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WILDLAND FIRE MANAGEMENT PLAN

PENDILLS CREEK
HIAWATHA FOREST
NATIONAL FISH HATCHERIES

GREAT LAKES-BIG RIVERS REGION

2002

JULY, 2002

WILDLAND FIRE MANAGEMENT PLAN

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HIAWATHA FOREST
NATIONAL FISH HATCHERIES

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INTRODUCTION

This plan will establish a combined Fire Management Plan (FMP) for Pendills Creek and Hiawatha Forest National Fish Hatcheries. As this plan is not generating new Federal actions that would affect the environment, it is deemed a categorical exclusion and requires no additional environmental documentation under the National Environmental Policy Act (NEPA). An informal Section 7 consultation will be conducted to ensure no adverse effects on Federally threatened or endangered (T&E) species. Based on past actions and associated reviews, sites subject to the National Historic Preservation Act (NHPA) are not likely present.

This plan is written as an operational guide for managing the hatchery's wildland fire program. It defines levels of protection needed to ensure safety, and protect facilities and resources, given current understanding of the complex relationships in natural ecosystems. It is written to comply with a service-wide requirement that units with burnable vegetation develop a fire management plan (620 DM 1).

This FMP outlines a program of full suppression of all wildland fires. There will be no prescribed fires or pile burning on the hatchery. Lands comprising the hatchery were originally acquired to protect the watersheds on three principal streams. This plan will provide guidance to wildland suppression agencies to protect hatchery water supplies while reducing the potential for fire related damage to the supporting watershed.

The hatchery complex has no personnel qualified for wildland fire suppression duties. Generally, the spring wildland fire season coincides with the most active part of the hatchery operational year. Suppression forces from the U.S. Forest Service (USFS) are responsible for suppression under an agreement with the Michigan Department of Natural Resources (MIDNR).

COMPLIANCE WITH USFWS POLICY

Land purchase of 85 acres for Pendills Creek National Fish Hatchery (NFH) was approved by an Act of Congress in 1949. The hatchery was established and construction begun in 1951. Under an agreement with the U.S. Forest Service (USFS) an additional 1,647 acres is under easement to protect the watershed of Pendills and Videan Creeks.

Hiawatha NFH was built by the Civilian Conservation Corps under the supervision of the USFS in 1936. In 1952, FWS and USFS signed a cooperative agreement that established land use of the present site and a protected water supply. The hatchery proper covers approximately 7 acres, additional acreage protects the watershed of Sullivan's Creek under the cooperative agreement with USFS.

Station development plans were prepared in 1986 for Hiawatha Forest and 1990 for Pendills Creek. The objectives listed in those plans include:

1. Increase fitness of stocked fish.
2. Optimize hatchery capability.
3. Improve stocking procedures.
4. Monitor contaminants.

This FMP supports objectives 1 and 2 by protecting the watershed values critical to successful hatchery operation.

Authority and guidance for implementing this plan are found in:

- Protection Act of September 20, 1922 (42 Stat. 857; 16 United States Code (U.S.C.) 594): authorizes the Secretary of the Interior to protect from fire, lands under the jurisdiction of the Department directly or in cooperation with other Federal agencies, states, or owners of timber.
- Economy Act of June 30, 1932: authorizes contracts for services with other Federal agencies.
- Reciprocal Fire Protection Act of May 27, 1955 (69 Stat. 66, 67; 42 U.S.C. 1856, 1856a and b): authorizes reciprocal fire protection agreements with any fire organization for mutual aid with or without reimbursement and allows for emergency assistance in the vicinity of agency lands in suppressing fires when no agreement exists.
- Disaster Relief Act of May 22, 1974 (88 Stat. 143; 42 U.S.C. 5121): authorizes Federal agencies to assist state and local governments during emergency or major disaster by direction of the President.
- Federal Fire Prevention and Control Act of October 29, 1974 (88 Stat. 1535; 15 U.S.C.2201): provides for reimbursement to state or local fire services for costs of firefighting on federal property.
- Wildfire Suppression Assistance Act of 1989. (P.L. 100-428, as amended by P.L. 101- 11, April 7, 1989).

- Departmental Manual (Interior), Part 620 DM, Chapter 1, Wildland Fire Management: General Policy and Procedures (April 10, 1998): defines Department of Interior fire management policies.
- Service Manual, Part 621, Fire Management (February 7, 2000): defines U.S. Fish and Wildlife Service fire management policies.
- National Environmental Policy Act of 1969: regulations implementing the National Environmental Policy Act (NEPA) encourages the combination of environmental comments with other agency documents to reduce duplication and paperwork (40 CFR 1500.4(o) and 1506.4).
- Clean Air Act (42 United State Code (USO) 7401 et seq.): requires states to attain and maintain the national ambient air quality standards adopted to protect health and welfare. This encourages states to implement smoke management programs to mitigate the public health and welfare impacts of Wildland and prescribed fires managed for resource benefit.
- Endangered Species Act of 1973.
- U.S. Fish & Wildlife Service Fire Management Handbook (2002).

This plan meets NEPA / NHPA compliance and will be implemented in coordination with the Endangered Species Act of 1973, as amended, under the section 7 programmatic review, and will take appropriate action to identify and protect from adverse fire effects any rare, threatened, or endangered species.

The authority for funding (normal fire year programming) and all emergency fire accounts is found in the following authorities:

> Section 102 of the General Provisions of the Department of Interior's annual Appropriations Bill provides the authority under which appropriated monies can be expended or transferred to fund expenditures arising from the emergency prevention and suppression of wildland fire.
>
> P.L. 101-121, Department of the Interior and Related Agencies Appropriation Act of 1990, established the funding mechanism for normal year expenditures of funds for fire management purposes.
>
> 31 U.S.C. 665(E)(1)(B) provides the authority to exceed appropriations due to wildland fire management activities involving the safety of human life and protection of property.

Authorities for procurement and administrative activities necessary to support wildland fire suppression missions are contained in the Interagency Incident Business Management Handbook.

FIRE MANAGEMENT OBJECTIVES

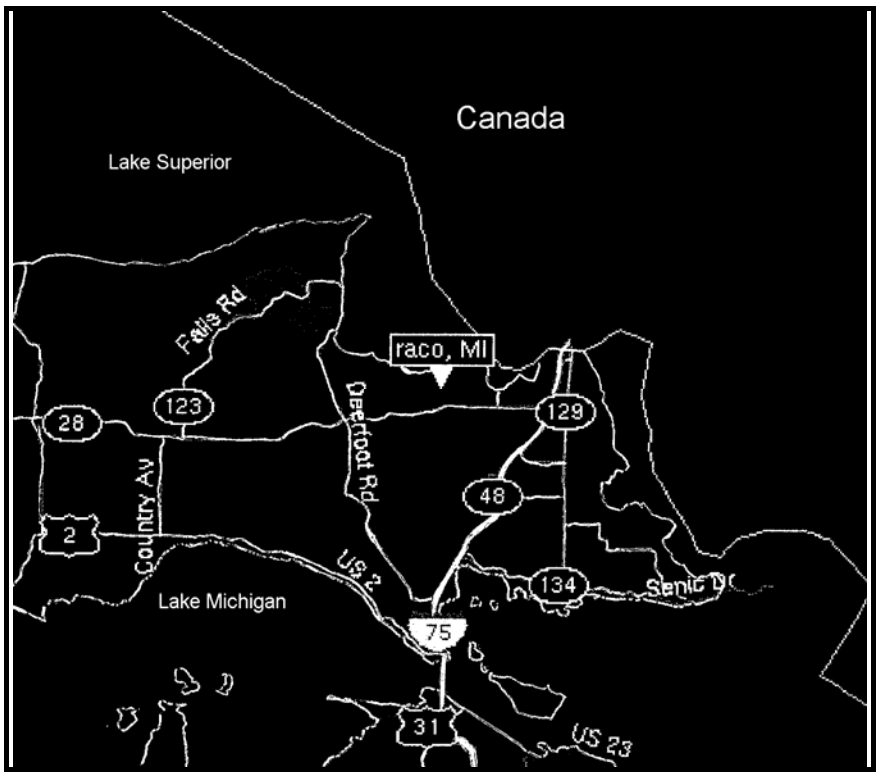
The overall objectives for fire management are to promote a program to ensure firefighter and public safety, aimed at reducing human-caused fires and to ensure appropriate suppression response capability to meet expected wildland fire complexity. Specific fire management objectives are:

- Promote a fire management program and control all wildland fires at less than 10 acres.
- Protect life, property, and resources from wildland fires at costs commensurate with resource values at risk, keeping losses to improvements and other property to less than $10,000 in any calendar year.
- Use appropriate suppression tactics and strategies that minimize long-term impacts of suppression actions, particularly related to water quality to avoid a reduction, caused by wildland fire, in hatchery production in any one year period.

DESCRIPTION OF HATCHERY

Pendills Creek: - This hatchery, located near Raco, MI, comprises 85 acres in Chippewa County, Michigan (Figures 1 and 2). An additional 1,647 acres are under easement from USFS to provide added watershed protection for Pendills and Videan Creeks. Shopping, schools and other municipal services are located about 18 miles east in Brimley, MI, or 30 miles east in Sault Ste. Marie, MI.

Hiawatha Forest - The hatchery covers only 7 acres and is located on an easement from USFS. Under the terms of the cooperative agreement allowing the use, additional acreage is involved to protect the watershed on Sullivan's Creek, the main hatchery water supply. Hiawatha Forest is located approximately 16 miles south of Pendills Creek.



Approximately 750,000 yearlings are stocked each year in Lakes Superior, Michigan and Huron. In addition, 12,000 broodstock are kept for egg and milt production.

Figure 1 - Location Map

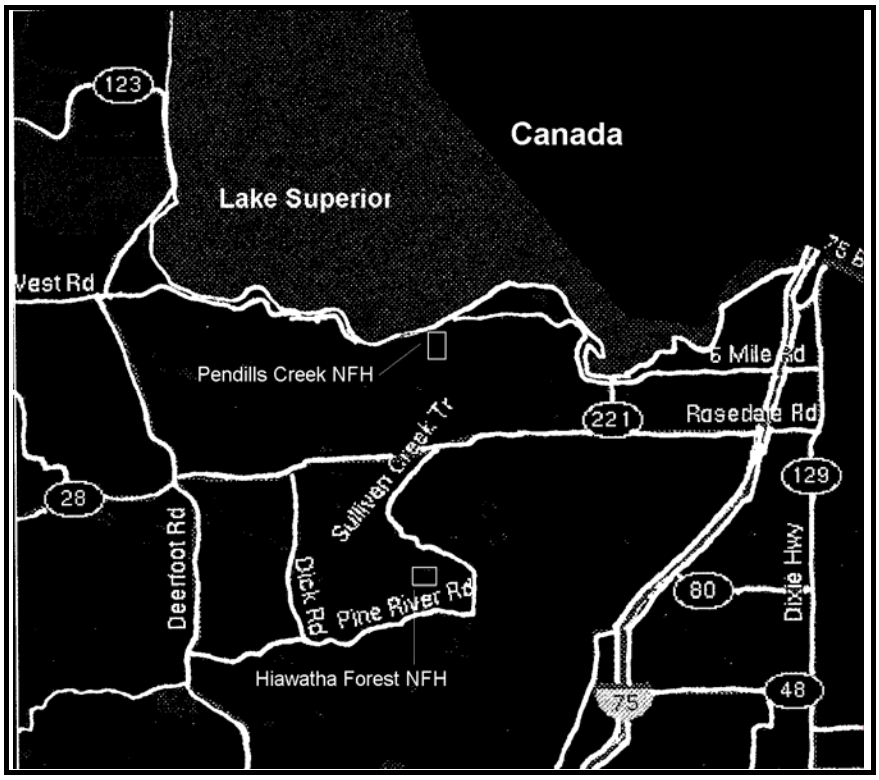


Figure 2 - Vicinity Map

CULTURAL RESOURCES

Information contained in the Public Use Management Plan (PUMP) from 1982 indicates that the only known historic sites on Pendills Creek were the foundations of the original Pendills Sawmill, dam and some residences. While no known prehistoric sites have been identified on the hatchery, there has been no archeological survey conducted. In the early 1980's USFS archeologists found a prehistoric site just outside the hatchery boundary.

No sites are known at Hiawatha Forest NFH. There is some potential to locate remnants of original construction from Civilian Conservation Corps days.

Sufficient construction has occurred since 1980 on both sites, that likely historic and prehistoric sites would have been identified and documented.

FISH AND WILDLIFE

There is no hunting allowed on either hatchery due to their small land area. However, hunting is allowed on the easement portion of Pendills under state regulations. Both Federal and state listed T&E or special emphasis species that could be found in the vicinity of the hatcheries are found in Tables 5-6 in Appendix F.

Beaver activity on water supply streams is quickly curtailed through trapping and demolition of the dam by hatchery or contracted personnel.

VEGETATION

Pendills Creek is almost entirely wooded with northern hardwood, pine, and swamp conifer forest. Wetter areas have stands that contain white spruce (*Picea glabra*), balsam fir (*Abies balsamea*), northern white cedar (*Thuja occidentalis*), and some birch (*Betula spp.*). More mesic sites support northern hardwoods such as sugar maple (*Acer saccharum*), red maple (*Acer rubrum*) and various oaks (*Quercus spp*.). Several areas are forested with white pine (*Pinus strobus*), red pine (*Pinus resinosa*), and jack pine (*Pinus banksiana*).

Hiawatha Forest is located in the area known locally as the Raco plains. Predominant species are jack pine, red and white pine with scattered spruce and balsam fir on wetter sites.

PHYSICAL RESOURCES

Geology/Soils - Geologically the area is typical of the glaciation found near Lake Superior resulting from the Wisconsin Ice Age. The soil is primarily made up of sand with mud pockets interspersed between the lake and the foothills. Some clay, sand. and other soils continue up the hill. Areas at the edge of the Raco Plains are dominated by sandy soil, some with associated organic soils in wetland areas.

The higher areas, according to the General Soil Map (2/8/73, Eastern Region Upper Peninsula, Resource Conservation and Development Project, Michigan) are characterized as part of the Shelldrake soil association.

Topography - Pendills Creek is in an area of gently rolling land on the south shore of Lake Superior. Behind the hatchery site to the south the terrain becomes steeper as it rises to the plain. The hatchery station is located on Pendills Bay, which is a sub-bay of much larger Whitefish Bay. Lake Superior elevation is charted at 600 feet; station elevation is 611 feet. Drainage is into Lake Superior

Hiawatha Forest is located on relatively flat terrain, broken by numerous drainages. The office/shop complex and residences are on a high, well drained flat area while the raceways and pollution control facilities are in the valley of Sullivan's Creek approximately 20-30 feet lower. Drainage is toward Lake Michigan.

Hydrology - Videan Creek is the main supply source for Pendills Creek. Pendills Creek proper is too cold in winter and too warm in summer to be used as a sole supply. As needed in spring and fall, water from Pendills is mixed with that of Videan to achieve the correct temperature for rearing. An intake structure on Videan Creek is located about 1,500 feet upstream from the hatchery. There is a similar structure on Pendills Creek. Water production averages 4,200 gallons per minute (gpm) in Videan Creek. Dry seasons can affect the flow, as noted in 1988 when the flow dropped to 3,200 gpm. In addition to the stream flows, two deep wells provide water for egg and fry production. Another well supplies domestic water to the office and residence area.

Sullivan's Creek, which supplies Hiawatha Forest, is spring fed with an average annual flow of 4,400 gpm. The watershed is well wooded, although the creek does carry a considerable silt load. Domestic water here is provided by two wells, one in the residence area and the other near the office.

Water quality is not expected to be affected by operations under this plan.

Air Quality - The area is rated as Class II air quality. This means that actions under this plan will be designed to prevent a significant deterioration in air quality.

Land Use - All surrounding lands at both hatcheries are owned and managed by the USFS, Hiawatha National Forest.

STRUCTURES AND FACILITIES

There are no adjoining private landowners. Protection of FWS facilities is the main consideration. Residence areas at both hatcheries are located adjacent to significant wildland fuels. Operational facilities tend to be in more open conditions.

Table 1 lists the structures on Pendills Creek that are subject to fire damage.

Table 1 - Pendills Creek Facilities

Facility	Value
Service Building	348,258

Facility	Value
Storage Building	24,799
Residence	147,713
Residence	147,713
Residence	147,713
Visitor Display	10,782
Storage Building	6,254
Hatchery Building/Office	1,484,681
Above Ground Fuel Storage	10,782
Raceway Covers	495,541
Total Value -Hatchery Structures	2,824,236

Table 2 lists the structures on Hiawatha Forest that are subject to fire damage.

Table 2 - Hiawatha Forest Facilities

Facility	Value
Service Building/Office	370,901
Residence	201,623
Residence	201,623
Gas & Oil Storage Building	21,564
Visitor Display	10,782
Finclipping & Storage Building	194,076
Generator Building	18,869
Above Ground Fuel Storage	8,626
Raceway Covers	242,595
Total Value - Hatchery Structures	1,270,659

WILDLAND FIRE MANAGEMENT SITUATION

HISTORIC ROLE OF FIRE

No unwanted wildland fires have been recorded over the last ten years. While it is likely that fire affected hatchery habitats in the past, generalizations based on knowledge of the silvicultural needs of the various forest tree species must be used.

Based on the historic fuel types, fire either from lightning or from anthropogenic sources would have affected the area of both facilities historically.

Pre-settlement fires

At Pendills Creek the pre-settlement forest probably consisted of the mixed northern hardwood-conifer type. A sawmill was active on the approximate site of the hatchery around prior to 1849 (PUMP, 1982) Information available indicates that the area probably had a significant white pine component. This would indicate a fairly long fire return interval, perhaps 200-400 years (Mladenoff et al, 1993). In addition, the hatchery site has a north aspect indicating a somewhat cooler, more moist, microclimate now supporting a large northern hardwood forest component with an expected long fire return interval.

At Hiawatha Forest the pre-settlement forest was likely pine with a large jack pine component. On more mesic sites, spruce, balsam fir and northern white cedar would be the expected fuels. On the sand plains with a large jack pine component, a fire return interval of 50-80 years would be likely. The drainages and more moist sites probably burned about every 150-200 years under drought conditions.

Post-settlement Fire History

Fire suppression or exclusion likely began when logging activities became prevalent in the area, about 1850. In the northern portions of the Lakes States fires frequently followed logging. Examples include the Pestigo, WI Fire (1871) and the Hinkley, MN Fire (1894). Many other fires are mentioned in numerous diaries and journals kept by the early European settlers. Attempts at farming frequently followed logging and fires from land clearing and slash burning were common.

The Upper Peninsula of Michigan typically has a split fire season. The first part is in the spring from the time snow disappears until vegetation has begun its growth (greenup). This part of the fire season (most active part) usually runs from late-April until early to mid-June. A fall season may follow the growing season. The first frost cures remaining fine fuels and this season often lasts until snow cover is on the ground. Growing season statistics for the area indicate a 139 day growing season on average. According to USFS fire personnel, the occurrence season runs from April 24 to November 21 (Jim Flores, personal communication, 2002).

Prescribed fire history

There has been no prescribed fire activity on either hatchery, although USFS prescribed fire operations have occurred within a couple of miles of Hiawatha Forest. There is no plan to conduct prescribed fire operations on either facility.

RESPONSIBILITIES

There is no fire management staff at Pendills Creek/Hiawatha Forest National Fish Hatcheries. The Project Leader is responsible for planning and implementing the fire management program on both facilities. A Zone Fire Management Officer (FMO) located at Leopold Wetland Management District, Portage, WI is responsible for fire management program oversight.

Pre-suppression planning and work is accomplished with resources and guidance provided by the Zone FMO. Emergency fire management actions will be handled by USFS as they have a legal responsibility for wildland fire suppression under an agreement with the MIDNR. The Zone FMO will be immediately notified of all emergency actions.

Project Leader (PL)

- Is responsible for implementation of all fire management activities within the unit and will ensure compliance with Department and Service policies.
- Selects the appropriate management responses to wildland fire.
- Identifies preparedness projects and biological objectives to Fire Management Officer (FMO) and notifies FMO of project constraints.
- Acts as the primary Hatchery Resource Management Specialist during fire management planning and operations.

Zone Fire Management Officer (FMO)

- Responsible for all fire-related planning and implementation for the Hatchery. Integrates biological objectives into all fire management planning and implementation.
- Solicits program input from the PL.
- Supervises preparedness project planning.
- Coordinates with cooperators to ensure adequate resources are available for fire operational needs.
- Is responsible for implementation of this Plan.
- Is responsible for preparation of fire reports following the suppression of wildland fires and for preparedness projects requiring such.
- Prepares an annual report detailing fire occurrences and preparedness activities undertaken in each calendar year. This report will serve as a past year's fire management activities review, as well as provide documentation for development of a comprehensive fire history record for the Hatchery.
- Submits budget requests and monitors FIREBASE funds.
- Maintains records for all personnel involved in suppression and preparedness activities, detailing the individual's qualifications and certifications for such activities.
- Updates all fire qualifications for entry into the Fire Management Information System.
- Nominates personnel to receive fire-related training, as appropriate.

Incident Commander

- Incident Commanders (of any level) use strategies and tactics as directed by the Project Leader and Wildland Fire Situation Analysis (WFSA), where applicable, to implement selected objectives on a particular incident. A specific Limited Delegation

of Authority (Appendix C) will be provided to each Incident Commander prior to assuming responsibility for an incident. Major duties of the Incident Commander are given in the National Wildfire Coordinating Group (NWCG) Fireline Handbook, including:

- Brief subordinates, direct their actions, and provide work tools.
- Ensure that safety standards identified in the Fire Orders, the Watch Out Situations, and agency policies are followed at all times.
- Personally scout and communicate with others to be knowledgeable of fire conditions, fire weather, tactical progress, safety concerns and hazards, condition of personnel, and needs for additional resources.
- Order resources to implement the management objectives for the fire.
- Inform appropriate dispatch of current situation and expected needs.
- Coordinate mobilization and demobilization with dispatch and the Collateral FMO.
- Perform administrative duties, i.e., approving work hours, completing fire reports for command period, maintaining property accountability, providing or obtaining medical treatment, and evaluating performance of subordinates.
- Assure aviation safety is maintained to the highest standards.

Initial attack modules
An initial attack module will not be assembled at this field station due to low fire occurrence and staff limitations.

Employees participating in any wildland fire activities on Fish and Wildlife Service or cooperators' lands will meet fitness requirements established in PMS 310-1, except where Service-specific fitness requirements apply.

INTERAGENCY COORDINATION
The USFS, Hiawatha National Forest, has primary responsibility for wildland fire suppression on hatchery lands under an agreement with the MIDNR. A table of cooperators and agreements is found below

Table 3 - Cooperator List

Cooperator	Agreement Type
MI Department of Natural Resources	None
U.S. Forest Service	None
Bay Mills VFD (Structure Protection)	None, Agreement with USFS
Brimley VFD	None, Agreement with USFS

Initial attack actions are the responsibility of the Hiawatha National Forest. USFS has signed agreements with each local fire department on the east end of the forest.

If needed, Pendills Creek and Hiawatha Forest NFH will use the Incident Command System (ICS) as a guide for fireline organization. Qualifications for individuals is per DOI Wildland Fire Qualifications and Certification System, part of NIIMS and the National Wildland Fire Coordination Group (NWCG) Prescribed Fire Qualification Guide.

PROTECTION OF SENSITIVE RESOURCES

A critical consideration during suppression operations is the use of foams or other retardants near water sources for the hatchery. Fish have been shown to be extremely sensitive to the presence of these agents (Gaikowski et al, 1996). An agreement with USFS to enumerate restrictions on retardant use within the hatchery watersheds is needed. Environmental guidelines for foam or retardant use, taken from a paper published by the Forest Service's Missoula Technology and Development Center, are found in Appendix K.

Water quality considerations should drive every facet of a wildland fire suppression operation on hatchery lands. Use of heavy equipment for fireline installation is restricted to those areas of the hatchery property downstream from the ponds and raceways.

It is unlikely that any wildlife resources will be affected more than temporarily by smoke and the flame front. Vegetation may be affected by fire; the effects will depend on fire intensity, rate of spread, condition of fuels and other factors.

Hatchery staff will be available to show critical areas that could be adversely affected by either fire or suppression operations, staff would act as resource advisor to the Incident Commander.

Preparation for prescribed fires such as constructing fire lines are subject to Section 106 of the National Historic Preservation Act. The procedures in the Notice dated December 8, 1999, "Historic Preservation Responsibilities," apply to the planning and preparation for conducting prescribed fires.

Efforts to control wildland fires (including prescribed fires that get out of control) are also subject to Section 106 of the National Historic Preservation Act. We will meet our obligations under this act in the following ways:

When the land covered by a wildfire has been inventoried to identify cultural resources, and the cultural resources have been evaluated for significance according to the criteria for the National Register of Historic Places, the Fire Management Officer will direct ground disturbing fire suppression efforts around (will avoid impacting) historic properties. Nevertheless, evidence of a previously undetected cultural resource may be encountered. The project leader shall immediately notify the Regional Historic Preservation Officer (RHPO). The RHPO will take immediate steps to have the cultural resource evaluated and protected, as appropriate, to the extent required by law and policy. This may require arranging for a qualified professional to visit and evaluate the site's importance and recommend a course of action. An evaluation and decision on the disposition of the cultural resource should be made within 48 hours of the discovery unless the project's schedule allows greater flexibility.

When the land covered by a wildfire has *not* been inventoried for cultural resources and wildfire suppression activities do result in ground disturbing activities, we will take the following action. Soon

after fire control, the project leader will contact the RHPO to arrange for an archeologist to investigate the disturbed areas to determine if sites were affected.

Hatchery operations and maintenance funds will pay the cost of these activities unless the action is an emergency archeological and historic property survey in unstable areas prone to further degradation (i.e., erosion) following a wildland fire or in association with an emergency fire rehabilitation treatment. Emergency archeological and historic property surveys in unstable areas prone to further degradation (i.e., erosion) following a wildland fire or in association with an emergency fire rehabilitation treatment, and archeological, historic structure, cultural landscape, and traditional cultural property resource stabilization and rehabilitation can be funded with emergency rehabilitation funding.

Impacts to archeological resources by fire vary. The four basic sources of damage are (1) fire intensity, (2) duration of heat, (3) heat penetration into soil, and (4) suppression actions. Of the four, the most significant threat is from equipment during line construction for wildland fire holding actions.

The following actions will be taken to protect archeological and cultural resources:

Wildland Fires

- Minimum impact fire suppression tactics will be used to the fullest extent possible.
- Foam use will be minimized in areas known to harbor surface artifacts.
- Resource Advisors will inform Fire Suppression personnel of any areas with cultural resources and should contact the Regional Historic Preservation Officer and/or his/her staff for more detailed information.
- Mechanized equipment should not be used in areas of known cultural significance.
- The location of any sites discovered as the result of fire management activities will be reported to the Regional Historic Preservation Officer.
- Rehabilitation plans will address cultural resources impacts and will be submitted to the Regional Historic Preservation Officer for review.

WILDLAND FIRE ACTIVITIES

Fire program management describes the operational procedures necessary to implement fire management at Pendills Creek/Hiawatha Forest NFH. Program management includes: fire prevention, preparedness, emergency preparedness, fire behavior predictions, step-up staffing plan, fire detection, fire suppression, minimum impact suppression, minimum impact rehabilitation, and documentation.

All fires will receive an appropriate management response. As this station has no fire history since start of acquisition, a full suppression response will be the usual practice.

Conversations with USFS fire personnel indicate an occurrence season that extends from April 24 to November 21 (Jim Flores, personal communication, 2002). This time span usually runs from last snow to first snow. Depending on the specific weather of any particular year the seasons may be shorter or longer and, therefore, may start earlier or last longer. During the occurrence season, USFS equipment and personnel are available for wildland fire response.

FIRE MANAGEMENT STRATEGIES

Although resource impacts of suppression alternatives must always be considered in selecting a fire management strategy, managing fire for resource benefit will not be a consideration. Appropriate suppression action will be taken to ensure firefighter safety, public safety, and protection of hatchery resources.

Critical protection areas, such as the headwaters and water intake areas for the hatchery will receive priority consideration in fire suppression planning efforts. In all cases, the primary concerns of fire suppression personnel shall be safety, and if needed, all individuals not involved in the suppression effort may be evacuated.

Suppression strategies should be applied so that the equipment and tools used to meet the desired objectives are those that inflict the least impacts upon the natural and cultural resources. Minimum impact suppression tactics (MIST) will be employed to protect all resources. Natural and artificial barriers will be used as much as possible for containment. When necessary, fire line construction will be conducted in such a way as to minimize long-term impacts to resources. Sites impacted by fire suppression activities or by the fire will be rehabilitated as necessary, based on an approved course of action for each incident.

Specific fire management strategies for Pendills Creek/Hiawatha Forest National Fish Hatcheries are:

- All wildland fires will be controlled using the appropriate suppression strategy which considers safety, property, natural resources, and economics.
- Priority will be given to the protection of hatchery water supplies and facilities for water collection.
- Mechanical treatment will be used to reduce hazardous fuels around structures and improvements as needed.
- Known cultural resource areas will be excluded from all fire management activities including fire line location, retardant drops, and adverse fire effects.

PREPAREDNESS

Preparedness is the work accomplished prior to fire occurrence to ensure that the appropriate response, as directed by the Fire Management Plan, can be carried out. Preparedness activities include: budget planning, equipment acquisition, equipment maintenance, dispatch (Initial attack, extended, and expanded), equipment inventory, personnel qualifications, and training. The preparedness objective is to have a well trained and equipped fire management organization to manage all fire situations within the hatcheries. Preparedness efforts are accomplished prior to normal fire season dates.

Historical weather analysis

The hatcheries have no weather station. Weather history (Figure 3) comes from National Oceanic and Atmospheric Administration (NOAA) records at Sault Ste. Marie, MI.

Figure 3 - Sault Ste. Marie, MI Climatology

The growing season extends for approximately 139 days. With the location of Pendills Creek on a north slope and at the edge of Lake Superior, hatchery temperature extremes and averages are likely to be moderated. The data from Sault Ste. Marie would be expected to more closely reflect actual conditions at Hiawatha Forest.

There is no occurrence data for either hatchery as no wildland fires have been reported in the last ten years and none are suspected in the last twenty years.

Fire Prevention
An active fire prevention program will be conducted, as needed, in conjunction with USFS to protect human life and property, and prevent damage to cultural resources or physical facilities.

A program of internal and external education regarding potential fire danger may be implemented. Visitor contacts, bulletin board materials, handouts and interpretive programs can be utilized to increase visitor and neighbor awareness of fire hazards.

During periods of extreme or prolonged fire danger emergency restrictions regarding hatchery operations, or area closures may become necessary. Such restrictions, when imposed, will be consistent with those implemented by USFS.

Hazard Reduction for Structure Protection
Hazard reduction is conducted to prevent wildland fires from spreading to structures owned by the FWS. Because most structures subject to fire damage are located in the open, mowed portions of the facilities, little protection is necessary. Defensibility is good to excellent for operational buildings and facilities. On both hatcheries, the residences are at some risk. Clear areas should be maintained at least 30 feet vertically and horizontally from the residences or associated outbuildings. This is particularly critical at Hiawatha Forest where structural protection is at least 45 minutes away and wildfire risk is exacerbated by the types of fuels around the hatchery.

Staffing Priority Levels
As no weather station is present and there is no suppression capability on staff, a limited Step-up Plan for prevention actions (Appendix H) has been developed.

It is expected that during periods of extreme fire danger as determined by USFS, visitors would be warned of the risk of fire and access to portions of the hatcheries beyond the raceways would be restricted.

Training

Departmental policy requires that all personnel engaged in suppression and prescribed fire duties meet the standards set by the National Wildfire Coordinating Group (NWCG). The hatchery complex will conform strictly to the requirements of the wildland fire management qualification and certification system and USFWS guidelines.

Basic wildland fire training refreshers are offered annually for red-carded firefighters and records are kept in a centralized database. Additional training is available from surrounding agencies in pump and engine operation, power saws, firefighter safety, fire weather and fire behavior, and helicopter safety. On-the job training is encouraged and will be conducted at the field level. Whenever appropriate, the use of fire qualification task books will be used to document fire experience of trainees. The FMO will coordinate fire training needs with those of other nearby FWS units, cooperating agencies, and the RO.

Fire suppression is an arduous duty. Poor physical condition of crew members can endanger safety and lives during critical situations. Personnel performing fire management duties will maintain a high level of physical fitness. This requires successful completion of a fitness pack test. Appendix J contains a brief explanation of the physical testing requirements.

Supplies and Equipment

There are no suppression tools or equipment on the hatchery except those handtools usually available (shovels, rakes, etc.) for grounds maintenance. As no one on the hatchery is trained for fire operations none of the personnel are equipped with Personal Protective Equipment.

DETECTION

Fires located by hatchery staff would be reported to USFS in Sault Ste. Marie. Fires detected by visitors would be reported in the same manner. As needed, USFS may have aerial detection flights.

The Fire Management Plan does not discriminate between human-caused and lightning-caused fire. All wildland fires will be suppressed. However, detection shall include a determination of fire cause. Moreover, human-caused fires will require an investigation and report by law enforcement personnel. For serious human-caused fires, including those involving loss of life, a qualified arson investigator will be requested. Qualified investigators are available from USFS.

COMMUNICATIONS

The hatchery has no land based radio system. Several distribution vehicles have radios capable of vehicle to vehicle contact, none of these radios is adequate for fire use. Cellular phone coverage around the hatchery is poor. Communications would be expected to be provided by the responding agency.

PRE-ATTACK PLAN

Upon discovery of a fire, all subsequent actions will be based on the following:

- The Incident Commander (IC) will:
  - Locate, size-up, and coordinate suppression actions.
  - Provide for public safety.
  - Considering the current and predicted fire conditions, the Incident Commander will assess the need for additional suppression resources and estimate the final size of the fire. The potential for spread outside of the hatchery should be

predicted, as well as the total suppression force required to initiate effective containment action at the beginning of each burning period.
- The Incident Commander will assess the need for law enforcement personnel for traffic control, investigations, evacuations, etc. and make the request to the FMO.
- Document decisions and complete the fire report (DI-1202).

- Should a wildland fire move into an extended attack a Delegation of Authority will be invoked. Once a Delegation of Authority has been authorized the Incident Commander will make the final decisions pertaining to the fire. A sample of a limited Delegation of Authority is in Appendix C.

FIRE MANAGEMENT UNITS

There are two Fire Management Units (FMU) on the complex. Each FMU fully encompasses a hatchery.

Due to staff limitations, relatively small land area, long response times, valuable resources, and values at risk on neighboring lands, neither Pendills Creek FMU nor Hiawatha Forest FMU will have wildland fire managed for resource benefit as a management option. Wildland fires will be suppressed using the appropriate management response.

Fire Effects

Pendills Creek - Fire effects are expected to be limited due to the mostly moist conditions found on the hatchery. Effects on forest vegetation are not expected to be severe unless significant drought conditions are present. Areas that are grass covered would recover within a growing season or less depending on the time of fire occurrence.

Effects of fire on wildlife may be divided into two categories. Large mammals are not likely to be affected as they are highly mobile and most fires in the area would be expected to be relatively slow moving (Craven, 1985). Smaller mammals and reptiles may be more subject to fire because of limited mobility. Most reptiles and amphibians would be in wetter areas or burrows where temperatures are cooler. Effects on small mammals would be more pronounced in grass fuels and in the ecotone between grass and forest or brush fuels where escape is difficult (Kelleyhouse, 1979). Small mammals usually have high reproductive rates and, with regeneration of their normal habitat, will usually recover within two or three years (Schramm et al, 1983).

Hiawatha Forest - Due to the small size of the hatchery, effects on forest vegetation could be significant. The primary concern is disturbance of the watershed upstream of the intake works. As Sullivan's Creek already carries some silt, serious disturbance of the watershed could have significant and long lasting effects on hatchery water supplies.

Again, due to the small area involved, effects on mammals, especially large mammals should be negligible.

Fuel Types

Northern Hardwoods - this type is best represented by Northen Forest Fire Laboratory (NFFL) fuel models 8 and 10. This fuel covers most of the hatchery property and consists of litter and understory growth with a 65 to 90 % crown closure. Species found in this fuel complex include

aspen, red maple, red oak and others requiring mesic sites. Most of Pendills Creek would be represented by this fuel complex.

Pine - this type is best represented by NFFL fuel model 8. Most of this type is found on the Hiawatha Forest site. Jack pine predominates with lesser amounts of red pine, white pine, spruce and balsam fir. Scattered oak brush and aspen contributes to the fuel complex.

Lowland brush - both sites have minor areas of lowland brush represented best by fuel model 5. Species present include Alder (*Alnus spp*.) and willows (*Salix spp*.).

Fire Behavior

Normal fire behavior in the northern hardwood fuels on the hatchery would be slow moving with minimal (1-2') flame lengths. Areas with a high percentage of pine would be expected to burn somewhat faster, with subsequently longer flame length and more heat output. Under normal conditions, the brush areas would see some creeping fire on higher areas, otherwise the type is normally wet enough to not support fire.

Extreme fire behavior in the hardwood areas would see flame lengths of 2-4 feet with potentially rapid spread depending on the season and condition of the litter layer. During dry fall conditions with cured fuels, flame lengths could run to 6+ feet with rates of spread and fireline intensity high enough to require indirect attack. The areas with a high percentage of pine could see flame lengths of 4-6' with the potential of crown fire development.

SUPPRESSION TACTICS

Suppression involves a wide range of possible tactics from the initial attack to final control. To this end, all wildland fires will be suppressed in a safe, aggressive, and cost-effective manner to produce efficient action with minimal resource damage and limit smoke impacts to local communities.

Typical initial attacks will include engines. At higher Forest Service staffing classes a dozer or tractor plow with additional personnel would dispatched as well. All fires will be assessed by the first on-scene incident commander and attacked using minimum impact fire suppression tactics for the hatchery. Roads and natural barriers will be used as much as possible to reduce fireline construction. Fireline and mop-up through riparian areas should consider long-term damage to water quality and vegetation. Unnecessary cutting and bucking should be replaced with alternative actions whenever possible. Back-fires and burnout operations should consider head fire intensities and attempt to avoid heating the soil or running fire into riparian areas. Where wildland fires cross roads, the burned area adjacent to the road should be mopped up and dangerous snags felled.

Foam and/or retardant use on the hatchery will be restricted due to sensitivity of fish populations to these chemicals. No foam or retardant will be used within 200 feet of watercourses supplying the hatchery nor within 400 feet of raceways and rearing ponds.

In addition to consultation with the Project Leader or their representative, a resource advisor should be assigned to the incident from the beginning to document rehabilitation needs, and also assist with on-the-ground tactical decisions.

There will be only one Incident Commander responsible to the project leader. The Incident Commander will designate all overhead positions on fires requiring extended attack. Reference should be made to a Limited Delegation of Authority (Appendix C).

Suppression Conditions

A full suppression alternative was selected for the complex which requires containment and control of all wildland fires. Certain guidelines have been developed to assist with this strategy to protect the hatchery from unnecessary damage. Heavy equipment and aircraft/retardant use is restricted due to cultural, wildlife, and safety concerns. Unless life or property is at imminent risk, consultation with the hatchery manager or their representative prior to their use is necessary. This decision is based on the fact that water quality to supply the hatcheries is critical to both hatchery operations and restoration of lake trout stocks. At an Annual Operating Plan Review, issues of restrictions should be discussed with cooperators. Changes and areas of concerns should be documented.

Wildland Fire Situation Analysis

For fires that cannot be contained in one burning period, a WFSA must be prepared. In the case of a wildland fire, the Project Leader, in conjunction with the Incident Commander, will prepare the WFSA. Approval of the WFSA resides with the Project Leader. The small size of each unit indicates that a WFSA would rarely be required.

The purpose of the WFSA is to allow consideration of alternatives by which a fire may be controlled. Damages from the fire, suppression costs, safety, and the probable character of suppression actions are all important considerations.

Public safety will require coordination between all hatchery staff and the IC. Notices should be posted to warn visitors, trails may be closed, traffic control will be necessary where smoke crosses roads, etc. Where wildland fires cross roads, the burned area adjacent to the road should be mopped up and dangerous snags felled. Every attempt will be made to utilize natural and pre-constructed barriers, including changing fuel complexes, in the control of wildland fire. Rehabilitation efforts will concentrate on the damages done by suppression activities rather than on the burned area itself.

Aircraft Operations

Aircraft may be used in all phases of fire management operations. All aircraft must be Office of Aircraft Services (OAS) or Forest Service approved. An OAS Aviation Policy Department Manual may be obtained from OAS.

Helicopters may be used for reconnaissance, bucket drops and transportation of personnel and equipment. Natural helispots and parking lots are readily available in most cases. New helispot construction will be avoided.

As in all fire management activities, safety is a primary consideration. Qualified aviation personnel will be assigned to all flight operations.

REHABILITATION AND RESTORATION

There are 3 types of fire rehabilitation, Suppression, Burn Area, and Emergency Stabilization. Suppression rehabilitation is to restore and repair property and resources from direct suppression activity damage, i.e. cut fences, dozer lines, and campsites. Burn area

rehabilitation and stabilization is to restore resources and property damaged or otherwise impacted from the fire, i.e. burned waterlines, denuded hill sides, etc.

Suppression Rehabilitation
In the event of a wildland fire, rehabilitation of fire suppression damage should be accomplished immediately. An appropriate time is within 7 days after the fire is controlled unless the regional fire coordinator grants an extension. Funding for suppression rehabilitation is from the specific fire cost account as established by the FMO. The Incident Commander as agreed to by the Project Leader will initiate suppression rehabilitation. Rehabilitation will be directed toward minimizing or eliminating the effects of the suppression effort and reducing the potential hazards caused by the fire. These actions may include:

- Backfill control lines, scarify, and seed*.
- Install water bars and construct drain dips on control lines to prevent erosion.
- Restore natural ground contours, which were altered.
- Remove all flagging, equipment and litter.
- Completely restore camping areas and improved helispots.
- Re-vegetation to restore sensitive impacted areas due to suppression actions*.

*If re-vegetation or seeding is necessary, only locally procured seeds of native plant species will be used.

A written suppression rehabilitation plan may be appropriate on larger incidents. Contractors or equipment may be hired to accomplish specialized work.

Emergency Stabilization Versus Rehabilitation
Emergency stabilization is the use of appropriate emergency stabilization techniques in order to protect public safety and stabilize and prevent further degradation of cultural and natural resources in the perimeter of the burned area and downstream impact areas from erosion and invasion of undesirable species. Rehabilitation is the use of appropriate rehabilitation techniques to improve natural resources as stipulated in approved hatchery management plans and the repair or replacement of minor facilities damaged by the fire.

Total "rehabilitation" of a burned area is not within the scope of the Emergency Rehabilitation funding. Emergency Rehabilitation funding can be used to begin the rehabilitation process if other funding is committed to continue the rehabilitation throughout the life of the project (beyond the initial 3 years of Emergency Rehabilitation funding). Major facilities are repaired or replaced through supplemental appropriations of other funding.

Burned Area Emergency Stabilization and Rehabilitation (ESR) Plan
The goal of the ESR Plan is to protect public safety and stabilize and prevent further degradation of natural and cultural resources, and to rehabilitate the stability, productivity, diversity, and ecological integrity of hatchery lands after a wildland fire as described in approved hatchery management plans. The ESR Plan is tiered to the hatchery Development Plan and Fire Management Plan. Development of ESR Plan objectives is guided by resource management objectives, general management practices, and constraints identified in approved plans.

If Burned Area Emergency Stabilization and Rehabilitation is required to reduce the effects of a wildland fire, then the hatchery should request appropriate funding through the Burned Area Emergency Stabilization and Rehabilitation (ESR) fund. The Service representative at the National Interagency Fire Center administers the ESR fund. A rehabilitation and restoration survey, plan, and request must be prepared and submitted according to agency guidelines. Smaller incidents may only need simple plans prepared by local staff. Larger incidents with extensive rehabilitation efforts should employ a ESR Team. A ESR Team is composed of personnel who specialize in key disciplines of resource management and are experts in ESR Plan preparation. A formal request for a ESR Team should be made in consultation with the Incident Management Team as soon as it appears damage may be significant. Instructions for ESR Team mobilization can be found in the National Wildfire Coordinating Group mobilization guide. Delays in making a request may hinder funding approval and magnify the damage. Once a ESR Team is employed, the Project Leader or their representative should provide guidance to the ESR team leader with expectations. The Project Leader and FMO will review all ESR Plans. The final plan will be submitted to the Region for review prior to submission to the WO. Direction on ESR guidelines can be found in the Interagency Burned Area Emergency Stabilization and Rehabilitation Handbook.

REQUIRED REPORTING

The IC will be responsible for documenting decisions and providing information to the Project Leader to complete the fire report (DI-1202). The FMO will be responsible for any additional required reports.

FIRE INVESTIGATION

Fire management personnel will attempt to locate and protect the probable point of origin and record pertinent information required to determine fire cause. They will be alert for possible evidence, protect the scene and report findings to the fireline supervisor.

Prompt and efficient investigation of all suspicious fires will be carried out. However, fire management personnel should not question suspects or pursue the fire investigation unless they meet requirements for federal investigators. All fire investigations should follow the guidelines outlined in 4.1-2 of the Fire Management Handbook (2002).

FIRE RESEARCH

No fire related research is occurring on the hatchery and none is planned.

PUBLIC SAFETY

Pendills Creek and Hiawatha Forest National Fish Hatcheries are dedicated to ensuring the safety of each visitor and to all hatchery residents. Access to areas outside the raceways may be closed. Access to both hatcheries does occur along public roads. If necessary, signs could be posted along the boundary on public roads, however, there is not staff enough to supervise any closure of that nature.

Areas of fire activity will be clearly displayed at visitor contact points.

A contact list for hatchery residents is found in the Dispatch Plan in Appendix E.

Local police, fire, and emergency medical services will be notified of any wildland fires.

PUBLIC INFORMATION AND EDUCATION

The public information program will be developed as follows:

- The fire management program may be incorporated into visitor contacts. 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 and cooperating agencies and the regional office will be provided with all fire management information.
- The fire management program will be discussed in informal talks with all employees and volunteers.

During wildland fire events, on-site information will be provided to alleviate visitor concern about the apparent destruction of resources by fire or the impairment of views due to temporary smoke impacts.

As outlined in the prevention section, emergency closures or restrictions may become necessary during periods of extreme or extended fire danger.

FIRE CRITIQUES AND ANNUAL PLAN REVIEW

FIRE CRITIQUES

Fire reviews will be documented and filed with the final fire report. The FMO will retain a copy for the hatchery files.

ANNUAL FIRE SUMMARY REPORT

The FMO will be responsible for completing an annual fire summary report. The report will contain the number of fires by type, acres burned by fuel type, cost summary, personnel utilized, and fire effects.

ANNUAL FIRE MANAGEMENT PLAN REVIEW

The Fire Management Plan will be reviewed annually. Necessary updates or changes will be accomplished prior to the next fire season. Any additions, deletions, or changes will be reviewed by the Project Leader to determine if such alterations warrant a re-approval of the plan.

CONSULTATION AND COORDINATION

The following agencies, organizations and/or individuals were consulted in preparing this plan.

Flores, Jim, Fire Staff, Supervisor's Office, Hiawatha National Forest
Gale, Cal, Program Analyst, RS Staffing, Inc.
LeGault, Crystal, Project Leader, Hiawatha Forest National Fish Hatchery
Maciak, John, Fire Staff, St. Ignace Ranger District, Hiawatha National Forest
Wiley, Don, Administrative Technician, Pendills Creek National Fish Hatchery

APPENDICES

APPENDIX A: REFERENCES CITED

Craven, S. 1985. Wisconsin woodlands: Wildlife management. University of Wisconsin-Extension, Department of Agricultural Journalism, University of Wisconsin- Madison. Publication No. G3097.

Gaikowski, Mark P., Steven J. Hamilton, Kevin J. Buhl, Susan F. McDonald, and Cliff Summers. 1996. Acute toxicity of firefighting chemical formulations to four life stages of fathead minnow. Ecotoxicolog and Environmental Safety. 34(0070):252-263. Northern Prairie Wildlife Research Center Home Page.
http://www.npwrc.usgs.gov/resource/othrdata/fireweb/fathminn/fathminn.htm (Version 02MAR98).

Gullion, G. W .1984. Managing northern forests for wildlife. Publication No.13,442, Miscellaneous Journal Series, Minnesota Agricultural Experiment Station, St. Paul, Minnesota.

Kelleyhouse, David G. 1979. Fire/wildlife relationships in Alaska. In: Hoefs, M.; Russell, D., eds. Wildlife and wildfire: Proceedings of workshop; 1979 November 27-28; Whitehorse, YT. Whitehorse, YT: Yukon Wildlife Branch: 1-36.

Mladenoff, D. I., and I. Pastor. 1993. Sustainable forest ecosystems in the northern hardwood and conifer forest region: concepts and management. Pages 145-180 m H.A. Aplet, et al. eds. Defining sustainable forestry. The Wilderness Society, Island Press, Washington D.C.

Schramm, Peter; Willcutts, Brian J. 1983. Habitat selection of small mammals in burned and unburned tallgrass prairie. In: Brewer, Richard, ed. Proceedings, 8th North American prairie conference; 1982 August 1-4; Kalamazoo, MI. Kalamazoo, MI: Western Michigan University, Department of Biology: 49-55.

USDA-USDI. 2002. Interagency Burned Area Emergency Stabilization and Rehabilitation Handbook. 151 pp.

USFS. Missoula Technology and Development Center. 1999.Wildland Fire Chemical Products, Toxicity and Environmental Issues and Concerns.

USFWS. Hiawatha Forest NFH Station Development Plan. 1986

USFWS. Pendills Creek NFH Station Development Plan. 1990.

USFWS. Pendills Creek NFH Public Use Management Plan (PUMP). 1982.

USFWS. Fire Management Handbook. 2002.

APPENDIX B: DEFINITIONS

Agency Administrator. The appropriate level manager having organizational responsibility for management of an administrative unit. May include Director, State Director, District Manager or Field Manager (BLM); Director, Regional Director, Complex Manager or Project Leader (FWS); Director, Regional Director, Park Superintendent, or Unit Manager (NPS), or Director, Office of Trust Responsibility, Area Director, or Superintendent (BIA).

Appropriate Management Action. Specific actions taken to implement a management strategy.

Appropriate Management Response. Specific actions taken in response to a wildland fire to implement protection and fire use objectives.

Appropriate Management Strategy. A plan or direction selected by an agency administrator which guide wildland fire management actions intended to meet protection and fire use objectives.

Appropriate Suppression. Selecting and implementing a prudent suppression option to avoid unacceptable impacts and provide for cost-effective action.

Bureau. Bureaus, offices or services of the Department.

Class of Fire (as to size of wildland fires):

Class A - ¾ acre or less.

Class B - more than ¾ but less than 10 acres.
Class C - 10 acres to 100 acres.
Class D - 100 to 300 acres.
Class E - 300 to 1,000 acres.
Class F - 1,000 to 5,000 acres.
Class G - 5,000 acres or more.

Emergency Fire Rehabilitation/Burned Area Emergency Rehabilitation (EFR/BAER). Emergency actions taken during or after wildland fire to stabilize and prevent unacceptable resource degradation or to minimize threats to life or property resulting from the fire. The scope of EFR/BAER projects are unplanned and unpredictable requiring funding on short notice.

Energy Release Component (ERC) A number related to the available energy (BTU) per unit area (square foot) within the flaming front at the head of a fire. It is generated by the National Fire Danger Rating System, a computer model of fire weather and its effect on fuels. The ERC incorporates thousand hour dead fuel moistures and live fuel moistures; day to day variations are caused by changes in the moisture content of the various fuel classes. The ERC is derived from predictions of (1) the rate of heat release per unit area during flaming combustion and (2) the duration of flaming.

Extended attack. A fire on which initial attack forces are reinforced by additional forces.

Fire Suppression Activity Damage. The damage to lands, resources and facilities directly attributable to the fire suppression effort or activities, including: dozer lines, camps and staging areas, facilities (fences, buildings, bridges, etc.), handlines, and roads.

Fire effects. Any consequences to the vegetation or the environment resulting from fire, whether neutral, detrimental, or beneficial.

Fire intensity. The amount of heat produced by a fire. Usually compared by reference to the length of the flames.

Fire management. All activities related to the prudent management of people and equipment to prevent or suppress wildland fire and to use fire under prescribed conditions to achieve land and resource management objectives.

Fire Management Plan. A strategic plan that defines a program to manage wildland and prescribed fires and documents the Fire Management Program in the approved land use plan. The plan is supplemented by operational procedures such as preparedness plans, preplanned dispatch plans, prescribed fire plans and prevention plans.

Fire prescription. A written direction for the use of fire to treat a specific piece of land, including limits and conditions of temperature, humidity, wind direction and speed, fuel moisture, soil moisture, etc., under which a fire will be allowed to burn, generally expressed as acceptable range of the various fire-related indices, and the limit of the area to be burned.

Fuels. Materials that are burned in a fire; primarily grass, surface litter, duff, logs, stumps, brush, foliage, and live trees.

Fuel loadings. Amount of burnable fuel on a site, usually given as tons/acre.

Hazard fuels. Those vegetative fuels which, when ignited, threaten public safety, structures and facilities, cultural resources, natural resources, natural processes, or to permit the spread of wildland fires across administrative boundaries except as authorized by agreement.

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

Maintenance burn. A fire set by agency personnel to remove debris; i.e., leaves from drainage ditches or cuttings from tree pruning. Such a fire does not have a resource management objective.

Natural fire. A fire of natural origin, caused by lightning or volcanic activity.

NFDRS Fuel Model. One of 20 mathematical models used by the National Fire Danger Rating System to predict fire danger. The models were developed by the US Forest Service and are general in nature rather than site specific.

NFFL Fuel Model. One of 13 mathematical models used to predict fire behavior within the conditions of their validity. The models were developed by US Forest Service personnel at the Northern Forest Fire Laboratory, Missoula, Montana.

Prescription. Measurable criteria which guide selection of appropriate management response and actions. Prescription criteria may include safety, public health, environmental, geographic, administrative, social, or legal considerations.

Prescribed Fire. A fire ignited by agency personnel in accord with an approved plan and under prescribed conditions, designed to achieve measurable resource management objectives. Such a fire is designed to produce the intensities and rates of spread needed to achieve one or more planned benefits to natural resources as defined in objectives. Its purpose is to employ fire scientifically to realize maximize net benefits at minimum impact and acceptable cost. A written, approved prescribed fire plan must exist and NEPA requirements must be met prior to ignition. NEPA requirements can be met at the land use or fire management planning level.

Preparedness. Actions taken seasonally in preparation to suppress wildland fires, consisting of hiring and training personnel, making ready vehicles, equipment, and facilities, acquiring supplies, and updating agreements and contracts.

Prevention Activities directed at reducing the number or the intensity of fires that occur, primarily by reducing the risk of human-caused fires.

Rehabilitation (1) Actions to limit the adverse effects of suppression on soils, watershed, or other values, or (2) actions to mitigate adverse effects of a wildland fire on the vegetation-soil complex, watershed, and other damages.

Suppression. A management action intended to protect identified values from a fire, extinguish a fire, or alter a fire's direction of spread.

Unplanned ignition. A natural fire that is permitted to burn under specific conditions, in certain locations, to achieve defined resource objectives.

Wildfire. An unwanted wildland fire.

Wildland Fire. Any non-structure fire, other than prescribed fire, that occurs in the wildland.

Wildland Fire Situation Analysis (WFSA). A decision-making process that evaluates alternative management strategies against selected safety, environmental, social, economical, political, and resource management objectives as selection criteria.

Wildland/urban interface fire A wildland fire that threatens or involves structures.

APPENDIX C: SAMPLE DELEGATION OF AUTHORITY

Pendills Creek National Fish Hatchery
Brimley, MI

Limited Delegation of Authority

As of 1800, May 20, 2001, I have delegated authority to manage the TT473 fire, number 3102, Pendills Creek National Fish Hatchery, to Incident Commander, John Doe and his Incident Management Team.

The fire which originated as an arson fire on May 18, 2001, is burning in habitat adjacent to the hatchery boundary. My considerations for management of this fire are:

1. Provide for firefighter safety.

2. I would like the fire managed in such a manner that suppression actions will cause little environmental damage as possible.

3. Key features requiring priority protection are: the watershed of the hatchery water supply.

4. Key resource considerations are: protecting water quality of Pendills and Videan Creeks.

5. Restrictions for suppression actions are no tracked vehicles in the area of the creeks; no foam or retardents use within 200 feet of the creeks or within 400 feet of raceways and rearing ponds.

6. Minimum tools for use are Type II/III helicopters, and chainsaws.

7. My agency advisor will be hatchery biologist, Tracy Walters.

8. Managing the fire cost-effectively for the values at risk is a significant concern.

_____

Crystal LeGault
Project Leader, Pendills Creek National Fish Hatchery
May 20, 2001

APPENDIX D: NEPA DOCUMENTATION

This plan does not support any activities that would constitute a new Federal action. It only documents the current situation which has been in existence since 1951. It is eligible for Categorical Exclusion status and this is reflected in the Finding of No Significant Impact.

APPENDIX E: ANNUAL UPDATE DOCUMENTS

Cache Equipment Inventory

No cache or fire equipment on station.

APPENDIX E: CONTINUED

Cooperator Contacts

Table 4 - Cooperator Contact List

Name	Phone Number
Hiawatha National Forest (Soo R.D.)	(906) 635-5311
Hiawatha National Forest (St. Ignace R.D.)	(906) 643-7900
Hiawatha National Forest (Raco Work Center)	(906) 248-3431

APPENDIX E: CONTINUED

Cooperative Agreements

No cooperative agreements currently in force.

APPENDIX E: CONTINUED

Wildland Fire Dispatch Plan

Pendills Creek/Hiawatha Forest National Fish Hatchery
Dispatch Plan

When report of smoke or fire is received get as much information as possible from the caller. The following list should be filled in.

Location of smoke or fire:

Location of caller:

Name and telephone number of caller:

Color of smoke:

Size of fire:

Type of Fuel:

Character of fire (running, creeping, etc.):

Anyone on the fire:

See anyone in the area or vehicles leaving the area:

1. *Check map location*
2. *If fire is on or threatening hatchery call USFS in Sault Ste. Marie (906) 635-5311.*
3. *Notify Project Leader*
4. *Maintain log of all telephone communications.*
5. *Remain on duty and notify:*

Hatchery Personnel	*Position*	*Home Phone*
(Pendills Creek)		
Faber Bland	*Biologist*	*(906) 248-5802*
Tracy Walters	*Biologist*	*(906) 437-4337*
John Shuman	*Maintenance Worker*	*(906) 248-3395*
Don Wiley	*Administrative Tech.*	*(906) 437-5580*
(Hiawatha Forest)		
Crystal LeGault	*Acting Project Leader*	*(906) 248-5957*

DIRECTORY

Regional Office

Brian McManus	*Fire Mgt. Coordinator*	*Office*	*(612) 713-5366*
		Home	*(507) 263-8878*
Todd Turner	*Hatchery Coordinator*	*Office*	*(612) 713-5127*

NIFC

Phil Street	*FWS Coordinator*	*Office*	*(208) 387-2595*
		Home	*(208)*

USFS Hiawatha National Forest (Soo RD)

Office (906) 635-5311

USFS Hiawatha National Forest (St. Ignace RD)

Office (906) 643-7900

USFS Hiawatha National Forest (Raco Work Center)

Office (906) 248-3431

Other Services

Hospital

War Memorial Hospital *(906) 635-4460*
500 Osborn Blvd., Sault Ste. Marie, MI 49783-1884

Ambulance (contact sheriff for ambulance) *(906) 635-9111*

Public Safety Ambulance *(906) 632-7799*
1523 W. 4th Ave., Sault Ste. Marie, MI 49783-1420

Sheriff (Chippewa County) *(906) 635-9111*

Michigan State Police *(906) 632-2216*

APPENDIX F: PENDILLS CREEK/HIAWATHA FOREST SPECIES LISTS

A list of species noted in the vicinity of the hatchery, or reasonably expected in the area may be found in the Pendills Creek Public Use Management Plan and will not be duplicated here.

Federal Threatened or Endanged Species

Table 5 - Federal Listed Threatened or Endangered Species

Common Name	Accepted Scientific Name	Status
BIRDS		
Bald Eagle	*Haliaeetus leucocephalus*	T
Kirtland's Warbler	*Dendroica kirtlandii*	E
Piping Plover	*Charadrius melodus*	E
MAMMALS		
Canada Lynx	*Lynx canadensis*	T
Eastern Puma	*Puma concolor couguar*	E
Indiana Bat	*Myotis sodalis*	E
Gray Wolf	*Canis lupis*	E
INSECTS: BUTTERFLIES & MOTHS		
Karner Blue Butterfly	*Lycaeides melissa samuelis*	E
Mitchell's Satyr Butterfly	*Neonympha mitchellii mitchellii*	E
PLANTS		
American hart's-tongue fern	*Asplenium scolopendrium var. americanum*	T
Dwarf lake iris	*Iris lacustris*	T
Eastern prairie fringed orchid	*Platanthera leucophaea*	T
Fassett's locoweed	*Oxytropis campestris*	T
Houghton's goldenrod	*Solidago houghtonii*	T
Lakeside daisy	*Hymenoxys herbacea*	T

Common Name	Accepted Scientific Name	Status
Michigan monkey-flower	*Mimulus glabratus var. michiganensis*	E
Pitcher's thistle	*Cirsium pitcheri*	T
Small whorled pogonia	*Isotria medeoloides*	T

Michigan State Threatened or Endangered Species

The table below is derived from the Michigan Natural Features Inventory and includes those state T&E species reported in, or reasonably expected to be found in, Chippewa County.

Table 6 - State Listed Threatened or Endangered Species - Chippewa County

Common Name	Scientific Name	Status
BIRDS		
Bald eagle	*Haliaeetus leucocephalus*	T
Common loon	*Gavia immer*	T
Common tern	*Sterna hirundo*	T
Merlin	*Falco columbarius*	T
Migrant loggerhead shrike	*Lanius ludovicianus migrans*	E
Osprey	*Pandion haliaetus*	T
Piping plover	*Charadrius melodus*	E
Red-shouldered hawk	*Buteo lineatus*	T
Short-eared owl	*Asio flammeus*	E
Yellow rail	*Coturnicops noveboracensis*	T
INSECTS		
Lake huron locust	*Trimerotropis huroniana*	T
MAMMALS		
Gray wolf	*Canis lupus*	E
PLANTS		

Common Name	Scientific Name	Status
Alpine bluegrass	*Poa alpina*	T
Ashy whitlow-grass	*Draba cana*	T
Auricled twayblade	*Listera auriculata*	SC
Awlwort	*Subularia aquatica*	E
Bedstraw	*Galium kamtschaticum*	T
Blunt-lobed woodsia	*Woodsia obtusa*	T
Bulrush sedge	*Carex scirpoidea*	T
Calypso or fairy-slipper	*Calypso bulbosa*	T
Canada rice-grass	*Oryzopsis canadensis*	T
Dwarf lake iris	*Iris lacustris*	T
False pennyroyal	*Trichostema brachiatum*	T
Farwell's water-milfoil	*Myriophyllum farwellii*	T
Flattened spike-rush	*Eleocharis compressa*	T
Goblin moonwort	*Botrychium mormo*	T
Green spleenwort	*Asplenium trichomanes-ramosum*	T
Hart's-tongue fern	*Asplenium scolopendrium var. americanum*	E
Houghton's goldenrod	*Solidago houghtonii*	T
Lake huron tansy	*Tanacetum huronense*	T
Lapland buttercup	*Ranunculus lapponicus*	T
Limestone oak fern	*Gymnocarpium robertianum*	T
New england sedge	*Carex novae-angliae*	T
Panicled screw-stem	*Bartonia paniculata*	T
Pine-drops	*Pterospora andromedea*	T
Pitcher's thistle	*Cirsium pitcheri*	T
Prairie-smoke	*Geum triflorum*	T
	Pellaea atropurpurea	

Common Name	Scientific Name	Status
Purple cliff-brake		T
Round-leaved orchis	*Amerorchis rotundifolia*	E
Small skullcap	*Scutellaria parvula*	T
Sweet coltsfoot	*Petasites sagittatus*	T
Vasey's rush	*Juncus vaseyi*	T
Walking fern	*Asplenium rhizophyllum*	T
Wall-rue	*Asplenium ruta-muraria*	E
Western moonwort	*Botrychium hesperium*	T
Wiegand's sedge	*Carex wiegandii*	T

APPENDIX G: HISTORIC FIRE SEASON ANALYSIS

No unwanted wildland fires have been recorded on the hatchery since initial land acquisition. An analysis may be completed in future revisions if sufficient fire activty occurs.

APPENDIX H: STEP-UP PLAN

As there is no fire qualified staff on the hatchery, the step-up plan only address public and visitor information needs. Adjective class will be obtained from WIDNR at the Brule Area Headquarters.

Adjective Class	Step up Actions
Low	No special public information efforts
Moderate	No special public information efforts
High	No special public information efforts
Very High	Personal contacts with visitors, bulletin board materials, and handoutswill be utilized to increase visitor and neighbor awareness of fire hazards.
Extreme	During periods of extreme or prolonged fire danger emergency restrictions regarding hatchery operations, or area closures may become necessary. Such restrictions, when imposed, will be consistent with those implemented by cooperators.

APPENDIX I: COMMUNICATION PLAN

As the hatchery has no radio system, a communication plan is not necessary. Cooperators will use their own systems with the appropriate frequency sharingf agreements in place.

APPENDIX J: PACK TEST BACKGROUND

What is the "pack test?"

Work capacity tests are used to qualify individuals for the three levels of wildland firefighting duty:
- ARDUOUS
- MODERATE
- LIGHT

The work capacity tests measure:

- Aerobic capacity
- Muscular strength
- Muscular endurance

All wildland firefighters must meet minimum levels of fitness requirements for the type of duties they are assigned:

Arduous: involves field work calling for above-average endurance and superior conditioning. All firefighters are required to perform arduous duty.

Moderate: involves field work requiring complete control of physical faculties and may include considerable walking, standing, and lifting 25-50 lbs._ Safety officers and fire behavior analysts are examples of moderate duty positions.

Light: involves mainly office-type work with occasional field activity. Examples include staging area and helibase managers.

Testing wildland firefighters for work capacity is important for several reasons:
- Personal safety and health
- Co-worker safety
- Improved operations

The table below provides test criteria for arduous, moderate, and light duty performance:
Fitness Requirement Test Description

ARDUOUS	Pack Test 3-mile hike with 45-lb. pack in 45 min.
MODERATE	Field Test 2-mile hike with 25-lb. pack in 30 min.
LIGHT	Walk Test 1-mile hike with no pack in 16 min.

FOR MORE INFORMATION:

Personal health, physical fitness, and work capacity all work toward making conditions safer for firefighters and the people they protect. Ask your local fire management office for more information.

APPENDIX K: ENVIRONMENTAL GUIDELINES FOR FOAM/RETARDANT USE

The following guidelines should be followed to minimize the likelihood of retardant chemicals entering a stream or other body of water.

- During training or briefings, inform field personnel of the potential danger of fire chemicals, especially foam concentrates, in streams or lakes.
- Locate mixing and loading points where contamination of natural water, especially with the foam concentrate, is minimal.
- Maintain all equipment and use check valves where appropriate to prevent release of foam concentrate into any body of water.
- Exercise particular caution when using any fire chemical in watersheds where fish hatcheries are located.
- Locate dip operations to avoid run-off of contaminated water back into the stream.
- Dip from a tank rather than directly from a body of water, to avoid releasing any foam into these especially sensitive areas.
- Use a pump system equipped with check valves to prevent flow of any contaminated water back into the main body of water.
- Avoid direct drops of retardant or foam into rivers, streams, lakes, or along shores. Use alternative methods of fire line building in sensitive areas.
- Notify proper authorities promptly if any fire chemical is used in an area where there is likelihood of negative impacts.
- While it is preferable that drops into or along any body of water not occur, it is possible that the fire location and surrounding terrain make it probable that some retardant may enter the water. The person requesting the retardant (such as the incident commander) must balance the impacts on the environment, i.e., potential fish kill, with the resources and values to be protected from the fire.