National Park Service
U.S. Department of the Interior

Pictured Rocks National Lakeshore • Michigan

WILDLAND FIRE MANAGEMENT PLAN

Pictured Rocks National Lakeshore
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EXECUTIVE SUMMARY

Fire management policies of the National Park Service (NPS) support the Pictured Rocks National Lakeshore resource management goals. An overriding goal is restoration or maintenance of the historic scene and the associated cultural resources, while providing for firefighter and public safety, protection of natural, and cultural resources, and human developments from wildfire.

This fire management plan contains the following program direction:

> **To guide the decision-making process where safety, social, political, and resource values are evaluated, and appropriate management response strategies are identified for wildfires.**
>
> **To provide a framework for fuels management strategies through the use of prescribed fire, mechanical, and chemical treatments.**
>
> **To provide a platform to cooperate more fully in planning and implementing a wildland fire program across agency boundaries.**

Program operations included in the plan are preparedness, prevention, suppression, and fuels management. Applicable resource goals and objectives are derived from approved agency resource and general management plans.

The plan is organized to combine the latest scientific knowledge, including regional and local studies, with a hierarchy of policy direction from Department and Agency to The Wildland and Prescribed Fire Management Policy (NIFC 1998), to accomplish resource and fire management goals and objectives. The intent of the plan is primarily operational in nature.

Compliance requirements with National Environmental Policy Act (NEPA) guidelines have been satisfied through development of a companion environmental assessment (EA). These requirements ensure a prudent assessment and balance between a federal action and any potential effects of that action, leading to consensus between fire managers, agency resource specialists, and the public. Any constraints or limitations imposed on the fire management program are also included.

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I. INTRODUCTION

A. Reasons for Developing Fire Management Plan

The National Park Service's Director's Order 18: Wildland Fire Management, (NPS 2003a) requires that all parks with vegetation capable of sustaining fire develop a fire management plan (FMP). There are acres of land within Pictured Rocks National Lakeshore (referred to throughout this document as "the lakeshore"), which are burnable and would benefit from periodic, prescribed fires. Land that can sustain fire consists of mixed conifer and deciduous forests, abandoned agricultural fields, bogs and wetlands. The use of prescribed fire as a resource management tool is expected to play an important role in meeting vegetation management objectives as well as a potential tool for controlling or eradicating invasive exotic species.

B. Collaborative Process in Development of Fire Management Plan

The Pictured Rocks National Lakeshore General Management Plan (NPS 2004a), Resource Management Plan (NPS 2003b), and the fire management plan are all developed with input from neighboring communities and cooperating agencies, as well as other National Park Service program management areas. Cooperating agencies include Michigan Department of Natural Resources, Hiawatha National Forest, U.S. Fish and Wildlife Service District Office, and Seney National Wildlife Refuge.

C. Implementation of Federal Fire Management Policy

This Fire Management Plan will implement fire management policies and help achieve fire management goals defined in: (1) Federal Wildland Fire Management Policy and Program Review (USDI/USDA 1995); (2) Managing Impacts of Wildfires on Communities and the Environment, and Protecting People and Sustaining Resources in Fire Adapted Ecosystems – A Cohesive Strategy, 2000; (3) A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment: 10 Year Comprehensive Strategy Implementation Plan, 2001; and (4) Review and Update of the 1995 Federal Wildland Fire Management Policy, 2001.

D. Compliance

In compliance with the National Environmental Policy Act (NEPA), an environmental assessment (EA) and a Finding Of No Significant Impact (FONSI) have been prepared for this fire management plan. Prescribed fires and fuels treatment projects, other than those identified in the environmental assessment, may have additional compliance work

completed prior to project implementation. This will include biological assessments and cultural/historical site surveys as appropriate.

All proposed prescribed fire plans will be reviewed for compliance with Section 106 of the National Historic Preservation Act.

E. Authorities for Implementation of the Fire Management Plan

The authority for fire management is found in the National Park Service Organic Act (Act of August 25, 1916), which states the Agency's purpose:

> *"... to conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations."*

This authority was further clarified in the National Parks and Recreation Act of 1978:

> "*Congress declares that...these areas, though distinct in character, are united...into one national park system.... The authorization of activities shall be construed and the protection, management, and administration of these areas shall be conducted in light of the high public value and integrity of the National Park System and shall not be exercised in derogation of the values and purposes for which these various areas have been established, except as may have been or shall be directly and specifically provided by Congress."*

Authorities to enter into agreements with other federal bureaus and agencies; with state, county, and municipal governments; and with private communities, corporations, groups, and individuals are cited in Director's Order-20 (Agreements).

The authority for rendering emergency fire or rescue assistance outside of the National Park System is the Act of August 8, 1953 (16USC 1b(1)), and the Department Manual (910 DM).

Related statutory authorities are the Weeks Act, Clean Air Act, Clean Water Act, Endangered Species Act, National Environmental Policy Act, Antiquities Act, Michigan State Law, and others.

II. RELATIONSHIP TO LAND MANAGEMENT PLANNING AND FIRE POLICY

A. NPS Management Policies as Related to Fire Management

It is the policy of the National Park Service to allow natural processes to occur to the extent practical while meeting the park management objectives. NPS Management Policies (NPS 2001) state "Fire is a powerful phenomenon with the potential to drastically alter the vegetative cover of any park. Fire may contribute to or hinder the achievement of park objectives. Park fire management programs will be designed around resource management objectives and the various management zones of the park". Specific guidance on wildland fire is contained in Directors Order, DO-18, (NPS 2003a) and attendant Reference Manual, RM-18, (NPS 2004b) for the National Park Service, and "The Wildland and Prescribed Fire Management Policy: Implementation and Reference Guide" (Zimmerman and Bunnell 1998).

B. Enabling Legislation and Purpose

Pictured Rocks National Lakeshore was authorized by Congress as a unit of the National Park Service in Public Law 89-668, October 15, 1966, which states:

"to preserve for the benefit, inspiration, education, recreational use, and enjoyment of the public a significant portion of the diminishing shoreline of the United States and its related geographic and scientific features" (P.L. 89-668).

The "diminishing shoreline" refers to public access to Great Lakes shores lost to private ownership. Formal establishment of the national lakeshore occurred October 6, 1972.

C. General Management Plan and Fire Management Objectives

The general management plan indicates that the lakeshore will strive to manage natural processes and continue to protect cultural resources in the lakeshore. The general management plan directs the lakeshore to suppress all wildfires as soon as possible and to potentially utilize prescribed fire to achieve resource management goals. Resource management goals are not well defined in the general management plan, but are subsequently presented in the Resource Management Plan.

D. Resource Management Plan/Fire Management Objectives

The fire management plan is tiered to the resource management plan. It integrates fire management objectives with other resource management programs. The goals of the

lakeshore's resource management program as they relate to wildland fire management are as follows:

1. **Natural Resource Management Plan Objectives**

    - Comply with requirements of the National Environmental Protection Act and all other applicable federal, state, or local laws and regulations for all lakeshore actions.

    - Preserve or restore natural ecosystem processes and native species; ensure survival of threatened and endangered species through habitat protection and restoration by such means as prescribed fire.

    - Develop and implement a program of resource inventory and ecological monitoring to track ecosystem changes, help determine causes for change, and develop strategies for attaining desired futures.

    - Conduct, encourage and support natural and social science research and effectively integrate research results into lakeshore management to better protect lakeshore ecosystems.

    - Provide research results and natural resource information to visitors, the general public, and other government agencies for educational purposes.

    - Integrate resource data into a spatially referenced database management system and to aid in the organization, analysis and dissemination of lakeshore data.

    - Support local and regional ecosystem management and sustainable development efforts through research, environmental education, and participation in Great Lakes protection efforts.

2. **Cultural Resource Management Plan Objectives**

    - Manage the lakeshore cultural resources program in full compliance with Service wide policy and directives to ensure appropriate management, preservation, and interpretation of these resources.

    - Provide for the protection and preservation of significant cultural resources through inspection, monitoring, treatment, and law enforcement.

- Permit activities and developments that are compatible with the preservation of significant cultural resources.

- Develop ethnographically sensitive approaches to conserving lakeshore cultural and natural resources.

- Recognize and respect the unique value system, religious practices, and life ways of Native Americans, and predicate preservation actions on culturally informed decisions.

- Enter into and maintain consultation with affiliated Native American tribes to manage and preserve natural and cultural resources within the lakeshore.

E. Fire Management and Meeting Lakeshore Objectives

The FMP provides a detailed action program that is consistent with NPS Management Policy and DO-18 (Wildland Fire Management). Implementation of the FMP will support the general management plan and resource management plan objectives by specifying fire management strategies designed to perpetuate natural ecosystem processes while providing for the protection and safety of people and resources.

III WILDLAND FIRE MANAGEMENT STRATEGIES

A. General Management Considerations

Wildland fire in the lakeshore will be managed to enhance community protection, diminish risk and consequences of severe wildfires, and, to the extent possible, increase health of watersheds. To these ends the lakeshore will employ the following goals:

- Improve prevention and suppression.
- Reduce hazardous fuels.
- Promote community assistance.

A community-based approach to wildland fire issues will involve close collaboration and cooperation with neighboring agencies that have a vested interest in areas of wildland fire issues.

B. Wildland Fire Management Goals

These goals are programmatic in direction and are intended to provide safe and effective implementation of the fire management plan.

Goal 1: Make firefighter and public safety the highest priority of every fire management activity.

Goal 2: Suppress all wildfires regardless of ignition source to protect the public, private property, and natural and cultural resources of the lakeshore.

Goal 3: Manage wildland fires in concert with federal, state, and local air quality regulations.

Goal 4: Facilitate reciprocal fire management activities through the development and maintenance of cooperative agreements and working relationships with pertinent fire management entities.

Goal 5: Reduce wildland fire hazard around developed areas and areas adjacent to cultural and historic sites.

Goal 6: Use prescribed fire as a method of restoring and maintaining the cultural and natural landscape to meet resource objectives of the lakeshore.

C. Wildland Fire Options

The following is a discussion of available wildland fire options and their use at the lakeshore:

1. Wildfire Suppression: All wildfires in the lakeshore will be suppressed using the most appropriate management action. Determination of the most appropriate management action will consider human safety, threat and potential damage to property, resources, and cost effectiveness. Resource objectives will not be a criterion in the choice of appropriate management response.

2. Prescribed Fire: May be used for protection of cultural resources, restoration and maintenance of historic scenes, reduction of hazard fuels and maintenance, hazard fuel reduction, and achievement of natural resource objectives.

3. Wildland Fire Use: This option was rejected due to the size and linear nature of the lakeshore, the degree of wildland urban interface along the boundary, and the lack of available qualified personnel required to manage these fires.

4. Non-Fire Applications: The reduction or removal of fuels by mechanical or chemical methods are options that may be used for objectives such as protection of resources, private property, historic scene restoration and maintenance, invasive species control, or meeting other natural resource objectives.

Prescribed fire and mechanical fuel reduction treatments may be used either sequentially or in conjunction with each other.

D. Description of Wildland Fire Management Strategies by Fire Management Unit

1. Pictured Rocks National Lakeshore Fire Management Unit

There is only one fire management unit in the lakeshore.

The 71,397 acres of the lakeshore are divided approximately equally into two distinct ownership and management zones. The federally owned Shoreline Zone (SZ) was established for traditional National Park Service reasons of preserving natural and cultural resources and providing for recreation. The non-federal Inland Buffer Zone (IBZ) was created "…*to stabilize and protect the existing character and uses of the land, waters, and other properties within such zone for the purpose of preserving the setting of the shoreline and lakes, protecting the watersheds and streams, and providing for the fullest economic utilization of the renewable resources through sustained yield timber management and other resource management compatible with the purposes of the Act*" (Public Law 89-668-Oct. 15, 1966). Congress intended that the buffer zone serve to preserve the setting of the Lake Superior shoreline and inland lakes and protect the watersheds

and streams. Sustained yield timber harvesting and other resource management activities compatible with preservation and recreational use are permitted in the IBZ. Consumptive resource use, however, is intended to be subordinate to public recreation and the protection of "the usefulness and attractiveness of the lakeshore" as stated in Public Law 89-668-Oct. 15, 1966. The IBZ is comprised of federal lands, national and state forestland, private commercial forest, and small private parcels. An area and the lakeshore map are shown below:

Figure 1, Area Map

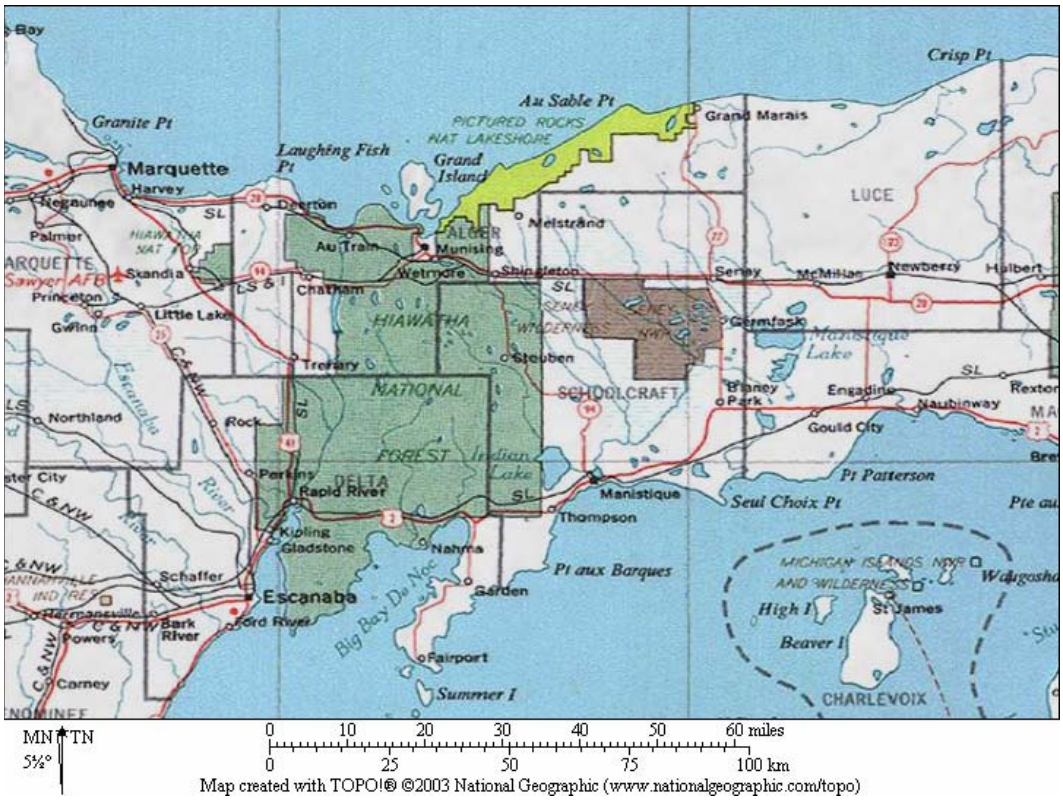
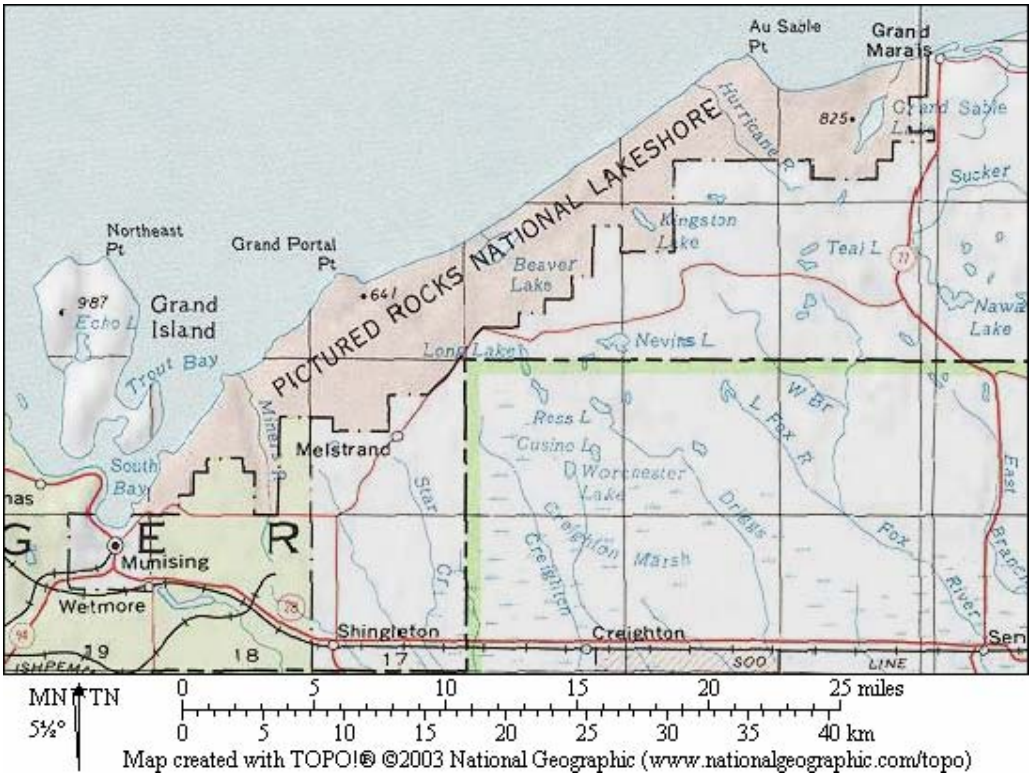


Figure 2, Lakeshore Map



a. Physical and Biotic Characteristics:

1.) Topography: The topography of the lakeshore is generally low rolling hills with the elevation of the lakeshore offices being 635 feet.

2.) Geology/Geomorphology: Geological history recorded in the sedimentary rocks and surficial deposits of the lakeshore is limited to two widely separated intervals of geologic time, the Late Precambrian, Cambrian, and Early Ordovician Periods (500-800 million years before present) and the Late Quaternary Period (2 million years before present to the present). During the Cambrian and Early Ordovician periods, sediments were deposited in the shallow seas and near-shore deltas that covered what is now northern Michigan. These deposits became the sandstone units that are exposed within the lakeshore. Except for their exposure near Lake Superior, a veneer of Quaternary glacial drift presently covers these units. Melting of glacial ice within the Superior Basin produced huge rivers that deposited millions of tons of pulverized rock rubble in various configurations to the south of the Superior Basin. As ice retreated completely from the Superior Basin, water levels in the

basin receded rapidly northward leaving the Pictured Rocks area "high and dry" about 9500 years ago.*http://www2.nature.nps.gov/geology/parks/piro*

The two dominant soil-forming elements are parent material and drainage conditions. Soil types of the lakeshore can be grouped together as follows: upland loams, plains sands, sandy loams and sands, upland stony loams and sands, lakeshore soils, swamp and wetland soils, and organic soils. A more comprehensive description of the soils can be found in the lakeshore resource management plan (NPS 2003b).

4.) Climate: The lakeshore is located approximately 46 degrees north latitude and 86 degrees west longitude. The coldest months average well below 0 C (32 F) and the warmer months about 22 C (70 F). Lake Superior greatly ameliorates temperature extremes, slowing spring warming and the onset of winter. The average date of the last freezing temperature in spring is June 8, and the average first fall freeze is September 23; however, freezing can occur during any month. The freeze-free period, or growing season, averages 107 days annually. Lake Superior's presence also increases precipitation in the lakeshore. Annual precipitation averages 79 cm (31"); annual snowfall is 320 cm (126"). Snow generally covers the ground from late November through late April or early May.

The area is within the second-most cloudy region of the United States, characterized by an annual mean cloud cover of 70 percent. Much of the cloudiness occurs in autumn and winter and can be attributed to the cool airflow over Lake Superior being warmed along the shore and forming clouds. This condition also often results in rain, fog, and snow. Spring is relatively clear due to the cold-water surface of the lake.

The prevailing wind is from the west, with average velocities ranging from 12 to 15 kilometers per hour (7 to 9 mph). High winds and storm conditions on Lake Superior are not uncommon. The highest recorded one-minute wind speed is 98 kilometers per hour (59 mph). The above climatic information was taken from the lakeshore resource management plan (NPS 2003b).

5.) Species of Concern: Habitat for four federally threatened species is found within the lakeshore boundary - gray wolf (*Canis lupus*), bald eagle (*Haliaeetus leucocephalus*), Pitcher's thistle (*Cirsium pitcheri*), and Canada lynx (*Lynx canadensis*) - and one endangered species, piping plover (*Charadrius melodus*). All species except Canada lynx have been documented in the national lakeshore.

The threatened Northern Blue butterfly (*Lycaeides idas nabokovi*) has been identified near the lakeshore in Alger County. Its larval host plant, dwarf bilberry has been documented within the lakeshore.

There is one plant listed as endangered , 10 plant species listed as threatened, and 11 species listed as species of concern by the State of Michigan present in the lakeshore. Acute-leaved moonwart (*Botrychium acuminatum*) is the one species listed as endangered by the State of Michigan. The 10 plant species listed as threatened by the State of Michigan include 3 moonwarts (*B. campestre*, *B. hesperium*, and *B. mormo*), calypso (*Calypso bulbosa*), Pitcher's thistle, black crowberry (*Empetrum nigrum*), Farwell's watermilfoil (*Myriophyllum farwellii*), Lake Huron tansy (*Tanacetum huronense*), Lake Huron locust (*Trumertropis huroniana*), and dwarf bilberry (*Vaccinium cespitosum*).

State-listed threatened and endangered mammalian, avian and reptilian species present include red-shouldered hawk (Buteo lineatus), gray wolf, piping plover, least shrew (*Dendroica cerula*), merlin (Falco columbarius), common loon (*Gavia immer*), bald eagle, and osprey (*Pandion haliaetus*). The mountain lion (*Felis concolor*) is believed to have been extirpated in Michigan by the turn of the 20th century, but occasional, unconfirmed sightings near the lakeshore and around the eastern Upper Peninsula persist.

The complete list of species of concern for the lakeshore can be found in the accompanying environmental assessment for this wildland fire management plan.

6.) Wildlife: Mammals of interest include American marten (*Martes americana*), moose (*Alces alces*), gray fox (*Urocyon cinereoargenteus*), river otter (*Lontra canadensis*), fisher (*Martes pennanti*), badger (*Taxidea taxus*) and beaver (*Castor canadensis*). Moose, lynx and gray fox are uncommon to the area. Otter, marten, and fisher were virtually extirpated in the area but have made a comeback. Badgers have expanded their range from the western prairies with records in the Upper Peninsula becoming more common. They may eventually occupy old farm fields within the lakeshore. Beaver are common and are important for the major changes their activities bring about to the forest ecosystem.

Other mammals include black bear (*Ursus americanus*), coyote (*Canis latrans*), red fox (*Vulpes vulpes*), bobcat (*Lynx rufus*), white-tailed deer (*Odocoileus virginianus*), mink (*Mustela vison*), muskrat (*Ondatra zibethicus*), skunk (*Mephitis mephitis*), raccoon (*Procyon lotor*), snowshoe hare (*Lepus americanus*), porcupine (*Erethizon dorsatum*) and eastern chipmunk (*Tamias striatus).*

About 171 species of birds have been observed in the lakeshore. Avian species of interest found within the lakeshore include upland species such as ruffed grouse (*Bonasa umbellus*), spruce grouse (*Dendragapus canadensis*), sharp-tailed grouse (*Tympanuchus phasianellus*), and American woodcock (*Scolopax minor*). Wading birds and waterfowl, including sandhill crane (*Grus canadensis*), great blue heron (*Ardea herodias*), and several species of the orders Anseriformes (geese, ducks and mergansers), Podicipediformes (grebes), and Charadriiformes (gulls and shorebirds).

Raptors are found within the lakeshore include northern goshawk (*Accipiter gentilis*), northern harrier (*Circus cyaneus*), sharp-shinned hawk (*Accipiter striatus*), red-tailed hawk (*Buteo jamaicensis*), barred owl (*Strix varia*), and other hawk and owl species.

Other common avian species include turkey vulture (*Cathartes aura*), several species of Orders Piciformes (woodpeckers) and Passeriformes (perching birds), including numerous warblers and other songbirds.

Only 21 reptile and amphibian species are known to exist within the lakeshore. Among the species are: American toad (*Bufo americanus*), spotted salamander (*Ambystoma maculatum*), spring peeper (*Hyla crucifer*), leopard frog (*Rana pipiens*), painted turtle (*Chrysemys picta*), snapping turtle (*Chelydra serpentina*), eastern garter snake (*Thamnophis sirtalis*), and northern water snake (*Nerodia sipedon*).
Additional information regarding species found in the lakeshore can be found at the following website:
http://www.nature.nps.gov/biology/endangeredspecies/T&E Data National Park.xls

7.) Vegetation: The lakeshore contains about 618 known species of plants. Of these, about 11% may be classified as exotic. Pictured Rocks lies within the northern hardwood/hemlock/white pine region of the eastern deciduous forest. This forest type is transitional between the more homogeneously deciduous forests to the south and the coniferous boreal forests to the north. Upland northern hardwoods dominate about 80 percent of the lakeshore. Dominant species are American beech (*Fagus grandifolia*), sugar maple (*Acer saccharum*) red maple (*Acer rubrum*), yellow birch (*Betula allegheniensis*), eastern hemlock (*Tsuga canadensis*), and eastern white pine (*Pinus strobus*).

On coarse outwash and coastal sands (about 10% of the lakeshore), red pine (*Pinus resinosa*), white pine and jack pine (*Pinus banksiana*) are dominant. Successional stands within these soils contain considerable amounts of paper birch (*Betula papyrifera*) and trembling aspen (*Populus tremuloides*).

Scattered small patches of wetter habitat occur on upland benches and in poorly drained topographic lows (about 10 percent of the lakeshore). These contain boreal forest elements such as black spruce (*Picea mariana*), white spruce (*Picea glauca*), northern white cedar (*Thuja occidentalis*), and tamarack (*Larix laricina).*

Bogs within the lakeshore are usually filled-in lakebeds having a sphagnum base and containing ericaceous shrubs, e.g., leatherleaf (*Chamaedaphne calyculata*), bog rosemary (*Andromeda glaucophylla*), bog laurel (*Kalmia polifolia*), and cranberries (*Vaccinium macrocarpon*; *V. oxycoccos*). Several species of orchids are found throughout the bogs.

A suite of unusual vascular plant species occupies the Grand Sable Dunes including federal and state listed species: dune grass, Lake Huron Tansy, ram's head orchid (*Cypripedium arietinum*), Douglas' hawthorn (*Crategus douglasii*), calypso orchid and Pitcher's thistle, and a variety of "moonworts" (*Botrychium* subgenus *Botrychium*) and orchids.

8.) Air Quality: The lakeshore is in a Class II airshed and presently meets all national ambient air quality standards. An assessment during the 1980s, based on lichen flora and elemental analysis, suggested that air quality in the vicinity of the lakeshore is presently quite good from most standpoints (Wetmore 1988). Although large-scale heavy industry is quite distant from the lakeshore, some long range/global atmospheric transport of pollutants to the lakeshore area has been documented. Acid deposition in the central Upper Peninsula is a well-established phenomenon. Long-range transport of toxics/pollutants has apparently influenced other remote park units (e.g., Isle Royale). No baseline information exists on any ambient air quality parameter within the boundaries of the lakeshore. There is an ozone monitoring station at Marquette, Michigan, 75 km (45 miles) to the west.

9.) Cultural Resources: The lakeshore contains many significant cultural resources covering a period of over 3,000 years. If one primary theme exists for the lakeshore, it is that of humans' relationship to, and use of, regional natural resources. Cultural resources at Pictured Rocks are varied. These range from middle to late archaic aboriginal habitation along river corridors and ancient beach ridges, early European fur trade and exploration, through basic resource extraction of farming and orchards, logging and blast furnace production of pig iron,. A variety of maritime history is found in the Lakeshore including U.S. Lifesaving and Lighthouse Service stations, and former U.S. Coast Guard Lifeboat Stations. The current recreational activity and facility development is a trend that began in the 1920's and has continued through today with both corporate and private recreational "camps" in the area.

10.) Adjacent Landownership: The lakeshore is surrounded by privately owned land that is being used for farming and timber. The State of Michigan also owns adjacent lands that are primarily being managed for timber production.

11.) Proposed Wilderness Area/Wilderness Area: The proposed wilderness area is 11,739 acres and located in the Beaver Basin. Congress will have to approve the wilderness proposal before it will become a legislated wilderness area. The area will be managed as a wilderness area until a decision is made by congress. As a part of the fire management unit the wilderness area is subject to the same policies, guidelines, strategies and objectives as described in this fire management plan. The exception being that inside the wilderness boundary there will be additional restrictions that can only be waived by the superintendent. These restrictions include:

- The use of motorized vehicles and/or equipment is prohibited.
- The landing of any aircraft is prohibited.
- MIST tactics will be employed to the maximum extent possible on all fire management actions.

b. Strategic and Measurable Fire Management Objectives

- Ensure that all wildland and prescribed fire operations sustain no injuries to members of the public or firefighters.
- 95% of all wildfires are controlled during initial attack.
- 100% of all prescribed fires are conducted consistent with federal, state, and local smoke management requirements.
- Manage suppression actions so that rehabilitation costs are less than 10% of suppression costs.

c. Management Considerations

These constraints, considerations, or decision criteria will influence all fire management activities within the fire management unit.

- No unacceptable impacts to cultural resources or threatened and endangered species are permitted.

- Ensure socio-political economic impacts, including wildland urban interface (WUI), are considered in developing implementation plans.

- Ensure that the public, organizations, and cooperating agencies are aware of any suppression or prescribed fire operation that may impact them.

d. Historic Role of Fire

The role of fire has been altered significantly over time and was adapted to meet the needs of those most actively using the land at the time of their occupancy.

Prior to the 19th century, surface fires were common at the lakeshore within pine-dominated patches of well-drained soils. The average fire occurrence in these areas was 21.8 years. Furthermore, patterns of fire occurrence for specific areas of the lakeshore possibly suggest that large-scale landscape fire conductivity may also play a role in the fire regime (Loope 1991).

Native Americans utilized fire for hunting many different animals and possibly to increase the occurrence of blueberries and other desired plant species. European settlers observed Native Americans using fire to herd deer onto peninsulas where they could be hunted more easily from canoes.

Ground and crown fires influenced this pine-dominated vegetation prior to European settlement. Europeans, however, held a different view of the balance of fire and vegetation. As Native American populations were displaced, the European settlers did not replicate the periodic, light fires that had characterized Native American use of fire. The settlers concentrated on permanent husbandry of crops and livestock.

Michigan was extensively logged toward the end of the 19th century. The white pine that had once covered Michigan was cut, followed by the harvesting of hardwood forests, and large expanses of slash were left behind. Several catastrophic fires resulted from the indiscriminate burning of slash following logging and land clearing for agriculture.

In the summer of 1871, a drought occurred over much of the Great Lakes region. The Peshtigo wildfire occurred in this year and resulted in one of the most devastating fire in U.S. history in terms of both lives and property lost. Michigan's first comprehensive forest fire law was enacted in 1903 (Act 249).
http://www.michigan.gov/dnr/0,1607,7-153-10367_11851-49815--,00.html

The effects of fires and their exclusion have had a strong influence on the present vegetation of the lakeshore. Two Kuchler types best describe the lakeshore's fire-prone vegetation types (Great Lakes pine forest, conifer bogs). The U.S. Forest Service maintains a web site that described fire effects on both individual species and Kuchler types. This website is titled Fire Effects Information System and can be found at:
http://www.fs.fed.us/database/feis

e. Wildland Fire Management Situation

1.) Historical Weather Analysis:

Tables 1 through 6 provide a look at historical averages in Munising, Michigan. It should be noted that the lakeshore is, for the most part, subject to lake effect weather that will appreciably differ from areas only slightly further inland. The proximity of the lakeshore to Lake Superior makes it subject to lake effect or onshore winds. This effect will often create weather conditions significantly different that conditions found only slightly further to the interior. The lakeshore is rated at a National Fire Danger Rating Service (NFDRS) climate class 3.

Historical Climate Data (Munising, MI)

Table 1, Temperature Summary Normals
Period of Record 1971-2000

Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
Max °F	22.5	25.5	33.8	45.9	60.0	68.0	73.1	71.7	62.8	51.8	38.2	27.3	48.4
Min °F	9.1	10.7	19.2	29.8	39.7	48.2	54.4	54.4	47.9	37.6	27.1	15.7	32.8

Table 2, Temperature Extremes
Period of Record: 1943-2001

Month	High Mean°F	Year	Low Mean°F	Year	1-Day Max°F	Date	1-Day Min°F	Date
JAN	25.9	1944	7.8	1977	50	1944	-27	1948
FEB	30.2	1998	9.4	1963	57	1981	-30	1985
MAR	37.1	1946	17.4	1972	80	1946	-26	1943
APR	45.2	1955	31.3	1950	89	1990	-4	1950
MAY	57.5	1977	42.5	1945	95	1969	17	1954
JUN	65.1	1995	52.9	1982	96	1956	24	1947
JUL	71.0	1983	59.2	1992	101	1988	31	1960
AUG	72.1	1947	57.6	1950	103	1947	31	1950
SEP	61.0	1948	51.2	1974	99	1947	25	1947
OCT	56.6	1947	41.3	1976	84	1947	13	1981
NOV	40.5	2001	27.1	1959	70	1961	-9	1950
DEC	30.2	2001	13.0	1976	60	1962	-21	1976
Annual	47.8	1985	37.1	1996	103	1947	-30	1985
Winter	26.1	1998	12.7	1977	60	1962	-30	1985
Spring	43.2	1991	33.1	1996	95	1969	-26	1943
Summer	67.2	1955	59.4	1972	103	1947	24	1947
Fall	50.5	1963	40.6	1976	99	1947	-9	1950

Table 2, Precipitation Summary Normals

Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
Precip (in)	3.2	2.0	2.4	2.0	2.6	3.0	3.3	3.2	3.9	3.7	3.3	3.4	35.9

Table 3, Precipitation Extremes
Period of Record: 1911-2001

Month	High (in)	Year	Low (in)	Year	1-Day Max (in)	Date
JAN	8.11	1982	0.76	1956	1.40	2000
FEB	5.48	1985	0.41	1912	1.40	1985
MAR	5.08	1979	0.30	1912	2.23	1959
APR	5.47	1914	0.27	1984	2.45	1914
MAY	6.18	1960	0.40	1923	3.51	1970
JUN	9.12	1943	0.49	1970	2.68	1916
JUL	8.44	1911	0.57	1981	3.12	1982
AUG	7.30	1988	0.18	1991	2.50	1988
SEP	7.10	1926	0.59	1967	2.33	1978
OCT	9.23	1968	0.42	1924	2.80	1967
NOV	6.91	1948	0.65	1954	2.14	1988
DEC	8.06	1983	0.68	1994	1.41	1983
Annual	47.84	1968	19.00	1985	3.51	1970
Winter	16.23	1982	4.41	1991	1.41	1983
Spring	12.61	1960	3.09	1925	3.51	1970
Summer	15.24	1949	4.08	1919	3.12	1982
Fall	16.88	1968	6.42	1963	2.80	1967

Table 4, Snowfall Summary
1971-2000 Averages

Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
Snow (In)	45.0	24.1	18.4	5.3	0.7	0.0	0.0	0.0	0.0	2.2	13.0	37.7	146.4

Table 5, Snowfall Extremes
Period of Record: 1911-2001

Month	High (in)	Year	1-Day Max (in)	Date
JAN	89.7	1997	15.0	1978
FEB	55.8	1967	13.5	1966
MAR	44.4	1955	17.0	1983
APR	30.6	1953	11.0	1928
MAY	13.0	1917	10.0	1917
JUN	0.0	-	-	-
JUL	0.0	-	-	-
AUG	0.0	-	-	-
SEP	2.0	1928	2.0	1928
OCT	31.3	1925	9.0	1925
NOV	40.7	1996	12.0	1927
DEC	84.4	1958	14.0	1983
Season (Jul-Jun)	238.7	1996-1997	17.0	1983

http://mcc.sws.uiuc.edu/

2.) Fire Season:

The lakeshore fire season normally starts in May, but is dependent on snow accumulations and temperature. Ignition potential decreases when temperatures increase sufficiently to allow new foliage to grow. The fire season lasts through summer and into fall, or until sufficient precipitation has occurred to adequately penetrate both surface and ground fuels. The fire season usually ends around the last of September.

3.) Fuel Type and Characteristics:

Fuels at the lakeshore can be divided into four broad categories: grass, brush, timber, and slash. The grass fuel types (short and tall) are primarily located in open fields maintained by mowing. The remainder of the lakeshore unit is in forest cover of mixed hardwood.

Table 7 identifies the fuel models by vegetation type. The table also correlates the National Fire Danger Rating System (NFDRS) and Fire Behavior Prediction System (FBPS) fuel models.

Table 6, Fuel Models by Vegetation Types

VEGETATION	NFDRS MODEL	FIRE FUEL
Grass Field	A	1
Abandoned Field	T	5
Hardwood Forest	E (dormant) R(green)	8
Conifer Forest	P	9/10
Slash	K	11

Deeming, J. & Lancaster, J. & Fosberg, M. & Furman, R. & Schroeder, M. 1972. National Fire Danger Rating System

FBPS Fuel Model 1 is used for short annual or perennial grasses of one foot or less. This represents the pastureland in the lakeshore.

FBPS Fuel Model 5 is represented by abandoned agricultural or farming fields that have encroaching woody species returning. Brush or small trees less than 6 feet in height.

FBPS 8 represents the hardwood forest that is characterized predominately by hardwoods that have leafed out. Widely scattered conifers may be present. Little undergrowth is present and it is mainly the litter layer that carries the fire. In the dormant season the NFDRS fuel model is E, while the trees are in full foliage the model changes to R.

FBPS 9 is typical of the conifer and predominately conifer/ hardwood forest stands.

The slash fuel model, FBPS 11 is a slash fuel model that may accumulate from such activities as logging, thinning, maintenance and site clearing. This fuel model will help to identify the expected fire behavior during debris and slash disposal.

4.) Fire Regime Alteration:

Forests of the lakeshore have undergone significant changes due to logging and land clearing for agricultural purposes. Exotic disease, and changes in fire regime have also contributed to change. Cutting of pine began in the mid-1880s and continued into the early 1900s. Several fires in slash subsequently burned over pineland areas. It is assumed that the open "stump prairie" of the Kingston Plains, is a result of these events.

The greatest change in the mixed conifer/deciduous forest has been a decrease in average tree diameter size in the buffer zone. Most of the original forest has been either clear cut or selectively cut. The hardwood forests of today are pole to small timber size (less than 20 inch diameter breast height). In wet areas, the Dutch elm disease has killed many large elm groves, and red maple has become more common. There has been relatively little compositional change in the bottomland cedar type.

Fire has not played a major role in shaping the character of the vegetation of the lakeshore since the advent of aggressive suppression practices in the 1920s (see Figure 3 for Michigan fire history). Fire exclusion combined with the cessation of logging within the shoreline zone of the lakeshore has allowed forest succession to progress toward older and larger stands with woody species encroaching onto abandoned fields. This should lead to the decline of pines and an increase in deciduous tree species. Any changes in stand composition are undocumented at this time.

While jack pine (*Pinus banksiana*) is considered a fire dependent species, a relatively uniform age stand is found near Miner's Castle that appears to be maintaining itself without the presence of fire. The proximity of this stand to the lakeshore (wind, blowdown, etc.) may have provided sufficient disturbance for the stand to develop.

5.) Control Problems:

The lakeshore is located on gentle sloping ground with some low hills. Farms, individual houses, roads, logging operations, and other small developments are relatively common in the IBZ. While these developments provide frequent breaks in the continuity of fuels and provide good access for suppression resources, they also increase the values at risk and the probability of an ignition.

Control problems could range from extreme to low depending on site specifics and burning conditions. Under normal fire season conditions, control problems could be expected to be low to moderate. However, under drought conditions, such as those that occurred at the time of the Peshtigo fires, control problems could be high.

6.) Elements Affecting Management:

The wildland urban interface is an important consideration for the lakeshore even though there are presently few subdivisions of concentrated housing in the immediate vicinity. High visitation and use by school groups and the public to the lakeshore's trails and facilities have the potential to be affected by fire management operations and need to be coordinated whenever possible. The lakeshore is in an EPA Class II airshed, but with the proximity of neighboring residents and vehicle traffic on roads immediately adjacent to the lakeshore boundary, smoke from any fire management operation is a primary concern from the standpoint of safety and health. Protection of the lakeshore's cultural resources is of paramount importance. Suppression actions may pose a greater threat to these cultural resources than the actual effects of a fire.

7.) Fire History:

Lightning, Native Americans and European settlement have each had an effect on the fire history of the lakeshore. In boreal conifer bogs fire frequency is on the order of 100-200 years. Estimates in fire frequency as a result of human activities including logging and fire suppression; the average age of the sites sampled was 72 years (Cogbill 1985). Historically red and white pine stands experienced moderately frequent to infrequent surface fires and infrequent crown fires. Short intervals between crown fires were characteristic of jack pine forests. Fire history studies in the Boundary Waters Canoe Area (BWCA), Minnesota, showed an average presettlement fire interval of 36 years between light surface fires in red and white pine stands. Severe surface fires and crown fires, where portions of stands were killed and new age classes developed, occurred about every 160 years (Heinselman 1981).

In the lakeshore, studies have shown that fire occurrence rates before 1910 ca. were 10 times the present rate of lightning-caused fire. The fire return interval in the upland sand plains has increased from an average of 23 years prior to 1910 to 29.3 years after 1910 (Loope 1998). Since the era of European settlement, there have been no significant wildfires within the lakeshore (Loope 1991).

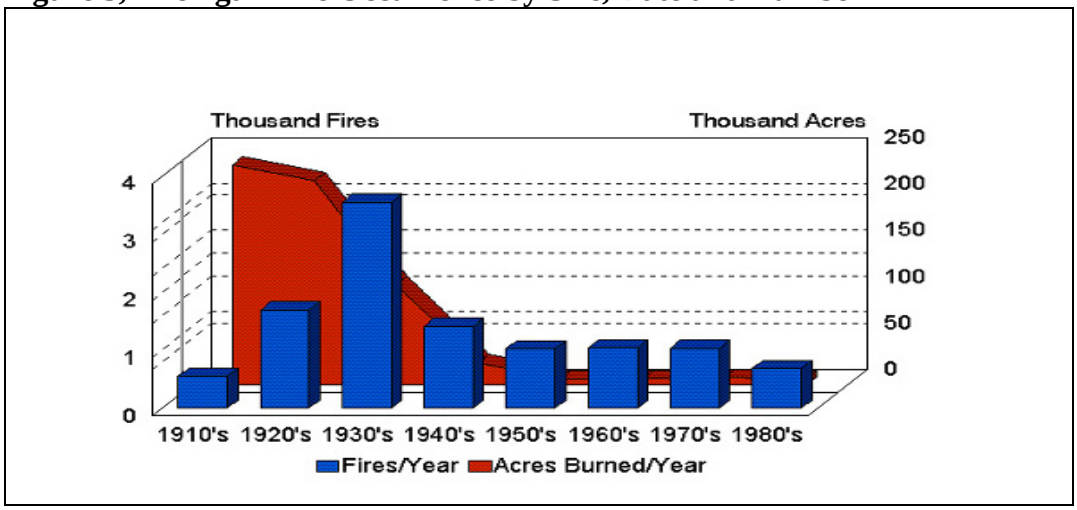
Table 8 lists the reported lakeshore fires between 1975 and 1997. During this 22 year period there was a total of 19 fires totaling 18.6 acres. This averages one fire every 1.5 years that is 1 acre in size.

Figure 3 shows the decrease in the number of fires and acres burned in Michigan since 1910. The primary reason for this decrease is attributed to changing land use and increased suppression efficiency.

Table 7, Fire Occurrence Pictured Rocks National Lakeshore (1975 – 1997)

Year:	# of Fires	Size (acres)
1975	1	1.0
1976	3	10.1
1977	3	.3
1984	1	1.0
1985	1	.1
1986	1	Unknown
1987	1	Unknown
1988	2	5.1
1990	1	.2
1992	2	.2
1993	1	0
1996	1	.1
1997	1	.5

Figure 3, Michigan Fire Occurrence by Size, Date and Number



http://www.michigan.gov/dnr/0,1607,7-153-10367_11851-49815--,00.html

IV WILDLAND FIRE MANAGEMENT PROGRAM COMPONENTS

A. General Implementation Procedures

A wildland fire implementation plan (WFIP) will be initiated for all wildfires. This plan will provide the framework for determining the appropriate management response. The WFIP Stage I: Initial Fire Assessment will be the responsibility of the incident commander or the chief ranger. As the lakeshore's fire management unit only allows for suppression of unplanned ignitions, the requirement for a decision checklist as a part of the Stage I analysis can be considered met. Subsequently, Stage I analysis may be satisfied at the programmatic level in the FMP through determinations made by combinations of values to be protected and/or fire behavior thresholds. A copy of the WFIP Stage I form can be found in Appendix L.

B. Wildland Fire Suppression

1. Range of Potential Fire Behavior:

The fire behavior described below can be expected under average spring and fall fire season conditions. A combination of drought, high wind, low humidity, and high temperatures can greatly increase expected fire behavior.

Fire spread in fire behavior fuel model (FBFM) 1 is governed by the fine, very porous, and continuous herbaceous fuels that have cured or are nearly cured. Surface fires are fires that move rapidly through the cured grass and associated material. Generally, fires are of moderate intensity with average rates of spread of 50 to 80 chains/hour and flame lengths of 3 to 4 feet.

FBFM 5 is characterized by fire that is carried by surface fuels in the understory. These fires are generally not very intense due to the light fuel loadings. Average rates of spread would be from 9 to 11 chains per hour and flame lengths of 2 to 5 feet.

Slow-burning surface fires with low flame lengths are generally the case in FBFM 8 as is evidenced by the one-foot flame lengths and average rate of spread of 1.6 chains/hour.

Fire is supported in the compact litter layer. This fuel model is typical for winter, spring, and summer periods where fuel compaction and moisture content are primary influences. The fuels pose fire hazards under severe weather conditions involving high temperatures, low humidities and high winds.

In FBFM 9, fires run through the surface litter faster than model 8 (7.5 chains/hour) and have longer flame lengths (averaging 2.6 feet). Fall fires in hardwoods are predictable, but high winds will actually cause higher rates of spread than predicted because of spotting from rolling and blowing leaves. Concentrations of dead-down woody material will contribute to possible torching out of trees, spotting, and crowning.

The slash group, represented by FBFM 11, demonstrates fire behavior that could be fairly active. However, depending on the location of the debris burning area, the shading from the overstory, and the aging of the fine fuels may decrease the fire potential. As the fine fuels burn and intensity builds up, and the larger fuels start burning, active flaming will occur with the potential of generating firebrands. Care should be taken in windy and/or dry conditions to look for spotting problems.

The fire behavior information is taken from BEHAVE (Andrews 1986).

Table 9 illustrates the comparative rates of spread and flame lengths for different fuel models under average conditions with fuel moisture content of 8% and a mid-flame windspeed of 5 miles/hour (Andrews 1986).

Table 8, Comparative Rates of Spread and Flame Lengths for Fuel Models

FIRE BEHAVIOR FUEL MODEL	RATE OF SPREAD (Chains/Hour)	FLAME LENGTH (Feet)
1	78	4
5	18	4
8	1.6	1
9	7.5	2.6
11	6	3.5

Andrews, P. 1986. BEHAVE

2. Preparedness Actions

a. Fire Prevention, Community Education and Assistance Programs

The following actions will be taken:

- An active fire prevention program will be conducted in conjunction with other agencies to protect human life and property and prevent damage to cultural resources or physical facilities.

- A program of public education regarding potential fire danger will be implemented when staffing levels IV or V are reached. Visitor contacts, bulletin board materials, handouts, and interpretive programs will be utilized to increase lakeshore visitor and neighbor awareness of fire hazards.

- Lakeshore employees will be informed about fire prevention and the objectives of the fire management program. Further, employees must be kept informed about changes in existing conditions throughout the fire season.

- Lakeshore interpretive staff and resource management staff will relate to the public the beneficial effects of prescribed fires as opposed to unplanned human-caused or natural fires. Information must emphasize the potential severity of human-caused wildfires and how to prevent them.

- During periods of extreme or prolonged fire danger, fire prevention messages will be included in interpretive programs. Emergency restrictions regarding fires or area closures may become necessary. Restrictions and closures will be coordinated and efforts will be made to be consistent with those implemented by neighboring agencies. The chief ranger will make recommendations to the superintendent who may then authorize restrictions and closures.

- When prescribed fires are burning in the lakeshore, signs at the visitor center and bulletin boards will be used to supplement visitor contacts. These signs will be used to administratively direct, inform, guide, and caution visitors about existing fire conditions and prescribed fire activities.

- The lakeshore staff will actively work with the Grand Marais Volunteer Fire Department, Munising Fire Department, Michigan Department of Natural Resources and other agencies with fire management responsibilities. Meetings will be to establish common protocols and procedures, identify training needs, cooperate on prevention, conduct joint training when possible, and develop strategies for safer and more efficient fire management operations.

b. Annual Training Activities:

Departmental policy requires that all departmental personnel engaged in and prescribed fire duties meet the standards set by the National Wildfire Coordinating Group (NWCG, 310-1). The DOI incident qualification system meets or exceeds all NWCG standards. The lakeshore will conform strictly to the requirements of the NPS wildland fire management qualification and certification system.

The chief ranger will be responsible for organizing the training required to meet agency requirements for red-carded firefighters. The chief ranger will assist the Midwest Region Wildland Fire Management Specialist by providing a list of red-carded employees to develop needed fire training. When advanced or specialized training is necessary, the chief ranger will work through the Midwest Region Wildland Fire Management Specialist to obtain funding and enrollment. The Midwest Region fire management staff can assist in the coordination of the lakeshore's fire training needs with those of other nearby parks, cooperating agencies, and the region.

The Midwest Region fire management staff will evaluate training needs for lakeshore personnel with their input. A priority will be placed on qualifying personnel as Type 1 and 2 firefighter, and incident commander type 4 and 5. The Midwest Region fire management staff will be contacted about needed courses and available regional funding for lakeshore participation. Lakeshore supervisors may be contacted about employee interest in participating in fire suppression.

In addition, during general seasonal orientation, all seasonal personnel should receive instruction in:

- Purpose and objectives of the fire management program.
- Planned prescribed fire actions.
- Role of prescribed fire in vegetation management.
- Public, employee, and firefighter safety during suppression and prescribed fire operations.

c. Annual Readiness Activities

The following outline details the calendar year fire management program for the lakeshore. These activities need to be initiated by the parks fire coordinator.

An annual preparedness activity schedule follows:

February-March:

- Meetings with cooperators; final review and revision of interagency agreements.
- Review and coordinate emergency dispatch procedures with the Midwest Region fire management staff and the Upper Peninsula Dispatch Center in Escanaba, Michigan.
- Semi-annual service of any mechanized fire equipment.
- Inventory fire cache and order all necessary fire items to maintain a fully stocked fire cache. Update the inventory list and make sure all equipment is in a fire ready condition.
- Review Step-Up Plan.
- Check established procedure for utilizing suppression and emergency preparedness accounts with the Midwest Region fire management staff.
- Update the fire callout list.
- Meeting or discussion with Midwest Region fire management staff to review plans and current program.
- Meeting of appropriate lakeshore staff to review approved fire management plan revisions and plan prescribed fire activities for the following year.
- Pre-season planning completed; all cooperative agreements revised and in effect.
- Issue Incident Qualification Cards to qualified personnel through the Midwest Regional Office..
- Coordinate fire weather program notification with nearby parks.

- Implement step-up plan and adjust level of readiness in response to changing fire danger levels.

April:

- Permanent and seasonal employees' physical fitness exams.
- Permanent employees' physical fitness scores due.
- Update fire experience and training records for red-carded personnel.
- Submit updated red-carded personnel records and physical fitness scores to the Midwest Region fire management staff.
- Archive training and experience records of seasonal personnel.
- Issue personal protective equipment to seasonal personnel, if necessary.
- Participate in annual seasonal fire training.
- Issue updated fire call-out list to the Midwest Region fire management staff, nearby parks, and cooperators.

May- July:

- Draft FIREPRO budget request and submit to Midwest Region fire management staff
- Equip the lakeshore vehicles with fire tools.
- Post fire danger posters as needed.
- Operate all mechanized fire equipment at least twice a month.

September:

- Meet with finance personnel on status of fire accounts and outstanding fire orders or requisitions.

October:

- Critique fire season. Evaluate individual performance of the lakeshore staff to correct deficiencies and recommend personnel for training as possible.

December-January:

- Review and revise fire management plan as necessary.
- Review interagency agreements, draft revisions as necessary, and submit to the superintendent for approval.
- Inventory fire cache and requisition replacement equipment and supplies to maintain approved levels.
- Submit proposals for annual training to superintendent for review.
- Forward nominations for interagency fire training to the Midwest Region fire management staff.
- Meeting of the lakeshore staff to review season and formulate program changes.
- Forward outstanding fire reports to Midwest Region fire management staff.

d. Fire Weather and Fire Danger

Weather Station: The Blue Lake station is operated by the U.S. Forest Service and is located approximately 18 miles south-southeast of Munising, Michigan, (*Station number 201002; latitude 46:15:00; longitude 86:35:00; elevation 815').* It should be again noted that this station is not as subject to lake effect winds (onshore) and fire danger conditions may be different than those found in the lakeshore. The

burning index (BI) is used to determine the breakpoints for the step-up staffing plan.

e. Step-up Staffing Plan

The BI integrates the effects of weather, fuels, topography, and other factors to estimate potential fire behavior and the corresponding amount of effort required to contain a fire. The staffing classes relate to the expected severity of fire conditions.

As fire danger increases, the lakeshore fire management organization's level of preparedness will increase. Preparedness actions defined by staffing classes are tied to the National Fire Danger Rating System in the step-up staffing plan in Appendix J. Each staffing class is progressive and includes the previous actions.

Each staffing class level has a corresponding set of actions that will be initiated to meet potential fire problems. Staffing class low, moderate, and high level actions are funded with lakeshore funds while actions taken at the very high and extreme levels are supported with emergency funds. The chief ranger will obtain these funds from the Midwest Region fire management staff. The superintendent has the authority to raise or lower the staffing class by one level based on such situations as heavy holiday use, lake effect conditions, predicted weather and other unusual factors that may affect the start of a fire.

Table 9, Pictured Rocks National Lakeshore Fire Danger Rating

Burning Index (BI)	Staffing Class	Adjective Rating
0-3	I	Low
4-8	II	Moderate
9-17	III	High
18-23	IV	Very High
24+	V	Extreme

3. Pre-Attack Plan

No written or formal pre-attack plan exists for the lakeshore. Volunteer fire departments have each developed their own protocols and procedures for initial attack of fires within the lakeshore boundary. These departments can receive funded training and wildland equipment support for rural fire departments through the NPS Rural Fire Assistance (RFA) program if available.

4. Initial Attack

Given limited fire staff at the lakeshore, initial attack will be conducted by Volunteer Fire Departments, and interagency cooperators, except for the smallest wildfires.

a. Priority setting during multiple fire occurrences

The resources listed below are examples or resources that can be used to establish priorities.

- Vegetative cover map; any fire with continuous fuels up to and across the lakeshore boundary or structures.
- Cultural and historic site map.
- Lakeshore facility map.

b. Criteria for appropriate initial attack response consistent with GMP/RMP objectives

The items listed below should be used in determining the appropriate initial attack response.

- Public and firefighter safety.
- Protection of cultural, historic, and natural resources.
- Protection of improvements and private property.
- Minimum fire-line construction.
- Available suppression resources and response times.
- Fire danger as determined by fuels, weather, and topography.
- Use aircraft and mechanized equipment only where necessary to support above-listed criteria.

Charts to assist in determining the appropriate management response are found in Appendix F. These charts consider such factors as fire danger, risk, threats, objectives, and time of season, external influences, and complexity.

c. Confinement as a Strategy

Confinement may be used to minimize resource damage and to provide for firefighter safety. A confinement strategy may be selected for initial attack as long as it is not being used solely to meet resource management objectives. Resource benefits may be a by-product, but the strategy must be based upon the criteria listed above. A confinement strategy may also be selected in the WFSA process when initial attack has failed to contain a wildfire.

d. Response Times

Response time for initial attack ground resources is generally one hour or less depending on proximity, accessibility, and other such variables. Extended attack resources should be able to respond in two to six hours depending on proximity and availability. Aviation resources will have the greatest range of response time. This time can vary from two hours to an indefinite period of time depending on seasonality, regional severity, fire priorities, availability, and proximity.

e. Restrictions and Special Concerns

Protection of specific lakeshore resources may require that constraints be placed on the management of suppression efforts and prescribed fire operations. These constraints include:

- Archaeological resources must be protected. Therefore, dozing, creating firelines, ditching or other earthwork activities will not take place over known sites, will be evaluated on a case-by-case basis and must be monitored at all times.

- The only mechanized equipment allowed unless otherwise authorized by the superintendent, will be chainsaws, portable and mobile pumps, backpack blowers, fire engines, all terrain vehicles (ATVs) and devices used for heat or fire detection.

- No mechanized equipment will be allowed in the wilderness area.

- No retardant will be used without the consent of the superintendent.

- No new roads will be created.

- Dead or live standing trees will not be cut unless firefighter, public safety, or suppression actions are compromised.

- Operation of vehicles off existing roads will not be allowed.

- Human-caused fires will require an investigation and report by law enforcement personnel, preferably trained in wildfire cause investigation.

- In the event of the threat of life or the potential for extensive property damage, the superintendent may amend these constraints.

Use of retardants and foam require lakeshore Superintendent approval on a case-by-case basis. When approved, the following guidelines apply to aerially-applied retardant and different types of foam suppressant use:

Retardant: No retardant drops within 400 feet of open water.

Foam (aerial delivery):

- Foam concentrate will only be injected into the holding tank after the water pick-up operation has been completed.
- Drops from T2 & T3 helicopters – no drops within 200 feet of open water.
- Drops from Scoopers, heavy air tanker or heavy helicopter – no drops within 400 feet of open water.

Foam (ground delivery with motorized pumps):

- No application within 25 feet of open water when using small pumps.
- No application within 50 feet of open water when using Mk III or equivalent pumps.
- All foam concentrate used for injection will be located in impermeable containment basins, i.e. visqueen (plastic sheet) spread over rocks or logs to form a catch basin.

Foam (ground delivery with backpack pumps):

- No application within 10 feet of open water.
- All backpack pumps will be filled a minimum of 10 feet 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.

f. Local Issues

Given the most favorable circumstances the lakeshore maximally has the ability to initial attack very small wildfires. Without additional support for training and the hiring of additional personnel, the lakeshore must heavily depend on local volunteer fire department resources for initial and extended attack. This close alliance requires that the lakeshore work closely with these agencies in planning, training, preparedness, and other fire management issues.

Suppression qualification standards of cooperator fire personnel will be accepted at that entity's standards while under that entity's supervision. Cooperators must meet NWCG standards while under NPS supervision. The closest additional force's dispatch concept will be utilized whenever a wildfire escapes initial attack and threatens to exceed the lakeshore's capability to control. In some cases it may be necessary to follow jurisdictional boundaries rather than closest forces. During initial attack personnel may use their agency standards.

5. Extended Attack and Large Fire Suppression

a. Extended Attack Needs

Extended attack needs will be determined by considering the following:

- Threats to life, property, and lakeshore resources.
- Availability of suppression forces.
- Current and expected fire behavior.

b. Implementation Plan Requirements: Wildland Fire Situation Analysis Development

When a wildfire cannot be controlled during the initial suppression action, the WFIP is considered to have been exceeded. The Wildland Fire Situation Analysis (WFSA) is initiated at this stage. Initiation of the WFSA is also necessary when implementation of a prescribed plan is not successful and must be suppressed. The following parameters and considerations will be used in WFSA preparation at Pictured Rocks National Lakeshore.

The WFSA is a decision process that employs a systematic and reasonable approach to determine the most appropriate management strategy for a particular situation. Reasonable management alternatives are identified,

analyzed, and evaluated, and are consistent with the expected probability of success /consequences of failure. The superintendent shall approve the WFSA and any revisions. Evaluation criteria include firefighter safety, anticipated costs, resource impacts, and social, political, and environmental considerations. The evaluation of alternatives becomes the triggering mechanism for re-evaluation of the WFSA.

Situations that could require selection of a new strategy through the WFSA include but are not limited to:

- Exceeding periodic assessment criteria (i.e. trigger points, air quality);
- Unacceptable risk to firefighter safety, natural or cultural resources, improvements;
- Fire leaving or threatening to leave the lakeshore boundary;
- Fire exceeds prescribed fire plan;
- Increasing demand on local and/or national fire management situation or agency administrator prerogative.

A hardcopy WFSA form can be found in Appendix G. An electronic version can be found at the U. S. Forest Service website at: *http://www.fs.fed.us/fire/wfsa/*.

c. Incident Management Transition

Transition to an incident management team entails a briefing by the superintendent and a limited delegation of authority for the suppression of the fire(s). The briefing should address agency specific concerns, priorities, firefighter and public safety, economic and resource concerns, and other topics or issues of importance.

d. Delegation of Authority

A delegation of authority from the superintendent to the incident commander is located in Appendix H.

6. Exceeding WFIP and New Strategy Selection

A wildland fire implementation plan (WFIP) is a progressively developed assessment and operational management plan that documents the analysis and selection of strategies and describes the appropriate management response. An example can be found in Appendix L.

A WFIP has been exceeded when a fire cannot be suppressed during initial attack suppression actions or when a prescribed fire becomes an escaped fire. Then, a Wildland Fire Situation Analysis (WFSA) must be developed. When completed, the WFSA will develop a new strategy by which the fire should be managed.

7. Minimum Impact Suppression Tactics (MIST)

MIST is not intended to represent a separate or distinct classification of firefighting tactics but rather a mind set - how to suppress a wildfire while minimizing the long-term effects of the suppression action. MIST is the concept of using the minimum tool to safely and effectively accomplish the task. MIST should be considered for application on all fires in all types of land management.

While MIST emphasizes suppressing wildfire with the least impact to the land, actual fire conditions and good judgment will dictate the actions taken. Consider what is necessary to halt fire spread and containment within the fireline or designated perimeter boundary, while safely managing the incident. Use of MIST **will not** compromise firefighter safety or the effectiveness of suppression efforts. Safety zones and escape routes will be a factor in determining fireline location.

- All fire management activities in the lakeshore will rely on tactics that cause a minimum amount of resource damage while maintaining the safety of firefighters, personnel, and the public as the highest priority.

- Superintendent approval is needed for off road use of vehicles, bulldozers, and mechanized equipment.

- Complete minimum impact guidelines are listed in Appendix I.

8. Rehabilitation Guidelines

When a suppression action is taken, rehabilitation may be necessary. On May 20, 2004, the Department of the Interior issued new policies on burned area emergency stabilization and rehabilitation. The specifics of the policy can be found in 620 DM 3 (USDI 2004). The most effective rehabilitation measure is prevention of impacts through careful planning and the use of minimum impact suppression tactics.

9. Records and Reports

The Chief Ranger is responsible for all fire related records and reports.

a. Fires

All fires will be sequentially assigned a fire number by calendar year. The incident commander will fill out a DI-1202 (Individual Fire Report) after the fire is declared out. A designated member of the lakeshore staff will review all DI-1202's for accuracy and completeness before a copy is mailed to the Midwest Region fire management staff. The original will be kept in the lakeshore files.

An Individual Fire Report (DI 1202) will be filed by fire number with each year having a separate folder. A complete lakeshore report will include the following attachments if applicable:

- Any written policies, guidelines, or authority statements signed by the superintendent.
- Copies of equipment purchase or personnel request orders.
- All situation maps.
- Personnel list (including individual fire fighter time reports (OF 288).
- Approved prescribed fire plans.
- Fire behavior analyst report/post burn evaluation.
- Press clippings.
- Accident reports.
- All weather data reports and records.
- Burning permits and air quality clearances for prescribed fires.
- Documentation of all financial charges made against the assigned fire account number.
- Complete minimum impact guidelines are listed in Appendix I.

- Rehabilitation plan.

b. Daily Situation Report

- All wildfires will be closely monitored. The following information will be relayed to the Midwest Region fire management staff by 9:30 a.m. daily for entry into the nationwide fire summary report via the Wildland Fire Management Information (WFMI) System. The chief ranger will be responsible for contacting the Midwest Region fire management staff. Specific applicable information may also need to be provided to Upper Peninsula Dispatch Center in Escanaba, Michigan.
- Fire name and start date (only for the first day).
- Present fire behavior.
- Estimate of acreage burned in last 24 hours.
- Direction of spread.
- Rate of spread.
- Type of fuels on ground.
- Windspeed, temperature and relative humidity on-site readings.
- Number of personnel and equipment committed to the fire.
- Resources threatened and whether or not actions need to be re-evaluated.
- Document all cultural resources encountered, affected visibility, archaeological, or cultural landscape features.
- Estimated control date.
- Judgment of the ability of local forces to control the fire.
- Anytime BI's reach the 90th percentile and the lakeshore moves into staffing class IV and V.

c. Individual Training and Experience

Every employee who has had training or fire experience in the past year will complete an Incident Qualifications Certification System (IQCS) form. Additional training or experience can be entered into the system at any time. If the training or experience qualifies an individual for additional qualifications, a new Incident Qualification card may be issued. The chief ranger will keep the originals and send copies to the Midwest Region fire management staff for entry into IQCS.

C. Wildland Fire Use

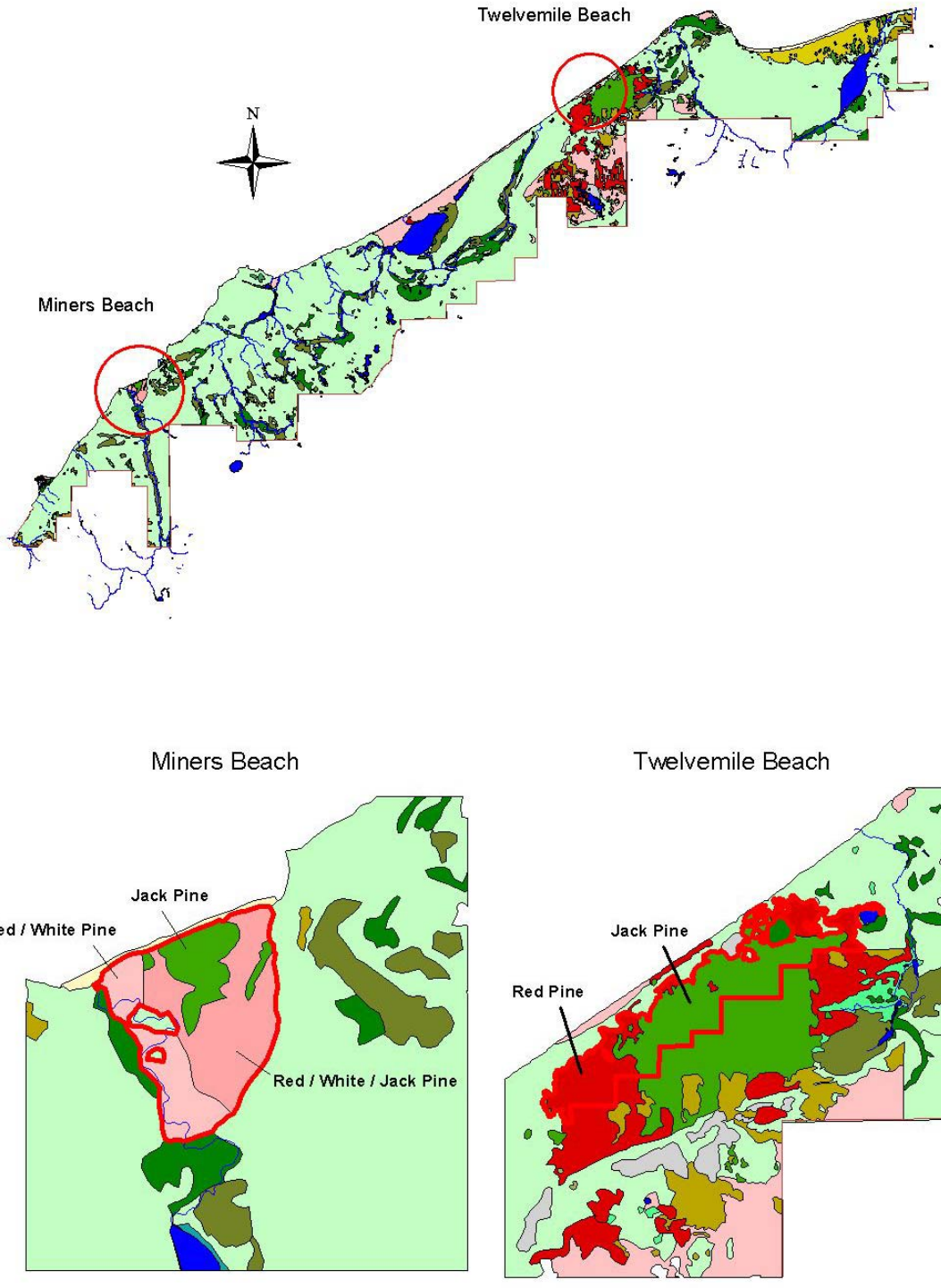
This option was rejected due to the size of the lakeshore, the degree of wildland urban interface along the lakeshore boundary, and the lack of available qualified personnel required to manage these fires.

D. Prescribed Fire

Prescribed fire may be used to reintroduce fire to some of the upland mixed pine communities as an attempt to help restore fire to the ecosystem. Any proposed project will be submitted for approval, funding and will meet all NEPA requirements. The two areas within the lakeshore that prescribed fire may be used are the Miners area in the west region of the lakeshore of about 221 acres, and the Twelvemile Beach area on the eastern half of the lakeshore of about 739 acres. Each contain a fairly well defined area consisting of upland mixed pine, and may benefit from prescribed fire in the future.

These potential locations are identified in Figure 4.

Figure 4, Potential Pine Restoration Prescribed Fire Locations



1. Planning and Documentation

a. Annual Activities for Preparation and Implementation of Program

Currently there are no prescribed fires planned for the lakeshore. As the prescribed fire plan develops, a 5-year plan will be developed, stating the proposed prescribed fires over the following 5 years. This plan will be updated annually, so that it is always looking ahead at least 5 years.

Within the parameters defined in the lakeshore's 5-year plan the chief ranger will annually meet with lakeshore staff to review all prescribed fires planned for that year. An assessment of the approved plans will identify need resources, individual responsibilities, and timelines. These activities include writing prescribed fire plans, scheduling of resources, coordination with neighboring agencies and communities, and obtaining necessary permits.

b. Long-Term Prescribed Fire Strategy

The goal of prescribed fire program at the lakeshore is to protect and preserve the cultural resources of the lakeshore, manage vegetation, and reduce fuel loading. The fuels management program complements the fire management program by reducing fire hazards, decreasing the potential damage to lakeshore resources and adjacent lands, and minimizing risks to employees, residents, and visitors. Prescribed fire objectives will be to:

- Reduce fuel accumulations around developed areas.
- Perpetuate natural plant succession through disturbance.
- Promote the growth of native vegetation, and control woody/invasive/exotic vegetation.
- Assist with the establishment and maintenance of the desired cultural scene.

In the implementation of a prescribed fire program, the strategy will be to start small and slowly build the program. The first units to be burned will be small, easy to implement, and have minimum risk. The program will burn larger and more prominent areas depending on the success of these initial prescribed fires. The park will use the adaptive management model. Monitoring and evaluation will be used to identify prescribed fire units and refine prescribed fire prescriptions.

c. Needed Personnel

The lakeshore does not have sufficient personnel to manage a prescribed fire. Personnel needed for a specific prescribed fire will be identified in the project's prescribed fire plan. The lakeshore will participate with other nearby cooperating agencies in a coordinated approach to mutual prescribed fire programs, in addition to taking advantage of NPS staff.

d. Fire Weather, Effects, and Behavior Monitoring

Monitoring of prescribed fires at the lakeshore is intended to provide information for quantifying and predicting fire behavior and its ecological effects on the lakeshore resources while building a historical record. Monitoring measures the parameters common to all fires: fuels, topography, weather, and fire behavior. In addition, ecological changes such as species composition and vegetation structure may be monitored. This information will be very useful in adjusting the prescribed fire program to better meet short and long-term resource objectives.

Fire weather and fire behavior will be monitored on all prescribed fires regardless of size. During prescribed fires, monitoring will include mapping, weather, site and fuel measurements, and direct observation of fire characteristics such as flame length, rate of spread, and fire intensity. Operational monitoring provides a check to ensure that the fire remains in prescription and serves as a basis for evaluation and comparison of management actions in response to measured, changing fire conditions, and changes such as fuel conditions and species composition.

Fire weather, fire behavior, fire effects on fuels and vegetation will be monitored on a lakeshore wide basis according to protocols in the NPS Fire Monitoring Handbook (NPS 2003c).

The prescribed fire burn boss will ensure that assigned qualified personnel are used to monitor prescribed fires. The most efficient utilization of personnel for fires of low complexity will be to utilize individuals with diverse experience (ignition, holding, and monitoring). An efficient and flexible monitoring program is predicated by selection of the appropriate tactics, assessment of their potential and the ability to characterize and quantify the resulting effects to determine if the fire is within prescription and is meeting identified resource goals and objectives.

Fire monitoring support will use protocols with adaptations described in the NPS Fire Monitoring Handbook and will be coordinated with the area fire ecologist.

e. Prescribed Fire Project Critique

A critique will be made for each prescribed fire. A report detailing the prescribed fire will accompany any recommendations or changes deemed necessary in the program. This report will be submitted to the superintendent. When appropriate, a post-season critique of the fire management program, including the prescribed fire program, will be held each year by lakeshore staff at the conclusion of the fall fire season.

f. Reporting and Documentation Requirements

All prescribed fire forms will be completed as outlined by the burn boss. A fire monitor will be assigned to collect all predetermined information and complete all necessary forms prior to, during, and after the fire. All records will be archived in the lakeshore's fire records for future use and reference.

The chief ranger will prepare a final report on the prescribed fire for the superintendent. Information will include a narrative of the fire operation, a determination of whether objectives were met, description of any resources adversely affected and why, weather and fire behavior data, map of the burn area, photographs of the burn, number of work hours, and final cost of the prescribed fire.

The forms necessary for documenting prescribed fire activities are outlined in RM-18. The Individual Fire Report, (DI-1202), is the responsibility of the chief ranger. The Case Incident Report (10-343), is also the responsibility of the chief ranger, and documents all personnel and equipment costs involved in the burn.

g. Historic Fuel Treatment Map

A historic fuel treatment (prescribed and mechanical) map will be developed and appended to this FMP as fuel treatments occur.

h. Prescribed Fire Plan Requirements

RM 18 differentiates between the requirements for implementing prescribed fire and debris disposal. For further information see RM 18, Chapter 10, sections VI and VII. The requirements for prescribed fires and debris disposal are shown below:

1.) Prescribed Fire:

- Original signed prescribed fire plan.
- Checklist of pre-burn prescribed fire activities.
- All reviewer comments.
- All maps.
- Notification checklist.
- Permits such as burn, smoke, etc.
- Monitoring data.
- Weather forecasts.
- Agency administrator Go/No-Go pre-ignition approval.
- Operational Go/No-Go checklist.
- Incident action plan(s).
- Unit logs, Daily Validation or other unit leader documentation.
- Press releases, public comments, and complaints.
- Smoke dispersal information.
- Post fire analysis.
- Individual Fire Report (DI-1202) must be reported in SACS.

2.) Debris Disposal:

- Has virtually no chance to exceed the perimeter of the non-wildland environment. (i.e. parking lot, boneyard, gravel pit)

- Will not damage surrounding natural or cultural resources.
- Does not present a safety threat to crewmembers.
- Will not require curtailment during the burning operation.
- Will not require a prescribed fire burn boss or fire-qualified personnel to implement.
- Will be reviewed by the Chief Ranger

2. Exceeding Prescribed Fire Plan

If the prescribed fire escapes the prescribed fire (burn) unit and immediate efforts at control are not successful, the prescribed fire will be declared a wildfire and suppressed. A wildland fire situation analysis (WFSA) will be completed and additional personnel and resources ordered as determined by the incident commander. If the fire continues to burn out of control, additional resources will be called from the local and volunteer fire departments. An incident management team or other non-local resources may be requested to assume command of the fire.

3. Air Quality and Smoke Management

a. Air Quality Issues

The objective for smoke management and compliance with the Clean Air Act is to encourage a natural process so long as it does not endanger public health and safety. Smoke levels become unacceptable when they impair visibility to such a degree that they detract from visitor enjoyment of the primary lakeshore resource with emphasis on the vistas of the lakeshore. Dense smoke within the lakeshore is generally unacceptable. However, it may be tolerated for short periods if the winds ensure good mixing. The lakeshore will also evaluate the forecasted impact of smoke on local communities and visitor safety. All of these considerations are difficult to quantify, monitor, and evaluate, and there will exist considerable room for discretion.

Prescribed fire activities will be in compliance with the Clean Air Act. The lakeshore is located in a Class II air quality area and is in an attainment area for all EPA nonattainment pollutants.

The State of Michigan does not place restrictions on prescribed fire activities and no permit is required.

b. Smoke Mitigation:

The lakeshore will notify the Michigan Department of Natural Resources as well as neighboring agencies at the time of any prescribed fire ignition. The chief ranger will contact the National Weather Service (NWS), Marquette, MI to verify the smoke management forecast, and consult with the state during the initial fire assessment. Thereafter, smoke characteristics will be evaluated daily along with the NWS smoke management forecast during prescribed fires.

To minimize the effects of smoke the following guidelines will be considered when planning a prescribed fire:

- A detailed smoke vector map will be included in every prescribed fire plan to identify sensitive areas and expected directional flow of smoke.
- Prescribed fires will be conducted only when: visibility exceeds 5 miles or when the fire weather forecast indicates the presence of an unstable air mass, afternoon mixing heights are 1640 feet or greater and the Ventilation Index is above 130 (130-299 Fair, 300-599 Good, 600+ Excellent).
- Local police may be used to mitigate traffic hazards from smoke.
- Smoke Dispersal: Mixing heights equal to or greater than 500 meters.
- Stumps, snags, and other hot spots will be mopped-up to reduce residual smoke, if needed.
- A fire weather forecast will be obtained from the National Weather Service, Marquette, MI prior to ignition of the prescribed fire.
- Media and other public affairs offices will be kept informed of fire and smoke dispersal conditions throughout the duration of the project.
- The lakeshore will provide traffic control, and efforts with local police will be used to mitigate traffic hazards from smoke.

E. Non-Fire Fuels Treatment Applications

1. Mechanical Treatments and Other Applications

a. Annual Activities

The lakeshore staff will annually consider proposed mechanical and/or chemical fuels treatment projects for the year. An assessment of the approved project plans will identify needed resources, individual responsibilities, and timelines. These activities include writing project plans, scheduling of resources, coordination with neighboring agencies and communities, and obtaining necessary permits.

Currently, only minimal clearing of brush and mowing are used near campsites and around buildings on an as needed basis. These activities will continue and fuel buildup will be assessed to develop annual plans.

b. Equipment and Seasonal Restrictions

The same restrictions apply to mechanical treatments as to prescribed and suppression fires. Off road vehicle or equipment use is prohibited unless the superintendent determines that there is little or no risk to the cultural resources. This determination may be weather dependent. In wilderness areas, only hand tools till be used for mechanical treatments.

c. Required Monitoring

Monitoring of mechanical treatments is essential to ensure that treatment objectives are being met and that no unwanted effects are occurring. The Area Fire Ecologist will recommend the recommended levels of monitoring in the Monitoring Plan (to be developed). At a minimum, Brown's lines to determine dead and downed fuels and photo points should be established.

d. Critique Format

The project supervisor will meet with the chief ranger and/or the supervisory biologist to critique the project. Accomplishment of objectives, methodology, cost effectiveness, safety issues, and resource damage are some of the topics to be discussed. A written project completion report incorporating the findings of the critique will be forwarded to the superintendent and the Midwest region fire management staff.

e. Cost Accounting

Individual project costs will be tracked by the lakeshore and submitted to the Midwest Region fire management staff for review. Expenditures should not exceed the authorized project amount. The lakeshore will consult with the MWR FMO in advance if project cost overruns are anticipated.

f. Reporting and Documentation

The following table lists the reports and other documents required for mechanical treatments.

Table 11 – Checklist of Non-Fire Treatment Documentation

Checklist of Non-Fire Fuel Treatment Documents and Reports		
Document	**Revision of Preparation Frequency**	**Responsible Party**
NIFPORS Project Submission	Annual	Chief Ranger/Fuels Specialist
Signed Project Plan	Each Project	Superintendent
Project Maps	Each Project	Chief Ranger\Project Manager
Notification Checklist	Each Project	Chief Ranger\or representative
Permits	Each Project	Staff
On-Site Effects Reporting	Each Project	Monitor
Unit Logs or Other Documentation	Each Project	Chief Ranger
Contracts	Each Project	Project Staff
Project Critique	Each Project	Project Staff

Time and filing deadlines are associated with each of these reports and will control scheduling and response times.

g. Annual Planned Project List

Any division chief may submit proposed projects, to include project description and budget, to the chief ranger, who will compile a list of these projects and submit them to the superintendent for approval and prioritization.

F. Emergency Rehabilitation and Restoration

On May 20, 2004, the Department of the Interior issued new policy on burned area emergency stabilization and rehabilitation. The specifics of the policy can be found in 620 DM 3. Details on rehabilitation can be found in the Burned Area and Emergency Stabilization and Rehabilitation Handbook (USDI 2002). The chief ranger and the supervisory biologist will jointly formulate a rehabilitation plan for each fire.

The burned area emergency response (BAER) will be submitted to the regional BAER coordinator (regional fire ecologist) for approval within one week of the date the fire is declared controlled. BAER project requests totaling $300,000 or less can be approved by the regional BAER coordinator. Submissions over this amount are reviewed at the regional level and forwarded to the FMPC for approval.

The incident commander and the lakeshore supervisory biologist will initiate rehabilitation. Rehabilitation will be directed toward minimizing or eliminating the effects of the suppression effort and reducing the potential damage and hazards caused by the fire:

These actions may include:

- Backfilling of control lines, scarify, and seed with native species.
- Installation of water bars and construction of drain dips on control lines to prevent erosion.
- Installation of check dams to reduce erosion potential in drainages.
- Flush cutting of stumps and camouflaging with soil and moss.
- The placement of cut vegetative materials in random positions.
- Positioning felled and bucked material so as to be least noticeable to visitors and camouflage where possible.
- Restoration of natural ground contours.
- Removal of all flagging, equipment, and litter.
- Complete restoration of camping areas and improved helispots.
- Consideration and planning for more extensive rehabilitation or revegetation to restore sensitive impacted areas.

The supervisory biologist will jointly formulate rehabilitation plans for each fire. Rehabilitation efforts should be initiated as soon as they can be safely implemented, which may be before the fire is declared controlled.

Rehabilitation work resulting from suppression actions will be charged to the corresponding suppression account. Rehabilitation work needed to rehabilitate the effects of the fire will be described in the BAER plan, and will be submitted to the regional BAER coordinator (regional fire ecologist) for approval within one week of the date the fire is declared controlled. BAER project requests totaling $300,000 or less can be approved by the regional BAER coordinator. Submissions over this amount are reviewed at the regional level and forwarded to the NPS Fire Management Program Center (FMPC) for approval.

V. ORGANIZATIONAL AND BUDGETARY PARAMETERS

A. Organizational Structure of Fire Management Program

Various areas of responsibility for implementation of the fire management program at the lakeshore are identified by specific lakeshore position. There may be instances that the same person functions in two areas of responsibility, e.g., the supervisory biologist and the chief ranger may be the same person. The purpose of this section is to clearly define areas of responsibility, provide clear direction and accountability, and further the development of a responsive wildland fire management program.

1. Superintendent

Wildland fire management at the lakeshore is the responsibility of the superintendent, with technical duties and accompanying responsibilities delegated to staff members. The superintendent will be responsible for management of the program within Departmental and National Park Service policy, Directors Orders #18, Reference Manual # 18, and all relevant laws and regulations.

- Ensures that a comprehensive fire management program is adequately planned, staffed, and implemented and that the fire management plan is reviewed annually and revised as necessary.
- Maintains and facilitates public and media relations pertaining to both suppression and prescribed fire.
- Approves prescribed fire plans.
- Approves of the use of mechanized, ground disturbing equipment, as appropriate.

2. Acting Superintendent

The acting superintendent is delegated all decision making responsibility when the superintendent is absent from the lakeshore.

3. Supervisory Biologist

- Coordinates fire research efforts with the area fire ecologist
- Serves as the primary resource advisor for wildfires and prescribed fires in conjunction with the area fire ecologist.

- Recommends approval of the fire management plan to the superintendent.

- Advises and informs the chief ranger of all fire activity information

- Develops resource objectives for prescribed fire in conjunction with the area fire ecologist.

- Evaluates all plans to ensure natural and cultural resources are not adversely affected or, for cultural resources, cumulative effects do not occur.

- Coordinates fire effects monitoring with the area fire ecologist.

4. Chief Ranger

- Responsible as the Fire Coordinator, for all wildland fire management activities and planning unless otherwise stated in this plan.

- Responsible for the coordination with the incident commander to provide oversight of safe suppression of all wildfires as well as demobilization and rehabilitation of the burned area.

- Ensures adequate inventory of equipment and supplies to efficiently implement the fire management program.

- Ensures that both a briefing statement and delegation of authority are prepared for incoming incident management teams.

- In cooperation with the Midwest Region fire management staff, coordinates dispatch of lakeshore personnel for fire assignments or provides assistance to other parks and agencies. Requisitions fire crews, fire resources, and supplies for use within the lakeshore.

- In cooperation with the Midwest Region fire management staff, prepares, reviews, and revises cooperative agreements with interagency cooperators. Maintains liaison with interagency cooperators through annual meetings to review agreements.

- Maintains technical references, maps, and aerial photos for the fire program.

- Responsible for completion of all fire reports (DI-1202s), and coordinates the timely entry of reports into the WFMI , with the Midwest Region fire management staff within 10 days of a fire.

- Prepares necessary evaluation information for each fire, provides timely update of current and predicted fire behavior, and provides technical advice and recommendations to the committee.

- Coordinates and prepares all press releases and will coordinate all public information activities.

- Briefs the superintendent on current and predicted fire management activity.

- Tracks the burning index.

- Ensures that the delegation of authority is consistent with lakeshore objectives before submitting for signature by the superintendent.

- Provides interested staff training necessary to support the fire program.

- Approves staff opportunity to participate in fire activities.

- Support fire activities by promoting and encouraging the development and issuance of site bulletins and the use of interpretive and educational programs.

5. Chief of Heritage Education (Interpretation)

- Provides cultural and archaeological location and significance information when planning fire management activities.

- Arranges investigation of archaeological sites discovered, uncovered, or inadvertently damaged by fire management activities.

- Develops informational brochures and public displays in coordination with fire management staff for public education and safety.

6. Midwest Region Fire Management Staff

- Ensures the preparation of individual prescribed fire plans in accordance with DO -18 and RM -18, and submits each prescribed fire plan to the superintendent for approval.

- Develops the annual prescribed fire program, including writing prescribed fire plans and conducting approved prescribed fires.

- Reviews lakeshore records concerning fire training and fire experience.

- Responsible for submission of lakeshore fire situation reports to FMPC.

- Provides expertise and advice at the planning and implementation levels as requested.

- Help the lakeshore arrange for needed resources and equipment and will assist in preparing FIREPRO funding requests as requested.

- A representative of the Midwest Region fire management staff will be available to serve as the agency representative regarding activities with an incident management team if requested by the lakeshore.
- Enters both prescribed fire and mechanical fuels reduction projects into NFPORS (National Fire Plan Operating and Report System), and update as needed.

7. Area Fire Ecologist (located at Voyageurs National Park)

Requests for assistance from the area fire ecologist will be coordinated through the fire management officer at Voyageurs National Park (VOYA). Requests should be made as far in advance as is practical.

- Provides fire ecology assistance to the lakeshore.

- Is responsible for monitoring plan, and coordinates fire effects monitoring.
- Will coordinate fire research with Supervisory Biologist
- Will work with resource management staff in developing prescribed fire objectives and other fire management related objectives.

B. FIREPRO Funding

The lakeshore does not have any FIREPRO funded positions. FIREPRO does fund approved fire and hazard fuel projects. FIREPRO funding is also authorized for approved fire training, preparedness, suppression, equipment, personal protective equipment, and burned area emergency stabilization and rehabilitation projects.

FIREPRO funds are managed through the Midwest Region fire management staff. Requests for FIREPRO funding are made from the lakeshore to the Midwest Region fire management staff.

C. Fire Management Organization in Relation to Lakeshore Structure

Although the visitor protection division has overall responsibility for the fire management program, successful implementation requires the cooperative effort of all divisions. The Chief Ranger/Fire Coordinator will make any necessary arrangements to secure the use of other divisions' fire qualified personnel. The appropriate division chief or superintendent must approve this request for assistance. The lakeshore staff will provide resource advisors for assignment to fires within the lakeshore during suppression operations and conduct post-fire research projects as necessary to assess fire effects. Resource advisors may be from cultural resources (archeology, cultural site location, etc.), natural resources (fire effects, suppression techniques, GIS, etc.), and maintenance (equipment availability, utilities, etc.).

D. Wildland Fire Use Certification

The option to use wildland fire use was rejected due to the size of the lakeshore, the degree of wildland-urban interface along the lakeshore boundary, and the lack of available qualified personnel required to manage these fires.

E. Interagency Coordination

Mutual aid agreements have been signed with the Michigan Department of Natural Resources, U.S. Fish and Wildlife Service, Seney National Wildlife Refuge and the U. S. Forest Service, Hiawatha National Forest for the purposes of fire management.

F. Interagency Contacts

Pictured Rocks National Lakeshore is actively involved and committed to cooperative agreements and interagency coordination to ensure that the fire management program is implemented in a timely, safe, cost efficient, and professional manner. A list of interagency contacts is listed in Appendix D.

G. Fire Related Agreements

Copies of agreements with Seney National Wildlife Refuge, Michigan Department of Natural Resources and the Hiawatha National Forest are located in files at lakeshore headquarters.

VI. MONITORING AND EVALUATION

A. Monitoring Program

Monitoring is critical to ensure that fire management objectives are being met, and that unwanted effects are not occurring. Monitoring is a critical link in adaptive management, and its data can assist the lakeshore in attaining its desired conditions for resources.

The lakeshore will implement long and short term monitoring to assess accomplishments and determine the effects of fire management activities on cultural and natural resources.

Monitoring will be conducted for prescribed fire, mechanical treatments and wildfires, as appropriate. For prescribed fires, the establishment of long-term vegetation plots is strongly recommended. Monitoring of mechanical treatments and wildfires will depend on the size of the affected area, and the potential for impacts.

For large wildfires, monitoring can be conducted using remotely sensed burn severity data. It is recommended that burn severity data should be requested for all wildland fires exceeding 500 acres on National Park Service lands as part of the NPS-USGS Burn Severity Mapping Project. A general overview of burn severity mapping is available at the NPS-USGS National Burn Severity Mapping Project website (http://burnseverity.cr.usgs.gov/). Burn severity requests should be coordinated through the area fire ecologist.

The area fire ecologist will work with the lakeshore to establish an adequate fire effects monitoring program to monitor the effects of prescribed fires, wildfires and mechanical fuels treatments. Efforts will be made to coordinate with the lakeshore's forest monitoring program and the Great Lakes Inventory and Monitoring (I&M) program.

B. NPS Fire Monitoring Handbook

The Fire Monitoring Handbook (NPS 2003c) will serve as the source document providing monitoring needs with minor adaptations made for local situations and conditions.

C. Fire Monitoring Plan

A Fire Monitoring Plan will be developed as prescribed fire projects are planned.

VII. FIRE RESEARCH

A. Previous and Ongoing Research

One paper concerning fire occurrence in the lakeshore (Loope 1991) has been written. Loope related fire occurrence as evidenced in both 100-year-old fire scarred stumps and live fire scarred trees to land use. The paper demonstrates that Native peoples, European settlement and contemporary land uses have each resulted in different fire frequencies. There are no fire related research projects ongoing in the lakeshore.

There has been substantial fire research completed for Northern Michigan and the Great Lakes area in the areas of fire effects, occurrence, and vegetation that are relevant and applicable to the lakeshore's fire management program. Loope (1998) addressed human versus lightning ignition of presettlement surface fires in costal pine forests of the upper Great Lakes. The paper determined that anthropogenic fires accounted for a vast majority of ignitions of that period.

B. Needed Research

As the lakeshore's fire management plan is implemented and tested, additional research will inevitably be identified for such purposes as refining prescriptions, improving the understanding of fire behavior and fire effects, refining monitoring protocols, defining desired future vegetation conditions, fire return cycles, describing the impacts on cultural resources, and other information needed for operational fire and resource management. Funding for fire research is available thru FIREPRO and through the Joint Fire Science Program (http://jfsp.nifc.gov). The Supervisory Biologist will coordinate any future fire research with the area fire ecologist.

VIII. PUBLIC SAFETY

A. Public Safety Issues and Concerns

Fire can be hazardous and must be given very high priority during conditions of high fire danger. Employees responsible for any wildland fire management action will never subordinate human lives to other values. Ensuring visitor safety will take priority over fire suppression and monitoring activities. All key fire management personnel are issued the National Wildfire Coordinating Group Fireline Handbook 410-1and Incident Response Pocket Guide. Consistent, accurate monitoring and evaluation of fire behavior in the lakeshore will provide the basis for developing contingency plans, contacts, and briefings that ensure public and personnel safety. The superintendent may close all or a portion of the lakeshore (including roads and trails) when a wildland or prescribed fire pose an imminent threat to public safety. The superintendent may close the lakeshore or areas of the lakeshore due to high fire danger.

B. Mitigation Safety Procedures

The lakeshore will implement and notify visitors of all fire activity through existing communication channels. A fire activity report will be updated as significant changes occur to inform the lakeshore personnel of potential fire threat. Areas of fire activity will be clearly signed at visitor centers and lakeshore bulletin boards. Residents adjacent to the lakeshore will be notified in advance of any prescribed fire and if any fire poses a threat to burn outside the lakeshore's boundaries through law enforcement personnel.

IX. PUBLIC INFORMATION AND EDUCATION

A. Public Information Capabilities and Needs

The lakeshore is committed to keeping the public informed of its fire management program and activities. Educational opportunities will be developed to reach as many segments of the public as possible. This may include special interest groups, schools, public organizations, and other groups. Materials and programs exist that will help deliver information concerning the role fire plays in preserving and protecting the cultural and natural resources of the lakeshore.

The Lakeshore Chief of Heritage Education and staff will be involved in developing and presenting personal and non-personal resources for public education about activities covered in the fire management plan. A Lakeshore Fire Information Liaison will be appointed to lead these duties.

The Midwest Region fire education, prevention, and information specialist is an available resource to the lakeshore for consultation and support.

B. Step-Up Public Information Activities

Information and education are important processes in public acceptance of the managed fire program at the lakeshore. Working with the Chief of Heritage Education, the chief ranger will coordinate all public information activities and will provide the superintendent with accurate information regarding current fire situations and management activities. The public information program will be developed as follows:

- Concepts of the prescribed fire program will be incorporated, as appropriate, in lakeshore publications, brochures, internet resources and handouts.

- During periods when prescribed fires are ignited handouts will be prepared and distributed to all visitors entering areas of fire activity.

- The fire management program will be incorporated into visitor contacts, interpretive talks, walks, and tour programs. Particular attention will be given when fires are conspicuous from roads or visitor use areas.

- News releases will be distributed to the media as appropriate.

- The public information outlets of neighboring, cooperating agencies, and the regional office will be provided with all fire management information.

- The role of the fire management program at the lakeshore will be developed and discussed, as appropriate, in off-site programs and talks.

- The fire management program will be discussed in informal talks with employees of all divisions, concessionaires, contractors, volunteers, residents, and the lakeshore's neighbors.

As outlined in the prevention section, emergency closures or restrictions may become necessary during periods of extreme or extended fire danger. Such closures will necessitate additional coordination and communication with the public and the media.

X. PROTECTION OF SENSITIVE RESOURCES

A. Cultural Resources Needing Protection and/or Treatment

Pictured Rocks National Lakeshore's archeological and historical resources are limited, fragile, nonrenewable, and must be protected; when disturbed, the scientific information they provide is often lost forever. Public concern for cultural resources protection and preservation is contained in numerous pieces of legislation that have been passed since the Antiquities Act in 1906. Great care will be taken during fire suppression and prescribed fire activities not to destroy or disturb important archeological and historical resources. Although a complete ground survey and inventory with detailed maps of sites, features, and environmental data are the best sources of cultural resources information for fire management planning, archeological and historical site surveys in the lakeshore are still incomplete. These ground surveys must be completed by qualified personnel prior to implementation of any prescribed fire activities.

Fire management activities that disturb the ground in any way, such as fireline construction using hand tools or heavy equipment, must involve paraprofessional and professional archeologists working in cooperation with firefighters and pre-burn crews to prevent needless damage to cultural resources. It must be recognized that during a wildland fire, the highest priorities are safety and controlling the blaze; if the fireline cannot be diverted, cultural resources may occasionally have to be sacrificed. In most cases, however, damage can be averted. During fire suppression, prescribed fire, and rehabilitation activities:

- Resource base maps showing archeological, ethnographic and historical site locations will be given to archeologists and fire bosses on the firelines.
- When numerous cultural resources are threatened, archeologists will be present to help mitigate the impacts of fire suppression and rehabilitation on cultural resources.
- Priority will be given to monitoring heavy equipment, especially bulldozers and graders, through all aspects of the suppression and rehabilitation efforts.
- Archeologists serving on a fire as technical specialists do not have to hold a current Incident Qualification Card to perform their specific advisory duties unless they are on the fireline.
- Line archeologists will be equipped with appropriate standard firefighting safety equipment.

- Special flagging will be used to identify archeological and historical sites.

- A photographic record will be kept of all archeological materials uncovered during fire management and rehabilitation activities. . If these materials fall within the Lakeshore's Scope of Collection, they will be added to the Museum Collection.

- The Chief of Heritage Education will coordinate all activities of line archeologists with fire bosses.

Consultation with the state historic preservation office (SHPO) and tribal historic preservation office (THPO) must be considered if any potential exists to cumulatively or adversely affect any cultural resources and all effects must be evaluated on a case-by-case basis.

B. Natural Resources Needing Protection and/or Treatment

Minimum impact suppression tactics are the primary procedures for protecting natural resources in the lakeshore during suppression activities. All eagle nests, gray wolf den locations, and sensitive plant locations which fall within or in close proximity to prescribed fire units will receive mitigation in prescribed fire plans to ensure they are not impacted. The complete list of species of concern for the lakeshore can be found in the accompanying environmental assessment for this wildland fire management plan.

Additional protective measures must be considered as new information emerges from the NPS I&M and Vital Signs programs.

C. Developments, Infrastructure, and Improvements Needing Protection and/or Treatment

Protection of these resources will involve:

- Increased prevention awareness in these areas.

- Priority for initial attack and aggressive suppression actions in these areas.

- Emphasis on hazard fuel reduction (both prescribed fire and mechanical treatment).

In addition to lakeshore improvements and values of concern identified in the resource management plan, there are tracts in private ownership some that are improved with residences. These tracts are of special concern for wildfire suppression and an emphasis for hazard fuel reduction work. Administrative sites, campgrounds and other improvements are to be protected. As funding allows, a defensible space will be

maintained around developments, infrastructure, and other improvements in the lakeshore.

XI. FIRE CRITIQUES AND ANNUAL PLAN REVIEW

All wildland and prescribed fires occurring with the lakeshore will receive, at a minimum, a review by those involved to evaluate such topics as: initial response, control methods used, safety concerns, and the need for new and replacement equipment. In addition to members of the team, the incident commander and/or prescribed fire burn boss, supervisory biologist chief ranger, and other staff members with special knowledge or interest in the particular fire should attend the critique. The purpose of this review is to recognize and document actions that were successful and to identify and rectify actions that were unsafe or ineffective. The critique will document for future reference any recommendations or changes in fire procedures, prescriptions, or needs for additional training to increase program effectiveness and efficiency.

The superintendent or his/her delegate will conduct closeout meetings with incident management teams and fire use teams to ensure a successful transition of the incident back to the lakeshore and to identify and evaluate incomplete fire business. Refer to RM-18, Chapter 13, Exhibit 1 for a sample closeout.

A regional or national level fire review may be conducted if one of the following occurs:

- Fire crosses the lakeshore boundary onto another jurisdiction without the approval of landowner or agency.
- Fire resulted in adverse media attention.
- Fire involved serious injury or death, significant property damage, or has the potential to do so.
- Fire results in controversy involving another agency.

Refer to RM-18, Chapter 13, Exhibits 2&3for further discussion of fire reviews.

All entrapments and fire shelter deployments will be reported and investigated as soon as possible after the deployment incident. Refer to RM-18, Chapter 13, Exhibit 4 & 5.

The lakeshore fire management program will be reviewed on an annual basis by the chief ranger to evaluate current procedures and identify any needed changes to the FMP. Specific information and documentation needed to make this review may include: Individual Fire Reports (DI-1202), WFIPs, WFSAs, fire monitoring forms, prescribed fire plans, and individual fire critiques. The lakeshore superintendent must approve significant changes to the FMP. The only exceptions to this procedure will include: grammatical corrections, minor procedural changes, deletions, corrections, and additions to the appendices. Copies of all changes will be forward to the Midwest Region fire management staff. Changes requiring approval and concurrence will be

submitted with a new cover sheet for signature and dates, which will replace the original cover sheet upon receipt by the superintendent. The fire management plan is subject to formal review every five years.

Prescribed fires or wildfires involving an incident management team or significant political, safety, or public issues should be reviewed by the Midwest region fire management staff. If a fire generates a major political or public concern, and/or involves multiple serious injuries or a fatality, the FMPC should conduct or participate in the review.

XII. CONSULTATION AND COORDINATION

The chief ranger and the supervisory biologist are jointly responsible for coordination and consultation with cooperators regarding fire management activities. Activities include involvement with county fire departments, state forestry and air quality board, nearby federal parks and forests, and the National Weather Service.

The following people were involved in the formulation and preparation of this fire management plan:

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Jim Mattingly, Wildland Fire Management Specialist, NPS, Omaha, Nebraska

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http://www.michigan.gov/dnr/0,1607,7-153-10367_11851-49815--,00.html

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http://mcc.sws.uiuc.edu/

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http://www.fs.fed.us/database/feis

Pictured Rocks National Lakeshore Geology
http://www2.nature.nps.gov/geology/parks/piro

Pictured Rocks National Lakeshore Endangered Species List
http://www.nature.nps.gov/biology/endangeredspecies/T&E Data National Park.xls

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http://endeavor.des.ucdavis.edu/nps/park.asp?park=USAthe park0A

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B. Definitions

A

Air Tanker: A fixed-wing aircraft equipped to drop fire retardants or suppressants.

Agency: Any federal, state, or county government organization participating with jurisdictional responsibilities.

Aramid: The generic name for a high-strength, flame-resistant synthetic fabric used in the shirts and jeans of firefighters. Nomex, a brand name for aramid fabric, is the term commonly used by firefighters.

Archeological Resources: Archeological resources are the physical evidences of past human activity, including evidences of the effects of that activity on the environment. What makes archeological resources significant are their identity, age, location, and context in conjunction with their capacity to reveal information through the investigatory research designs, methods, and techniques used by archeologists.

B

Backfire: A fire set along the inner edge of a fireline to consume the fuel in the path of a wildland fire and/or change the direction of force of the fire's convection column.

Backpack Pump: A portable sprayer with hand-pump, fed from a liquid-filled container fitted with straps, used mainly in fire and pest control. (See also Bladder Bag.)

Behave: A system of interactive computer programs for modeling fuel and fire behavior that consists of two systems: BURN and FUEL.

Bladder Bag: A collapsible backpack portable sprayer made of neoprene or high-strength nylon fabric fitted with a pump. (See also Backpack Pump.)

Brush: A collective term that refers to stands of vegetation dominated by shrubby, woody plants, or low growing trees, usually of a type undesirable for livestock or timber management.

Bulldozer: Any tracked vehicle with a front-mounted blade used for exposing mineral soil.

Burning Conditions: The state of the combined factors of the environment that affect fire behavior in a specified fuel type.

Burning Index: An estimate of the potential difficulty of fire containment as it relates to the flame length at the most rapidly spreading portion of a fire's perimeter.

Burning Period: That part of each 24-hour period when fires spread most rapidly, typically from 10:00 a.m. to sundown.

C

Chain: A unit of linear measurement equal to 66 feet.

Closure: Legal restriction, but not necessarily elimination of specified activities such as smoking, camping, or entry that might cause fires in a given area.

Command Staff: The command staff consists of the information officer, safety officer, and liaison officer. They report directly to the incident commander and may have assistants.

Contain a fire: A fuel break around the fire has been completed. This break may include natural barriers or manually and/or mechanically constructed line.

Control a fire: The complete extinguishment of a fire, including spot fires. Fireline has been strengthened so that flare-ups from within the perimeter of the fire will not break through this line.

Control Line: All built or natural fire barriers and treated fire edge used to control a fire.

Cooperating Agency: An agency supplying assistance other than direct suppression, rescue, support, or service functions to the incident control effort; e.g., Red Cross, law enforcement agency, telephone company, etc.

Crown Fire (Crowning): The movement of fire through the crowns of trees or shrubs more or less independently of the surface fire.

Cultural Landscape: A cultural landscape is a geographic area, including both natural and cultural resources, associated with a historic event, activity, or person. The National Park Service recognizes four cultural landscape categories: historic designed landscapes, historic vernacular landscapes, historic sites, and ethnographic landscapes. These categories are helpful in distinguishing the values that make landscapes cultural resources and in determining how they should be treated, managed, and interpreted.

D

Debris Burning: A fire spreading from any fire originally set for the purpose of clearing land or for rubbish, garbage, range, stubble, or meadow burning.

Defensible Space: An area either natural or manmade where material capable of causing a fire to spread has been treated, cleared, reduced, or changed to act as a barrier between an advancing wildland fire and the loss to life, property, or resources. In practice, "defensible space" is defined as an area a minimum of 30 feet around a structure that is cleared of flammable brush or vegetation.

Dispatch: The implementation of a command decision to move a resource or resources from one place to another.

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 control in first attack, and sends them to the proper place.

Dispatch Center: A facility from which resources are directly assigned to an incident.

Duff: The layer of decomposing organic materials lying below the litter layer of freshly fallen twigs, needles, leaves, and immediately above the mineral soil.

E

Engine: Any ground vehicle providing specified levels of pumping, water, and hose capacity.

Entrapment: A situation where personnel are unexpectedly caught in a fire behavior-related, life-threatening position where planned escape routes or safety zones are absent, inadequate, or compromised. An entrapment may or may not include deployment of a fire shelter for its intended purpose. These situations may or may not result in injury. They include "near misses."

Environmental Assessment (EA): EAs were authorized by the National Environmental Policy Act (NEPA) of 1969. They are concise, analytical documents prepared with public participation that determine if an environmental impact statement (EIS) is needed for a particular project or action. If an EA determines an EIS is not needed, the EA becomes the document allowing agency compliance with NEPA requirements.

Environmental Impact Statement (EIS): EISs were authorized by the National Environmental Policy Act (NEPA) of 1969. Prepared with public participation, they assist decision makers by providing information, analysis, and an array of action alternatives allowing managers to see the probable effects of decisions on the environment. Generally, EISs are written for large-scale actions or geographical areas.

Escape Route: A preplanned and understood route firefighters take to move to a safety zone or other low-risk area, such as an already burned area, previously constructed safety area, a meadow that won't burn, or natural rocky area that is large enough to take refuge without being burned. When escape routes deviate from a defined physical path, they should be clearly marked (flagged).

Escaped Fire: A fire that has exceeded or is expected to exceed initial attack capabilities or prescription.

Ethnographic Resource: Park ethnographic resources are the cultural and natural features of a park that are of traditional significance to traditionally associated peoples. These peoples are the contemporary park neighbors and ethnic or occupational communities that have been associated

with a park for two or more generations (40 years), and whose interests in the park's resources began prior to the park's establishment. Living peoples of many cultural backgrounds—American Indians, Inuit (Eskimos), Native Hawaiians, African Americans, Hispanics, Chinese Americans, Euro- Americans, and farmers, ranchers, and fishermen— may have a traditional association with a particular park.

Ethnography, part of cultural anthropology, is concerned with the peoples associated with parks, with their cultural systems or ways of life, and with the related technology, sites, structures, other material features, and natural resources. In addition to traditional regimes for resource use, for example, and family and community economic and social features, cultural systems include expressive elements that celebrate or record significant events and may carry considerable symbolic and emotional weight. These include rituals, sacred narratives such as origin myths, verbal arts including folk tales, and performing and graphic arts. Cultural anthropologists refer to behavioral, value, and expressive patterns, and technology, as features of cultural systems. Preservation specialists may use the term "intangible" to refer to behavior, values, and expressive culture.

F

Fine (Light) Fuels: Fast-drying fuels, generally with comparatively high surface area-to-volume ratios, which are less than 1/4-inch in diameter and have a timelag of one hour or less. These fuels readily ignite and are rapidly consumed by fire when dry.

Fire Behavior: The manner in which a fire reacts to the influences of fuel, weather, and topography.

Fire Behavior Forecast: Prediction of probable fire behavior, usually prepared by a fire behavior officer, in support of fire suppression or prescribed burning operations.

Fire Behavior Specialist: A person responsible to the planning section chief for establishing a weather data collection system and for developing fire behavior predictions based on fire history, fuel, weather, and topography.

Fire Cache: A supply of fire tools and equipment assembled in planned quantities or standard units at a strategic point for exclusive use in fire suppression.

Fire Crew: An organized group of firefighters under the leadership of a crew leader or other designated official.

Fire Intensity: A general term relating to the heat energy released by a fire.

Fireline: A linear fire barrier that is scraped or dug to mineral soil.

Fire Management Plan (FMP): 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. The plan is supplemented by operational plans such as preparedness plans, preplanned dispatch plans, prescribed fire plans, and prevention plans.

Fire Season: 1) Period(s) of the year during which wildland fires are likely to occur, spread, and affect resource values sufficient to warrant organized fire management activities. 2) A legally enacted time during which burning activities is regulated by state or local authority.

Fire Shelter: An aluminized tent offering protection by means of reflecting radiant heat and providing a volume of breathable air in a fire entrapment situation. Fire shelters should only be used in life-threatening situations, as a last resort.

Fire Shelter Deployment: The removing of a fire shelter from its case and using it as protection against fire.

Fire Weather: Weather conditions that influence fire ignition, behavior, and suppression.

Flame Length: The distance between the flame tip and the midpoint of the flame depth at the base of the flame (generally the ground surface); an indicator of fire intensity.

Flare-up: Any sudden acceleration of fire spread or intensification of a fire. Unlike a blow-up, a flare-up lasts a relatively short time and does not radically change control plans.

Fuel: Combustible material. Includes vegetation, such as grass, leaves, ground litter, plants, shrubs and trees that feed a fire. (See Surface Fuels.)

Fuel Loading: The amount of fuel present expressed quantitatively in terms of weight of fuel per unit area.

Fuel Model: Simulated fuel complex (or combination of vegetation types) for which all fuel descriptors required for the solution of a mathematical rate of spread model have been specified.

Fuel Moisture (Fuel Moisture Content): The quantity of moisture in fuel expressed as a percentage of the weight when thoroughly dried at 212 degrees Fahrenheit.

Fuel Reduction: Manipulation, including combustion, or removal of fuels to reduce the likelihood of ignition and/or to lessen potential damage and resistance to control.

Fuel Type: An identifiable association of fuel elements of a distinctive plant species, form, size, arrangement, or other characteristics that will cause a predictable rate of fire spread or difficulty of control under specified weather conditions.

G

Geographic Area: A political boundary designated by the wildland fire protection agencies, where these agencies work together in coordination and effective utilization

Ground Fuel: All combustible materials below the surface litter, including duff, tree or shrub roots, punchy wood, peat, and sawdust that normally support a glowing combustion without flame.

H

Helispot: A temporary landing spot for helicopters.

I

Incident: A human-caused or natural occurrence, such as wildland fire, that requires emergency service action to prevent or reduce the loss of life or damage to property or natural resources.

Incident Action Plan (IAP): Contains objectives reflecting the overall incident strategy and specific tactical actions and supporting information for the next operational period. The plan may be oral or written. When written, the plan may have a number of attachments, including: incident objectives, organization assignment list, division assignment, incident radio communication plan, medical plan, traffic plan, safety plan, and incident map.

Incident Commander: Individual responsible for the management of all incident operations at the incident site.

Incident Management Team: The incident commander and appropriate general or command staff personnel assigned to manage an incident.

Incident Objectives: Statements of guidance and direction necessary for selection of appropriate strategy (ies), and the tactical direction of resources. Incident objectives are based on realistic expectations of what can be accomplished when all allocated resources have been effectively deployed.

Incident Qualification Card (Red Card)-: Fire qualification card issued to fire rated persons showing their training needs and their qualifications to fill specified fire suppression and support positions in a large fire suppression or incident organization

Initial Attack: The actions taken by the first resources to arrive at a wildland fire to protect lives and property, and prevent further extension of the fire.

L

Large Fire: 1) For statistical purposes, a fire burning more than a specified area of land e.g., 300 acres. 2) A fire burning with a size and intensity such that its behavior is determined by interaction between its own convection column and weather conditions above the surface.

Light (Fine) Fuels: Fast-drying fuels, generally with comparatively high surface area-to-volume ratios, which are less than 1/4-inch in diameter and have a timelag of one hour or less. These fuels readily ignite and are rapidly consumed by fire when dry.

Litter: Top layer of the forest, scrubland, or grassland floor, directly above the fermentation layer, composed of loose debris of dead sticks, branches, twigs, and recently fallen leaves or needles, little altered in structure by decomposition.

M

Mineral Soil: Soil layers below the predominantly organic horizons; soil with little combustible material.

Mobilization: The process and procedures used by all organizations, federal, state and local for activating, assembling, and transporting all resources that have been requested to respond to or support an incident.

Mop-up: To make a fire safe or reduce residual smoke after the fire has been controlled by extinguishing or removing burning material along or near the control line, felling snags, or moving logs so they won't roll downhill.

Mutual Aid Agreement: Written agreement between agencies and/or jurisdictions in which they agree to assist one another upon request, by furnishing personnel and equipment.

N

National Environmental Policy Act (NEPA): NEPA is the basic national law for protection of the environment, passed by Congress in 1969. It sets policy and procedures for environmental protection, and authorizes environmental impact statements and environmental assessments to be used as analytical tools to help federal managers make decisions.

National Fire Danger Rating System (NFDRS): A uniform fire danger rating system that focuses on the environmental factors that control the moisture content of fuels.

National Wildfire Coordinating Group: A group formed under the direction of the Secretaries of Agriculture and the Interior and comprised of representatives of the U.S. Forest Service, Bureau of Land Management, Bureau of Indian Affairs, National Park Service, U.S. Fish and Wildlife Service, and Association of State Foresters. The group's purpose is to facilitate coordination and effectiveness of wildland fire activities and provide a forum to discuss, recommend action, or resolve issues and problems of substantive nature. NWCG is the certifying body for all courses in the National Fire Curriculum.

Nomex ®: Trade name for a fire resistant synthetic material used in the manufacturing of flight suits, pants, and shirts used by firefighters (see Aramid).

Normal Fire Season: 1) A season when weather, fire danger, and number and distribution of fires are about average. 2) Period of the year that normally comprises the fire season.

O

Operational Period: The period of time scheduled for execution of a given set of tactical actions as specified in the incident action plan. Operational periods can be of various lengths, although usually not more than 24 hours.

Overhead: People assigned to supervisory positions, including incident commanders, command staff, general staff, directors, supervisors, and unit leaders.

P

Personnel Protective Equipment (PPE): All firefighting personnel must be equipped with proper equipment and clothing in order to mitigate the risk of injury from, or exposure to, hazardous conditions encountered while working. PPE includes, but is not limited to: 8-inch high-laced leather boots with lug soles, fire shelter, hard hat with chin strap, goggles, ear plugs, aramid shirts and trousers, leather gloves, and individual first aid kits.

Preparedness: Condition or degree of being ready to cope with a potential fire situation

Prescribed Fire: Any fire ignited by management actions under certain, predetermined conditions to meet specific objectives related to hazardous fuels or habitat improvement. A written, approved prescribed fire plan must exist, and NEPA requirements must be met, prior to ignition.

Prescribed Fire Plan (Burn Plan): This document provides the prescribed fire burn boss information needed to implement an individual prescribed fire project.

Prescription: Measurable criteria that define conditions under which a prescribed fire may be ignited, guide selection of appropriate management responses, and indicate other required actions. Prescription criteria may include safety, economic, public health, and environmental, geographic, administrative, social, or legal considerations.

Prevention: Activities directed at reducing the incidence of fires, including public education, law enforcement, personal contact, and reduction of fuel hazards.

Pulaski: A combination chopping and trenching tool, which combines a single-bitted axe-blade with a narrow adze-like trenching blade fitted to a straight handle. Useful for grubbing or trenching in duff and matted roots. Well-balanced for chopping.

R

Rate of Spread: The relative activity of a fire in extending its horizontal dimensions. It is expressed as a rate of increase of the total perimeter of the fire, as rate of forward spread of the fire front, or as rate of increase in area, depending on the intended use of the information. Usually it is expressed in chains or acres per hour for a specific period in the fire's history.

Rehabilitation: The activities necessary to repair damage or disturbance caused by wildland fires or the fire suppression activity.

Relative Humidity (RH): The ratio of the amount of moisture in the air, to the maximum amount of moisture that air would contain if it were saturated. The ratio of the actual vapor pressure to the saturated vapor pressure.

Resources: 1) Personnel, equipment, services, and supplies available, or potentially available, for assignment to incidents. 2) The natural resources of an area, such as timber, crass, watershed values, recreation values, and wildlife habitat.

Resource Management Plan (RMP): A document prepared by field office staff with public participation, and approved by field office managers that provides general guidance and direction for land management activities at a field office. The RMP identifies the need for fire in a particular area and for a specific benefit.

Retardant: A substance or chemical agent that reduces the flammability of combustibles.

S

Safety Zone: An area cleared of flammable materials used for escape in the event the line is outflanked, or in case a spot fire causes fuels outside the control line to render the line unsafe. In firing operations, crews progress so as to maintain a safety zone close at hand allowing the fuels inside the control line to be consumed before going ahead. Safety zones may also be constructed as integral parts of fuel breaks; they are greatly enlarged areas, which can be used with relative safety by firefighters and their equipment in the event of a blowup in the vicinity.

Single Resource: An individual, a piece of equipment and its personnel complement, or a crew or team of individuals with an identified work supervisor that can be used on an incident.

Slash: Debris left after logging, pruning, thinning or brush cutting; includes logs, chips, bark, branches, stumps, and broken understory trees or brush.

Smoke Management: Application of fire intensities and meteorological processes to minimize degradation of air quality during prescribed fires.

Snag: A standing dead tree or part of a dead tree from which at least the smaller branches have fallen.

Spot Fire: A fire ignited outside the perimeter of the main fire by flying sparks or embers.

Spotting: Behavior of a fire producing sparks or embers that are carried by the wind and start new fires beyond the zone of direct ignition by the main fire.

Strategy: The science and art of command as applied to the overall planning and conduct of an incident.

Suppressant: An agent, such as water or foam, used to extinguish the flaming and glowing phases of combustion when direction applied to burning fuels.

Suppression: All the work of extinguishing or containing a fire, beginning with its discovery.

Surface Fuels: Loose surface litter on the soil surface, normally consisting of fallen leaves or needles, twigs, bark, cones, and small branches that have not yet decayed enough to lose their identity; also grasses, forbs, low and medium shrubs, tree seedlings, heavier branchwood, downed logs, and stumps interspersed with or partially replacing the litter.

T

Tactics: Deploying and directing resources on an incident to accomplish the objectives designated by strategy.

Timelag: Time needed under specified conditions for a fuel particle to lose about 63 percent of the difference between its initial moisture content and its equilibrium moisture content. If conditions remain unchanged, a fuel will reach 95 percent of its equilibrium moisture content after four timelag periods.

Torching: The ignition and flare-up of a tree or small group of trees, usually from bottom to top.

Type: The capability of a firefighting resource in comparison to another type. Type 1 usually means a greater capability due to power, size, or capacity.

W

Wildland Fire: Any nonstructural 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 Situation Analysis (WFSA): A decision-making process that evaluates alternative suppression strategies against selected environmental, social, political, and economic criteria. Provides a record of decisions.

Wildland Fire Use: The management of naturally ignited wildland fires to accomplish specific prestated resource management objectives in predefined geographic areas outlined in fire management plans.

Wildland Urban Interface: The line, area or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels.

C. Flora and Fauna Species List

A current species list can be found at:
http://endeavor.des.ucdavis.edu/nps/park.asp?park=USAthe park0A

D. Contacts

1. Agency and Interagency Contacts

a. Agency

Pictured Rocks National Lakeshore
N8391 Sand Point Road
P.O. Box 40
Munising MI 49862-0040

Name	Work Phone
Jim Northup Superintendent	906-387-2607
Larry Hach Chief Ranger	906-387-2607
Bruce Leutscher Biologist	906-387-2680
Gregg Bruff Chief of Heritage Education	906-387-2607
Jim Mattingly Wildland Fire Management Specialist	402-661-1762
Jim DeCoster Regional Fire Ecologist	402-661-1758
Doug Alexander Regional Fire Management Officer	402-661-1754

b. Cooperating Agencies

Organization	Phone	Address
Michigan Forest, Mineral & Fire Mangt. Marquette Field Office	(906) 249-1497	110 Ford Rd, Marquette MI 49855
Dept. of Nat. Res. Forest Mangt. Div., Wildfire Prevention	(906) 452-6227	Shingleton, MI

NWS, Marquette Weather Forecast Office	(906) 475-5782	112 Airpark Drive S. Negaunee, MI 49866
Hiawatha National Forest	Voice (906) 786-4062 Fax (906) 789-3311	2727 N. Lincoln Road Escanaba, MI 49829
Seney National Wildlife Refuge	Voice (906) 586-9851 Fax (906) 586-3800	1674 Refuge Entrance Rd. Seney, MI 49883

E. Long-Term Prescribed Fire and Hazard Fuel Reduction Plan

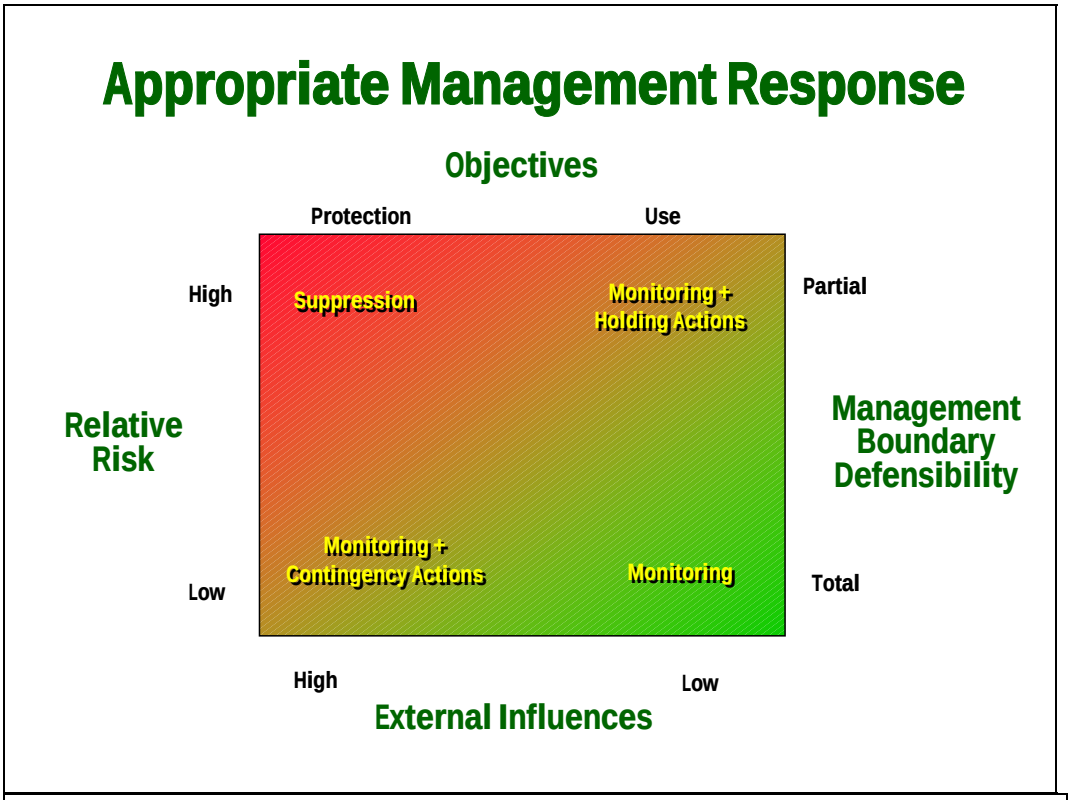
1. Multi-Year Prescribed Fire Schedule

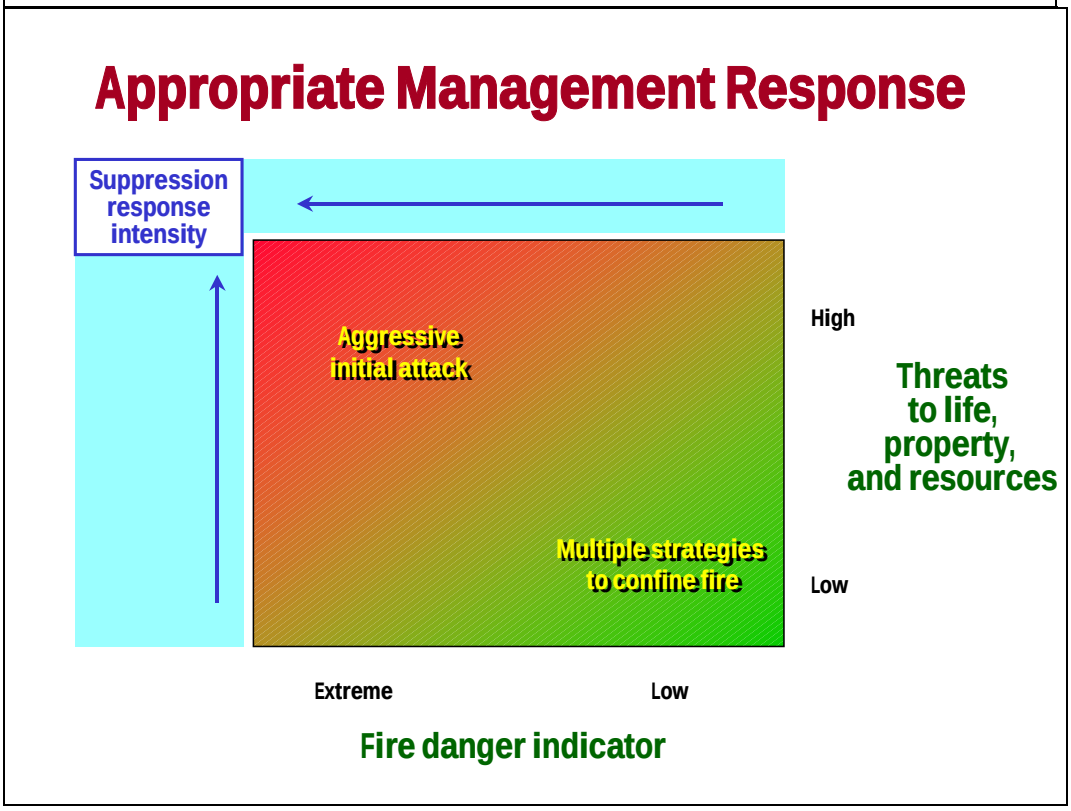
There are no prescribed fires currently planned at Pictured Rocks National Lakeshore.

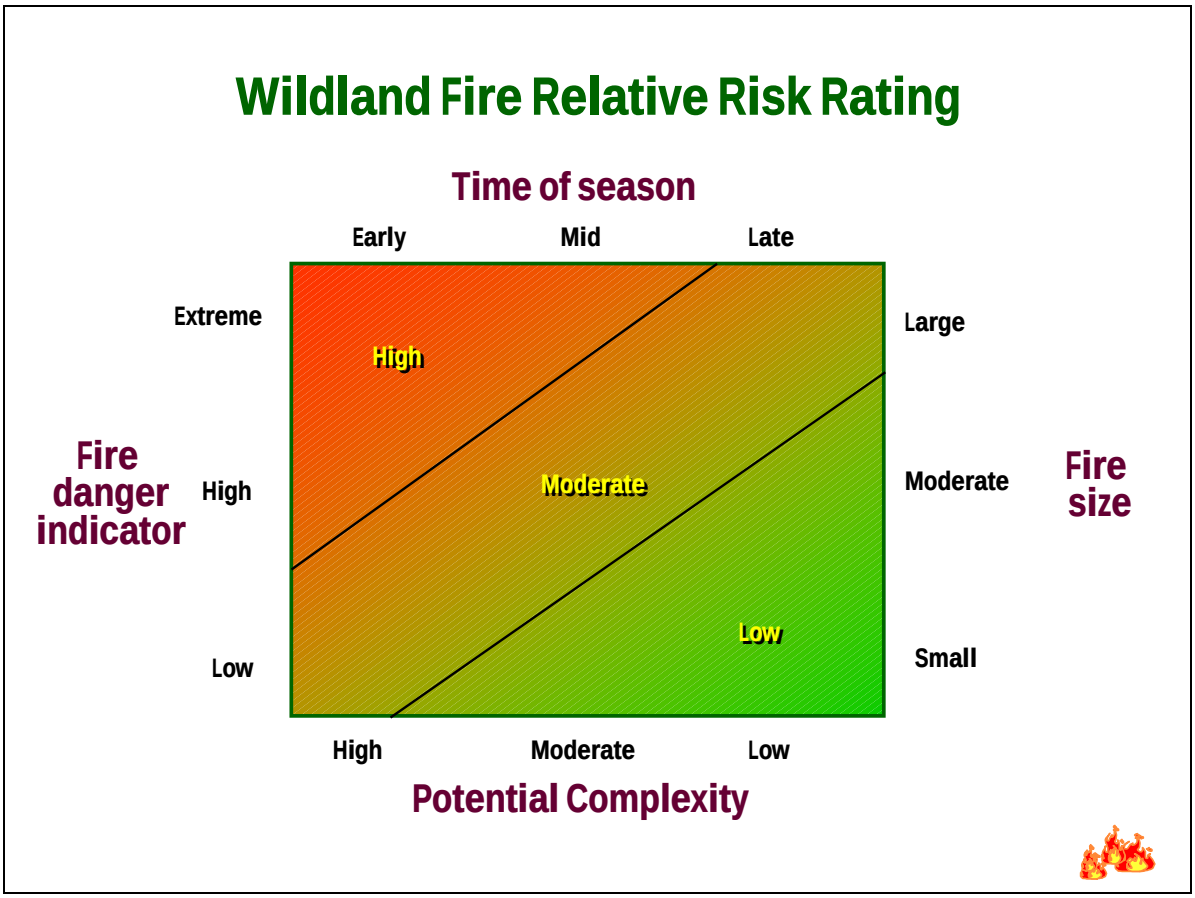
2. Hazard Fuels Reduction Plan

Pictured Rocks National Lakeshore does not have a hazard fuels reduction plan in place. Fuel loads are very light throughout the lakeshore, and have been assessed by the area fire ecologist to not pose an immediate threat to lakeshore resources. Areas surrounding campgrounds, cultural resources, and NPS facilities are visually inspected and maintained on a yearly basis.

F. Charts For Determining Appropriate Management Response







Zimmerman, G. & Bunnell, D.1998. Wildland and Prescribed Management Policy – Implementation Procedures Reference Guide
http://www.fs.fed.us/fire/fireuse/wildland_fire_use/ref_guide/refguide.doc

G. Wildland Fire Situation Analysis (WFSA)

Section I, WFSA Information Page (*This page is completed by the Agency Administrator(s).*

A. Jurisdiction(s): *Assign the agency or agencies that have or could have fire protection responsibility, e.g., USFWS, BLM, etc.*

B. Geographic Area: *Assign the recognized "Geographic Coordination Area" the fire is located in, e.g., Northwest, Northern Rockies, etc.*

C. Unit(s): *Designate the local administrative unit(s), e.g., Hart Mountain Refuge Area, Flathead Indian Reservation, etc.*

D. WFSA #: *Identify the number assigned to the most recent WFSA for this fire.*

E. Fire Name: *Self-explanatory.*

F. Incident #: *Identify the incident number assigned to the fire.*

G. Accounting Code: *Insert the local unit's accounting code.*

H. Date/Time Prepared: *Self-explanatory.*

I. Attachments: *Check here to designate items used to complete the WFSA. "Other could include data or models used in the development of the WFSA. Briefly describe the "other" items used.*

I. Wildland Fire Situation Analysis	
To be completed by the Agency Administrator(s)	
A. Jurisdiction(s)	B. Geographic Area
C. Unit(s)	D. WFSA #
E. Fire Name	F. Incident #
G. Accounting Code:	
H. Date/Time Prepared _____@_____	
I. Attachments	

- Complexity Matrix/Analysis *
- Risk Assessment/Analysis *
  Probability of Success *
  Consequences of Failure *
- Maps *
- Decision Tree **
- Fire Behavior Projections *
- Calculations of Resource Requirements *
- Other (specify)

*Required

**Required by FWS

Section II. Objectives and Constraints (*This page is completed by the Agency Administrator(s).*

A. Objectives: Specify objectives that must be considered in the development of alternatives. Safety objectives for firefighter, aviation, and public must receive the highest priority. Suppression objectives must relate to resource management objectives in the unit resource management plan.

Economic objectives could include closure of all or portions of an area, thus impacting the public, or impacts to transportation, communication, and resource values.

Environmental objectives could include management objectives for airshed, water quality, wildlife, etc.

Social objectives could include any local attitudes toward fire or smoke that might affect decisions on the fire.

Other objectives might include legal or administrative constraints which would have to be considered in the analysis of the fire situation, such as the need to keep the fire off other agency lands, etc.

B. Constraints: List constraints on wildland fire action. These could include constraints to designated wilderness, wilderness study areas, environmentally or culturally sensitive areas, irreparable damage to resources or smoke management/air quality concerns. Economic constraints, such as public and agency cost, could be considered here.

II. Objectives and Constraints
To be Completed by the Agency Administrator(s)
A. Objectives (Must be specific and measurable) 1. Safety - Public - Firefighter 2. Economic 3. Environmental 4. Social 5. Other **B. Constraints**

Section III. Alternatives (*This page is completed by the Fire Manager and/or Incident Commander.)*

A. Wildland Fire Management Strategy: Briefly describe the general wildland fire strategies for each alternative. Alternatives must meet resource management plan objectives.

B. Narrative: Briefly describe each alternative with geographic names, locations, etc., that would be used when implementing a wildland fire strategy. For example: "Contain within the Starvation Meadows' watershed by the first burning period."

C. Resources Needed: Resources described must be reasonable to accomplish the tasks described in Section III.B. It is critical to also look at the reality of the availability of these needed resources.

D. Final Fire Size: Estimated final fire size for each alternative at time of containment.

E. Estimated Contain/Control Date: Estimates of each alternative shall be made based on predicted weather, fire behavior, resource availability, and the effects of suppression efforts.

F. Cost: Estimate all incident costs for each alternative. Consider mop-up, rehabilitation, and other costs as necessary.

G. Risk Assessment: Probability of Success/Consequences of Failure: Describe probability as a percentage and list associated consequences for success and failure. Develop this information from models, practical experience, or other acceptable means. Consequences described will include fire size, days to contain, days to control, costs, and other information such as lakeshore closures and effect on critical habitat. Include fire behavior and long-term fire weather forecasts to derive this information.

H. Complexity: Assign the complexity rating calculated in "Fire Complexity Analysis" for each alternative, e.g., Type II, Type I.

I. Map: A map for each alternative should be prepared. The map will be based on the "Probability of Success/Consequences of Failure" and include other relative information.

III. Alternatives (*To be completed by FMO / IC*)			
	A	B	C
A. Wildland Fire Strategy			
B. Narrative			
C. Resources Needed			
Handcrews			
Engines			
Dozers			
Airtankers			
Helicopters			
Other			
D. Final Size			
E. Est. Contain/ Control Date			
F. Costs			
G. Risk Assessment			
- Probability of Success			
- Consequence Of failure			
H. Complexity			
I. Attach maps for each alternative			

Section IV. Evaluation of Alternatives (*This page is completed by the Agency Administrator(s), FMO and/or Incident Commander.)*

A. Evaluation Process: Conduct an analysis for each element of each objective and each alternative. Objectives shall match those identified in Section II.A. (Those listed are defaults only – not all will be applicable to every fire – add or delete as appropriate for each incident.) Use the best estimates available and quantify whenever possible. Provide ratings for each alternative and corresponding objective element. Fire effects may be negative, cause no change, or may be positive. Examples are: 1) a system which employs a "-" for negative effect, a "0" for no change, and a "+" for positive effect; 2) a system which uses a numeric factor for importance of the consideration (soils, watershed, political, etc.) and assigns values (such as -1 to +1, - 100 to +100, etc.) to each consideration, then arrives at a weighted average. If you have the ability to estimate dollar amounts for natural resource and cultural values, this data is preferred. Use those methods which are most useful to managers and most appropriate for the situation and agency. To be able to evaluate positive fire effects, the area must be included in the resource management plan and consistent with prescriptions and objectives of the fire management plan.

Sum of Economic Values: Calculate for each element the net effect of the rating system used for each alternative. This could include the balance of:
Pluses (+) and minuses (-), numerical rating (-3 and +3), or natural and cultural resource values in dollar amounts. (Again, resource benefits may be used as part of the analysis process when the wildland fire is within a prescription consistent with approved Fire Management Plans and in support of the unit's Resource Management Plan.)

IV. Evaluation of Alternatives			
To be Completed by the Agency Administrator(s) and Fire Manager / Incident Commander			
A. Evaluation Process	A	B	C
Safety Firefighter			
Aviation			
Public			
Sum of Safety Values			
Economic			
Forage			
Improvements			
Recreation			
Timber			
Water			
Wilderness			
Wildlife			
Other (specify)			
Sum of Economic Values			
Environmental			
Air			
Visual			
Fuels			
T & E Species			
Other (specify)			
Sum of Environmental Values			
Social			
Employment			
Public Concern			
Cultural			
Other (Specify)			
Sum of Social Values			
Other			

Section V. Analysis Summary (*This page is completed by the Agency Administrator(s) and Fire Manager and/or Incident Commander.)*

A. Compliance with Objectives: Prepare narratives that summarize each alternative's effectiveness in meeting each objective. Alternatives that do not comply with objectives are not acceptable. Narrative could be based on effectiveness and efficiency. For example: "most effective and least efficient," "least effective and most efficient," or "effective and efficient." Or answers could be based on a two-tiered rating system such as "complies with objective" and "fully complies with or exceeds objective." Use a system that best fits the manager's needs.

B. Pertinent Data: Data for this Section has already been presented, and is duplicated here to help the Agency Administrator(s) confirm their selection of an alternative. Final Fire Size is displayed in Section III.D. Complexity is calculated in the attachments and displayed in Section III.H. Costs are displayed on page 4. Probability of Success/Consequences of Failure is calculated in the attachments and displayed in Section III.G.

C. External and Internal Influences: Assign information and data occurring at the time the WFSA is signed. Identify the Preparedness Index (1 through 5) for the National and Geographic levels. If available, indicate the Incident Priority assigned by the MAC Group. Designate the Resource Availability status. This information is available at the Geographic Coordination Center, and is needed to select a viable alternative. Designate "yes," indicating an up-to-date weather forecast has been provided to, and used by, the Agency Administrator(s) to evaluate each alternative. Assign information to the "Other" category as needed by the Agency Administrator(s).

Section IV. Decision

Identify the alternative selected. Must have clear and concise rationale for the decision, and a signature with date and time. Agency Administrator(s) signature is mandatory.

V. Analysis Summary			
To be Completed by the Agency Administrator(s) and Fire Manager / Incident Commander			
Alternatives	A	B	C
A. Compliance with Objectives			
Safety			
Economic			
Environmental			
Social			
Other			
B. Pertinent Data			
Final Fire Size			
Complexity			
Suppression Cost			
Resource Values			
Probability of Success			
Consequences of Failure			
C. External / Internal Influences			
National & Geographic Preparedness Level _____			
Incident Priority _____			
Resource Availability _____			
Weather Forecast (long-range) _____			
Fire Behavior Projections _____			

National & Geographic
Preparedness Level _____
Incident Priority _____
Resource Availability
_____
Weather Forecast
(long-range) _____
Fire Behavior Projections
_____

VI. Decision

The Selected Alternative is: _____
Rationale:

_____ _____
Agency Administrator's Signature Date/Time

Section VII. Daily Review (This Section is completed by the Agency Administrator(s) or designate.)

The date, time, and signature of reviewing officials are reported in each column for each day of the incident. The status of Preparedness Level, Incident Priority, Resource Availability, Weather Forecast, and WFSA validity is completed for each day reviewed. Ratings for the Preparedness Level, Incident Priority, Resource Availability, Fire Behavior, and Weather Forecast are addressed in Section V.C. Assign a "yes" under "WFSA Valid" to continue use of this WFSA. A "no" indicates this WFSA is no longer valid and another WFSA must be prepared or the original revised.

Section VIII. Final Review (This Section is completed by the Agency Administrator(s). A signature, date, and time are provided once all conditions of the WFSA are met.).

VIII. Daily Review

To be completed by the Agency Administrator(s) or Designate

Selected to be reviewed daily to determine if still valid until containment or control

			PREPAREDNESS LEVEL	INCIDENT PRIORITY	RESOURCE AVAILABILITY	WEATHER FORECAST	FIRE BEHAVIOR PROJECTIONS	WFSA VALID
Date	Time	By						

If WFSA is no longer valid, a new WFSA will be completed!

VIII. Objectives Final Review

The elements of the selected alternative were met on:

_____ _____

Date Time

By:_____

(Agency Administrator(s)

A GUIDE FOR ASSESSING FIRE COMPLEXITY

The following questions are presented as a guide to assist the Agency Administrator(s) and staff in analyzing the complexity or predicted complexity of a wildland fire situation. Because of the time required to assemble or move an Incident Management Team to wildland fire, this checklist should be completed when a wildland fire escapes initial attack and be kept as a part of the fire records. This document is prepared concurrently with the preparation of (and attached to) a new or revised Wildland Fire Situation Analysis. It must be emphasized this analysis should, where possible, be based on predictions to allow adequate time for assembling and transporting the ordered resources.

Use of the Guide:

1. Analyze each element and check the response "yes" or "no."

2. If positive responses exceed, or are equal to, negative responses within any primary factor (A through G), the primary factor should be considered as a positive response.

3. If any three of the primary factors (A through G) are positive responses, this indicates the fire situation is, or is predicted to be, Type I.

4. Factor H should be considered after all the above steps. If more than two of these items are answered "yes," and three or more of the other primary factors are positive responses, a Type I team should be considered. If the composites of H are negative, and there are fewer than three positive responses in the primary factors (A-G), a Type II team

should be considered. If the answers to all questions in H are negative, it may be advisable to allow the existing overhead to continue action on the fire.

GLOSSARY OF WFSA TERMS

Potential for blow-up conditions - Any combination of fuels, weather, and topography excessively endangering personnel.

Rate or endangered species - Threat to habitat of such species or, in the case of flora, threat to the species itself.

Smoke management - Any situation which creates a significant public response, such as smoke in a metropolitan area or visual pollution in high-use scenic areas.

Extended exposure to unusually hazardous line conditions - Extended burnout or backfire situations, rockslide, cliffs, extremely steep terrain, abnormal fuel situation such as frost killed foliage, etc.

Disputed fire management responsibility - Any wildland fire where responsibility for management is not agreed upon due to lack of agreements or different interpretations, etc.

Disputed fire policy - Differing fire policies between suppression agencies when the fire involves multiple ownership is an example.

Pre-existing controversies - These may or may not be fire management related. Any controversy drawing public attention to an area may present unusual problems to the fire overhead and local management.

Have overhead overextended themselves mentally or physically - This is a critical item that requires judgment by the responsible agency. It is difficult to write guidelines for this judgment because of the wide differences between individuals. If, however, the Agency Administrator feels the existing overhead cannot continue to function efficiently and take safe and aggressive action due to mental or physical reasons, assistance is mandatory.

FIRE COMPLEXITY ANALYSIS

A. FIRE BEHAVIOR: Observed or Predicted **Yes/No**

1. Burning Index (from on-site measurement of weather conditions predicted to be above the 90% level using the major fuel model in which the fire is burning. ___ ___

2. Potential exists for "blowup" conditions (fuel moisture, winds, etc.). ___ ___

3. Crowning, profuse or long-range spotting. ___ ___

4. Weather forecast indicating no significant relief or worsening conditions. ___ ___

Total: ___ ___

B. RESOURCES COMMITTED

1. 200 or more personnel assigned. ___ ___

2. Three or more divisions. ___ ___

3. Wide variety of special support personnel. ___ ___

4. Substantial air operation which is not properly staffed. ___ ___

5. Majority of initial attack resources committed. ___ ___

Total ___ ___

C. RESOURCES THREATENED

1. Urban interface. ___ ___

2. Developments and facilities. ___ ___

3. Restricted, threatened or endangered species habitat. ___ ___

4. Cultural sites. ___ ___

5. Unique natural resources, special designation zones or wilderness. ___ ___

6. Other special resources. ___ ___

Total ___ ___

D. SAFETY

1. Unusually hazardous fireline conditions.	___	___
2. Serious accidents or facilities.	___	___
3. Threat to safety of visitors from fire and related operations.	___	___
4. Restricted and/or closures in effect or being considered.	___	___
5. No night operations in place for safety reasons.	___	___
Total	___	___

E. OWNERSHIP **Yes/No**

1. Fire burning or threatening more than one jurisdiction.	___	___
2. Potential for claims (damages).	___	___
3. Conflicting management objectives.	___	___
4. Disputes over fire management responsibility.	___	___
5. Potential for unified command.	___	___
Total	___	___

F. EXTERNAL INFLUENCES

1. Controversial wildland fire management policy.	___	___
2. Pre-existing controversies/relationships.	___	___
3. Sensitive media relationships.	___	___
4. Smoke management problems.	___	___
5. Sensitive political interests.	___	___
6. Other external influences.	___	___
Total	___	___

G. CHANGE IN STRATEGY

1. Change in strategy to control from confine or contain.	___	___

2. Large amount of unburned fuel within planned perimeter. ___ ___

3. WFSA invalid or requires updating. ___ ___

Total ___ ___

H. EXISTING OVERHEAD

1. Worked two operational periods without achieving initial objectives. ___ ___

2. Existing management organization ineffective. ___ ___

3. IMT overextended themselves mentally and/or physically. ___ ___

4. Incident action plans, briefings, etc., missing or poorly prepared. ___ ___

Total ___ ___

Signature_____

Date_____ Time_____

H. Limited Delegation of Authority

LIMITED DELEGATION OF AUTHORITY

To: _____, Incident Commander

From: Superintendent, Pictured Rocks National Lakeshore

Subject: Limited Delegation of Authority

As of _____hours, on this date _____, I have delegated limited authority to manage the _____ fire in the Pictured Rocks National Lakeshore.

As superintendent I have ultimate responsibility for protection of the Pictured Rocks National Lakeshore's resources and the lives of the visitors and employees. Your expertise in the area of wildland fire incident management will assist me in fulfilling that responsibility during the present situation. My considerations for management of this fire are:

1. Provide for firefighter, visitor, resident and neighbor safety.

2. I would like the fire managed using the most appropriate strategy that foremost considers, safety, economic cost, and probability of success and consequences of failure. The selected strategy should be implemented using minimum impact management tactics.

3. Key cultural features requiring priority protection are:
_____
_____
_____
_____

4. Key resource considerations are:
_____
_____
_____
_____

5. Restrictions for suppression actions are: no tracked or wheeled vehicles in the following areas:
_____
_____
_____

except when human life is at immediate risk. Helicopters, powersaws, portable pumps, and leaf blowers may be used as required. Chemical retardant is authorized as stipulated in the lakeshore fire management plan.

6. My agency advisor/representative will be:

7. Manage the fire cost effectively for the values at risk.

8. Provide training opportunities for lakeshore and local firefighters to the extent possible.

9. Minimize disruption of visitor access to lakeshore consistent with pubic safety.

_____

Superintendent, Pictured Rocks National Lakeshore

_____

Date

I. Minimum Impact Suppression Tactics Guidelines (MIST)

General Discussion

Suppression tactics will have an impact on the landscape. Following the minimum impact suppression tactics (MIST) guidelines outlined below can reduce the degree of long-term impacts associated with wildland fire suppression tactics. It is important that decision makers are aware of the long-term impacts fire suppression tactics can have on the landscape, and very carefully weigh those long-term impacts to fire suppression safety issues related to wildland fire incidents. The following are MIST standards that will be used in the lakeshore:

Also refer to RM-18, Chapter 9, Exhibit 5

Tactical Standards

- Taking advantage of natural barriers, rock outcrops, trails, roads, and streams will minimize fireline construction, and other existing fuel breaks.
- Firelines will be the minimum width necessary to halt the spread of the fire, and will be placed to avoid impacts to natural and cultural resources vulnerable to the effects of fire and fire suppression activities.
- Limbing along the fireline will be done only as essential for the suppression effort and for safety.
- Unburned material may be left within the final line.
- Clearing and scraping will be minimized.
- Snags or trees will be felled only when essential for control of the fire or for safety of personnel.
- Where possible, on site archeological clearance will be obtained prior to line construction.

Terminating the Fire

- The route to the fire from the nearest trail or road will be flagged. The last person to leave the area will remove flagging.
- All equipment and debris will be removed from the area for proper disposal.
- Before leaving the fire, rehabilitation will be completed to eliminate impacts from the suppression effort.

Restoration of Fire Area

- Backfill cup trenches and scarify wide firelines.
- Construct waterbars to prevent erosion.
- Place “boneyards” in a natural or random arrangement.
- Position cut ends of logs so as to be inconspicuous to visitors and camouflage where possible.
- Flush cut stumps, camouflage with soil and moss.

Aircraft

Helicopters

- Minimize use.
- Restore helispots.

Retardant Aircraft

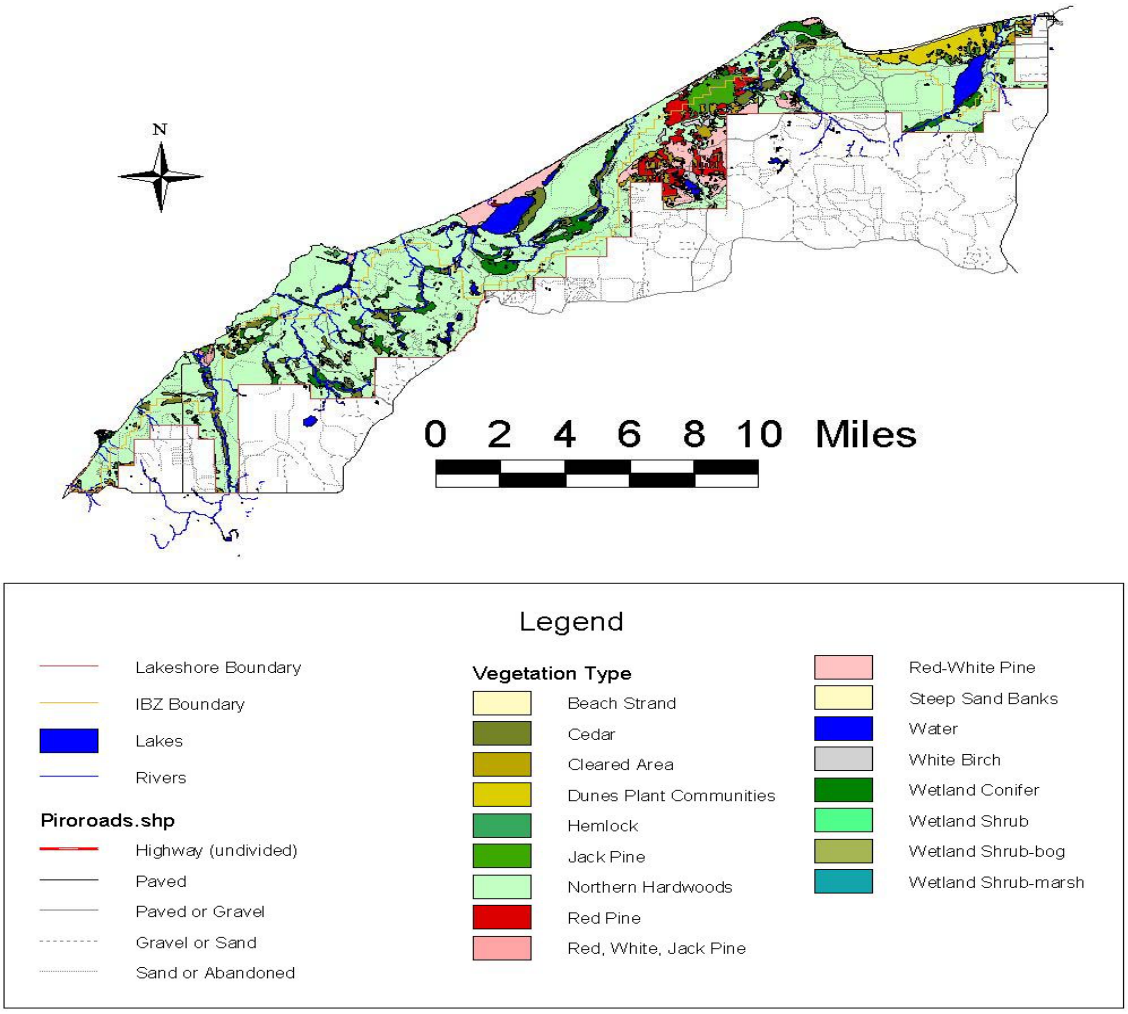
- Retardant drops require Superintendent’s approval.
- Use water drops where practical.
- Minimize number of drops to what is essential for control of the fire.

J. Step-Up Staffing Plan

STAFFING CLASS	ADJECTIVE RATING	BURNING INDEX	ACTIONS TO BE TAKEN
I	Low	0 - 3	Normal tours of duty and staffing, fire equipment and tools ready for use
II	Moderate	4 - 8	Normal tours of duty and staffing, fire equipment and tools ready for use
III	High	9 - 17	Normal tours of duty and staffing, slip-on pumper units mounted and filled, all initial attack forces notified. At upper Staffing Class III go to Class IV if conditions warrant.
IV	Very High	18 - 23	Potential 7-day work week for initial attack personnel and extended hours on a daily basis, key management may also work longer; slip-on pumper units mounted and filled; place initial attack forces in areas of highest probable fire occurrence.
V	Extreme	24+	Staffing Class IV actions, plus prohibit open fires in the backcountry.

Note: Each of the above staffing classes is progressive and includes the previous actions.

K. Lakeshore Vegetation Map



L. Wildland Fire Implementation Plan Stage 1

Fire Name					
Fire Number					
Jurisdiction(s)					
Administrative Unit(s)					
FMP Unit(s)					
Geographic Area					
Management Code					
Start Date/Time					
Discovery Date/Time					
Current Date/Time					
Current Size					
Location:	Legal Description(s)	T.	R.	Sec.	Sub.
	Latitude				
	Longitude				
	UTM:				
	County:				
	Local Description				
Cause					
Fuel Model/Conditions					
Current Weather					
Predicted Weather					

Availability of Resources	

DECISION CRITERIA CHECKLIST

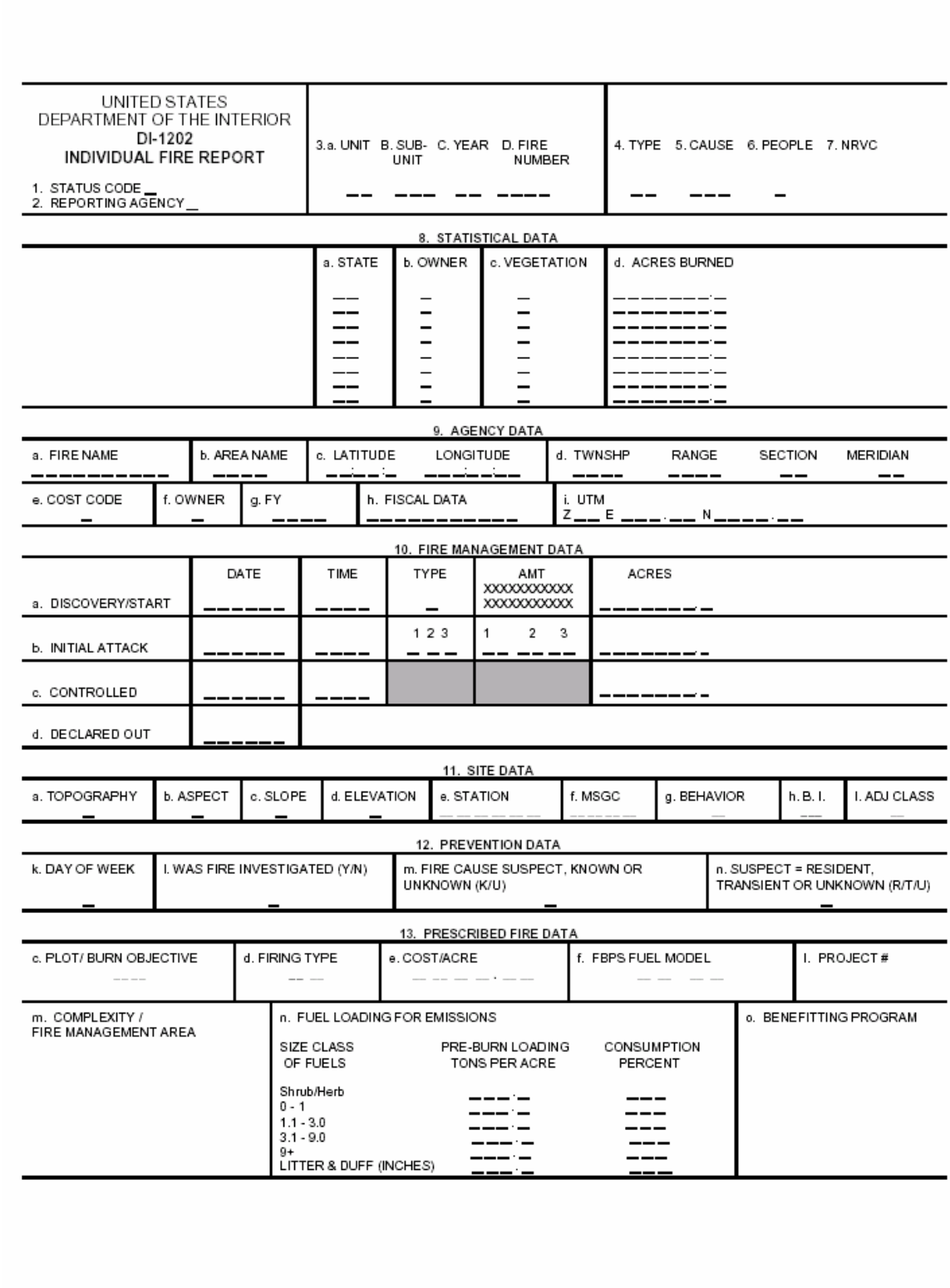
Decision Element	Yes	No
Is there a threat to life, property, or resources that cannot be mitigated?		
Are potential effects on cultural and natural resources outside the range of acceptable effects?		
Are relative risk indicators and/or risk assessment results unacceptable to the appropriate Agency Administrator?		
Is there other proximate fire activity that limits or precludes successful management of this fire?		
Are there other Agency Administrator issues that preclude wildland fire use?		

The Decision Criteria Checklist is a process to assess whether or not the situation warrants continued wildland fire use implementation. A “Yes” response to any element on the checklist indicates that the appropriate management response should be suppression-oriented.

Recommended Response Action (check appropriate box)	NO-GO (Initial attack/suppression action)	
	GO (Other appropriate management response)	

Signature	Date

L. Individual Fire Report (DI 1202)



UNITED STATES
DEPARTMENT OF THE INTERIOR
DI-1202
INDIVIDUAL FIRE REPORT

1. STATUS CODE __
2. REPORTING AGENCY __

3.a. UNIT	B. SUB-UNIT	C. YEAR	D. FIRE NUMBER
__	___	__	____

4. TYPE	5. CAUSE	6. PEOPLE	7. NRVC
__	___	_	

8. STATISTICAL DATA

	a. STATE	b. OWNER	c. VEGETATION	d. ACRES BURNED
	__	_	_	_____._
	__	_	_	_____._
	__	_	_	_____._
	__	_	_	_____._
	__	_	_	_____._
	__	_	_	_____._
	__	_	_	_____._
	__	_	_	_____._

9. AGENCY DATA

a. FIRE NAME	b. AREA NAME	c. LATITUDE / LONGITUDE	d. TWNSHP / RANGE / SECTION / MERIDIAN
_____	____	__.__.__ / ___.__.__	____ / ____ / __ / __

e. COST CODE	f. OWNER	g. FY	h. FISCAL DATA	i. UTM
_	_	____	_____	Z__ E ___.___ N____.__

10. FIRE MANAGEMENT DATA

	DATE	TIME	TYPE	AMT (XXXXXXXXXX / XXXXXXXXXX)	ACRES
a. DISCOVERY/START	_____	____	_		_____._
b. INITIAL ATTACK	_____	____	1 2 3 _ _ _	1 2 3 __ __ __	_____._
c. CONTROLLED	_____	____			_____._
d. DECLARED OUT	_____				

11. SITE DATA

a. TOPOGRAPHY	b. ASPECT	c. SLOPE	d. ELEVATION	e. STATION	f. MSGC	g. BEHAVIOR	h. B. I.	I. ADJ CLASS
_	_	_	_	_____	_____	__	__	__

12. PREVENTION DATA

k. DAY OF WEEK	l. WAS FIRE INVESTIGATED (Y/N)	m. FIRE CAUSE SUSPECT, KNOWN OR UNKNOWN (K/U)	n. SUSPECT = RESIDENT, TRANSIENT OR UNKNOWN (R/T/U)
_	_	_	_

13. PRESCRIBED FIRE DATA

c. PLOT/ BURN OBJECTIVE	d. FIRING TYPE	e. COST/ACRE	f. FBPS FUEL MODEL	I. PROJECT #
____	__ __	_____._	__ __ __	

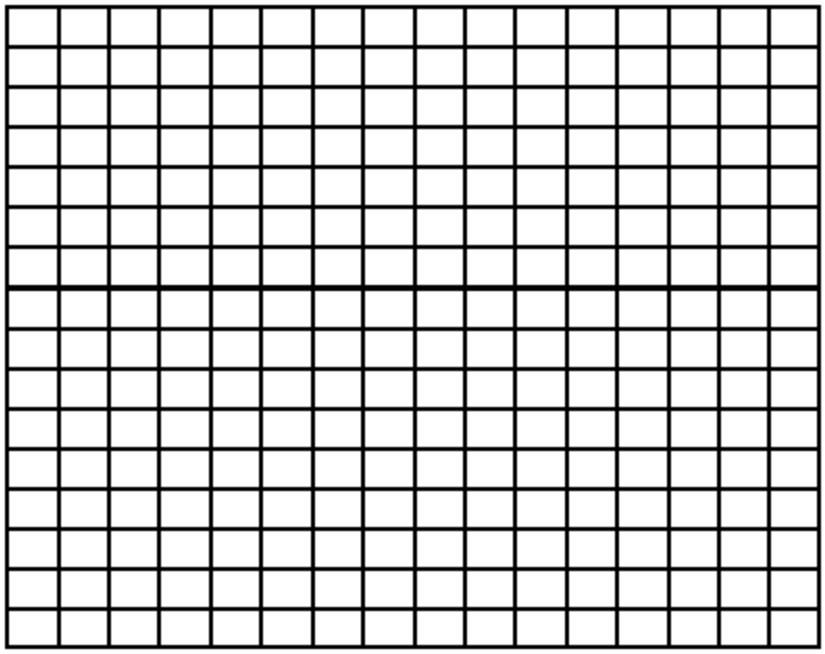
m. COMPLEXITY / FIRE MANAGEMENT AREA	n. FUEL LOADING FOR EMISSIONS			o. BENEFITTING PROGRAM
	SIZE CLASS OF FUELS	PRE-BURN LOADING TONS PER ACRE	CONSUMPTION PERCENT	
	Shrub/Herb	___._	___	
	0 - 1	___._	___	
	1.1 - 3.0	___._	___	
	3.1 - 9.0	___._	___	
	9+	___._	___	
	LITTER & DUFF (INCHES)	___._	___	

NARRATIVE - Enter information about the fire.

TITLE INFORMATION - (Mandatory)
Submitted by:
Submitted Title:
Submitted Date:
Entered by:
Entered Title:
Entered Date:

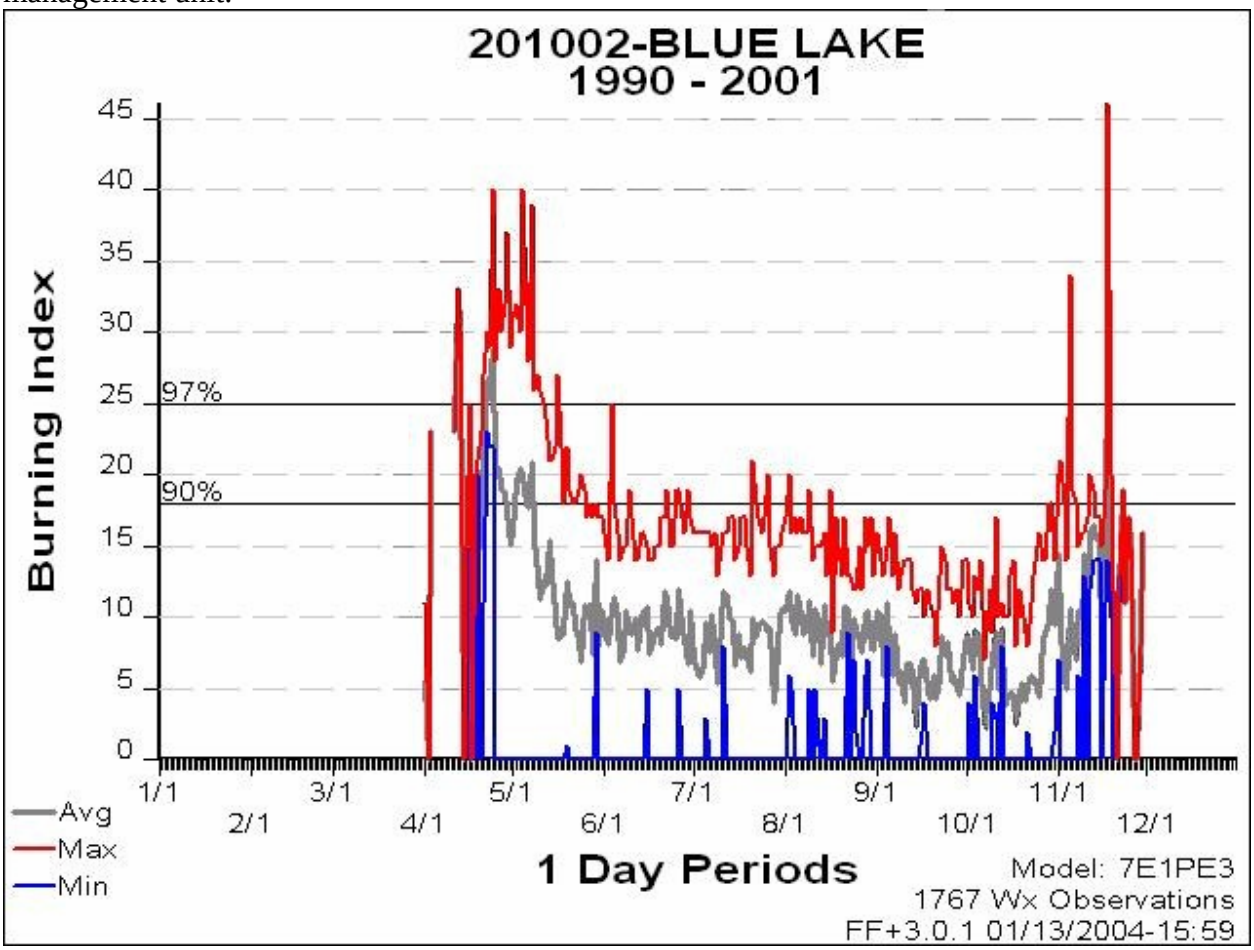
MAP: - (Optional)

LOCATION PLAT SCALE: " = 1 MILE



N. Graph of 10 Year High, Low and Average Burning Index

Blue Lake weather station 10 year high, low and average Burning Index for the lakeshore fire management unit.



USDA, Forest Service, Fire Family Plus (3.0)

XIV. ADDENDUM

A. Environmental Assessment

The companion environmental assessment for this FMP has been prepared in accordance with NEPA and ESA guidelines. The environmental assessment is located in lakeshore headquarters files.

B. Interagency Agreements

Current agreements for fire fighting activities with The State of Michigan, Hiawatha National Forest, and Seney National Wildlife Refuge are located in lakeshore headquarters files.

C. Fire Call-Up List

The current lakeshore call-up list of red-carded individual is located in lakeshore headquarters files.

D. Preparedness Inventory

The current list of inventories fire fighting equipment is located in lakeshore headquarters files.

E. Fire Monitoring Plan

No fire monitoring plan has been written due to the low occurrence and small size of fires, and no use of prescribed fire within the lakeshore. At such time the lakeshore decides to utilize prescribed fire a monitoring plan will be formalized.

F. Pre-Attack Plan

No pre-attack plan has been written due to the low occurrence and small size of wildfires and the initial attack responsibility of the different cooperating agencies.

G. Fire Prevention Plan

No prevention plan has been written due to the low occurrence and small size of wildfires.

H. Rental Equipment Agreements

No rental equipment agreements exist at this time.

I. Contract for Suppression and Prescribed Fire Resources

No contracts for suppression or prescribed fire resources exist at this time.

J. Burned Area Emergency Stabilization and Rehabilitation Plan

No burned area emergency stabilization and rehabilitation plan has been written due to the low occurrence and small size of wildfires.

K. Historic Fuels Treatment Map

No historic fuels treatment map exists as no treatments have occurred within the lakeshore. As treatments occur in the future, maps will be created and stored in lakeshore headquarters files.

L. Archeological and Historic Resources Sites Map

This information is sensitive and not available to the general public. It should, however, be available to fire planning and operations staff.

Prepared for Pictured Rocks National Lakeshore

National Park Service

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