Smoke Management Plan.
- Air quality impacts will be addressed as a part of the alternative development and selection in the Wildland Fire Situation Analysis.

Objective: Review and modify as necessary agreements with the organizations listed below by April 30 each year.

Strategies:

- Coordinate with the following entities:
 - Grand Portage Reservation Tribal Council, Fire Department
 - Grand Portage TLR Forestry Unit
 - U.S. Department of the Interior, Bureau of Indian Affairs Minnesota Agency
 - Minnesota Department of Natural Resources, Division of Forestry
 - U.S. Forest Service, Superior National Forest, Gunflint District
 - Cook County Sheriff
 - Ontario Ministry of Natural Resources
- Maintain good working relationship with the Grand Portage Fire Management Program operated by the GP-Band Trust Lands and Resources.
- Cooperate with adjacent landowners to prevent wildfire on adjacent lands.

c. WUI-FMU Fire Management Considerations

- Due to its location within the Village of Grand Portage, protection of personal safety, and public and private property are the foremost management concerns in the WUI-FMU.
- Proximity to the Reservation school, health service, elder housing and tribal government offices make smoke management a major issue in all fire management activities, and are of particular concern for prescribed fire implementation (Figure 7).
- Existing roadways and other rights-of-way are useful fire breaks for controlling the spread of fire within the WUI-FMU.



Figure 7: Historic Meadow in Lakeshore Area of Grand Portage National Monument. Maintenance of this area with prescribed fires will use a traditional method to retain this community type, which is unique within Monument property. Location of the site within WUI-FMU presents challenges for burn implementation, and opportunities for informing the local community of the management benefits attain through fire use.

- Reservation fire fighting equipment, both structural and wildland fire, are based within one-half mile of the reconstructed buildings.
- Naturally or human-ignited fires on Mount Rose or along the Grand Portage trail corridor have the greatest risk of escaping Monument property due to potential delay in detection and firefighter response.

d. Fire Ecology of the Wildland-Urban Interface FMU

The fire ecology of the birch-aspen-spruce-fir woods found on Mount Rose and along the 100-ft-wide trail corridor is described under the GF-FMU entry (page 35). All other habitats in the WUI-FMU are cultural landscapes controlled by a variety of maintenance activities that minimize the occurrence of fires.

Based on historic accounts, the fire history of the WUI-FMU appears to be similar to the GF-FMU (page 36). Under normal conditions, the moderating effect of Lake Superior probably made surface fires less frequent near the shore than on inland areas, due to cooler, moister weather. During periods of regional drought, landscape-scale fires threatened the lakeshore as frequently as inland areas.

e. Wildland Fire Management Situation for the Wildland-Urban Interface FMU

In general, the wildland fire management situation for the WUI-FMU is the same as for the GF-FMU (beginning page 39). Differences for the lakeshore area of the Monument are due to the effect of Lake Superior on climate, and the history of human occupation, resulting in altered vegetation.

1) *Historical weather analysis*

The Seagull Station operated by the US Forest Service is located approximately 50 miles inland from the WUI-FMU, where average summer conditions are notably warmer and drier. Seagull Station data provides conservative information for preventative actions, such fire danger ratings, but is not suitable for prescribed fire management on the lakeshore. This problem will be eliminated when a weather station operated by the GP Band is functional. The weather station at Windigo, on Isle Royale, may provide the best estimate of the historical weather for the WUI-FMU for preparation of burn prescriptions.

2) *Fire season*

Spring burning conditions may occur between mid-April and early June. Fall burning conditions can develop early in September or even in late August in exceptionally dry years. Most naturally ignited wildland fires occur in late summer, when fuel is dry from summer heat and herbaceous growth is senescing.

3) *Fuel characteristics*

The GP-Band Strategic Wildland Fire Management Plan (1999) describes two fuel models for Reservation lands. The desire to define small burn areas based on localized plant communities may permit the use of additional fuel models for Monument lands (Table 4). In addition to the three categories of wildland fuels described for the GF-FMU (page 40), there is an additional fuel type found in the WUI-FMU. A natural stand of jack pine are found on the dry crest of Mount Rose, while maturing plantations of jack pine, red pine and spruce are found near the stockade and east of Grand Portage Creek.

The most flammable conifer fuels are immature upland stands of jack, red, or white pine, spruce and fir. High flammability and the presence of ladder fuels may lead to torching and intense crowning. The main carrier of fire in mature stands is compacted needle litter of spruce-fir, or the less compacted needle litter of pines. Senescing stands and those damaged by windthrow or insect infestations contain large amounts of dead and downed fuels.

For further details on the fuels found in the WUI-FMU, refer to the fuel models and fuel load information in the GF-FMU description (page 41).

4) *Fire Regime Alteration*

No formal study has been done to classify the condition class of the current WUI-FMU vegetation. Two historic practices have probably influenced the fire return interval within the WUI-FMU. In “Special History: The Environment and the Fur Trade Experience in Voyageurs National Park, 1730-1870” (VOYA, 2001), the effect of fuel and building material harvest during the fur trade era on local forests is clear; extensive areas near posts and major portages were stripped of trees. It is likely that the lakeshore area of the WUI-FMU was clear of trees during the height of the fur trade at Grand Portage. During the 20th Century fire suppression throughout the region led to less diversity in forest types and stand ages. Logging of aspen and birch since the 1920s perpetuated the growth of these pioneer species in place of more diverse forests. Based on the above considerations, the Condition Class is most likely Class 2. This class is

defined as moderately altered from the historic fire regime due to either an increased or decreased prevalence of fire activity. There is also a moderate risk that key components of the vegetation community could be lost as a result of these changes in fire frequency.

5) *Control Problems*

In general, the WUI-FMU of the Monument is protected from wildland fire spread from forestry lands by MN Hwy 61. This major road provides a wide fuel break around the west side of the Village of Grand Portage. Local roads intersect the WUI-FMU and provide fuel breaks around the stockade area, for some conifer plantations and the historic meadow area. In particular, the meadow area is encircled by NPS maintenance and local roads, providing sufficient barriers for use with prescribed fires.

Maintenance of landscape lawns provides a defensible space around the reconstructed buildings, stockade and other interpretive features. Although there is no break in the fuels between surrounding lands and the Monument WUI-FMU along the 100-ft-wide trail corridor or the inland boundary on Mount Rose, any fire starts in these areas is likely to be readily detected. The Grand Portage volunteer fire department is located within the Village and rapid response would be possible.

6) *Fire environment*

All the lands between MN Hwy 61 and Lake Superior are considered wildland-urban interface under the Grand Portage Strategic Wildland Fire Plan (GP Band 1999). This designation is in concert with the Monument WUI-FMU goals. Protection of human life and property are the primary objectives and directs fire response actions. The proximity of the WUI-FMU to community services (school, health service, elder housing) makes air quality a prime concern. All wildland and prescribed fire actions will comply with the Minnesota Smoke Management Plan, with the added consideration that many local residents and public buildings use wood for fuel.

IV. WILDLAND FIRE MANAGEMENT PROGRAM

A. General Fire Implementation Procedures

All wildland fires originating within the GF-FMU and WUI-FMU of Grand Portage National Monument will be suppressed using the appropriate management response (AMR) based on the immediacy of threat to public safety, and using MIST. Naturally ignited fires originating outside of and spreading into GF-FMU may be managed to accomplish specific, pre-stated resource management goals in cooperation with the GP-Band. The random and unpredictable occurrence of wildland fires requires more intensive planning and evaluation for wildland fire use fires, than for prescribed fires and suppression actions.

Time is critical when responding to any wildland fire. Preplanning decisions based on behavior indices saves valuable time in the event of a fire, and allows fire managers to rapidly determine the appropriate management response to a wildland fire. This preplanned decision process forms the framework of a Wildland Fire Implementation Plan (WFIP). Preparation of the WFIP is based on knowledge of fire hazards and current risks, past fire history and an accurate assessment of the fire fighting resources available for immediate response and as additional support. The limited size and configuration of the Monument necessitates collaboration between the NPS fire staff serving Grand Portage National Monument and the GP-Band TLR in developing the WFIP.

Wildland Fire Implementation Plan (WFIP)

Not all fires need to receive the same on-the-ground response. A WFIP is a three-step, decision-making process for evaluating new fire starts and assessing ongoing wildland fires in order to permit the widest choice of appropriate management actions. The stages of a WFIP are summarized as:

WFIP Stage I: An approved GO/NO GO decision process to validate the use of wildland fire.

Initial Fire Assessment:

- Fire origin and cause
- Fire management zone affected
- Projected fire growth under normal and drought conditions

Decision criteria checklist:

- Immediate and projected threats to life and property
- Immediate and potential impacts to visitors, users, and local communities
- Immediate and projected threats to cultural or natural resources
- Smoke and health concerns

Availability of necessary qualified personnel and fire management resources

Availability of a qualified fire manager

WFIP Stage II: Short term implementation actions.

*Fire Behavior Predictions and Risk assessment
Complexity Rating Worksheet*

WFIP Stage III: Long term implementation actions.

Maximum Manageable Areas (MMA)

Descriptions, maps, values at risk, restrictions, threats

Long-term management factors

Fire projections and maps

Weather season/drought discussion and prognosis

Probability of success

Availability of resources

Costs

Risks

Smoke dispersion and effects

Threats to public and firefighter safety

Periodic assessment

Reaffirm that adequate capability exists to manage each fire.

Suppression and prescribed fires are the only management strategies defined in this FMP. Therefore, the decision checklist in Stage I is considered to be met. As such, superintendent approval is not required before an initial attack response is implemented. Only the most complex fires managed for resource benefits in GF-FMU might require completion of all stages of a WFIP.

Selection of any AMR, other than initial attack, for fires on Monument property must be approved by the superintendent, or acting superintendent, and chosen in concert with the GP-Band resource and fire staff. All AMRs must be consistent with the Monument FMP and the Grand Portage Band Strategic Wildland Fire Management Plan (1999).

Specific guidance and standard forms for developing a WFIP are in the NPS Wildland and Prescribed Fire Implementation Procedures Reference Guide. The GP-Band WFMP also includes standard forms as Exhibits 1-3.

B. Wildland Fire Suppression

1. Potential Range of Fire Behavior

Wildland fires may occur during periods of severe regional or local drought. When high winds are present, such fires may develop into crown fires which

may run many miles or start spot fires beyond the fire front. Controlling such fires with locally available firefighters may be difficult. Shifting winds may threaten public or firefighter safety and property in the Grand Portage area.

During unusually dry spring or fall weather, fires burn readily and spread quickly (Heinselman, 1973). Cured surface vegetation, fallen conifer needles, and dried leaves of deciduous trees and shrubs all add to surface fuels. The succulent green vegetation of summer is also absent, eliminating a critical energy absorbing heat sink. Crowning in conifers or total removal of the overstory is possible when fuels have 10-hr time lag moisture below 9 percent, humidity is below 30 percent, and winds exceed 15 to 20 miles per hour (Haines and Sando 1969, Roussopoulos 1978).

Wet, frozen soils and organic layers, and moisture in heavy fuels usually prevent thorough consumption of organic layers, snags and fallen trees during spring fires. Fall fires have more potential to move rapidly and to consume heavy fuels and organic layers. Light surface fires, causing little injury to fire-resistant red and white pines, are possible during spring or fall, if it is not too dry and wind not excessive (Buckman 1964).

Summer fires require a long period of dry weather, and more severe fire weather than spring or fall fires, to achieve similar intensities and spread rates (Heinselman 1973). Prolonged droughts dry out litter and duff layers, and these become part of the fuel. Snags, fallen trees and other heavy fuels also dry and may be consumed. Summer fires are frequently smoldering and slow-moving, with burning of heavy fuels and organic layers retarded by the green understory and surface vegetation. Without control, such fires could burn large areas during prolonged droughts. Some summer fires may burn into the fall when more rapid fire spread is likely.

2. Wildland Fire Preparedness

a. Fire Prevention Plan

The process for evaluating the values at risk, the degree of hazard and the steps needed to reduce the potential for undesired wildland fire is described in a Wildland Fire Prevention Plan. Informing the public of fire hazards which may exist within the Monument is an important component of this process, as is the direct reduction of risk through fuel removal or restricted use. Wildland fire prevention should be a part of all management functions including interpretation, visitor protection, maintenance and administration. All employees play a role in incorporating these themes into their routine performance of duties. A (Draft) Fire Prevention Plan (2003) for the Monument is attached as Appendix I. This identifies the wildland fire hazards specific to the Grand Portage area, and the responsibilities of Monument staff in preventing

fires that would adversely affect the Monument or surrounding Reservation properties.

b. Training

Qualifications: All personnel involved in wildland fire suppression or prescribed fires will meet national standards as determined by the National Wildfire Coordinating Group (NWCG) Wildland Fire Qualifications System. All personnel involved in fire management operations will have their qualifications, training, and experience entered into the Shared Applications Computer System (SACS).

Fitness standards adopted by the NWCG Wildland Fire Qualifications System for specific assignments will be met by all personnel for wildfires and prescribed fires within and dispatched from Grand Portage National Monument.

Needs: To fully implement the Monument's fire management program and support the NPS commitment to the national interagency fire program, a qualified Incident Commander Type IV position may be maintained to meet the Monument's minimum wildfire suppression needs. Higher level positions needed for fire suppression actions or prescribed fire will be obtained from the NPS Border Waters Group of parks, or through the Minnesota Incident Command System (MNICS) cooperating agencies.

Training opportunities offered through MNICS will be utilized by the Monument to meet its minimum qualifications needs. Permanent personnel will be nominated to 300-level and higher courses at the regional and national level, based on the Monument and NPS needs.

Permanent staff requiring training to meet or maintain target Incident Command System (ICS) qualification levels identified in Chapter VII will attend MNICS-sponsored training courses. Seasonal staff who are identified for Basic Firefighter Training will receive a minimum of 32 hours of S-130 (Introduction to Firefighting) and S-190 (Introduction to Fire Behavior). Such training will be conducted through MNICS or in cooperation with BIA Forestry.

c. Supplies and Equipment

Fire caches will be inventoried annually. New equipment or replacement supplies may be requested through the Border Waters Fire Management Officer (FMO) for funding through FirePro fire cache support funds. However, if these funds are insufficient, the Monument must fill its needs with park base funding.

The Monument central fire cache is located in the maintenance shop in the lakeshore area of the Monument; a small initial attack field fire cache is at Fort Charlotte. The normal preparedness inventory for each cache is located in Appendix E-2. When indicated by the step-up staffing plan, the Monument lead ranger will confirm that the unit's slip-on pump and tank, which are on long-term loan to the GP-Band, have been placed on a four-wheel drive pickup truck by the GP-Band fire staff. A boat and motor for transporting personnel and supplies is available throughout the summer at the maintenance cache on the Pigeon River outside the west boundary of the Fort Charlotte unit.

Personal protective equipment (PPE) will be issued to all permanent and seasonal staff qualified for fire duty. They are expected to augment these supplies with additional clothing and personal items, and be ready for dispatch to a fire with minimal notice.

d. Fire weather

Fire weather forecasts for the Monument are available through the National Weather Service (NWS) Duluth Office via the internet at <http://www.crh.noaa.gov/dlh/firewx.htm>. Spot forecasts can be requested through a link on this web page.

1) Weather stations

Grand Portage Band forestry is planning the installation of a remote automated weather station (RAWS) for collecting fire weather information in the near future. The solar-powered facility planned will provide direct access to current conditions and the data necessary for calculating Reservation-specific fire danger ratings.

Until the GP-Band weather station is operational, the closest RAWS is located about 22 miles east on Isle Royale. Lake Superior moderates weather conditions on Isle Royale and at Grand Portage in similar ways, so fire danger indices based on Windigo data provides an approximation of conditions for WUI-FMU. A RAWS operated by the U.S. Forest Service at Seagull Ranger Station is located about 50 miles west of Fort Charlotte but may provide better information for inland areas of the Monument. Table 7 provides catalog information and data access web sites for both stations.

2) Fire danger ratings

The Canadian Forest Fire Danger Rating System (CFFDRS) indicates the potential for and severity of an unwanted wildland fire occurrence (Stocks *et al.* 1989, Van Wagner 1987). The Fire Weather Index (FWI) is a numerical rating of fire intensity and is widely used as a general index of

Table 7: Catalog information for Remote Automated Weather Stations (RAWS) proximate to Grand Portage National Monument. Windigo is operated by the NPS, Seagull by the U.S. Forest Service. Hourly readings for previous 24-hr period available for both stations at <http://fire.boi.noaa.gov>.

Name	Station	Latitude	Longitude	Elevation	Aspect	Slope	Climate	Fuel Model
Windigo (Isle Royale)	200403	47°54'42"	89°9' 27"	700 ft	West	Flat	3	H
Web sites:		http://www.dnr.state.mi.us/www/fmd/weather/Tables/windaily.txt http://www.dnr.state.mi.us/www/fmd/weather/images/windigo.gif						
Seagull (Superior NF)	210709	48° 7' 1"	90°51' 0"	1480 ft	South	Flat	3	G
Web site:		http://www.dnr.state.mn.us/forestry/fire/news/canadian_indexes_o.html http://www.dnr.state.mn.us/forestry/fire/news/Canadian_indexes_f.html						

fire danger. Observed and predicted CFFDRS indices for the Seagull RAWS are available on the MNICS web site from the end of April through mid- to late October (Table 7.)

The GP-Band forester uses the Seagull RAWS CFFDRS indices for estimating the fire danger on Reservation lands. Fire management staff for Grand Portage National Monument will also use the CFFDRS for rating fire danger to support a cooperative response in the event of wildland fires.

The National Fire Danger Rating System (NFDRS) indices were previously used for Minnesota fire danger ratings. The NFDRS Burning Index (BI) provides a rating for the difficulty of containing a wildland fire similar to the FWI. This rating system is also more familiar to fire staff from other areas of the country than the CFFDRS. Although the CFFDRS will be the primary system for management decisions in the Monument, the NFDRS will be tracked when additional fire staff are on-site.

Predicting active fire behavior under existing fuel moisture and wind conditions is an important part of selecting the appropriate management response, and in providing for firefighter and public safety. The CFFDRS and NFDRS are intended for planning purposes and do not provide adequate information for active fire response decisions. Several fire behavior models have been developed and are distributed on-line through the National Interagency Fire Center (<http://www.fire.org>) or through private vendors. Software programs for predicting fire behavior

include: BehavePlus, Fire Behavior Prediction System (FBPS) and Canadian Forest Fire Behavior Prediction System (CFFBPS).

Fire behavior predictions will be calculated for all active wildland fires and for prescribed fire planning using the Fuel Models identified in Table 4.

e. Step-up staffing Plan

The step-up staffing plan for the Monument is based on the CFFDRS Fire Weather Index (FWI), which is calculated from daily environmental data. The FWI is used to determine the staffing class level and appropriate fire management actions during periods of very high or extreme fire danger (Table 8). Staffing class levels were determined by analyzing 24 years of data from the Superior National Forest's Seagull RAWS under fuel model GIP₃ (NFDRS fuel model G, slope class 1, herbaceous class perennial, climate class 3). The break between "high fire danger" and "very high fire danger" is at the 90th percentile of the FWI range. Staffing classes based on the FWI do not reflect the probability of fire, but are related to the difficulty of controlling a fire (Hirsch 1996).

3. Pre-attack

Pre-attack actions are performed prior to the occurrence of fires to insure Monument fire management staff can initiate effective wildland fire suppression. Emergency pre-attack actions provide extra coverage during times of extreme or unusual fire danger, such as prolonged local or regional drought. The NPS Wildland and Prescribed Fire Management Policy Implementation Guide (hereafter Implementation Guide) permits the use of emergency pre-attack funds to accomplish approved step-up activities when the Monument is in Staffing Class V. Use of emergency pre-attack accounts must be strictly documented, tied to NFDRS fire danger indices and NWS forecasts.

Emergency pre-attack activities normally funded:

- Overtime and premium pay for increased fire prevention, detection, or readiness by fire-qualified personnel
- Aircraft detection by U.S. Forest Service
- Hire of emergency firefighters
- Travel or transportation necessary to preposition resources

Table 8. Step-up Staffing Plan for Grand Portage National Monument based on the Canadian Forest Fire Behavior Prediction System (CFFBPS) Fire Weather Index (FWI). Each of the following staffing classes is progressive and includes the actions in previous level.

Staffing Class		FWI	Actions to be Taken
Low	(I)	0 - 7	All work and visitor activities proceeds as normal unless some unusual situation, such as an ongoing fire, precludes them. Normal preparedness operations: track daily weather conditions and fire danger rating on watch for ignitions.
Moderate	(II)	8 - 14	All work and visitor activities proceed as normal unless some unusual situation, such as an ongoing fire, precludes them. Post fire danger rating in public area of ranger station.
High	(III)	15 - 24	At least one qualified firefighter should be available during duty hours near the main fire cache for fire preparedness and suppression activities.
Very High	(IV)	25 - 29	Visitor Center (Great Hall/Kitchen) will alert the public to fire hazard. Interpretive activities will include fire safety message. Notify Border Waters Fire Management Officer (at VOYA) of status. Notify Minnesota Interagency Fire Center (MIFC) of status. Notify Isle Royale National Park of status. All fire qualified personnel with fire gear in possession on routine duty. Confirm Grand Portage Band fire suppression staff informed and Monument slip-on pumper ready for deployment by them. At least two qualified firefighters should be available during duty hours near the main fire cache for fire preparedness and suppression activities.
Extreme	(V)	30+	Smoking may be prohibited everywhere in the back-country. Place Incident Commander Type IV on standby (paid). Ensure weekend coverage. In coordination with MNICS, close Monument to the use of open fires. Display Extreme Fire Danger and any fire closure notices on bulletin board at stockade and trailhead registration boxes. Request Superior National Forest dispatch to extend the "east" air detection patrol flights to cover Grand Portage National Monument.

No special detection actions are required at the Monument except during periods of very high fire danger or extreme lightning activity. When a fire is reported to any Monument staff member, the lead ranger must be notified as soon as possible. The lead ranger or designee will dispatch qualified initial attack personnel to investigate and assess the situation. The lead ranger will designate a dispatcher to log all radio and telephone messages during the initial response. This includes all information concerning the fire: a record of personnel and equipment sent to the fire, and all pertinent times, such as time of fire report, initial attack dispatch, and when the fire was staffed, controlled, and declared out.

The Incident Commander will be responsible for all actions taken on the fire from size-up to demobilization. The Incident Commander's decisions will be accepted and requests serviced as quickly as possible. After arriving at the wildland fire, the Incident Commander will inform the dispatcher of the size of the fire, rate of spread, fire potential, and personnel and equipment requirements.

As fire complexity increases, the initial attack Incident Commander may be replaced by a more qualified Incident Commander. Depending upon fire behavior and potential complexity, this second organization may be replaced by another Incident Commander and staff personnel following the guidelines in the National Wildfire Coordinating Group (NWCG) Fireline Notebook 410-1 (1998).

4. Initial Attack

Initial attack is aggressive action by readily available fire fighting resources to suppress wildland fires as quickly as possible. Site-specific initial attack activities are determined by the degree of risk to firefighter or public safety and the nature of other values to be protected. Human life and property are of greatest concern in the WUI-FMU. Known and unknown in-ground cultural resources are the most significant values at risk for Monument property in the GF-FMU. These resources may be at greater risk of disturbance or destruction through fire suppression actions than through direct effects of fire. For this reason, initial attack for wildland fires discovered in Grand Portage National Monument will be limited to use of wet lines and water suppression unless human life or property are immediately threatened. Further suppression actions may be approved by the Monument superintendent, cultural resource specialist, or their designee.

The Monument superintendent and cultural resource specialist will be notified as soon as possible in the event of a wildland fire. When the location and intensity of a fire are known, further suppression actions may be permitted as part of an appropriate management response (AMR).

a. Information for selecting an appropriate management response

Location of fire in relation to Monument FMUs and values at risk:

- Maps of Monument fire management units.
- Location of reconstructed buildings and other structures
- Location of operation facilities
- GIS-linked information (in development by Monument staff)

Criteria for selecting the appropriate management response

If human safety is not at immediate risk, selection of an AMR should be consistent with objectives of Monument GMP and RMP; specifically protection of cultural resources and the historic scene. The potential impact of fire, fire fighting and mop-up actions on cultural resources is site-specific. As such, permission for additional fire fighting tactics will be extended on a case-by-case basis. Due to the proximity of Grand Portage to Monument headquarters and staff, it is likely that decisions on permissible fire fighting activities can be made within an hour or two after notification of a fire is received by the superintendent, or designee.

b. Confinement as an initial response strategy

Confinement may be used as an initial attack strategy, as long as it is not used to meet natural or cultural resource management objects. A confinement strategy is selected instead of wildland fire use during periods of high fire danger, when highly valued areas have increased risk of fire. The objectives for selecting a confinement strategy over full suppression are to:

- Maximize firefighter safety,
- Minimize suppression costs
- Minimize cost plus loss in low valued natural or cultural resource areas
- Maximize availability of critical suppression and fire management resources

When confinement is selected for the initial attack action, the same fire management procedures apply as for a wildland fire use fire. Preparation of a WFIP, prepared in stages, provides guidance for the long-term implementation of the fire. Confinement can also be selected through the Wildland Fire Situation Analysis (WFSA, page 69) process when the fire is expected to exceed initial attack capability or planned management capability.

c. Fire response time

Location of the WUI-FMU within the Village of Grand Portage provides for immediate response, with the potential for qualified firefighters arriving on scene within a few minutes.

Most backcountry areas of the Grand Portage Reservation, including the Monument GF-FMU, are accessible to fire fighting resources within a few hours during periods of low to moderate fire danger. When fire danger is increased, GP-Band and cooperating reservation fire teams are present in backcountry areas for more immediate response.

d. Restrictions on fire management activities

In order to protect significant in-ground and surface cultural resources, minimum impact suppression tactics (MIST, see page 69) are to be used, wherever and whenever practical, on all fire actions in Grand Portage National Monument. In addition, further restrictions apply on actions and equipment that have a high potential for adversely affecting cultural resources. These restrictions can be waived only by the Monument superintendent or designee through a limited delegation of authority.

- No off road vehicle use unless approved by the superintendent, or designee.
- No bulldozer or grader use unless approved by the superintendent, or designee.
- No ground delivery of retardant or foam unless approved by the superintendent or designee, except where human life or property is immediately threatened. Aerial application of retardant or foam is to minimize to the degree practical.
- Ensure that a cultural resource advisor is informed of all suppression actions and is available on site to guide mop-up activities.

e. Other issues affecting initial attack

Monument staff will inform the GP-Band TLR immediately of any reported fires. Because Monument property is not fenced or otherwise delineated in backcountry areas, it is more likely that fires will be reported to GP-Band staff first. When reports indicate fires are on or abut Monument property, the GP-Band TLR should inform Monument staff as soon as possible. Following initial attack, the selection of further appropriate management responses should be a joint decision whenever Monument property is affected, or threatens to be affected, by a reported fire.

5. Extended Attack and Large Fire Suppression

When necessary, the Incident Commander can request assistance for initial attack from neighboring MNICS agencies using the closest forces policy. Requests would be made in the following order:

- Grand Portage Band Trust Lands Division 218-475-2415
- Minnesota DNR, Grand Marais 218-387-3037
- U.S. Forest Service, Grand Marais 218-387-1750
- Minnesota Interagency Fire Center, Grand Rapids 218-327-4558

If a fire threatens to exceed Monument initial attack or confinement capabilities, and will likely burn onto Reservation lands, a unified command structure will be formed with the GP-Band to jointly determine objectives, strategy, and priorities. The Monument superintendent, or designee, will represent NPS on the unified command. A joint WFSA will be prepared by GP-Band and the Monument to determine the most appropriate suppression strategy.

The unified command may request an Interagency Fire Management Overhead Team through the Minnesota Interagency Fire Center (MIFC) in Grand Rapids, MN. The existing and expected complexity of the fire situation will determine the amount and type of assistance requested, which will be documented on a Resource Order Form (NFES-1470).

The procedure for managing the transition between Incident Management Teams is found in the MNICS Mobilization Guide. The transfer of responsibility for suppression actions on fires within Monument boundaries will be officially accomplished ONLY through execution of a limited delegation of authority by the Monument superintendent, or designee (Appendix G).

The USFS Region 9 Fire Cache is located in Grand Rapids, MN, at the Minnesota Interagency Fire Center. It is part of the National Fire Cache System, and is maintained and stocked to meet the resource needs of wildland fire suppression activities on two project fires within Region 9 for the first 36 hours (USDA, 1991). Additional supplies and equipment needed for fires at Grand Portage, can be requested from the MNICS dispatcher with a Resource Order Form (NFES-1470). This form can be transmitted verbally by phone or by FAX. Procedures for ordering emergency fire resources are in MNICS Mob Guide and in the Interagency Fire Business Management Handbook (NWCG, 2000).

6. Wildland Fire Situation Analysis

The unpredictable nature of wildland fires may result in the inability to suppress or confine fires within the first operational period. A Wildland Fire Situation Analysis (WFSA) is a decision process to determine the most appropriate management strategy for developing situations. Reasonable management alternatives are identified, evaluated, and are considered with the expected probability of success and consequences of failure. Evaluation criteria include firefighter safety, anticipated costs, resource impacts, and environmental, social, and political considerations. Evaluation of alternatives clearly identifies the point at which failure of the alternative is imminent. This becomes the triggering mechanism for re-evaluation of the WFSA. For situational guidelines for selecting alternatives in a WFSA see Wildland and Prescribed Fire Management Policy Reference Guide.

When any of the following conditions occur, the WFSA process will be completed:

- Fire is not controlled by the end of the first operational period and continues beyond this period.
- Fire is projected to leave NPS jurisdiction, and the adjoining jurisdiction will not or cannot accept management of the fire.
- Prescribed fire exceeds prescription and management capabilities.

The WFSA will be completed by the Incident Commander for the Monument and GP-Band unified command. It must be reviewed daily by the Monument Fire Management Committee (see page 82). The WFSA and any revisions shall be approved by the Monument superintendent, or designee, to ensure it accurately describes the current fire activity, displays management objectives, and includes natural and cultural resource data pertinent to suppression actions on the fire. The format and procedures for completing the WFSA are found in the Implementation Guide.

If a change in strategy occurs, fully qualified personnel will be assigned and appropriate action initiated, following the selected alternative defined in the WFSA, and within the guidance and constraints contained in the limited delegation of authority issued for that fire.

7. Minimum Impact Suppression Tactics

All Monument property is within a historic district because of its significance to the history of North American exploration and the fur trade. Much of the lakeshore area has been archeologically investigated, but most of the trail corridor and Fort Charlotte have not. Preservation of these sites into the future is a primary resource objective within the Grand Portage National

Monument GMP (2003) and RMP (2001). Therefore, it is necessary to minimize any wildland fire activities that would directly disrupt in-ground cultural materials, lead to increased erosion, or make artifacts susceptible to looting.

Use of Minimum Impact Suppression Tactics (MIST) will be the standard policy on all fires within the Monument. Fire crews brought in for extended attack or management fires will be informed of this policy by the superintendent, or designee, prior to reporting to the fire camp. It will be reinforced by the Incident Commander, or designee, prior to dispatching crews to the field. This policy integrates NPS ethics with fire fighting practices; it is not a replacement of normal safe fire fighting practices. Minimum impact suppression tactics are described in RM-18, Chapter 9, Exhibit 5 (NPS 1999).

Suppression forces will choose methods and equipment which least alter the landscape or disturb park natural and cultural resources including, but not limited to:

- Decisions on appropriate MIST practices will be made by the Incident Commander, in consultation with the Monument cultural resource specialist and superintendent or designee.
- Wetlines, or environmental lines, used in lieu of handline construction if water and pumps are available.
- 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; when necessary, slant cut to face away from Grand Portage trail, or recut during rehabilitation
- 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 aerial delivery of water instead of fire retardant or foam to the degree practical, except as approved by the superintendent (or designee), in consultation with Grand Portage Band restrictions.
- Use natural barriers wherever possible for firelines. Firelines kept to minimum width necessary to allow backfiring or safe blackline creation
- No ground delivery retardant or foam application unless approved by the superintendent or designee, except where human life or property is immediately threatened.
- No backpack applied foam or retardant within 10 feet (3 m) of open water. All backpack pumps will be filled a minimum of 10 feet (3 m) from open water. A separate, uncontaminated container must be used to transport water from source to backpack pump. This container must be kept uncontaminated by concentrate.
- 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.

8. Short and Long-term Rehabilitation

Rehabilitation will only be required where the impacts of the fire itself or the associated suppression actions are significant and can be mitigated. See Section IV. F. (page 79).

9. Required records and reports

A fire situation report will be transmitted by 10:00 hours each day to MIFC in all cases where fires have occurred, and whenever very high or extreme fire danger exists in the Monument (Step-up Staffing Class IV and V).

Each wildland or prescribed fire within the Monument will have an Individual Fire Folder, in accordance with the Implementation Guide. When any additional analysis documents (WFIP, WFSA) or Incident Command

System forms are used during a fire, these will be saved as part of the permanent project file for that fire. Guidance on appropriate forms is in the Implementation Guide.

Original reports, records and documents for fire management actions within Grand Portage National Monument are in the resource management files at Monument headquarters. This will be permanently placed in the park unit archives, with possible conversion to digital storage in the future. These include fire reports (DI-1201), fire atlas, fire equipment inventories, historic records, and all other maps or records pertinent to fire management.

C. Wildland Fire Use

One goal of the Grand Portage National Monument RMP is to restore the forests along the trail corridor to their condition during the fur trade era, or about 200 years ago. Evidence from a few historic journals suggests the landscape was much more open than today, and areas near fur posts may have been denuded of trees. Regeneration of pine stands is another component of historic restoration. Although never abundant in the Grand Portage area, pine trees were more prevalent than now. Use of low-intensity naturally-ignited fires in select areas of the Monument trail corridor would enhance the regeneration of white pine and open areas of the understory for views of the surrounding terrain.

In collaboration with the GP-Band TLR, the Monument will use prescribed fire to restore the cultural landscape, reduce hazard fuels, and manage vegetation. The Monument will encourage actions of mutual benefit by providing information and maps of areas where fire may be beneficial, and of areas to be protected from fire. As much as possible, areas requiring fireline construction should be away from culturally sensitive sites both inside and beyond Monument boundaries. Consultation with GP-Band forestry is needed to identify areas where natural or constructed barriers, such as bluffs, recently logged areas or roads, form boundaries of maximum manageable areas (MMAs) for confinement actions. During periods with high fire danger conditions, or when other fires are active in the region, wildland fire use will not be approved.

D. Prescribed Fire

The prescribed fire program for Grand Portage National Monument includes: prescribed fire plans, burn prescriptions, burn operations and monitoring, documentation and reporting, and burn critiques. Specific guidelines for preparation for, approval and conduct of prescribed fires are found in RM-18, Chapter 10 (NPS 1999). In addition, prescribed fires within Grand Portage National Monument will be:

Conducted with the direct aid and cooperation of the GP-Band wildland fire staff

Conducted with cooperation and assistance from Grand Portage community services to reduce effects of smoke on residents

Conducted in accordance with the Minnesota Smoke Management Plan , as well as following the US Environmental Protection Agency (EPA) Best Available Control Measures (BACM).

1. Planning

a. Preparation

A Prescribed Fire Plan is a site specific action plan which describes the purpose, objectives, prescription, and operational procedures needed to prepare and safely conduct the burn. The treatment area, objectives, constraints, and alternatives will be clearly outlined, and no burn will be ignited unless all prescriptions of the plan are met. The factors to be considered in preparing a Prescribed Fire Plan are contained in RM-18, Chapter 10 (NPS 1999).

A Prescribed Burn Boss (PBB) will conduct a field reconnaissance of the proposed burn location with the Monument Fire Management Committee to discuss objectives and special concerns, and to gather necessary information. After completing the reconnaissance, the Monument resource specialist will assist with writing the prescribed fire plan specifying the objectives to be accomplished.

The Border Waters Fire Management Officer will request FirePro funding for all actions related to the prescribed fire including operation, holding actions, and interpretation or public information actions. The prescribed fire plan includes anticipated unprogrammed budget expenditures, such as overtime or special equipment not available in the park or vicinity. Fire team members will be paid from their own accounts for regular work hours.

Based on on-site weather data, the PBB selects a proposed ignition date (or dates) and schedules all necessary personnel and equipment for the burn at that time. The PBB will verify any required pre-burn activities are completed, such as line construction and snag felling, and ensure closure and informational signs related to the prescribed fire plan are properly posted. The PBB supervises ignition, holding, and mop-up, and fireline patrol during the burn. When the burn team is assembled, the PBB will notify the Monument Fire Management Committee and interpretive division staff. A test fire will be used to determine if fire behavior will be

acceptable. If fire behavior and effects are not satisfactory, the test fire will be suppressed and ignition date for the burn rescheduled.

b. Long-term management objectives

Within the context of this FMP, the use of prescribed fire within the Monument is approved for a single site in WUI-FMU (Figure 8). This area is about 6 acres in size, and is bordered on two sides by hard-surfaced and gravel roadways. The remaining perimeter is bordered by thickets of alder, willow and poplar on moisture retaining soils. Beyond these thickets, another hard-surfaced road prevents fire spread onto GP-Band Reservation lands. Information from local residents and other sources indicates this meadow area has been maintained by fire historically. Continuing this practices with prescribed fires meets the Monument goal of retaining a cultural landscape through traditional methods.

Future use of prescribed fires in the GF-FMU will be through collaborative efforts with the GP-Band TLR forestry and fire fighting staff. Project design will depend on identifying suitable burn areas where resource goals for both entities can be met. For the Monument, these goals may include maintenance of historic landscapes and hazard fuel reduction.

c. Prescribed Fire Team

The superintendent, in consultation with the NPS Border Waters FMO, will designate a qualified PBB, and in conjunction with the PBB, designate other Burn Team members. Only personnel meeting NWCG prescribed fire qualifications will be used. The limited fire trained staff of the Monument requires supplementing with GP-Band fire staff, under cooperative arrangements, or qualified staff from other NPS Border Waters parks or MNICS agencies.

d. Prescribed Fire Monitoring

Prescribed fires will be ignited only when specified weather, fuel moisture, and fire characteristic parameters are met, as described in the prescribed fire plan. Fire weather will be recorded by the PBB, or designee, for a period of 30 days (preferred time span) prior to the earliest ignition date for the burn. A minimum of 10 to 14 days of readings must be available before fire weather forecasts are calculated by WIMS. A temporary, portable weather station may be established and fuel moisture sticks placed in characteristic fuel types. This will provide accurate data for calculating the appropriate time lag fuel moistures through WIMS.

Fire weather and fire behavior will be monitored during all prescribed fires to help managers keep fires within predetermined criteria, know

when to take suppression action, protect human life or property, and to verify success of long-term measurable objectives. A fire monitor will observe the fire, assess its potential and provide a historical record. Monitoring will include documenting the fire environment (weather, fuels, topography), fire behavior (manner and rate of spread, flame length, etc.), and fire effects (percent of fuels consumed, changes in plant and animal community composition and structure, etc.). Photographs will be taken. Weather readings will be made periodically with a belt weather kit at the fire site. Standards for fire monitors; and monitoring levels and minimum acceptable standards for documenting fire weather, behavior and effects are in the NPS Fire Monitoring Handbook (NPS 2001). The fire monitoring plan for Grand Portage National Monument will be attached as Appendix F to this Wildland Fire Management Plan when completed.

e. Prescribed Fire Critique

The Monument Fire Management Committee will critique each prescribed fire to determine if objectives were met. A report of results from the critique will be prepared and submitted to the superintendent and Border Waters FMO for review.

f. Documentation and Reporting

The Prescribed Burn Boss, or designee, will prepare a final report on the burn for the resource management specialist that will include: total work-hours, burn costs, summary of the burn chronology, complete weather and prescription records, and a map of the actual burn perimeter. Using data from fire monitors on fire behavior and effects, the report may evaluate the ongoing prescribed fire program, and may recommend changes in operation to achieve desired objectives. The Border Waters FMO and Monument resource management specialist ensure completion of fire report documents. All prescribed fire records, and the fire monitoring forms completed by the fire monitoring team, will be retained by Monument resource management staff for future use in planning and evaluating prescribed fire operations.

2. Exceeding Prescribed Fire Plan

In the event the prescribed fire exceeds the plan, the PBB will use the WFS process to select and implement the appropriate management response. This may be limited or complete control actions if a prescribed fire threatens to exceed prescription, escape predetermined boundaries, fail to achieve desired objectives, or threaten public safety or property. Limits of acceptable holding action, as well as the criteria for declaring an escaped fire, will be clearly stated in the prescribed fire plan. The superintendent will be notified

immediately of any control actions on a prescribed fire. If the escaped fire exceeds the fire management qualifications of the PBB, an Incident Commander with the necessary qualifications will be requested through the proper fire resource channels.

Smoke dispersal will be monitored continuously during all prescribed fires. If smoke creates a hazard or nuisance, the prescribed fire will be extinguished.

3. Cultural Resources

Prescribed burn 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 burn area and recommend protective measures to persons preparing prescribed burn plans.

4. Air Quality and Smoke Management

Local air quality is an important consideration when planning prescribed fire or suppression activities in the WUI-FMU. The Reservation school and health service are located about one-quarter mile, and an elder housing facility about one-half mile, to the north of Monument property.

The Minnesota Pollution Control Agency (MPCA) has the authority to implement and enforce federal regulations regarding air quality standards, including the Clean Air Act and the National Ambient Air Quality Standards (NAAQS). These laws address both visibility standards and criteria pollutants.

The Minnesota Department of Natural Resources (MnDNR) is responsible for granting permission for open burning in Minnesota. This authority is stated in Minnesota Statutes Chapter 88. While not bound by State burning laws, Federal agencies in Minnesota have historically complied with State burning regulations. Procedures for coordinating the establishment of Open Burning Restrictions between the State and Federal agencies are set in section 41 of the MNICS Mobilization Plan. The Minnesota Smoke Management Plan (Prescribed Fire Working Team 2003) represents a formal agreement among signatory agencies, which includes the National Park Service, for State burning regulation compliance for the purposes of smoke reduction. Specific Minnesota and local air quality guidelines for prescribed fires and smoke management are contained in the Air Quality/Smoke Management Guideline (Chapter XI of MN Smoke Management Plan 2003).

Grand Portage National Monument is a Class II air quality area, but it is located in proximity to two Class I airsheds, the BWCAW and Isle Royale National Park. Although air quality and visibility are not as stringently protected in Class II airsheds, the Monument will follow the guidelines below

to avoid unacceptable smoke levels in the Monument and adjoining lands during prescribed fires:

- Prescribed fire plans will have clear objectives and consider the impacts of the burn on the total environment
- The prevailing wind at the time of a prescribed fire will be away from nearby occupied buildings
- The location of burning will not be within 600 feet of occupied buildings other than those located on the property on which the burning is conducted
- No prescribed fire will be set while temperature inversions exist in the area, since these conditions trap smoke near the ground
- General weather information and fire weather forecasts will be used on all prescribed fires to determine smoke dispersal characteristics
- Test fires will be used on all prescribed fires to confirm that smoke dispersal and direction are acceptable
- Backing fires will be used whenever possible to provide for more complete fuel consumption and to lessen visibility problems. Fall fires burning in dry fuels also produce less smoke than spring fires burning in wet fuels
- Burn out and mop-up as quickly as possible to reduce impacts of residual smoke on visibility and health
- Notify the local GP-Band Fire Department, nearby residents, adjacent landowners, and local communities on the day of the burn so that all concerned will know it is not a wildfire
- 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
- Copies of the burn plan will be provided to the Grand Portage Band TLR and the MnDNR, Grand Marais District.

E. Non-Fire Fuel Applications

Non-fire treatments may be used to address three fire management objectives of the Monument: maintain defensible wildland fire boundaries, hazard fuel reduction and vegetation management for enhanced pine regeneration. Of these, only the first is a current practice; the latter two are not currently planned or funded for the Monument.

Wildland-Urban Interface WUI-FMU

Routine landscape activities maintains defensible space around reconstructed buildings and other structures in the WUI-FMU. Closely mowed turf is maintained around parking areas, in the picnic grounds, along paths and on road shoulders; areas where discarded smoking materials are the most likely to occur. The perimeters of buildings are kept free of brush and rampant grass growth. These activities are funded through Monument base operations funds.

The first half-mile of the Grand Portage follows a 100-ft-wide corridor through the forested stream valley of Grand Portage Creek from the lakeshore area to MN Hwy 61. No fuel inventory of this area is available or planned. Hazard fuel reduction along this portion of the trail would not substantially reduce the risk of fire, unless similar actions occurred on surrounding GP-Band land. However, the WUI is isolated from the remainder of the Reservation by the hard-surface Hwy 61 and its deforested rights-of-way, providing an effective fire break for the spread of surface fires from outside the WUI.

Non-fire Treatments in the GF-FMU

Development of defensible fire breaks in the GF-FMU would require collaboration with Grand Portage Band forestry. The few natural features that enhance the effectiveness of such fire boundaries extend beyond the narrow trail corridor onto Reservation forest lands. There are currently no existing fire breaks within the GF-FMU.

An inventory of fuel loads is needed to identify areas with the greatest risk and in most need of hazard fuel treatment in the GF-FMU. To limit ground disturbance and the potential damage to unknown in-ground cultural resources, appropriate treatments are limited to mechanical methods: hand saws, pruners and chain saws. Due to the restricted width of the trail corridor, and the desire to provide visitors with an historic scene without intrusions from modern maintenance activities, disposition of the removed fuels must be carefully considered for each non-fire treatment plan. Piles of removed fuels, whether eventually burned or not, must be carefully placed. Removal of material from treatment sites depends on equipment accessibility via logging or maintenance trails on adjacent Reservation lands. Wheeled or motorized equipment is not permitted along the Grand Portage for routine, non-emergency activities, limiting the distance removed fuel can be manually hauled by that route.

Areas suitable for thinning and understory removal to enhance pine growth have not been identified. A proposal for such a study is submitted

for FY2006 funding. Once identified, non-fire treatments of this sites will have the same logistical limitations as described for hazard fuel reduction.

F. Burned Area Rehabilitation and Restoration

The NWCG Burned Area Rehabilitation Guide provides guidance in restoration efforts, when such actions are necessary. Rehabilitation will only be required where the impacts of the fire itself or the associated suppression actions are significant and can be mitigated. If Minimum Impact Suppression Tactics are used, only minimal rehabilitation should be necessary. Locating firelines to use streams and existing natural fire breaks will reduce the need for felling trees. In no case will action that compounds the damage be taken in the name of rehabilitation. Monument management will play an active role in rehabilitation actions to see that this happens. The delegation of authority to Incident Commanders and the WFSA are key components of this process.

Because of the cultural significance of Fort Charlotte and the Grand Portage trail corridor, rehabilitation actions should not commence until the Monument cultural resource specialist, or other trained archeologist, has completed a surface survey of burned areas, including firelines constructed during fire management actions. After completing the survey, the Monument resource management specialist and natural resource staff will determine the most suitable rehabilitation actions to take.

Burned areas will not be seeded; abundant seed sources exist in the local area. Residual seed and sprouting from surviving rootstalks also contribute to natural revegetation. Efforts to control potential erosion on firelines and slopes will be the primary rehabilitation in the Monument. Funding of normal rehabilitation costs is covered by the Emergency Rehabilitation account (PWE-385).

V. MONUMENT FIRE PROGRAM ORGANIZATION AND BUDGETING

A. Monument Wildland Fire Staff

The limited staff of Grand Portage National Monument necessitates division of on-site wildland fire management responsibilities among the resource, ranger and interpretive divisions (Table 9). Ultimately, all staff members have a role in providing for public and visitor safety during periods of high fire danger. Specific responsibilities assigned to staff positions are as follows:

Superintendent

The superintendent is responsible for all fire management activities within the park, and must manage the program in accordance with Department of the Interior and NPS policy, as set forth in Director's Order 18 and Reference Manual 18. The superintendent ensures the preparation of individual prescribed fire plans and submission to the NPS Midwest Region Fire Program for concurrence prior to implementation. S/he is responsible for

Table 9: Staff Positions Responsible for Fire Management Policy and Implementation at Grand Portage National Monument.

Decision/Action	Responsible Position
Fire management planning	Border Waters Fire Management Officer Fire Management Committee Approval by Superintendent
Wildfire mobilization	Lead Ranger
Prescribed fire mobilization	Fire Management Committee Approval by Superintendent
Fire prevention	Chief, Resource Management Division Chief, Interpretation Division
Interagency mobilization	Border Waters Fire Management Officer Lead Ranger Approval by Superintendent
Interagency cooperation	Lead Ranger Border Waters Fire Management Officer
Fire management training	Lead Ranger
Public information	Chief, Resource Management Division
Public safety	Lead Ranger Chief, Interpretation Division
Archeological/historical	Chief, Resource Management Division
Fire monitoring	Chief, Resource Management Division

public and media relations pertaining to both wildland and prescribed fire, and will ensure effective cooperative fire relations with other fire entities and adjacent landowners.

Lead Ranger

The lead ranger is responsible for the park's preparedness and stage of readiness. S/he will:

- Ensure that adequate NPS wildland fire qualifications ratings are attained by members of the park staff
- Direct fire closures and restrictions as conditions warrant
- Ensure that human-caused fires are investigated
- Act as the MNICS (Minnesota Incident Command System) coordinator for the Monument

The Lead Ranger should maintain a minimum qualification of Crew Boss, with a target level Incident Commander Type IV, or higher.

Chief, Resource Management

The resource management chief is responsible for planning and implementation of the Fire Management Program. S/he will obtain qualified assistance for the planning of specific prescribed fires, for determining who will determine prescriptions, and assist in preparing burn plans for higher approval. S/he will head the Fire Management Committee which will plan strategies as documented in this plan.

Border Waters Fire Management Officer

The Border Waters Fire Management Officer (FMO) is located at Voyageurs National Park but provides professional fire management support to Grand Portage National Monument. S/he is responsible for coordinating all wildfire prevention, pre-attack, suppression, and prescribed fire activities with the Monument superintendent, lead ranger and resource management chief.

The Border Waters FMO acts as the Grand Portage National Monument coordinator for Memoranda of Understanding with other agencies regarding wildland fire. S/he also coordinates in-park fire dispatches and out-of-park fire assignments through the Minnesota Incident Command System (MNICS) at the Minnesota Interagency Fire Center in Grand Rapids, Minnesota; and represents Grand Portage National Monument in the MNICS organization.

B. FirePro Funding

Grand Portage National Monument is not directly funded by FirePro (NPS fire management analysis and funding program) because of the infrequent

occurrence of wildland fires. Midwest Region FirePro supports the Border Waters FMO and Fire Ecologist, both stationed at Voyageurs National Park, who are responsible for implementation of the Monument FMP and consulting in fire related issues. Refer to RM 18, Chapter 17 (NPS 2002) for FirePro financing procedures and restrictions on account use.

C. Fire Management Committee

The superintendent chairs the Grand Portage National Monument Fire Management Committee, which includes the lead ranger, resource management chief, maintenance supervisor and Border Waters FMO. Technical expertise from other individuals or agencies may be requested by the Committee as needed. The Committee evaluates prescribed fire plans for compliance with Monument management objectives, prescription parameters, and implementation strategy.

The Committee may be convened during periods of high fire danger to coordinate pre-attack activities. During active wildland fires, the Committee will coordinate fire operations with the Reservation and assist with preparation of a Wildland Fire Situation Analysis (WFSA).

D. Superintendent Responsibilities

The park superintendent is responsible to periodically assess and certify by signature that continued management of wildland fire use actions is acceptable. This is particularly important in regard to fire fighting actions that may threaten the cultural resources of the Monument, such as use of chains saws, wheeled vehicles, or other heavy equipment in backcountry areas. Under certain conditions, these responsibilities may be delegated to staff at another organizational level, or an incident commander, through a limited delegation of authority (Appendix G).

E. Interagency agreements

Grand Portage National Monument is part of the federal interagency wildland fire community whose resources are available for local fire emergencies. In turn, NPS wildland fire management personnel are expected to assist when needed on fire emergencies in other areas. The Monument will participate in major fire mobilizations when resources are available and local fire conditions permit. Wildland fire personnel may not be available for dispatch during periods of high fire danger (Staffing Class IV or V) or while there are any ongoing fires locally. The decision on sending staff is made by the Monument superintendent and lead ranger.

F. MNICS

Grand Portage National Monument, Voyageurs National Park, Isle Royale National Park, and St. Croix National Scenic Riverway are all members of the Minnesota Incident Command System (MNICS). These NPS units contribute resources for 20-person Type II fire crews dispatched through the Minnesota Interagency Fire Coordination Center (MIFC) in Grand Rapids, MN. In addition to responding to fire needs in Minnesota, teams may be dispatched for regional or national fire activities. MIFC coordinates large fire activity in Minnesota, and responds to resource requests from the Eastern Area Coordination Center (EACC) in Ft. Snelling, MN. The EACC receives requests from the National Interagency Coordination Center (NICC) in Boise, ID. The Border Waters FMO coordinates NPS resource mobilization and is the primary MIFC contact for call-up.

A Memorandum of Understanding (MOU) for prescribed fire between MNICS agencies was ratified in October 2001. This MOU allows for sharing of resources for prescribed fires between federal and state agencies. Grand Portage National Monument is officially represented on the MNICS Board of Directors by the Voyageurs National Park superintendent and on the MNICS Task Force by the Border Waters FMO. As the only FirePro funded NPS unit in Minnesota, Voyageurs National Park contributes the yearly fair-share cost of MNICS operations for all NPS units through the FirePro funding process.

G. Other Agency Agreements

Grand Portage Band of Minnesota Chippewa, Bureau of Indian Affairs, Minnesota Agency

An Interagency Agreement between Grand Portage National Monument and Grand Portage Reservation Tribal Council exists for the joint coordination of fire management and fire suppression activities. This agreement addresses both structural fire emergencies and wildland fire management activities. The Bureau of Indian Affairs, Minnesota Agency, has a separate agreement addressing mutual aid in response to wildland fire emergencies in all NPS units in Minnesota.

Minnesota Department of Natural Resources

All NPS park units in Minnesota have a mutual aid MOU with the MnDNR.

Ontario Ministry of Natural Resources

An Agreement exists between resource management agencies with wildland fire protection responsibilities along the north Minnesota border and the Ontario Ministry of Natural Resources. This Agreement establishes a "Common Zone" for approximately two miles (3.20 km) on either side of the International Boundary. Any agency discovering a wildland fire within this Common Zone can

respond with an initial attack, whether or not the fire is on the agency's side of the border.

All inter-agency MOUs and agreements with sovereign entities are included here by reference. These documents appear as Appendix E-3 in working copies of this FMP housed in the Resource Management Office of the Monument and Border Waters Area Office. Contact the Grand Portage National Monument resource staff or Border Waters FMO for further information.

VI. MONITORING AND EVALUATION

Any wildland fire use and all prescribed fires must have short and long-term monitoring programs to assess the success of fire management on the cultural and natural resource goals, as specified in the Grand Portage National Monument RMP (2001). The NPS Fire Monitoring Handbook (2001) provides guidance on the development and implementation of a fire effects monitoring plan. A monitoring plan for limited prescribed fires of an historic meadow in the Monument lakeshore area is required, and will be attached as Appendix F of this FMP when completed.

The purpose of monitoring fires is to:

- Document the fire environment (weather, fuels, topography)
- Document fire behavior (manner and rate of spread, flame length, etc.)
- Provide fire information to management for making decisions
- Compare observed fire behavior with the burn prescription and predicted behavior
- Assess the potential behavior of the fire
- Increase knowledge of fire behavior and effects at the Monument
- Refine fire prescriptions
- Determine if fire objectives are met
- Provide a historical record through data, photos, and narrative

Fire information is critical to determine when to declare a prescribed fire a wildland fire, and should be used in determining appropriate prescribed fire holding actions, suppression tactics, and line placement.

VII. FIRE RESEARCH

A. Grand Portage National Monument fire research

A forest history study for the Grand Portage National Monument trail corridor and Fort Charlotte area was recently completed (White and Host 2003). One objective of this study was to determine the frequency of wildland fire in the Grand Portage region prior to the 20th Century. This information will guide the Grand Portage National Monument Fire Management Committee when making decisions among suppression, confinement or fire use as the appropriate management response to wildland fires.

Most of the forest communities along the Grand Portage trail corridor originated after 1870. Some notable exceptions were found along the western half of the trail corridor and at Fort Charlotte. The oldest stand consists of northern white cedars and a few white pines. Core samples from two cedars in this stand yielded estimated origin dates of 1796 and 1775. The earliest date in the study came from a cross-section taken 12 feet above the root collar on a fallen white pine, which dated to the mid-1700s. This upland stand of cedar was apparently the result of a major disturbance event (fire?) more than 200 years ago. Analysis of tree ring widths on cedar core samples suggested surface fires may have occurred on a regular basis, but with sufficiently low intensity that these fire-susceptible trees were not killed. Core samples from white pine, white spruce and cedar in the Fort Charlotte area yielded a range of dates from 107 to 127 years. In this case, trees were established on an individual basis, not as the result of a major stand-replacing disturbance (White and Host 2003).

The moderating effect of Lake Superior on the local climate, mesic soil moisture conditions, and a relatively low frequency of lightning strike ignitions created a fire regime that differs from inland areas of Minnesota. The mesic conifer dominated forest systems of the Grand Portage area were subject to a 200-400 year fire cycle for stand replacing fires prior to fire suppression efforts during the last century. Windthrow (1000-2000 year cycle) and insect infestations also influenced forest dynamics. Maintenance fire (20-40 year interval) may have been important for pine dominated stands on dry-mesic sites (White and Host 2003).

In general, conifers are less prevalent within the Monument than during pre-settlement times, while aspen is likely significantly more abundant (White and Host 2003). Re-introduction of disturbance, through low-intensity fires or mechanical methods, would enhance pine regeneration in areas with mature red and white pines.

B. Research needs

Other disturbance events, specifically spruce bud-worm outbreaks and wind storms, have an impact on the Monument wildland fire management program by contributing to the fuel load. A recent fuel inventory for this park unit is not available. This is a primary need to assess the continuing effect of bud-worm infestations from the early to mid-1990s. The western portion of the trail corridor traverses an upland ridge for several miles, and is prone to wind falls during the fall storms. Continual renewal of heavy surface fuels results from this situation. A fuel inventory will aid in determining the potential success of initial management response.

Few young white pines occur within the Monument trail corridor; regeneration is hampered by the lack of forest openings. A vegetative cover map for the Monument is needed to identify the areas appropriate for resource use of wildland fires. Restoration of the landscape to the fur trade era is a major goal of the RMP (2001).

VIII. PUBLIC SAFETY

A. Issues and Concerns

The following are the public safety considerations for the Monument:

- Major visitor use is concentrated within the lakeshore area of the Monument, WUI-FMU
- Visitors may ignore warnings, or be unaware of potential dangers
- Opportunities for back-country visitors to escape a large, fast moving fire are limited to the trail corridor
- Whenever human life is endangered, all means must be taken to warn or evacuate visitors
- Certain areas may be closed when considerable risk to visitor safety exists

The Grand Portage National Monument safety officer will be assigned to all large wildland fires and all prescribed fires. National Park Service employees responsible for any wildland fire management action will never place other values before public or firefighter safety. Actions that ensure visitor safety have priority over fire suppression and monitoring activities. All key fire management personnel are issued the NWCG Fireline Handbook 410-1 (1998). Consistent, accurate monitoring and evaluation of fire behavior in the Monument will provide the basis for developing contingency plans, contacts, and briefings that ensure public and personnel safety.

B. Mitigation Actions

To ensure visitor safety, the following actions will be taken:

- 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 burns are properly posted.
- News releases may be provided to local news media.
- Burned over 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.

The lead ranger will notify the following about fire activities in the Monument: GP-Band, Cook County Commissioners, MnDNR Forestry, U.S. Border Patrol, Ontario Ministry of Natural Resources, and Superior National Forest. (See Appendix E-1 for contact information.)

IX. PUBLIC INFORMATION AND EDUCATION

A. Public information needs

The National Park Service has come under increased scrutiny for its fire management program as a result of recent catastrophic events. As a result, the goal of the NPS to maintain fire-dependent and fire-adapted natural environments in the parks, while protecting public safety and property, has become complex. Informing the public about the role fire plays in maintaining desirable natural environments is an essential factor in establishing public support. The Monument wildland fire management information program will be factual, straightforward, and aimed primarily at the Grand Portage community.

Fire management information will be incorporated into appropriate visitor orientation information and interpretative talks, the Monument newspaper, and ranger station exhibits. Particular attention will be given to informing the public about management activities when fires are conspicuous from the interpretive site or local community. Information handouts explaining the fire management program will be prepared and periodically updated. During periods when fires are burning, these handouts will be distributed to visitors: at park information boxes and the ranger station; and by NPS field personnel during informal contacts in the Monument.

B. Public information 'step-up' plan

During periods with very high or extreme fire danger ratings (Staffing levels IV and V), Monument staff will prepare to initiate the following public information actions:

- Signs notifying the public about fire danger levels and appropriate restrictions, area closures, ongoing prescribed fires or wildfires, dense smoke hazards, or other special situations will be placed at the interpretive site and ranger station, at trailheads, parking areas where roadways intersect the trail corridor, and at the Grand Portage Lodge.
- The Chief of Interpretation (or designated Public Information Officer) will be informed daily by the lead ranger of management actions and status of fires in the Monument.
- To effectively answer visitor questions, every NPS employee in the Monument will be made aware of the wildland fire management program and the status of ongoing fires
- During ongoing fires, news articles may be written and released to local newspapers, radio, and television stations

- Public information outlets for neighboring land management agencies will be provided with fire management information, particularly when ongoing fires are burning in the Monument

X. PROTECTION OF SENSITIVE RESOURCES

A. Cultural Resources

Grand Portage National Monument's archeological and historical resources are a limited, fragile, and nonrenewable part of the environment which must be protected; once disturbed, the scientific information they possess is lost. Great care will be taken during fire suppression, wildland fire use and prescribed fire activities in the Monument to limit disturbance or destruction of cultural resources.

Public concern for cultural resource preservation is contained in the National Historic Preservation Act (NHPA, 1966), which built on the Antiquities Act (1906). Section 106 of NHPA (1996, as amended) mandates that effects on cultural resources be taken into account when Federal action is undertaken. This applies particularly in non-emergency cases, such as prescribed fires. Completion of pre-burn site surveys is, therefore, of the greatest importance. The limited areas within the lakeshore area of the Monument considered for prescribed fires have been archeologically studied in the past. Limited surface surveys prior to implementing burns should meet Section 106 compliance. For each prescribed fire, the park will submit a Section 106 Compliance Form in a timely manner for completion of field work prior to the scheduled burn.

In the Monument, fire management activities that disturb the ground, even fireline construction using hand tools, will have a wildland fire trained cultural resource specialist on site over seeing field crews. During any wildland fire, the highest priorities remain personal safety and controlling the blaze; therefore, if the fireline cannot be diverted, damage to cultural resources may be unavoidable. If cultural resources are discovered and/or damaged during fire operations, the Monument cultural resources specialist is to be notified immediately.

Protection of cultural resources in the Fort Charlotte area is of special concern. Since the terrestrial resources have not been previously studied, any disturbance of the soil within the core area could potential destroy information. No wheeled or tracked vehicles are allowed in this area, unless approved by the Monument superintendent or designee. Continued protection of remaining submerged resources in the stream bed of the Pigeon River and Snow Creek must also be considered during fire fighting activities in this area. Mechanical means of removing water from these streams should not be used within the historic area except as approved by the superintendent.

Cultural Resource Surveys

Some areas of the WUI-FMU have been intensively studied in the past, but most of the FMU has not, and only select areas of the GF-FMU have been surveyed for archeological resources. Surveys of the trail corridor continue

as funding becomes available, but it is unlikely that the entire Monument property will be surveyed. When practicable, ground surveys will be conducted prior to any prescribed fire. A surface survey for newly exposed features will be made soon after all wildland or prescribed fires. Observations and survey reports will be referred to MWAC for archiving and follow-up actions within their work plans. The park, in consultation with MWAC, will determine any additional management actions necessary to protect cultural resources after reviewing post-fire surveys.

Cultural Resource Mapping

Digital maps of cultural resource sites will be developed and incorporated into the Monument geographic information system (GIS) to aid decision making during prescribed fire planning and for incident commanders during active fires. The data set will include location, site number (if assigned), site type, and site evaluation. Preferred fire management activities will be identified for specific sites or site types. Actions identified may include site avoidance (buffer areas), use of physical or applied barriers, approved methods for reducing fuel loads, systematic collection of certain artifact classes prior to prescribed fires, post-fire follow-up survey and collection. Development of this tool is affected by other duties of the Monument resource division and an estimated completion date is yet to be determined.

During fire suppression, prescribed fire, and rehabilitation activities:

- No vehicles, wheeled or tracked equipment is permitted off road surfaces within Monument boundaries or along the trail corridor, without permission of the Monument superintendent
- GIS-generated base maps indicating known and suspected cultural sites, and suggested fire fighting restrictions, will be provided to the Incident Commander and cultural resource specialist on the fireline
- When cultural resources are threatened by a fire, archeologists will be present to help mitigate the impacts of fire suppression and rehabilitation.
- Archeologists serving on a fire as technical specialists should hold a 'red card' to perform their specific advisory duties, and shall be equipped with appropriate standard fire fighting safety equipment
- Special flagging will identify cultural sites known prior to prescribed fires and newly discovered post-fire sites.
- Archeological materials uncovered during fire management activities must be left in place, flagged, and reported to the Monument cultural resource specialist.

- The Monument Resource Management Chief coordinates all activities of line archeologists with fire operations.
- When possible, a ground survey will be conducted immediately post-burn to locate newly exposed material

B. Natural Resources

Environmental resources critical to Federally threatened wildlife are not limited in the Grand Portage area. State wildlife species of concern also have vast portions of the region which are suitable for habitation. Because of its limited acreage, no apparent adverse effect to wildlife species of concern should arise from wildland fires within the Monument.

The plant species of concern within the Monument are primarily restricted to small, rocky, steeply sloping sites on Mount Rose within the WUI-FMU. Historic photos indicate Mount Rose was bare of trees in the early 20th Century, suggesting that the rare and uncommon plants found here are adapted to a dynamic habitat.

Minimum impact suppression techniques will be the most effective action for protecting these species:

- GIS-generated base resource maps with highly critical sites indicated will be provided to Incident Commander on the fireline
- Photos of sensitive areas, (i.e., specific rock outcrops) that require hand removal of fuels will be provided to the Incident Commander on the fireline
- Wetlines, or environmental lines, used where possible in lieu of handline construction if water and pumps are available
- Utilize fog nozzles; avoid "boring" and hydraulic action on vertical rock outcrops and loose shale slopes
- Firelines kept to minimum width necessary to allow backfiring or safe blackline creation

C. Reconstructed buildings and infrastructure

The reconstructed buildings and stockade that depict the original North West Company fur trade depot are the primary interpretive features of the park. These structures are set within a maintained landscape on the shore of Lake Superior. The turf lawn and limited woody vegetation of this area provides a defensible zone around the reconstructions. Several hydrants serviced by the community water system are located throughout the sites.

Service buildings, the ranger residence and future Heritage Center (construction planned in 2005-2006) are set within mixed hardwood-conifer woods. Where tree removal is not possible, for environmental or aesthetic reasons, to provide adequate defensible space around buildings, surface fuels will be mechanically removed.

Wildland fire fighting issues related to buildings and infrastructure:

- Location in Village (WUI-FMU) implies early detection of fires
- Proximity to Village fire department for rapid response
- Presence of high pressure hydrants from community water supply
- Proximity of Lake Superior provides an abundant year-round water supply for wetlines and building protection

XI. FIRE CRITIQUES AND ANNUAL PLAN REVIEW

All wildland fires and prescribed fires will be reviewed within two weeks after the fire is declared out, in accordance with procedures in Wildland and Prescribed Fire Management Policy and Implementation Procedures Guide (NPS 1998).

Reviews for most fires will be informal unless there are unusual incidents or the fire escapes Monument boundaries. A more formal park-level critique will take place for each wildland fire over 10 acres in size and every prescribed fire to determine the effectiveness of the Monument wildland fire management program. The superintendent, after consulting with the resource management specialist and lead ranger, will appoint the review team. Normally, the team consists of the Incident Commander or Prescribed Burn Boss, Border Waters FMO, and staff members from any division with special knowledge or interest in the particular fire.

The critique documents recommendations for changes in fire procedures, prescriptions to achieve different fire effects, or needs for additional training to increase program effectiveness and efficiency. A short report of each critique will be submitted to the Monument superintendent and the Midwest Regional Fire Management Officer for review.

The Monument wildland fire management program will be reviewed annually by the resource management specialist and lead ranger, in consultation with the Border Waters FMO, and with input from interested staff members.

Recommendations for changes will be made to the superintendent as necessary. Areas to be reviewed include:

- Adjustments to burning prescriptions
- Changes to the prescribed fire program
- Operational procedures
- Revision/update of the Monument FMP, in collaboration with the GP-Band Trust Lands and Resources

If no recommendations are forwarded to the superintendent, then the program will be executed as stated in this FMP. Proposed FMP revisions will be forwarded to the Border Waters FMO and NPS Midwest Regional FMO for review. When approved, revisions will be incorporated within the FMP as an appendix for that year. The review process will be scheduled in a timely manner to permit approval of any revisions by April 15 each year, so alterations in the Monument wildland fire management program are in place prior to the fire season.

XII. CONSULTATION AND COORDINATION

The limited size, location and configuration of Grand Portage National Monument required a cooperative approach in developing a park-specific wildland fire management plan. The importance of integrating any fire management actions within the Monument with the need to protect people, property and forest resources on surrounding Reservation lands cannot be overstated. At the same time, management of the vegetation communities within the Monument in efforts to present an 18th Century landscape would benefit from occasional surface fires, either through prescribed fires or resource use of naturally-ignited wildland fires. The following agencies and staff played a part in evaluating the options available for reaching these goals within the context of the Grand Portage National Monument Wildland Fire Management Plan.

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Appendix B: DEFINITIONS USED IN THIS FMP

- Appropriate Management Response** – Specific actions taken in response to a wildland fire to implement protection and fire use objectives.
- Backing** – A fire, or that part of a fire, spreading or set to spread against the wind or downslope.
- Canadian Forest Fire Behavior Prediction (FBP) System** – A mathematical modeling system used by land management agencies to assess theoretical fire behavior under prevailing conditions.
- Canadian Forest Fire Danger Rating System (CFFDR)** – A mathematical modeling system used by land management agencies to assess various aspects of fire danger on a day-to-day basis. Daily fire weather observations are the inputs, and outputs include predicted fuel moistures and likelihood of ignition.
- Confinement** – Confinement is 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.
- Controlled** – Status of unwanted wildland fire when a holding line has been established around the entire perimeter and no further spread is expected.
- Crown Fire** – A fire that advances from top of trees or shrubs more or less independently of the surface fire.
- Crowning** – Fire burning as a crown fire, consuming tree tops and spreading from tree to tree independently of surface fuels.
- Detection** – The act or system of discovering and locating fires.
- Dispatcher** – A person employed who receives reports of discovery and status of fires, confirms their locations, takes action promptly to provide people and equipment likely to be needed for appropriate management, and sends them to the proper place.
- Fire Evaluation** – The process of examining and appraising fire monitoring information.
- Fire Management Plan** – A strategic plan that defines a program to manage wildland and prescribed fires and documents the Fire Management Program in the approved land use plan.
- 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 set it apart from management characteristics of an adjacent unit.
- 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 Occurrence** – Number of fires per unit time in a specified area.

Fire Prescription – A written statement defining the objectives to be attained and conditions under which a fire will be allowed to burn; generally expressed as an acceptable range of fire weather indices and the limit of the geographic area to be covered.

Fire Prevention – All activities concerned with minimizing the incidence of unwanted wildland fires.

Fire Regime – Periodicity and pattern of naturally-occurring fires in a particular area or vegetative type, described in terms of frequency, biological severity, and areal extent.

Flame Height – The average height of flames as measured on a vertical axis. It may be less than flame length if flames are angled.

Flame Length – The distance measured from the tip of the flame to the middle of the flaming zone at base of the fire. It is measured on a slant when the flames are tilted due to effects of wind and slope.

Fuel – Any organic material – living or dead, in the ground, on the ground, or in the air – that will ignite and burn.

Hazard Fuel Reduction – Any treatment of a fuel complex defined by kind, arrangement, volume, condition, and location that reduces a special threat of ignition or of suppression difficulty.

Holding Actions – Those actions needed to keep a prescribed fire within its prescription. Examples include patrol, control of spot fires and slopovers, wetting fuels outside a fireline, burning out fingers, etc.

Incident – An occurrence or event, either human-caused or natural phenomena, that requires action by emergency service personnel to prevent or minimize loss of life or damage to property and/or natural resources.

Incident Commander – Individual who meets qualifications of the NWCG at an appropriate level (Type 1, Type 2, etc.) and is responsible for all incident operations.

Initial Attack – An aggressive suppression action consistent with firefighter and public safety and values to be protected.

Ladder Fuels – Fuels which provide vertical continuity between strata. Fire is able to carry from surface fuels by convection into the crowns with relative ease.

National Fire Danger Rating System (NFDRS) – A mathematical modeling system used by land management agencies to assess various aspects of fire danger on a day-to-day basis. Daily fire weather observations are the inputs, and outputs include predicted fuel moistures, likelihood of ignition, and some characteristics of a theoretical fire. Commonly-used adjective classes describing fire danger (Low, Medium, High, Very High, Extreme) are also products of NFDRS.

Natural Ignition – Any fire of natural origin (e.g., lightning, spontaneous combustion, volcanic activity).

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.

- Prescribed Fire** – Skillful application of fire within a fire prescription in order to achieve predetermined resource management objectives.
- Prescribed Fire Plan** – A plan required for each fire application ignited by managers.
- Prescription** – Measurable criteria that define conditions under which a prescribed fire may be ignited, guide selection of appropriate management response, and indicate other required actions.
- Rate of Spread** – The relative activity of a fire in extending its horizontal dimensions. It is expressed as rate of increase of the total perimeter of the fire; or as rate of forward spread of the fire front; or as rate of increase in area, depending upon the intended use of the information. Usually ROS is expressed in chains or acres per hour. (One chain = 66 feet).
- Resource Order** – A form used by dispatchers, service personnel, and logistics coordinators to document the request, ordering or release of resources, and the tracking of those resources on an incident.
- Smoldering** – Behavior of a fire burning without flame and barely spreading. Smoldering fires generate the most emissions, even though much of the smoke is invisible.
- Spotting** – Behavior of a fire producing sparks or embers that are carried by convection columns and/or wind and which start new fires beyond the zone of direct ignition by the main fire.
- Surface Fire** – A fire that burns surface litter, debris, and small vegetation.
- Surface Fuels** – All materials lying on, or immediately above, the ground, including needles or leaves, duff, grass, small dead wood, downed logs, stumps, large limbs, low brush, or reproduction. Most fires are carried by surface fuels.
- Torching** – Fire burning principally as a surface fire that intermittently ignites the crowns of trees or shrubs as it advances.
- Unwanted Wildland Fire** – A free-burning fire not burning according to management objectives. All unwanted wildland fires are suppressed in national parks.
- Weather Information Management System (WIMS)** – A comprehensive computer-based system that stores weather information used in wildland fire program management.
- Wildland Fire** – Any non-structure fire, other than prescribed fire, that occurs in the wildland.
- Wildland Fire Implementation Plan (WFIP)** – A progressively developed assessment and operational management plan that documents the analysis and selection of strategies and describes the appropriate management response for a wildland fire being managed for resource benefits.
- Wildland Fire Management Program** – The full range of activities and functions necessary for planning, preparedness, emergency suppression operations, and emergency rehabilitation of wildland fires, and prescribed fire operations, including non-active fuels management to reduce risks to public safety and to restore and sustain ecosystem health.

Wildland Fire Situation Analysis (WFSA) – A decision making process that evaluates alternative management strategies against selected safety, environmental, social, economic, political, and resource management objectives.

Wildland Fire Suppression – An appropriate management response to wildland fire that results in curtailment of fire spread and eliminates all identified threats from the particular fire.

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.

APPENDIX C: SPECIES LISTS

Complete lists of vertebrate animal and vascular plant species known to occur within Grand Portage National Monument have been compiled as part of the NPS Inventory and Monitoring Program. Partial lists also exist for lichens, large moths, ground beetles and caddisflies. Contact Monument Resource Management staff for further information.

Table C-1. Vascular Plant Species Reported as Common or Abundant within Grand Portage National Monument.

Ferns and fern allies

Order: Polypodiales - Family: Dennstaedtiaceae
Pteridium aquilinum bracken

Order: Polypodiales - Family: Dryopteridaceae
Athyrium filix-femina lady fern
Dryopteris carthusiana spinulose wood fern
Dryopteris expansa spreading woodfern
Gymnocarpium dryopteris western oak fern

Order: Equisetales - Family: Equisetaceae
Equisetum arvense field horsetail

Order: Lycopodiales - Family: Lycopodiaceae
Lycopodium dendroideum tree groundpine

Gymnosperms

Order: Pinales - Family: Pinaceae
Abies balsamea balsam fir
Picea glauca white spruce
Pinus resinosa red pine
Pinus strobus eastern white pine

Order: Pinales - Family: Cupressaceae
Thuja occidentalis arborvitae

Angiosperms (monocots)

Order: Arales - Family: Araceae
Calla palustris water arum

Order: Cyperales - Family: Cyperaceae
Carex castanea chestnut sedge
Carex deweyana Dewey sedge
Carex disperma soft-leaf sedge
Carex gracillima graceful sedge
Carex intumescens greater bladder sedge
Carex peckii Peck's sedge

Carex pedunculata long-stalk sedge
Carex retrorsa knotsheath sedge
Carex stipata owlfruit sedge

Order: Cyperales - Family: Poaceae
Calamagrostis canadensis bluejoint grass

Order: Liliales - Family: Iridaceae
Iris versicolor blueflag wild iris

Order: Liliales - Family: Liliaceae
Clintonia borealis bluebead

Maianthemum canadense
Streptopus roseus

Canada mayflower
rose twisted stalk

Order: Juncales - Family: Juncaceae
Luzula acuminata

hairy woodrush

Angiosperms (dicots)

Order: Apiales - Family: Apiaceae

Carum carvi
Heracleum lanatum
Sium suave

caraway
common cow parsnip
common water parsnip

Order: Asterales - Family: Asteraceae

Achillea millefolium
Anaphalis margaritacea
Antennaria neglecta
Aster ciliolatus
Aster lanceolatus
Aster macrophyllus
Aster puniceus
Eupatorium maculatum
Hieracium aurantiacum
Hieracium kalmii
Hieracium piloselloides
Hieracium scabrum
Hieracium umbellatum
Petasites frigidus
Solidago canadensis
Solidago gigantea

common yarrow
common pearly everlasting
field pussytoes
Lindley's aster
white panicle aster
bigleaf aster
purplestem aster
spotted joe-pye-weed
orange hawkweed
Kalm's hawkweed
tall hawkweed
rough hawkweed
narrow-leaf hawkweed
arctic sweet coltsfoot
Canada goldenrod
giant goldenrod

Order: Cornales - Family: Cornaceae

Cornus canadensis
Cornus stolonifera

bunchberry
red-osier dogwood

Order: Dipsacales - Family: Caprifoliaceae

Diervilla lonicera
Linnaea borealis ssp.
Lonicera canadensis

northern bush honeysuckle
twinflower
American fly honeysuckle

Order: Fabales - Family: Fabaceae

Lathyrus ochroleucus

pale peavine

Order: Fagales - Family: Betulaceae

Alnus incana ssp. rugosa
Alnus viridis ssp. crispa
Betula papyrifera
Corylus cornuta

speckled alder
mountain alder
paper birch
beaked hazelnut

Order: Gentianales - Family: Apocynaceae

Apocynum androsaemifolium

bitterroot

Order: Lamiales - Family: Boraginaceae

Mertensia paniculata

tall lungwort

Order: Lamiales - Family: Lamiaceae

Lycopus americanus
Mentha arvensis
Scutellaria galericulata
Scutellaria lateriflora
Stachys hispida

American bugleweed
field mint
hooded skullcap
blue skullcap
hedge nettle

Order: Myrtales - Family: Onagraceae

Epilobium angustifolium

fireweed

Order: Ranunculales - Family: Ranunculaceae

Actaea rubra
Anemone canadensis
Anemone quinquefolia
Coptis groenlandica
Thalictrum dasycarpum

red baneberry
Canada anemone
wood anemone
goldthread
purple meadow-rue

Order: Rosales - Family: Rosaceae

<i>Agrimonia striata</i>	roadside agrimony
<i>Fragaria vesca</i>	woodland strawberry
<i>Fragaria virginiana</i>	wild strawberry
<i>Geum aleppicum</i>	yellow avens
<i>Geum macrophyllum</i>	large-leaf avens
<i>Rosa acicularis</i>	prickly rose
<i>Rosa blanda</i>	smooth rose
<i>Rubus parviflorus</i>	thimbleberry
<i>Rubus pubescens</i>	dwarf red blackberry
<i>Rubus strigosus</i>	raspberry
<i>Spiraea alba</i>	spirea

Order: Rosales - Family: Saxifragaceae

<i>Mitella nuda</i>	bare-stem bishop's-cap
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Order: Salicales - Family: Salicaceae

<i>Populus balsamifera</i>	balsam poplar
<i>Populus tremuloides</i>	quaking aspen
<i>Salix bebbiana</i>	Bebb willow
<i>Salix discolor</i>	pussy willow
<i>Salix petiolaris</i>	meadow willow

Order: Sapindales - Family: Aceraceae

<i>Acer spicatum</i>	mountain maple
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Order: Scrophulariales - Family: Scrophulariaceae

<i>Euphrasia officinalis</i>	eyebright
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Order: Violales - Family: Violaceae

<i>Viola incognita</i>	white violet
<i>Viola renifolia</i>	northern white violet

Table C-2. Vertebrate Species Confirmed to Occur in Grand Portage National Monument, as of March 2004.
Presence may be seasonal, and rare through abundant.

Fish

Order: Cypriniformes - Family: Catostomidae	Order: Osmeriformes - Family: Osmeridae
<i>Catostomus catostomus</i> longnose sucker	<i>Osmerus mordax</i> smelt
<i>Catostomus commersoni</i> white sucker	
Order: Cypriniformes - Family: Cyprinidae	Order: Perciformes - Family: Percidae
<i>Couesius plumbeus</i> northern lake chub	<i>Etheostoma nigrum</i> johnny darter
<i>Luxilus cornutus</i> common shiner	<i>Perca flavescens</i> yellow perch
<i>Notropis heterolepis</i> blacknose shiner	<i>Percina caprodes</i> logperch
<i>Notropis hudsonius</i> spottail shiner	<i>Stizostedion vitreum</i> walleye
<i>Phoxinus eos</i> northern redbelly dace	Order: Salmoniformes - Family: Salmonidae
<i>Pimephales promelas</i> fathead minnow	<i>Coregonus artedii</i> lake herring
<i>Rhinichthys cataractae</i> longnose dace	<i>Oncorhynchus kisutch</i> coho salmon
<i>Semotilus atromaculatus</i> creek chub	<i>Oncorhynchus mykiss</i> steelhead
Order: Gadiformes - Family: Lotidae	<i>Prosopium cylindraceum</i> menominee
<i>Lota lota</i> burbot	<i>Salvelinus fontinalis</i> coaster brook trout
Order: Gasterosteiformes - Family: Gasterosteidae	Order: Scorpaeniformes - Family: Cottidae
<i>Culaea inconstans</i> brook stickleback	<i>Cottus bairdii</i> mottled sculpin
Order: Osmeriformes - Family: Galaxiidae	<i>Cottus cognatus</i> slimy sculpin
<i>Lepidogalaxias salamandroides</i> central mudminnow	

Amphibian

Order: Anura - Family: Bufonidae	<i>Rana pipiens</i> leopard frog
<i>Bufo americanus</i> American toad	<i>Rana septentrionalis</i> mink frog
Order: Anura - Family: Hylidae	<i>Rana sylvatica</i> wood frog
<i>Hyla versicolor</i> gray treefrog	Order: Caudata - Family: Ambystomatidae
<i>Pseudacris crucifer</i> spring peeper	<i>Ambystoma laterale</i> blue-spotted salamander
<i>Pseudacris triseriata</i> boreal chorus frog	Order: Caudata - Family: Plethodontidae
Order: Anura - Family: Ranidae	<i>Plethodon cinereus</i> red-backed salamander
<i>Rana clamitans</i> green frog	

Reptile

Order: Squamata - Family: Colubridae
<i>Thamnophis sirtalis</i> eastern garter snake

Birds

Order: Anseriformes - Family: Anatidae			
<i>Aix sponsa</i>	wood duck	<i>Calidris melanotos</i>	pectoral sandpiper
<i>Anas crecca</i>	green-winged teal	<i>Gallinago gallinago</i>	common snipe
<i>Anas platyrhynchos</i>	mallard	<i>Scolopax minor</i>	American woodcock
<i>Aythya collaris</i>	ring-necked duck	Order: Columbiformes - Family: Columbidae	
<i>Branta canadensis</i>	Canada goose	<i>Zenaida macroura</i>	mourning dove
<i>Bucephala clangula</i>	common goldeneye	Order: Coraciiformes - Family: Cerylidae	
<i>Cygnus columbianus</i>	tundra swan	<i>Ceryle alcyon</i>	belted kingfisher
<i>Mergus merganser</i>	common merganser	Order: Cuculiformes - Family: Coccozyidae	
<i>Mergus serrator</i>	red-breasted merganser	<i>Coccyzus erythrophthalmus</i>	black-billed cuckoo
Order: Apodiformes - Family: Apodidae		Order: Galliformes - Family: Phasianidae	
<i>Chaetura pelagica</i>	chimney swift	<i>Bonasa umbellus</i>	ruffed grouse
Order: Ciconiiformes - Family: Accipitridae		<i>Dendragapus canadensis</i>	spruce grouse
<i>Accipiter gentilis</i>	northern goshawk	Order: Passeriformes - Family: Bombycillidae	
<i>Accipiter striatus</i>	sharp-shinned Hawk	<i>Bombycilla cedrorum</i>	cedar waxwing
<i>Buteo jamaicensis</i>	red-tailed hawk	Order: Passeriformes - Family: Certhiidae	
<i>Buteo platypterus</i>	broad-winged hawk	<i>Certhia americana</i>	brown creeper
<i>Haliaeetus leucocephalus</i>	bald eagle	<i>Troglodytes aedon</i>	house wren
<i>Pandion haliaetus</i>	osprey	<i>Troglodytes troglodytes</i>	winter wren
Order: Ciconiiformes - Family: Ardeidae		Order: Passeriformes - Family: Corvidae	
<i>Ardea herodias</i>	great blue heron	<i>Corvus brachyrhynchos</i>	American crow
<i>Botaurus lentiginosus</i>	American bittern	<i>Corvus corax</i>	common raven
Order: Ciconiiformes - Family: Ciconiidae		<i>Cyanocitta cristata</i>	blue jay
<i>Cathartes aura</i>	turkey vulture	<i>Perisoreus canadensis</i>	gray jay
Order: Ciconiiformes - Family: Falconidae		Order: Passeriformes - Family: Fringillidae	
<i>Falco columbarius</i>	merlin	<i>Agelaius phoeniceus</i>	red-winged blackbird
Order: Ciconiiformes - Family: Gaviidae		<i>Calcarius lapponicus</i>	Lapland longspur
<i>Gavia immer</i>	common loon	<i>Carduelis pinus</i>	pine siskin
Order: Ciconiiformes - Family: Laridae		<i>Carduelis tristis</i>	American goldfinch
<i>Larus argentatus</i>	herring gull	<i>Carpodacus purpureus</i>	purple finch
<i>Larus delawarensis</i>	ring-billed gull	<i>Coccothraustes vespertinus</i>	evening grosbeak
Order: Ciconiiformes - Family: Phalacrocoracidae		<i>Dendroica caerulescens</i>	black-throated blue warbler
<i>Phalacrocorax auritus</i>	double-crested cormorant	<i>Dendroica castanea</i>	bay-breasted warbler
Order: Ciconiiformes - Family: Scolopacidae		<i>Dendroica coronata</i>	yellow-rumped warbler
<i>Actitis macularia</i>	spotted sandpiper	<i>Dendroica fusca</i>	blackburnian warbler
<i>Calidris alba</i>	sanderling	<i>Dendroica magnolia</i>	magnolia warbler
		<i>Dendroica palmarum</i>	palm warbler

<i>Dendroica pensylvanica</i>	chestnut-sided warbler	Order: Passeriformes - Family: Passeridae	
<i>Dendroica petechia</i>	yellow warbler	<i>Anthus spinoletta</i>	water pipit
<i>Dendroica tigrina</i>	Cape May warbler	Order: Passeriformes - Family: Regulidae	
<i>Dendroica virens</i>	black-throated green warbler	<i>Regulus calendula</i>	ruby-crowned kinglet
<i>Geothlypis trichas</i>	common yellowthroat	<i>Regulus satrapa</i>	golden-crowned kinglet
<i>Junco hyemalis</i>	dark-eyed junco	Order: Passeriformes - Family: Sittidae	
<i>Melospiza georgiana</i>	swamp sparrow	<i>Sitta canadensis</i>	red-breasted nuthatch
<i>Melospiza lincolni</i>	Lincoln's sparrow	Order: Passeriformes - Family: Sturnidae	
<i>Melospiza melodia</i>	song sparrow	<i>Sturnus vulgaris</i>	European starling
<i>Mniotilta varia</i>	black-and-white warbler	Order: Passeriformes - Family: Tyrannidae	
<i>Oporornis philadelphia</i>	mourning warbler	<i>Contopus virens</i>	eastern wood-pewee
<i>Parula americana</i>	northern parula	<i>Empidonax alnorum</i>	alder flycatcher
<i>Passerculus sandwichensis</i>	savannah sparrow	<i>Empidonax flaviventris</i>	yellow-bellied flycatcher
<i>Passerella iliaca</i>	fox sparrow	<i>Empidonax minimus</i>	least flycatcher
<i>Pheucticus ludovicianus</i>	rose-breasted grosbeak	<i>Myiarchus crinitus</i>	great crested flycatcher
<i>Piranga olivacea</i>	scarlet tanager	<i>Sayornis phoebe</i>	eastern phoebe
<i>Quiscalus quiscula</i>	common grackle	<i>Tyrannus tyrannus</i>	eastern kingbird
<i>Seiurus aurocapillus</i>	ovenbird	Order: Passeriformes - Family: Vireonidae	
<i>Seiurus noveboracensis</i>	northern waterthrush	<i>Vireo olivaceus</i>	red-eyed vireo
<i>Setophaga ruticilla</i>	American redstart	<i>Vireo philadelphicus</i>	Philadelphia vireo
<i>Spizella passerina</i>	chipping sparrow	<i>Vireo solitarius</i>	solitary vireo
<i>Vermivora peregrina</i>	Tennessee warbler	Order: Piciformes - Family: Picidae	
<i>Vermivora ruficapilla</i>	Nashville warbler	<i>Colaptes auratus</i>	northern flicker
<i>Wilsonia canadensis</i>	Canada warbler	<i>Dryocopus pileatus</i>	pileated woodpecker
<i>Zonotrichia albicollis</i>	white-throated sparrow	<i>Picoides pubescens</i>	downy woodpecker
<i>Zonotrichia leucophrys</i>	white-crowned sparrow	<i>Picoides villosus</i>	hairy woodpecker
Order: Passeriformes - Family: Hirundinidae		<i>Sphyrapicus varius</i>	yellow-bellied sapsucker
<i>Hirundo rustica</i>	barn swallow	Order: Strigiformes - Family: Strigidae	
Order: Passeriformes - Family: Muscicapidae		<i>Bubo virginianus</i>	great horned owl
<i>Catharus fuscescens</i>	veery	<i>Strix varia</i>	barred owl
<i>Catharus guttatus</i>	hermit thrush	Order: Trochiliformes - Family: Trochilidae	
<i>Catharus ustulatus</i>	Swainson's thrush	<i>Archilochus colubris</i>	ruby-throated hummingbird
<i>Turdus migratorius</i>	American robin		
Order: Passeriformes - Family: Paridae			
<i>Parus atricapillus</i>	black-capped chickadee		

Mammals

Order: Artiodactyla - Family: Cervidae

Alces alces moose
Odocoileus virginianus white-tailed deer

Order: Carnivora - Family: Canidae

Canis latrans coyote
Canis lupus gray wolf

Order: Carnivora - Family: Felidae

Lynx rufus bobcat

Order: Carnivora - Family: Mephitidae

Mephitis mephitis striped skunk

Order: Carnivora - Family: Mustelidae

Lutra canadensis river otter
Martes americana marten
Martes pennanti fisher
Mustela erminea ermine
Mustela vison mink

Order: Carnivora - Family: Ursidae

Ursus americanus American black bear

Order: Chiroptera - Family: Vespertilionidae

Lasiurus cinereus hoary bat
Myotis lucifugus little brown bat

Order: Insectivora - Family: Soricidae

Blarina brevicauda northern short-tailed shrew
Sorex cinereus masked shrew

Order: Lagomorpha - Family: Leporidae

Lepus americanus snowshoe hare

Order: Rodentia - Family: Castoridae

Castor canadensis beaver

Order: Rodentia - Family: Dipodidae

Zapus hudsonius meadow jumping mouse

Order: Rodentia - Family: Erethizontidae

Erethizon dorsatum porcupine

Order: Rodentia - Family: Muridae

Clethrionomys gapperi southern red-backed vole
Peromyscus maniculatus deer mouse

Order: Rodentia - Family: Sciuridae

Glaucomys sabrinus northern flying squirrel
Tamias minimus least chipmunk
Tamias striatus eastern chipmunk
Tamiasciurus hudsonicus red squirrel

Table C-3: Wildlife Species Known or Suspected to Occur within Grand Portage National Monument that are Listed as Threatened (Thr) or of Special Concern (SC) under the Environmental Species Act, or by the State of Minnesota.

Scientific Name	Common Name	Federal Status	State Status	Monument FMU*
<i>Canis lupus</i>	Gray wolf	Thr	SC	GF WUI (?)
<i>Haliaeetus leucocephala</i>	Bald eagle	Thr	SC	WUI GF (?)
<i>Felis concolor</i>	Mountain lion	–	SC	GF (?)
<i>Lynx canadensis</i>	Canada lynx	Thr	–	GF (?)
<i>Mustela nivalis</i>	Least weasel	–	SC	WUI (?) GF (?)
<i>Adoxa moschatellina</i>	Moschatel	–	SC	WUI (?)
<i>Allium schoenoprasum var sibiricum</i>	Wild chives	–	Thr	WUI
<i>Botrychium simplex</i>	Least moonwort	–	SC	WUI
<i>Botrychium lunaria</i>	Common moonwort	–	Thr	WUI
<i>Crataegus douglasii</i>	Black hawthorn	–	Thr	WUI
<i>Deschampsia flexuosa</i>	Wavy hairgrass	–	SC	WUI
<i>Draba arabisans</i>	Rock whitlow-grass	–	SC	WUI
<i>Juniperus horizontalis</i>	Creeping juniper	–	SC	GF
<i>Osmorhiza depauperata</i>	Blunt-fruited sweet cicely	–	SC	GF
<i>Salix pellita</i>	Satiny willow	–	SC	WUI
<i>Stellaria longipes</i>	Long-stalked chickweed	–	SC	GF
<i>Woodsia glabella</i>	Smooth woodsia	–	Thr	WUI
<i>Woodsia scopulina</i>	Rocky Mountain woodsia	–	Thr	WUI

* GF is the General Forest Fire Management Unit, WUI is the Wildland-Urban Interface Fire management unit,

APPENDIX D: COMPLIANCE DOCUMENTS

1. NEPA compliance

An environmental assessment has been completed for this Fire Management Plan and is considered an attached appendix. See the following Grand Portage National Monument Fire Management Plan Environmental Assessment.

2. NHPA 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 is considered an unattached appendix to this document.

3. ESA compliance

The U.S. Fish and Wildlife Service 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 considered an unattached appendix to this document.

U.S. DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

WILDLAND FIRE MANAGEMENT PLAN
GRAND PORTAGE NATIONAL MONUMENT

APPENDIX E: ANNUALLY REVISED DOCUMENTS

1. Fire call-up list

The Grand Portage National Monument call-up list is updated annually and inserted into the working copies of this plan, which are found in the Chief, Natural Resources Management and Border Waters Fire Management Officer offices. Home phone numbers are not included in public copies of this plan.

2. Preparedness inventory

3. Cooperative agreements

Complete cooperative agreement documents reside in the working copies of this FMP on file with the Border Waters Fire Management Officer and the Grand Portage National Monument Resource Management division.

*a. Grand Portage Indian Reservation and
US Bureau of Indians Affairs, Minnesota Agency*

Mutual Aid for Wildland and Structural Fire Protection Agreement
(currently lapsed, update in progress)

b. Minnesota Incident Command System

MNICS Charter	1994
Implementation Plan	1994
MIFC Financial Plan	FY2004

c. Minnesota Department of Natural Resources Agreement

Memorandum of Understanding, Mutual Aide	2001-2006
Memorandum of Understanding, Prescribed Fire	2001-2006

d. Ontario Ministry of Natural Resources

Border Waters Agreement	2003-2008
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e. Minnesota Pollution Control Agency

Minnesota Smoke Management Plan	2002
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1. NPS and Interagency Contacts

Minnesota Interagency Fire Center (MIFC)

Dispatch (218) 327-4558
FAX (218) 327-4528

www.dnr.state.mn.us/forestry/fire/index.html

Northeast Interagency Fire Cache

MIFC (218) 327-4578
MNICS Coordinator (MIFC)(218) 327-4563

Superior National Forest

Forest Dispatch (MIFC) (218) 327-4175
FAX (218) 327-4528
Fuels Specialist (MIFC) (218) 327-4571
FAX (218) 327-4527
SUF/CPF Fire Mgmt. Officer
(MIFC) (218) 327-4568
Gunflint Ranger District FMO
Grand Marais (218) 387-1750

Minnesota Department of Natural Resources

District Forester
Grand Marais (218) 387-1075
Forest Technician
Hovland (218) 475-2210
Area Forest Supervisor
Duluth (218) 723-4765

Grand Portage Indian Reservation

Trust Lands/Resources (218) 475-2415
Forester ext. 41
Natural Resources Director ext. 35
BIA FMO
Minnesota Agency (218) 751-2011 ext.408
Red Lake Dispatch (218) 679-3381

Ontario Ministry of Natural Resources

Fire Dispatcher
Thunder Bay (807) 475-1415
Fire Management Supervisor
Thunder Bay District (807) 476-2248

National Park Service

Grand Portage National Monument

Ranger Station (218) 475-2202
FAX (218) 475-2280
Headquarters (218) 387-2788
FAX (218) 387-2790

Lead Ranger
Home (218) 475-xxxx
Resource Management Specialist
Home (218) 387-xxxx

Border Waters Fire Group:

VOYA (218) 283-9821
Fire Management Officer
Home (218) 283-xxxx
Cell (218) 260-1492

Administrative Officer
Home (218) 278-xxxx
Cell (218) 360-1493
Assistant FMO, VOYA

Home (218) 219-xxxx
Cell (218) 360-1494

Midwest Regional Fire Program

Fire Ecologist, VOYA
Midwest Field Area FMO
Omaha (402) 221-3475
FAX (402) 342-2283

MWR Fire Ecologist
Omaha (402) 221-3859
FAX (402) 342-2283

NOAA National Weather Service Offices

Fire Weather Program Leader
Minneapolis (612) 361-6672
Fire Weather Program Leader
Duluth (218) 729-6485

Fire Weather Forecasts <http://www.crh.noaa.gov/dlh/firewx.htm>

WIMS website: <http://famweb.nwcg.gov/>

Spot forecasts: Duluth (218) 729-6485 <http://spot.nws.noaa.gov/cgibin/spot/spotmon?site=dlh>

2. PREPAREDNESS INVENTORY

Fire cache location: Maintenance facilities of the park unit

HAND TOOLS

Double bit axe	2
Council tool	4
Brush hook	2
McCloud	4
Pulaski	8
Shovel	8

PERSONAL SAFETY EQUIPMENT

Hard hat	4
Fire shirt	4
Fire pants	4
Fire shelter w/case	3
Gloves	4
Goggles	4
Red packs	2
Yellow packs	2
First aid kit	4
Canteen w/cover	8
Chainsaw chaps	2
Ear plugs	10 pr.
Headlamp	4
Batteries, D-cell	16

PUMPS AND HOSE

Bladder bags	4
Gorman Rupp pump	2
Pump kit	2
Gas can, 5 gal	2
Pumper, 200 gal slip-on	1
Hose, 1.5" x100' synthetic	10
Hose 1.0" x100' synthetic	10
Assorted valves and connectors	8
Assorted nozzles	8

POWER EQUIPMENT

Chainsaw/kit	1
Saw sharpening kit	1

MISCELLANEOUS

Sleeping bags	2
MRE (case)	1
Fussee (case)	1

U.S. DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

WILDLAND FIRE MANAGEMENT PLAN
GRAND PORTAGE NATIONAL MONUMENT

APPENDIX F: WILDLAND AND PRESCRIBED FIRE MONITORING PLAN

A Monitoring Plan will be developed for the prescribed fire area in consultation with the Great Lakes Eco-Region fire ecologist. It will be attached here when approved.

APPENDIX G: SAMPLE DELEGATION OF AUTHORITY

Grand Portage National Monument

Grand Portage, Minnesota

Limited Delegation of Authority

As of 1800, May 15, 2004, I have delegated authority to manage the Fort Charlotte fire, number 003, Grand Portage National Monument, to Incident Commander John Doe and his Incident Management Team.

The fire, which originated as a lightning strike on May 12, 2004, is burning in habitat near the Fort Charlotte campground. My considerations for management of this fire are:

1. Provide for firefighter and public safety.
2. I would like the fire managed in such a manner that suppression actions will cause as little environmental and cultural damage as possible.
3. Key features requiring priority protection are: cultural resources, park facilities and streams in the area.
4. Restrictions for suppression actions are no tracked vehicles will be utilized.
5. Minimum tools for use are chainsaws.
6. My agency advisor will be the Border Waters Fire Management Officer.
7. Managing the fire cost-effectively for the values at risk is a significant concern.
8. Provide training opportunities for park personnel is requested to strengthen our organizational capabilities.

Superintendent, Grand Portage National Monument

May 15, 2004

U.S. DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

WILDLAND FIRE MANAGEMENT PLAN
GRAND PORTAGE NATIONAL MONUMENT

APPENDIX H: LONG-TERM PRESCRIBED FIRE AND HAZARD FUEL REDUCTION PLAN

1. Multi-year prescribed fire schedule

A single prescribed fire area is currently defined for Grand Portage National Monument at this time (Figure H-1). Prior to this site becoming part of the Monument, fire was used regularly to maintain this grass-sedge meadow and keep it free of brush and trees. The goal of using prescribed fire at this site is to maintain the grass-sedge vegetation community and discourage the invasion of woody plants.

The long-term prescribed fire plan for the Monument is to use fire annually on this site. In practice, this will most likely not be possible. The period of time that weather and fire conditions are suitable for prescribed fires is very brief in this region, and frequently do not occur throughout an entire spring or fall burn season. As a result, it is possible that a prescribed fire would only be conducted every two to three years. A prescribed fire plan will be prepared for use on an annual basis in order to take advantage of suitable conditions whenever they occur.

A collaborative arrangement with GP-Band forestry will make it possible to perform the prescribed fire in the Monument meadow whenever fire conditions are suitable. The GP-Band uses tribal and interagency fire crews for prescribed fires each spring for maintaining blueberry areas. Using the Monument prescribed fire as a training exercise will benefit both the fire crews and the Monument.

2. Hazard fuel reduction areas and schedule

Removal of brush and tall grasses is standard practice around reconstructed buildings in the WUI-FMU of the Monument and is performed as part of the routine landscape maintenance.

Areas amenable to hazard fuel reduction by mechanical methods or through prescribed fires have not been identified for the GF-FMU. A recent fuel inventory has not been conducted for the Monument, and is not currently scheduled. Future collaboration with the GP-Band may lead to identification of areas where spruce budworm killed trees could be treated to reduce fuel loads.

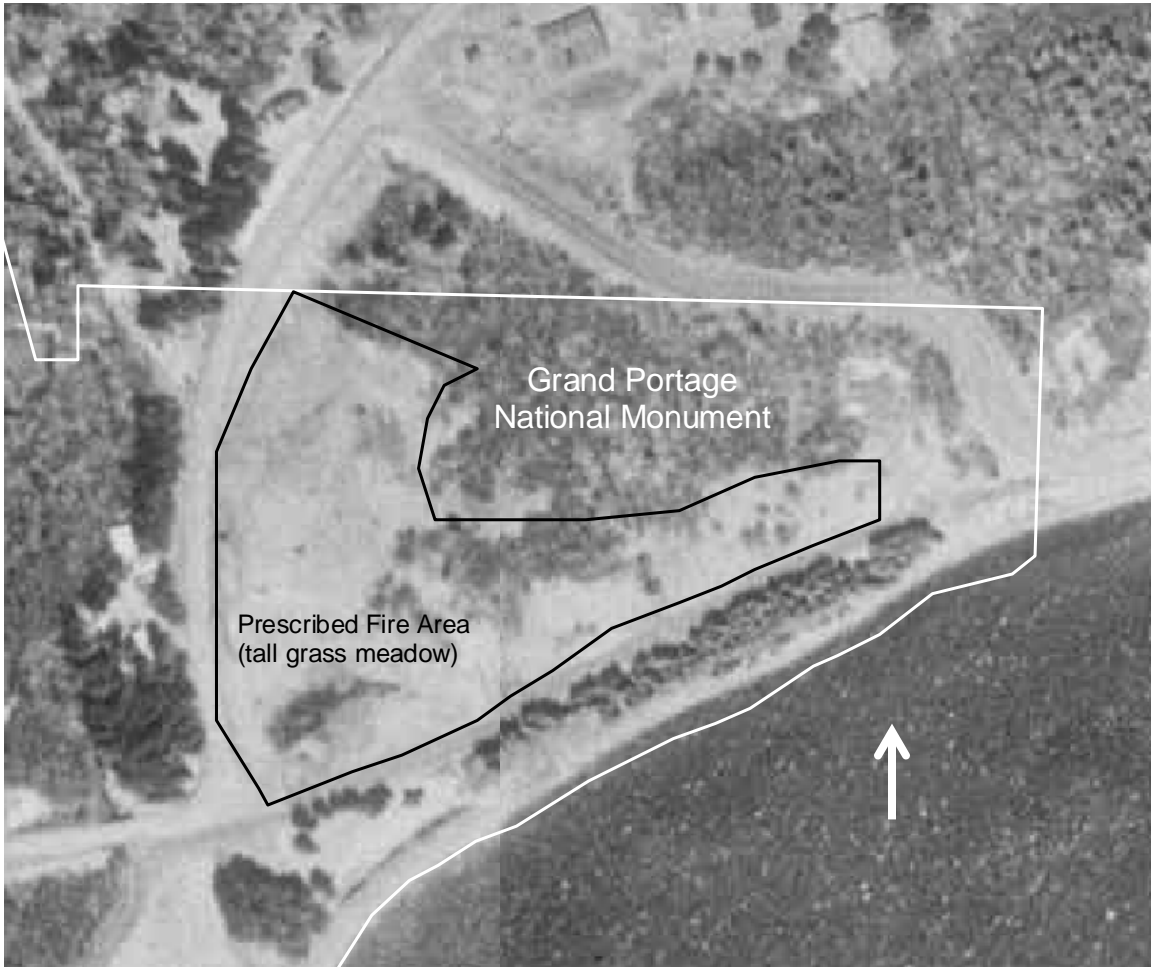


Figure H-1: Prescribed Fire Area on Shore of Lake Superior, Grand Portage National Monument.

APPENDIX I: DRAFT FIRE PREVENTION PLAN

Purpose

This Wildland Fire Prevention Plan describes a process for evaluating the values at risk, the type and severity of hazards, and means to reduce the potential for undesired wildland fire in Grand Portage National Monument (GRPO). It defines specific actions to incorporate wildland fire prevention and education into all areas of Monument management activities through the involvement of all staff.

Strengthening connections with the Grand Portage Band Trust Lands Division and public schools for complementary wildland fire prevention and public education activities is key to the success of this program.

This plan is to be reviewed annually and updated as field conditions or educational opportunities change. Memoranda of Understanding between Grand Portage National Monument and the Grand Portage Reservation Tribal Council specific to wildland fire prevention and this plan will be reviewed annually.

Unit Description

Physical Features

Topography: The Grand Portage Highlands are the most rugged terrain in Minnesota. Glacial action, followed by a series of post-glacial lakes, modified the dike and sill topography by scouring the ridges and partially filling the valleys. The area is characterized by long, steep ridges with frequent vertical faces, interspersed with wet valleys. The base elevation is 602 ft above mean sea level at the shore of Lake Superior. The Grand Portage trail corridor climbs through gaps in several ridges to an elevation of nearly 1400 ft about 6-½ miles from the lake, then gently descends the last 2 miles to Fort Charlotte on the western end of Monument property.

Unit size: Grand Portage National Monument comprises 710 acres, most of which arcs as a 600-ft-wide trail corridor from Lake Superior to the Pigeon River, unevenly bisecting the 41,500 acres of forested lands on the Grand Portage Band Reservation. Within the Village of Grand Portage, the primary interpretive unit of the Monument has four reconstructed buildings, a stockade and visitor services on 78.78 acres on the lake shore. Another 101.15 acres on the banks of the Pigeon River forms the undeveloped Fort Charlotte unit of the park.

Forest Type: Although logging has not occurred within the Monument for more than 50 years, the general plant communities are similar to the surrounding Reservation forests, which are managed for forestry products,

primarily pulpwood. A 1989 survey estimated that aspen-birch-spruce-fir woods covered 70 percent of the forested lands in the Reservation. Other major types include northern hardwood (mostly maples, 6 percent), white cedar (5 percent), and pine, (3 percent). The remaining types include black spruce, tamarack, and swamp hardwood, which, along with stands of maple, are mostly absent from the Monument trail corridor. In 1989, 70 percent of the forests on the Reservation were considered mature or over-mature.

Access: Roads and Trails: Vehicular access to Monument property varies from good to limited. Minnesota Highway 61 crosses the Grand Portage one-half mile from the Village of Grand Portage; and County Road 17 (Mile Creek and Upper Road) passes through the lakeshore unit. These two-lane routes are bituminous, all weather surfaces with regular maintenance. Old Hwy 61 intersects the trail corridor at about its mid-point; the mixed bituminous and aggregate surfaced road is maintained for year-round travel. Several Reservation roads and logging trails are located near Monument boundaries, one of which crosses the Grand Portage trail corridor one-half mile west of Old Hwy 61. These one-lane forest roads provide access for hunting, logging and other uses, and are accessible only by four-wheel drive vehicles or snowmobiles during some seasons.

Access to the interior of the Monument is by means of the Grand Portage. Due to the historic nature of the trail corridor, its listing on the National Register of Historic Places, and the need to protect in-ground archeological resources, use of the trail is restricted to travel on foot, by skis, snowshoes or dog sled. Other means of access for fire fighting purposes requires approval by the superintendent. Several maintenance trails that provide access to the beaver pond area and Fort Charlotte connect with Reservation logging roads, but the final portions of these are limited to foot access. Forested areas of Mount Rose can be reached on foot along the steep, hard-surfaced interpretive trail, or from a local access trail near the southwest corner.

Human Use

Land Use: In 1995, the Grand Portage Reservation Tribal Council established a land use ordinance which, in conjunction with an earlier "Forest Resources Management Plan," specifies what activities and developments are permitted for Reservation lands (see Attachment B, Grand Portage Reservation Zoning). Most of the Reservations 560 residents (2000 Census) live within the village or near MN Hwy 61 along the shore of Lake Superior. These residential areas are designated Wildland-Urban Interface (WUI) Zones for wildland fire management purposes. The lakeshore unit of the Monument is sited within the village and is part of the WUI. Lands surrounding the Grand Portage trail corridor and Fort Charlotte area are used for general forestry purposes; other areas are set aside for preservation of resources, or are managed to enhance

wildlife populations. Although the Grand Portage Lodge/Casino is currently the primary influence in the community, use of forest resources for pulp production remains a consistent contributor to the local economy.

The Grand Portage area is ideally suited for recreation; the most popular forms among the local population are hunting, fishing, boating and ORV use (snowmobiles, ATVs and dog sleds). Tourism attracts people more interested in cross-country skiing, snowmobiling, hiking/snowshoeing, camping, and gaming. Most visitors to Grand Portage concentrate use in areas within the village and along the lakeshore, such as the reconstructed fur post at the Monument, Grand Portage Lodge/Casino, and the Grand Portage State Park. Only about 30 percent of the visitors use the forest for recreation, with the greatest use occurring during late summer and early fall. In addition to interpreting the historic fur trade, the Grand Portage National Monument offers opportunities for hiking, skiing, snowshoeing, dog sledding and primitive camping. Annual visitation at the Monument is around 80,000, mostly occurring as visits within the lakeshore unit lasting one to two hours. About 200 people per year use the primitive campground at Fort Charlotte, with many more using the Grand Portage trail corridor for day use activities.

Definitions

Risks are defined as any heat source or human activity that can result in wildland fire ignition.

Hazards are defined as the fuels and the topography on which a wildland fire will spread.

Values are defined as areas where losses from wildland fire would be unacceptable. Since the determination of values is subjective, they will be formulated through an interdisciplinary process.

FIRE PREVENTION ACTION PLAN

The Grand Portage National Monument Fire Prevention Action Plan consists of general items applied to all areas of the Monument (Table H-1), and site specific actions for areas where high risks or values exist (Table H-2).

Table H-1: General action items for the overall Grand Portage National Monument Fire Prevention Program.

A. Smokers and campfires:

Prevention efforts focus on public information messages directed at persons who engage in these activities within Monument areas. All fire prevention messages should explain the differences between human-caused wildland fires and prescribed fires or wildland fires used for resource purposes, with respect to park ecosystems and threats to park developments.

Actions:

Responsible positions:

- | | |
|---|---|
| 1. A message appears in the Monument annual newspaper, The Grand Portage Guide, regarding human fire causes and fire prevention. | Lead Ranger,
Chief of Interpretation |
| 2. Appropriate fire danger signs installed at trailheads, Fort Charlotte campground, picnic grounds, and other appropriate locations. | Lead Ranger |
| 3. Back-country brochures reviewed and revised if necessary to ensure an adequate fire prevention message is included. | Lead Ranger
Chief of Interpretation |
| 4. A fire prevention message delivered by the staff at the time of issuance of back-country use permits. | Lead Ranger |
| 5. Monument step-up staffing plan for wildland fire requires increased fire prevention patrols during periods of high fire danger on or near Monument lands. | Lead Ranger |
| 6. When Memoranda of Understanding regarding wildland fire with neighboring agencies are revised, cooperative fire prevention efforts will be explored and implemented. | Superintendent |
-

Table H-1: General action items continued.

B. Logging Operations:

Logging operations as a source of wildfires include exhaust from chainsaws, hot carbon particles discharging from vehicles, and by contact of flammable materials with the exhaust system. Escaped slash-burning is also a potential cause of wildland fires.

Actions:

Responsible positions:

- | | |
|--|------------------------------|
| 1. Meet with the Grand Portage Band Trust Lands forester to discuss wildfire prevention as it relates to the contract loggers and all other forest users. | Chief of Resource Management |
| 2. Fire danger signs posted at all back-country Monument boundaries along roadways to get the message to loggers. | Lead Ranger |
| 3. When Memoranda of Understanding regarding wildland fire with neighboring agencies is revised, cooperative fire prevention efforts will be explored and implemented. | Chief Resource Management |
| 4. Monument step-up staffing plan for wildland fire requires increased fire prevention patrols during periods of high fire danger on or near Monument lands. | Lead Ranger |
-

Table H-2: Specific rating and actions items for Monument fire prevention zones.

Zone	Risks	Hazard	Values
1: Fort Charlotte	<p>Medium:</p> <ul style="list-style-type: none"> Campfires at Fort Charlotte campground Hiker smoking materials 	<p>Medium:</p> <ul style="list-style-type: none"> Mixed conifers-hardwoods; 0%-100% slope Back-country primitive campground location Adjacent to Reservation and Canadian lands 	<p>High :</p> <ul style="list-style-type: none"> Archeological resources would be significantly threatened by fire. Political Value
	<p>Actions</p> <ul style="list-style-type: none"> Fire prevention message delivered by staff at time of issuance of back-country permit. Trailhead poster will contain fire prevention message. Education and enforcement through normal back-country patrols. Seasonal training will emphasize need for fire prevention education and enforcement. 		<p>Position responsible</p> <ul style="list-style-type: none"> Lead Ranger, back-country seasonal staff Lead Ranger Lead Ranger, back-country seasonal staff Lead Ranger Chief of Interpretation
2: Grand Portage trail corridor	<p>Medium:</p> <ul style="list-style-type: none"> Illegal campfires Hiker smoking materials Illegal uses, such as vehicles 	<p>High:</p> <ul style="list-style-type: none"> Conifers, 0-100 % slope Dry marsh grasses at beaver pond <p>Medium:</p> <ul style="list-style-type: none"> Mixed conifer-hardwoods, 0-100% slope Adjoining reservation lands <p>Low:</p> <ul style="list-style-type: none"> Hardwoods (leaf off), 0-100% slope 	<p>High:</p> <ul style="list-style-type: none"> Archeological resources Plant species of concern <p>Medium:</p> <ul style="list-style-type: none"> Political value <p>Low:</p> <ul style="list-style-type: none"> Aesthetic beauty of trail Water resources
	<p>Actions</p> <ul style="list-style-type: none"> Same as Zone 1, Coordination with GP-Band forestry and fire departments for back-country fire prevention. Annual fire prevention program at the Grand Portage Elementary School during Fire Prevention Week. 		<p>Position responsible</p> <ul style="list-style-type: none"> As above Chief Resource Management, Lead ranger Lead Ranger Chief of Interpretation

Table H-2: Specific rating and actions continued.

Zone	Risks	Hazard	Values
3: Adjacent Reservation lands recently or currently logged.			
	Medium: Fire associated with logging operations	High: Logging, increase in surface fuels	High: Archeological resources Plant species of concern Low: Aesthetic value of trail
Actions		Position responsible	
Coordination with GP-Band forestry in fuel reduction in logging areas.		Chief, Resource Management	
Additional patrols along park boundaries near logged areas when fire danger is very high or extreme.		Lead Ranger	
4: Road rights-of-way crossing or adjacent to Monument			
	Medium: Disposal of smoking materials Other risks from human activities	Medium: Mixed conifer-hardwoods, 0-100% slope Hardwoods, 0-100% slope	High: Village of Grand Portage Archeological resources Stockade and buildings Maintenance facilities Ranger facilities Low: Aesthetic beauty of Grand Portage
Actions		Position responsible	
Fire prevention messages on all bulletin boards, trailheads, registration boxes, etc.		Lead Ranger, back-country ranger staff	
Fire prevention messages on park boundaries along roadways		Lead Ranger	
5: Lakeshore unit of the Monument			
	Medium: Disposal of smoking materials Other risks from human activities	High: Conifers, 0-100 % slope Medium: Mixed conifer-hardwood, 0-100 % slope	High: Archeological resources Great Hall Kitchen Canoe warehouse Maintenance facilities Ranger facilities
Actions		Position responsible	
Fire prevention messages on all bulletin boards, trailheads, registration boxes, etc.		Lead Ranger, back-country ranger staff	
Fire prevention messages on park boundaries along roadways		Lead Ranger	

Guidelines for Implementing Fire Prevention Plan

Education.

Prevention programs utilize a variety of methods to inform the public of the need for wildland fire prevention. The specific activities are intended to create and maintain public and employee awareness, understanding, and support. It should be stressed in all public education efforts that a person causing a wildland fire could be held civilly liable for the cost of suppressing the wildland fire as well as being charged criminally.

Visitor Services and Facilities: Wildland fire prevention/education information can be integrated into existing visitor service and interpretive presentations, posted on bulletin boards, and used in temporary exhibits. The Department of Interior (National Interagency Fire Center) has tabletop and freestanding displays on the role of fire that can be used upon request to the NIFC External Affairs Office.

Personal Contacts: Park, cooperating association, and concession staffs play an important role in communicating the wildland fire prevention/education message in all personal contacts.

Internal Communications: Park personnel and concessionaires shall be aware of wildland fire prevention/education procedures and communicate these to the public.

Outreach Programs: Wildland fire prevention/education messages should be incorporated into off-site programs presented to schools, civic groups, and other organizations. Fire prevention and education information can also be presented at on-site workshops, seminars, and other educational programs.

Engineering.

Wildland fire prevention engineering is the process of reducing risks and hazards by shielding or removing heat sources, or by removing fuels. Prevention engineering includes activities such as moving fuel away from roadways, removing vegetation from around a structure, creating firebreaks around campgrounds, and using spark arresters on internal combustion engines and fireplaces. Prescribed fire can be used to reduce fuels, thereby minimizing the threat of ignition or fire spread.

Enforcement.

Visitor Use Regulation: Wildland fire prevention enforcement should be practiced at the minimum level necessary (as defined in RM-9, Law Enforcement Guideline) to gain compliance with fire laws and regulations. The Superintendent's compendium shall include elements to implement the

fire prevention plan. Those sections of Title 36, CFR, which concern fire prevention shall be emphasized.

The inadvertent or intentional ignition of wildland fuels by humans is a crime. All wildland fires will be investigated at the earliest possible time. The investigation may range from a documented determination of cause by the initial attack fire crew to criminal investigation by a qualified arson investigator. The primary job in investigation will be to obtain all the information and evidence possible to identify the responsible party. The initial actions by the fire crew on the fire will affect the investigation's chance for success. Every initial attack firefighter needs to receive some minimal training in finding and protecting the point of origin of any fire. They must also understand how to protect the point of origin and any possible evidence. Much of this is covered in the Wildland Fire Cause Determination Handbook of the National Wildfire Coordinating Group.

All violators will be held liable for civil costs and for appropriate criminal action when laws or regulations have been violated.

Public Use Restrictions: The superintendent has the authority to impose public use and access restrictions in times of high fire danger (36 CFR 1.5) These public use restrictions could include:

- Restricted fire use, i.e., no fires outside developed sites, no fires in backcountry, etc.
- Restriction of public use activities, i.e., off-road vehicles, backcountry access, etc.
- Restriction of park operations or contract activities, i.e., construction blasting, chain saw use, etc.
- Total or partial closure of unit.