

## IV. WILDLAND FIRE MANAGEMENT

### A. GENERAL IMPLEMENTATION PROCEDURES

FMU II (Mainland Unit) will have no wildland fire use. All unplanned ignitions, human or natural, will have an aggressive initial attack suppression action consistent with firefighter and public safety and values to be protected.

A Wildland Fire Implementation Plan (WFIP) will be initiated for all wildland fires. 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 Park's Fire Coordinator. As this Park 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 N.

If the fire escapes initial attack then a Wildland Fire Situation Analysis (WFSA) will be prepared to determine the selected alternative to manage the incident. A hardcopy of the WFSA document can be found in Appendix O. An electronic version can be found at <http://www.fs.fed.us/fire/wfsa/>.

FMU I (Island Unit) has the potential to use naturally occurring (lightning caused) fires for resource benefits. Fires in or adjacent to village areas, campgrounds, or cultural landscapes on the islands will have an aggressive suppression action consistent with firefighter and public safety and values to be protected. The agency administrator Go/No Go Checklist is shown in Table 3 on the following page and is an integral part of the WFIP.

If any of the items in the checklist cannot be answered "no", the fire will be suppressed. If the WFIP indicates that a Stage II Short-Term Implementation Action Plan be completed, this will be accomplished by the individual in charge on the island in consultation and coordination with a qualified fire use manager. The Stage II Plan includes information on objectives and desired effects, safety considerations, external concerns, environmental concerns, threats, short term actions such as: monitoring, burning out edge etc., and estimated costs. These items will be completed for each potential wildland fire use fire passing the Go/No Go Checklist.

Detailed information and instructions for the WFIP are found in Chapter 4 of the Wildland and Prescribed Fire Implementation Guide. The same information is available in the WFSA Plus '99 software.

**B. WILDLAND FIRE USE**

1. Objectives of Wildland Fire Use

The primary objective of the wildland fire use program is to allow restoration of naturally-ignited fire as an ecological process and natural disturbance agent on North and South Manitou Islands. In addition, wildland fire use provides an appropriate means of reducing hazard fuels.

**Table 3 – Decision Criteria Checklist  
Wildland Fire Use (Naturally Occurring)  
Decision Criteria Checklist**

Decision Element	Yes	No
<p>Is there a threat to life, property, or resources that cannot be mitigated? Considerations include:</p> <ul style="list-style-type: none"> <li>• Is fire within Wildland Fire Use Fire Management Unit?</li> <li>• Is unit (or Maximum Manageable Area, once established) boundary threatened and available holding resources not able to mitigate?</li> <li>• Is there a threat to life and/or property within or outside the management unit?</li> </ul>		
<p>Are potential effects on cultural and natural resources outside the range of acceptable effects? Considerations include:</p> <ul style="list-style-type: none"> <li>• Are impacts of fire on natural and cultural resources, the public, and local economies acceptable?</li> </ul>		
<p>Are relative risk indicators and/or risk assessment results unacceptable to the appropriate Agency Administrator? Considerations include:</p> <ul style="list-style-type: none"> <li>• Projected fire perimeter locations are acceptable?</li> <li>• Equipment &amp; personnel are available to allow for an increase in fire size and complexity?</li> <li>• Local/regional/national fire situation stressing interagency resources is acceptable?</li> </ul>		
<p>Is there other proximate fire activity that limits or precludes successful management of this fire? Considerations include:</p> <ul style="list-style-type: none"> <li>• More than 75% of unit firefighting resources committed?</li> </ul>		
<p>Are there other Agency Administrator issues that preclude wildland fire use? Considerations include:</p> <ul style="list-style-type: none"> <li>• Qualified Fire Use Manager available to manage fire</li> </ul>		

Decision Element	Yes	No
<ul style="list-style-type: none"> <li>• Potential size of fires burning within the Lakeshore is acceptable and manageable</li> <li>• Short-term fire weather and/or fire behavior are acceptable</li> <li>• Long-term fire weather and/or fire behavior are acceptable</li> <li>• Effects of regional drought on fire behavior/size are acceptable</li> <li>• Smoke dispersal and direction are acceptable</li> </ul>		

**Recommended Response Action**

Suppression Oriented Response (if any boxes checked yes)	
Other appropriate management response (if all boxes checked no)	

2. Decision Criteria for Wildland Fire Use

Fires ignited by lightning in FMU I – Island will be allowed and managed for resource benefit if all the boxes in Table 3 can be checked “no”. Reassessment of fire conditions are made each day that a wildland fire use is actively burning (i.e., spreading). Periodic reassessment will be made when the fire is inactive but has not been declared out. Fires ignited by lightning outside of FMU I or threatening values at risk will be suppressed using a suppression response. Additional information regarding initial attack process is found in [Section IV.C.4](#), Initial Attack.

Wildland fire use fires will be continually monitored and evaluated from the time of discovery until they are declared out to ensure that they remain within prescription. Lightning ignitions that do not satisfy these decision criteria and ongoing wildland fire use fires that exceed the criteria will be reclassified as unwanted wildland fires and an appropriate management response will be taken according to a Wildland Fire Situation Analysis (WFSA). A variety of holding actions are appropriate to keep a wildland fire use within planned boundaries. The level of holding activity that will be acceptable before a fire is declared an unwanted wildland fire will be determined on a case by case basis and these thresholds documented within the Wildland Fire Implementation Plan (WFIP).

If they remain within the decision criteria, some fires may be allowed to burn for a few months or longer without direct control or until extinguished by rain or snow. It is important for the public to understand that fires are not being allowed to burn indiscriminately, but that fires are managed under strict predetermined criteria. The fire monitoring system described below will ensure that these criteria are met.

3. Preplanned Implementation Procedures

Any wildland fire use that has the potential (as determined by fire behavior predictions based on fire weather forecasts) to reach any portion of a cultural

landscape or village area within two burning periods will automatically require a Stage III, Long-Term Implementation Assessment. This stage is similar to Stage II but requires a deeper analysis of long-term weather, fire behavior and other factors that will affect fire behavior, spread, difficulty of control etc. National Fire Danger Rating System indices will be available daily.

#### 4. Non-Preplanned Implementation Procedures

A Maximum Manageable Area (MMA) boundary establishment, the Decision Criteria Checklist, Risk Assessment, and Complexity Analysis are not pre-planned. All of these planning items will be determined during a wildland fire use project as the WFIP is developed.

##### a. Periodic assessment procedures

The Revalidation Checklist in the Implementation Guide and the items in the Decision Criteria Checklist are used for daily revalidation while a wildland fire use fire is active (i.e., actively spreading). When a wildland fire use fire becomes inactive (non-spreading) but has not been declared out, re-assessment and revalidation will occur once a week until either the fire becomes active again or is declared out.

##### b. Requirements for preparation of Implementation Plans

The Wildland and Prescribed Fire Policy Implementation Guide will be the source and reference for the preparation of all plans and documentation for wildland fire use. Information requirements for the WFIP Stages are described in the Wildland Fire Implementation Guide and are also available in the WFS Plus '99 software.

#### 5. Potential Impacts of Plan Implementation

Fire use can have both positive and negative impacts. Positive impacts are the benefits to forest development when fire plays its natural role as an ecosystem process. Grasslands may benefit ecologically as well. Socially, there is the potential for visitors to witness a natural event not often seen by the public, in relative safety from the water.

Negative impacts for fire use at on the islands would be mostly of a social nature. Smoke impacts to visitors and inholders are a possibility although those effects would be temporary.

Another potential negative impact is to Lakeshore staff. Supporting these projects can require a substantial commitment of staff time. Use of outside resources and teams to supplement local staff will be necessary to minimize this impact.

#### 6. Staff Responsibilities for Wildland Fire Use Implementation

If wildland fire complexity escalates to Stage III of the WFIP, or during multiple Stage I/II fires, the Lakeshore staff will require assistance to manage the fire (a Fire Use Manager, or FUMA) and to complete fire spread modeling and Maximum

Manageable Area development (a Long Term Fire Behavior Analyst, or LTAN). These positions may be ordered separately or as part of a Fire Use Team.

a. Superintendent

The Superintendent has responsibility for making the Go/No Go decision, signing the WFIP and periodic assessments to validate the WFIP decision. S/he declares closures when needed and will issue a written delegation of authority in the event a Fire Use Management Team is assigned to a wildland fire use at Sleeping Bear Dunes National Lakeshore.

b. Area Fire Management Officer (Area FMO) Indiana Dunes National Lakeshore/Sleeping Bear Dunes National Lakeshore

The Area FMO ensures implementation of FMP and coordinates wildland fire and prescribed fire programs and ensures that the fire program is managed within RM-18 guidelines and in accordance with the FMP. Responsibilities also include providing technical assistance for analyzing fire weather and fire season severity to support fire use decisions, and preparing WFIP Stages I, II and III. S/he provides staffing assistance for monitoring and advisory assistance and escalating staffing due to increases in complexity and fire behavior. The individual should be immediately notified of potential fire use projects during WFIP Stage I if not on location. The Area FMO provides fire behavior predictions for Stage I and II wildland fire use fires and ensures that a comprehensive fire management program at the Lakeshore is adequately planned for and implemented.

c. Park Fire Coordinator (PFC)/Chief of Natural Resources

The PFC ensures implementation of FMP and coordinates wildland fire and prescribed fire programs and is also responsible for ensuring that the fire program is managed within RM-18 guidelines.

d. Chief Ranger

The Chief Ranger evaluates fire activity in terms of public and employee safety and makes recommendations to the Superintendent for closures. S/he patrols to ensure closures are enforced. S/he designs and implements the island evacuation plan at the discretion of the Superintendent.

e. Chief of Maintenance

The Chief of Maintenance acts as Lakeshore consultant on cultural resource issues involving wildland and prescribed fire issues. Will provide information on cultural resources that could be impacted by prescribed fires and identify sites at risk from wildland fire.

f. Great Lakes Fire Ecologist

The Great Lakes fire ecologist provides oversight to monitoring program and provides input into MMA and long term risk assessment in accordance with Stage III needs.

g. Fire Use Management Team

The number of personnel required for an incident will vary. Management could range from a Stage I & II Fire Use Manager (FUM2) to a full Fire Use Management Team (FUMT) for a Stage III complexity fire. Staffing levels will be evaluated daily and adjusted as needed based on actual and predicted fire behavior, predicted weather, other fire activity, etc. The Lakeshore is not large enough to have its own wildland fire use team and support will be needed to implement wildland fire use and many prescribed fires. NPS Fire Use Modules: can provide both planning and operational assistance related to wildland fire use and prescribed fires.

7. Public Information

When wildland fire use projects are implemented, information will be made available to the public to promote understanding, acceptance, and support. Local media (newspapers, radio and television) will be provided with briefings and photo/interview opportunities. Visitor information staff and rangers will be kept informed concerning wildland fire use status. In addition, local cooperators will be kept informed. If wildland fire use operations persist for extended periods and burn substantial areas, consider ordering a Fire Information Officer. See [Section X](#) for additional public information procedures. A list of key contacts within the agency, in other agencies, both federal and state, and Congressional delegation contacts will be maintained annually in [Appendix E](#).

8. Wildland Fire Plans and Documentation

All designated wildland fire use fires will be documented for the record and for future reference. All wildland fire use fires of 100 acres or greater will be permanently mapped and the maps archived. Other records should include:

- Wildland Fire Implementation Plan (WFIP) and all amendments and revisions;
- Wildland Fire Situation Analysis (if used);
- Monitoring reports and summaries of findings;
- Revalidation and certification documents;
- Fiscal reports;
- Project maps;
- Daily weather records;
- Fire Behavior predictions;
- Smoke emission and transport observations;
- DI-1202;
- Resource Orders;

- Other information as appropriate for the situation such as photos, video, photo points, etc.

## 9. Cost Tracking

All wildland fire use costs will be tracked and documented in the fire record. Costs will include all personnel services, service contracts, aircraft, supplies and equipment procurement.

### **C. WILDLAND FIRE SUPPRESSION**

#### 1. Fire Behavior

Due to the maritime influence, fires in Sleeping Bear Dunes National Lakeshore are essentially wind-driven. Slowly spreading surface fires with occasional torching are normal with wind speeds below 15 mph. Short-duration “mini-droughts” quickly dry out the sandy soils and increase rates of spread. While the presence of numerous roads, streams, wetland areas and lakes make effective firebreaks under low to moderate conditions, during extreme fire conditions, potential one-eighth to one-quarter mile spotting distances render many of these existing firebreaks ineffective in stopping forward spread.

#### 2. Preparedness

##### a. Prevention

The goals of the Lakeshore’s fire prevention program are: to prevent human caused wildland fires and to incorporate prevention messages into interpretive programs. A Fire Prevention Plan will be developed and included as [Appendix J](#).

##### b. Annual Training

Annual refresher training emphasizing safety is required each year for qualified firefighters and will be made available to Lakeshore staff. Minimum training will include LCES (**Lookouts - Communications - Escape Routes - Safety Zones**), Standards for Survival, fire shelter training, a pack test and/or other updates as appropriate or required. In addition, each year the Chief of Natural Resources and Area Fire Management Officer at Indiana Dunes National Lakeshore will assess the current qualifications of the unit's fire qualified personnel. From this assessment, current and future training needs for both the unit and individuals will be determined. Training will be obtained in the most cost-effective manner either in house or through interagency training courses. Qualified instructors will be utilized for all courses.

##### c. Readiness

Each year prior to and after the fire season, District Rangers or designated fire staff will conduct inventories of the District fire caches. Any needed supplies or equipment will be requested through the Park Fire Coordinator. The District Rangers or fire staff will also be responsible for ensuring that unit fire tools and equipment are maintained in a state of readiness, especially during the fire season.

d. Fire Weather and Fire Danger

(1). Weather Stations

The primary weather station is station number 202010, Bear. NFDRS fuel model E/R, hardwood litter, is the selected model for fire danger predictions using the National Fire Danger Rating System.

(2). NFDRS

Sleeping Bear Dunes uses NFDRS Models E/R, and Burning Index (BI) as the trend monitoring index and fire danger prediction scale. The Step-up Plan in [Appendix H](#) shows the break points for each individual staffing class along with the actions, both preparedness and prevention, required in each class.

(3). Monthly Risk Analysis

When weather and fuels appear to be outside the expected parameters, a monthly risk analysis will be conducted by the Area FMO. The state preparedness level will determine when fuels are outside expected parameters, and will be decided by the Area FMO. The items considered will include the items in the following table. Results should be passed on to the regional FMO for compilation and use for requesting additional funds and/or resources for wildland fire suppression. Information developed from this analysis may be used to modify actions planned under various staffing classes in the Step-up Plan

**Table 4 – Monthly Risk Analysis**

Monthly Risk Analysis		
Factor	Current Level	Historic Average
Temperature Levels (Highs)		
Temperature Levels (Lows)		
Precipitation Levels		
Keetch-Byram Drought Index		
1000 hour Fuel Moistures		
Live Fuel Moistures		
Unusual Weather Events Ice storms, hard freezes		None
Unusual fire load		
30-90 day temperature forecast		None
30-90 day precipitation forecast		None

e. Step-Up Plan

The Step-up Plan provides actions and minimum staffing levels needed as fire danger indices increase. The Step-Up Plan can be found in [Appendix H](#).

### 3. Pre-Attack Plan

The pre-attack plan is a checklist of items to be considered prior to wildland fire occurrence. The table is divided into four parts that correspond to four of the functions found in the Incident Command System and is found in [Appendix G](#).

### 4. Initial Attack

#### a. Unit I – Island FMU

The Decision Criteria and WFIP Stage I Initial Fire Assessment will be used to determine the appropriate management response in this FMU. If the decision is to manage a lightning-caused fire as wildland fire use, a fire monitor will be assigned to the fire to gather necessary information to guide periodic reassessments. Within 24 hours (per the Implementation Guide) a Stage II Short-term Implementation Action Plan will be completed. At any time a wildland fire use is predicted to threaten values at risk within two burning periods, a detailed assessment of predicted behavior, weather, fuel conditions and current visitation will be completed (Stage III Long-Term Assessment). This Stage III assessment, which is described in the Implementation Guide, will suggest appropriate holding or suppression actions to mitigate the danger to values at risk.

#### b. Unit II – Mainland FMU

All fires will receive an appropriate suppression response with due consideration for firefighter and public safety. Priority will be given to fires threatening private inholdings, use and occupancy tenants, or adjacent property occupied by residents. Second priority will be given to visitor use areas and third to other areas.

#### c. Confinement as an Initial Attack Suppression Strategy

A confinement strategy may be selected as an initial attack action in both FMUs as long as it is not used to meet resource management objectives. Confinement may be selected in lieu of full suppression to maximize firefighter safety, minimize suppression costs, minimize resource loss, and to maximize the availability of critical suppression and management resources. Confinement may also be a strategic selection though the WFSA process when the fire is expected to exceed initial attack or planned management capability. When confinement is selected as the initial attack action, the same process applies as for wildland fire use decisions: prepare a WFIP in stages as fire or management considerations dictate.

#### d. Response Times

For Mainland FMU fires, response time by NPS equipment and personnel can be up to 40 minutes depending on the location of the fire and responding personnel. As the Lakeshore builds response capability, this time will decrease. Local volunteer fire departments are likely to respond as well and will generally be on site within 20 minutes.

On the islands response time depends on availability of personnel and location of the fire. On North Manitou as an example, if firefighters were not available on the island, response time to get a boat to the island then to a fire site in the interior of the island could take several hours. If personnel are available and fires were close to the administrative buildings, response time could be as short as 5 minutes.

e. Management Restrictions and Special Concerns

There are six primary management restrictions:

- The use of bulldozers in suppression or prescribed fire operations must be authorized by the Superintendent or designee;
- Engines are restricted from areas identified as potentially affected by vehicle traffic, such as where rutting, soil compaction or other habitat damage could occur;
- Hand lines will be constructed so as to prevent damage to archeological and/or historic resources whenever possible;
- Equipment will not be used, nor will hand lines be constructed, on dune surfaces.
- Class II air quality standard will be maintained (see definitions).
- Minimum Impact Suppression Techniques (MIST) will be used.

The following special restrictions will apply with regard to aerially applied retardant and foam use:

*Retardant* – Every attempt will be made to exclude fire retardant chemical from surface waters, including perennial and intermittent streams. No retardant drops within 400 feet of open water.

*Foam (aerial delivery)* – Aerial delivery of foam requires Superintendent approval on a case-by-case basis. When approved, the following guidelines apply:

- Foam concentrate will only be injected into the holding tank after the water pick-up operation has been completed.
- Drops from Beaver, 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 (waterbug, Mk 26, Shindawa, etc.)
- 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. 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 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

Close communication with local units of government, volunteer fire departments, adjacent landowners, inholding owners and use and occupancy tenants should reduce wildland fire risk and controversy to a minimum.

5. Extended Attack and Large Fire Suppression

a. Extended Attack Needs

Based on the fire history from Michigan Department of Natural Resources (DNR) records from 1946 and Lakeshore records since establishment, most fires will be controlled in the first burning period. The largest recorded fire in the area now included in the Lakeshore was 23 acres in 1953. Since the Lakeshore's establishment in 1970, the largest single fire was 20 acres in 1974. For extended attack needs, available cooperators include the DNR, local fire departments, and the U.S. Forest Service, Manistee Unit of the Huron-Manistee National Forest.

For large fires requiring large numbers of personnel or other resources, contact with the Lower Peninsula Coordination Center at Mio will bring any necessary resources from regional and/or national sources.

b. Implementation Plan Requirements

WFSAs will be required at the point where the second burning period will not see control of fire spread. At this point the fire management personnel assigned to the incident will implement a strategy to achieve the objectives outlined in the WFSAs. A hardcopy of the WFSAs is found in Appendix O. An electronic copy can be found at <http://www.fs.fed.us/fire/wfsa/>.

c. Complexity Decision

When a WFSAs has been completed for use during the operations in a second burning period, the fire will be considered to be an extended attack fire.

d. Delegation of Authority

Should fire activity and complexity warrant the ordering of an Incident Management Team, a Delegation of Authority will be signed by the Superintendent and the incoming Incident Commander, giving the Team authority to manage the incident. A sample delegation of authority to an incident commander is included in [Appendix E](#).

6. Exceeding Existing WFIP

If the periodic reassessment of managing a wildland fire incident indicates that objectives cannot be met or implementation of a prescribed fire is unsuccessful, the following actions will be taken:

- Prepare a WFSA at this stage to select a new strategy. This action applies to both FMUs.
- In FMU I if the Stage II Complexity Analysis rates at Moderate or higher, a Fire Use Team will be ordered to manage the incident.

7. Minimum Impact Suppression Tactics (MIST)

Director's Order #18 states that: "Methods used to suppress wildland fires should minimize impacts of the suppression action and the fire, commensurate with effective control and resource values to be protected." See the Wildland Fire Management Manual, RM-18 (NPS-2001) Chapter 9, Exhibit 5, for specific details about MIST. Lakeshore specific restrictions are listed in [Section IV.C.4.e](#).

8. Fire Rehabilitation

Within both FMUs, the only rehabilitation needs anticipated are those associated with fireline construction and mop-up activities. Proper placement of hand constructed firelines should reduce the need for major work. Areas with hand lines will be restored to their pre-fire condition as soon as possible. The nature of fires on the unit indicates that only emergency stabilization should be necessary. Should a Burned Area Emergency Rehabilitation Team (BAER) be required on the unit an archeologist or cultural resource specialist will be part of the team. Rehabilitation will only be required where the impacts of the fire itself or of the associated suppression actions are significant and can be mitigated. In no case will action be taken in the name of rehabilitation which further compounds the situation. If Minimum Impact Suppression Techniques are used, as described above, then only minimal rehabilitation will be necessary. Burned areas will generally not be reseeded. If reseeded is determined to be necessary, native seed stock will be used. Following are Lakeshore specific guidelines:

- Trash will be removed from lines, camp locations and other staging areas;
- Should waterbars be necessary they will be installed every 70-200 feet for slopes 0 to 15%, 50-70 feet for 15-30%, and 30-50 feet for 30+% slopes;
- Stumps will be cut within 3 inches of the ground whenever possible;
- If required for fuel reduction, snags or trees felled will be lopped and the branches scattered;

- Rehabilitation will occur before resources are released from the fire to the greatest extent possible;
- Evidence of saw cuts will be mitigated whenever possible.

9. Records and Reports

The Superintendent is ultimately responsible for fire reporting and fiscal accounting. Individual report assignments may be made by the Superintendent. The table below is a checklist of possible wildland fire documents and the individual usually responsible for completing them.

**Table 5 – Checklist of Wildland Documentation**

<b>Checklist of Wildland Fire Documents and Reports</b>		
<b>Document</b>	<b>Revision or Preparation Frequency</b>	<b>Responsible Party</b>
DI-1202	Each incident	Incident Commander
WFSA	As needed	Unit management/IC
Fire Weather	Daily in season	PFC
Fire Situation Report	Daily in season	PFC
Fire Danger	Daily in season	PFC
Fire Complexity Analysis	Per Incident as Needed	Incident Commander
Pre Season Risk Analysis	Annually	PFC
Pre-Attack Plan	Annually	PFC
Wildland Fire Critique	Each Incident	On site suppression staff

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

## V. FUELS MANAGEMENT

### A. LONG-TERM FUELS MANAGEMENT

Over the period of this plan, the Lakeshore staff intends to implement a hazard fuels management program that includes mechanical fuel reduction as well as the use of prescribed fire. Implementation of the program will contribute to achieving the goals found in [Section II.E](#), Achieving GMP and RMP Objectives through the FMP.

The primary purpose of the program is to protect human life and property, including all park resources, inholdings and other infrastructure. Due to the density of development along the boundary of the Mainland Unit, all fires starting within 600 feet of the boundary will be considered wildland-urban interface fires with the commensurate level of complexity. Use of WUI project funds to reduce fuels in the areas most at risk will provide some mitigation of the problem. Although the primary purpose of these projects from a Federal perspective is to protect property outside Federal boundaries, the same projects help to protect Federal lands from unwanted intrusions of fire into Lakeshore natural resources. Several project requests have been prepared and the schedule is found in [Appendix I](#).

Mechanical hazard fuel projects on the Islands will be conducted if necessary to protect infrastructure and inholdings including the cultural landscapes.

Prescribed fire projects will be used to meet multiple objectives including hazard fuel reduction, restoring /maintaining vegetation composition and structure, improvement of wildlife habitat, and restoring/maintaining cultural landscapes. Projects will be identified by an interdisciplinary team that includes both natural and cultural resource specialists. As specific needs are identified, project proposals will be prepared and funding requested.

### B. PRESCRIBED FIRE

#### 1. Annual Preparation

At the time of preparation of this plan, Sleeping Bear Dunes National Lakeshore has no immediate plans to initiate any prescribed fire projects. However, one of the fire management objectives for the Lakeshore is to develop a five-year plan of proposed prescribed fire units to reduce hazard fuels in WUI areas and to maintain open fields. Once the five-year plan is developed and approved, it will be appended to this plan and reviewed annually. An annual review will determine if fuel conditions are such that prescribed fire implementation can and should take place. As part of the review, past burn areas will be examined to determine if prescribed fire objectives are being achieved, so that adjustments can be made to objectives, prescription parameters and fire application techniques.

## 2. Long-term Prescribed Fire Relation to FMUs

At the time of writing of this plan, no long-term prescribed fire strategy has been identified for Sleeping Bear Dunes National Lakeshore. When the five-year plan is developed and approved, the long-term strategy will be appended to this Plan during the internal annual review of the fire management program.

## 3. Personnel Requirements

Qualified local staff will be used to the extent possible as the primary source of fire personnel. Fire qualified personnel from other units will be asked to assist on an ad hoc basis. The Fire Management Officer will designate, with approval by the Superintendent, a qualified Prescribed Burn Boss/Incident Commander who will be responsible for all aspects of the prescribed fire. Qualified Prescribed Burn Bosses, Section Chiefs, Ignition Specialists, holding forces, and Fire Monitors, etc. will be selected from a list of those certified by the Area Fire Management Officer.

## 4. Fire Behavior and Fire Effects Monitoring

All prescribed and wildland fire use fires will be monitored. Information gathered during fire monitoring is needed to determine whether fires are burning within predetermined criteria, to identify trigger points for suppression action, to protect human life and property, and to increase knowledge of fire behavior in Lakeshore fuel types and of fire effects on the Lakeshore ecosystems. A fire monitoring team will observe the fire, assess its potential and provide a historical record. Monitoring will include documenting the fire environment (weather, fuels, topography), fire behavior (manner and rate of spread, flame length, etc.), and fire effects (percent of fuels consumed, changes in plant and animal community composition and structure, etc.). Photographs may be taken. Weather readings will be made periodically with a belt weather kit at the fire site. Forms for recording data will be supplied to monitors. The National Park Service Fire Monitoring Handbook (NPS 2001) will be the primary source for protocols for monitoring fire weather, behavior and effects. The Handbook describes in detail all aspects of a comprehensive monitoring program. The Sleeping Bear Dunes National Lakeshore Fire Effects Monitoring Plan is an appendix to this Fire Management Plan. It defines for the Lakeshore fire monitoring goals and objectives; monitoring types; minimum qualification standards for fire monitors; monitoring levels; and minimum acceptable standards for documenting fire weather, behavior and effects.

## 5. Critique of Prescribed Fire Operation

The Park Fire Coordinator and the burn boss will critique each prescribed fire in the Lakeshore to determine the effectiveness of the project. A report of the results of the critique will be prepared and submitted to the Superintendent for review. Reference Manual 18, chapter 10 provides a "Post-Project Evaluation" template for each project. The following items, as a minimum, will be reviewed following each prescribed fire operation.

- Were any unsafe acts noted?
- Were prescribed fire objectives met within an acceptable range of results?
- What should be done differently to obtain desired results or get better results?
- Was there any deviation from plan? If so, why?
- Was prescription appropriate?
- Were weather changes a factor in accomplishing prescribed fire?
- Problems and general comments

6. Documentation and Reporting

The following table lists the reports and other documents that are required for prescribed fire operations.

**Table 6 – Checklist of Prescribed Fire Documentation**

<b>Document</b>	<b>Revision or Preparation Frequency</b>	<b>Responsible Party</b>
Project Submission NFPORS ( <a href="#">National Fire Plan Operations and Reporting System</a> )	Annual	Area FMO
Original Signed Prescribed Fire Plan	Each Project	Regional Director
Checklist of Pre-Burn Prescribed Fire Activities (no specific form)	Each Project	Prescribed Fire Burn Boss
All Reviewer Comments	Each Project	Reviewers
All Maps	Each Project	PFC/Prescribed Fire Burn Boss
Notification Checklist	Each Project	Prescribed Fire Burn Boss
Permits such as burn, smoke, etc.	Each Project	PFC/Prescribed Fire Burn Boss
Monitoring data	Each Project	Prescribed Fire Monitor
Weather forecasts	Each Project	PFC/Prescribed Fire Burn Boss
Agency Administrator Go/No-Go Pre-Ignition Approval	Each Project	Superintendent
Operational Go/No-Go Checklist	Each Project	Prescribed Fire Burn Boss
Incident Action Plan(s)	Each Project	PFC/Prescribed Fire Burn Boss
Unit logs, Daily Validation or other unit leader documentation	Each Project	PFC/Prescribed Fire Burn Boss
Press Releases, Public Comments, and Complaints	Each Project	Local Lakeshore Staff
Smoke dispersal information	Each Project	PFC/Prescribed Fire Burn Boss
Post fire analysis (Critique)	Each Project	All Participants in

Checklist of Prescribed Fire Documents and Reports		
Document	Revision or Preparation Frequency	Responsible Party
Fire Occurrence (DI-1202) report (Must also be reported in WFMI)	Each Project	Operation Prescribed Fire Burn Boss

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

## 7. Historic Fuel Treatments

At the time of writing of this plan, no record exists of prescribed fire fuels treatments having been conducted in the Lakeshore. As projects are executed, a map will be prepared and incorporated into the Lakeshore’s Geographical Information System (GIS) data base.

### **C. PRESCRIBED FIRE PLAN**

Prescribed fire plan requirements are described in RM-18, Chapter 10, Section VI. A. Prescribed Fire Planning.

### **D. EXCEEDING PRESCRIBED FIRE PLAN**

In instances where a prescribed fire exceeds the parameters of the plan, a WFSA will be completed and an appropriate management response (suppression action) will be initiated based on the WFSA. Guidelines for this process are found in RM-18, Chapter 9.

### **E. AIR QUALITY AND SMOKE MANAGEMENT**

#### 1. Air Quality Issues

On the mainland there are multiple targets for smoke. The area is a Class II air quality location and visibility is generally good. Prevailing winds tend to move smoke inland from the Lakeshore to areas with extensive residential development and of high recreational value. In addition, in spring and fall, weather patterns occur that tend to cause foggy conditions. This occurs at a time of year when prescribed fire activity could occur. Unwanted wildland fires are normally of short duration and have little effect on air quality past the initial burning period. Wildland fires on the islands designated as fire use may have some minimal effects on the campgrounds and back country areas of the islands. Smoke from island fires of any nature are not expected to have any affect on mainland areas.

#### 2. Smoke Management

##### a. State Requirements

Michigan does not have specific visibility regulations, and its air pollution rules that relate to fire are aimed at protecting the public from the nuisance of smoke as much as the health or aesthetic effects. Open burning regulations ([http://www.michigan.gov/dnr/0,1607,7-153-10367\\_11851-33501--,00.html](http://www.michigan.gov/dnr/0,1607,7-153-10367_11851-33501--,00.html))

permit the burning of "trees, logs, brush, and stumps..." in remote areas provided the fire does not become a nuisance. To that end, the state Department of Natural Resources (DNR) has requested that the NPS notify them when prescribed fires will be in progress, and they reserve the right to order the Lakeshore to shut down a fire if it generates smoke-related complaints that can not be resolved.

(1). Notification Procedures.

- Unwanted wildland fires: no notification required
- Prescribed fires: NPS will send a copy of prescribed fire plan to DNR at least two weeks in advance of fire (preferably more).
- Wildland fire use fires: NPS will notify by telephone first full business day after decision to manage fire as wildland fire use and follow up with a letter stating reasons for the fire.
- Notification contacts are in [Appendix E](#).

(2). Approvals

In all cases, the DNR will notify the NPS in writing or by telephone of their ruling. In most cases, approval will be routine, provided that smoke is not expected to adversely impact people. The DNR will not grant permission for a fire that generates a reasonable complaint if the NPS is unable to mitigate the problem either by reducing emissions or smoke residence in sensitive areas or by assisting people to get away from impacted areas.

b. Smoke Sensitive Targets

Management needs to recognize areas where smoke problems are likely and take steps to notify visitors and/or mitigate the smoke intrusion.

At Sleeping Bear Dunes, the notification process is the responsibility of the Burn Boss, and may be delegated to someone by the Burn Boss. Information on the objectives of the fire management program will be explained to visitors and residents exposed to smoke from any fires.

There are numerous small communities east of the mainland unit that may be subject to smoke impacts. From the islands there are fewer targets because of the distance from the mainland shore.

Within the mainland FMU, developed areas at Platte River, D.H. Day and backcountry camp sites commonly have between 6 and several hundred people in residence. Other sensitive receptors are use and occupancy tenants and private inholdings. Any or all of these targets could be affected by smoke produced from fires at Sleeping Bear Dunes, although past history suggests that the frequency of smoke events is extremely low. Areas most likely to be impacted by smoke are those within a thirty degree arc of the path of any smoke plume and within twenty miles of the fire. Critical targets of special concern are those that are within .75 miles of the plume.

Most of the problems associated with fire emissions are caused by particulates. Smoke which remains near the ground from a smoldering fire is more likely to be a problem than the interception of smoke plumes. Depending on the season, smoke particles may serve as the nuclei for fog development and smoke-generated fog may cause dangerous visibility problems along roads on the mainland, or possibly boats near the islands.

c. Mitigation Strategies

(1). Prescribed fires and Wildland Fire Use fires

Prescribed Fires will have a smoke dispersion component in the prescription. If smoke creates a prolonged hazard or significant nuisance, appropriate actions will be taken to mitigate the condition causing the problem or the fire will be suppressed. Smoke is one of the additional considerations in the Lakeshore's Decision Criteria Checklist for wildland fire use.

(2). Suppression

Suppress or mop up smoldering fuels when they generate smoke management problems. Some examples include: atmospheric conditions conducive to repeated cycles of fog formation, unexpected inversion conditions or wind shifts.

(3). Ignition

Smoldering fuels may be ignited to get them to burn with an active flame, which generates less than half the emissions than smoldering combustion (NWCG, 1985). Flaming combustion also generates convection columns, which raise smoke above ground level.

(4). Types of Fires

Use backing fires when possible.

(5). Dispersion

Recognize poor dispersion conditions that will last several days, such as the predicted passage of a slow-moving warm front; a lingering high pressure system with stable atmosphere; or high humidity conditions, and adjust burning strategies as necessary.

(6). Residual Smoke

When a fire has burned for an extended period of time and generated a lot of residual smoke, the NPS will consider suppressing all new starts to minimize additional smoke production.

(7). Firefighter Safety

During high smoke production phases of a fire suppression operation, crews will be rotated out of high smoke areas.

(8). Cultural Resource Areas

The park contains significant historical buildings, cultural landscapes, and ethnographic resources as previously described in this plan. Although impacts from smoke should be negligible for these resources, considerations for their protection will be part of smoke management.

(9). Public Visitation Areas

Prescribed fires in or near public visitation areas will be ignited, if possible, when visitation is low.

d. Guidelines

The following are the management guidelines for all phases of the fire management program.

- Prescribed fires will not be ignited during air pollution alerts, mixing heights less than 1,640 feet, or when a burn ban has been established by state government.
- Forecasted mixing heights and upper level winds from fire weather forecasts will be used to project smoke dispersal.
- Prescribed fires will be ignited only when weather conditions meet the prescription parameters in the prescribed fire plan for smoke dispersal.
- Firing techniques that lower smoke production will be utilized whenever possible
- Smoke projection maps will be prepared, as required by RM-18, Chapter 10, to assist in projecting smoke dispersal patterns.
- Local police and fire agencies will be notified of prescribed fires so they may provide any needed assistance with traffic flow should problems with smoke dispersal occur.
- The park environmental compliance Interdisciplinary Team will review projects for adverse effects, per section 106 of the Historic Preservation Act, and modify the project accordingly. If a determination of adverse affect is unavoidable, formal consultation will be initiated with the State Historic Preservation Officer and the Advisory Council on Historic Preservation.

**F. NON-FIRE APPLICATIONS**

During the current planning horizon (2005-2010), a number of mechanical fuel hazard treatments are anticipated. These treatments will be located near boundaries, both external and internal (inholdings), and are designed to reduce the threat of WUI fires and their consequences.

1. Annual Preparation

Projects will be developed and submitted for approval each year in accordance with NPS Fire Management Guidelines (RM-18). Approved project preparation will involve scheduling labor and equipment for the time period of the project.

2. Restrictions

There are few restrictions expected for mechanical projects. Flexible scheduling should allow for maximum protection of natural resources. Every effort will be made to avoid fragmenting native habitats in conducting these operations.

3. Effects Monitoring

Effects monitoring will be conducted in a manner and degree that meets current NPS guidelines dealing with non-fire fuel treatment activities. Monitoring may include measuring effectiveness of treatment and long term fuel loadings. As a minimum, fuel load sampling or photo points should be used to monitor the effects of mechanical treatments. The Great Lakes fire ecologist will provide assistance in defining the appropriate level of monitoring.

4. Mechanical Treatment Critique Format

The following items will be part of mechanical fuel reduction project critiques:

- Were any unsafe acts noted?
- Were project objectives met?
- What should be done differently to obtain desired results or get better results?
- Was there any deviation from plan? If so, why?
- Were weather changes a factor in completing project?
- Problems and general comments.

5. Cost Accounting

All costs associated with an individual mechanical project will be charged to the project code provided with the funding.

6. Documentation and Reporting

Table 7 lists the reports and other documents required for mechanical fuel reduction operations.

**Table 7 – Checklist of Non-Fire Treatment Documentation**

<b>Document</b>	<b>Revision or Preparation Frequency</b>	<b>Responsible Party</b>
NFPORS Project Submission	Annual	Area FMO
Signed Project Plan	Each Project	Superintendent
Project Maps	Each Project	PFC\Project Manager
Notification Checklist	Each Project	Local Staff\Project Manager
Permits	Each Project	Local Staff
On-Site Effects Reporting	Each Project	Monitor
Unit Logs or Other Documentation	Each Project	Local\Project Staff
Contracts	Each Project	Area FMO\Local\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.

7. Annual Planned Project List

This list is found in [Appendix J](#) with other annually updated documents.

## VI. FIRE MANAGEMENT ORGANIZATION AND RESPONSIBILITIES

### A. ORGANIZATIONAL STRUCTURE

#### 1. Superintendent or Designee

Responsible for the overall program direction. Has final decision making authority for management operations. Approves and signs Interagency Agreements pertaining to the unit. An additional responsibility requires periodic assessment signature to certify that continued wildland fire use actions are acceptable.

#### 2. The Area Fire Management Officer (FMO)

The Area FMO is located at Indiana Dunes National Lakeshore and is responsible for providing technical and professional support to SLBE. This includes preparing or reviewing fire use implementation plans, preparing and submitting FIREPRO budget requests, annual reports, develops and implements cooperative fire management agreements with other federal, state, Canadian, and local agencies, and may serve in operations roles during wildland or prescribed fire incidents within the park. The Area FMO prepares, in consultation with park Natural Resources Division Staff, implementation plans for prescribed fires, wildland fire use fires, and mechanical fuels treatments and/or designates a Burn Boss/Fire Use Manager to implement the plan

#### 3. Park Fire Coordinator (PFC)– Chief of Natural Resources

This position is based at SLBE. The Park Fire Coordinator is responsible for day to day fire management operations at the Lakeshore level. He/she is responsible for implementation of the Fire Management Plan. This responsibility includes coordination and supervision of all prevention, preparedness, detection, wildland fire, prescribed fire, monitoring, and post fire activities involving NPS land. The PFC submits budget requests through the Area Fire Management Office for FIREPRO input and monitors FIREPRO funds allocated to SLBE. He/she may serve as Incident Commander, Prescribed Burn Boss, or Fire Use Manager during fire operations within the park if qualified. PFC develops resource management objectives involving fire's role in the ecosystem; working closely with the Great Lakes Fire Ecologist and Area FMO to identify priorities for the use of fire as a management tool, including planning, and compliance. With the Great Lakes Fire Ecologist, coordinates all fire related research within the park. He/she is responsible for preparation of all required fire reports and reporting. The PFC maintains records for all personnel involved in suppression and prescribed fire activities, detailing the individual's qualifications and certifications for such activities and updates all fire qualifications for entry into the Incident Qualifications and Certification System (IQCS). The PFC nominates personnel to receive fire-related training as appropriate.

4. Chief Ranger

The Chief Ranger is responsible for oversight of District Rangers who will help to maintain fire caches and wildland fire suppression equipment. The Chief Ranger also is responsible for park dispatch operations. The park dispatcher is utilized in the fire program for fire dispatch, fire weather and station maintenance, fire records and as pack test administrator.

5. Great Lakes Fire Ecologist

The Great Lakes Fire Ecologist assists park resource management specialists and Area FMO to develop resource management objectives involving fire’s role in the ecosystem. Maintains close contact with the Area FMO to identify priorities for the use of fire as a management tool, including planning, compliance, mitigation, and rehabilitation standards if indicated. With the park’s Fire Effects Monitor, coordinates fire effects monitoring activities and data analysis within the park and makes recommendations regarding fire effects to the Area FMO.

**B. FIREPRO FUNDING**

FIREPRO funding is currently available only for approved equipment needs. Project and staffing proposals are submitted through the Area FMO at Indiana Dunes. Currently no permanent or seasonal personnel at SLBE are funded by FIREPRO.

**C. INTERAGENCY COORDINATION AND AGREEMENTS**

The Lakeshore maintains a good working relationship with local Volunteer Fire Departments scattered across two counties. The following table lists the townships and fire departments responsible for protection and current agreement dates. These agreements also cover all other non-law enforcement emergency responses (search and rescue, spills, structural fire, etc.) The agreements are located in [Appendix E](#).

**Table 8 – Table of Cooperative Agreements**

<b>Fire Department</b>	<b>Township Protected</b>	<b>Agreement Date</b>
Empire Township Fire and Rescue Department	Empire	August 6, 2001
Solon-Centerville Township Fire and Rescue Department	Cleveland, Centerville and Kasson	November 11, 2001
Frankfort Fire Department	Lake	August 30, 2001
Homestead Township Fire Department	Platte	October 22, 2001
Glen Arbor Fire Department	Glen Arbor	April 20, 2005

Township fire departments that have response requirement on NPS lands, but currently do not have co-operative agreements include Leland Township Fire Department and Benzonia Township Fire Department.

Additionally, the Michigan Department of Natural Resources and the Huron-Manistee National Forest are available for assistance on wildland fires.

For needs exceeding the capacity of local cooperators, the U.S. Forest Service, Manistee Dispatch Center, located at the Huron-Manistee NF in Baldwin, Michigan can be contacted at 231-745-4631, extension 3116. This contact will bring any resources necessary to the assistance of the Lakeshore, at any time circumstances dictate.

## VII. FIRE RESEARCH

### A. PREVIOUS AND ONGOING FIRE RELATED RESEARCH

Past research has included a broad review of the fire history of the Lakeshore area. A fire related research project started in fall 2003. This project is looking at biological legacies of historical fires, logging and fire suppression on the structure and composition of coastal pine forests at SLBE. The principal investigator is Dr. P. Charles Goebel.

The only fire research previously conducted at SLBE was done through USGS (Loope/Anderton, 1998). This project was titled "Human vs. Lightning Ignition of Pre-settlement Surface Fires in Coastal Pine Forests of the Upper Great Lakes." This study suggests local fire occurrence prior to 1910 were 10 times that expected for lightning-caused fires. Human ignition probably accounted for more than half of the pre-1910 fires.

### B. FIRE RESEARCH NEEDS

To fully support the fire management program on the Lakeshore, the highest priority research need is a mapping of fuel loads to assist in long-range prescribed fire planning. A second need is a study of the costs and benefits of various hazard fuel treatments to mitigate WUI concerns along the boundary and internally on private inholdings and use and occupancy tenants. Finally, research into the history and role of fire in coastal pine/oak savannas is essential to the resource management goal of sustaining natural processes.

## VIII. MONITORING

### A. SHORT AND LONG-TERM MONITORING

All wildland fires and prescribed fires, as well as wildland fire use fires, will be monitored. Information gathered during fire monitoring is needed to keep fires within predetermined criteria, to help identify trigger points for initiating holding and suppression actions, and to protect human life and property. On any fire that burns beyond the initial attack stage, Lakeshore personnel will observe the fire, assess its potential and provide a historical record. Monitoring will include documenting the fire environment (such as weather, fuels, and topography), fire behavior (such as manner and rate of spread, and flame length), and fire effects (such as percent of fuels consumed and changes in plant and animal community composition and structure). Photographs may be taken. Weather readings will be made periodically with a belt weather kit at the fire site. Forms for recording data will be supplied to observing personnel.

Fire effects monitoring will be undertaken to determine whether prescribed fire objectives are being met, and if any unwanted effects are occurring. This monitoring generally consists of the establishment of permanent vegetation/fuels plots, as outlined in the NPS Fire Monitoring Handbook (2003).

Fire effects monitoring in the Lakeshore will consist of sampling permanent vegetation plots, which includes measurements of overstory and pole-size trees, ground cover, dead and down fuels, and surface fuels, and taking photographs. Plots will be sampled pre-burn, immediately post-burn, and one, two, five, and ten years post-burn. Data analysis will be reported to the Lakeshore's resource managers. Data should indicate if the success or failure of the prescribed fire project, and should feed into the adaptive management of the resources. For example, if prescribed fire objectives are not being met or unwanted effects are occurring, the following should be considered:

- Are objectives reasonable
- Should prescriptions be modified?
- Should other treatments (mechanical/ herbicide) be considered in conjunction with or instead of prescribed fire?

Is more research necessary? Fire weather will be collected every day at 1400 hours (local time) at Bear permanent remote automated weather station from April 1 to October 31). Daily fire weather records from permanent and temporary fire weather stations will be entered into the Weather Information Management System (WIMS). The weather station readings will provide the daily information required to calculate the prescribed indices under the National Fire Danger Rating System (NFDRS). All data entered directly into WIMS will be automatically archived in the National Fire Weather Data Library (Bradshaw and Fischer 1984). The resultant time series data base of fire weather provides management a powerful foundation to assess the significance of current fire danger in comparison to historic trends and fire occurrence

data using FIREFAMILY Plus software. Additional general weather information may be obtained from the National Weather Service (NWS) weather station at Traverse City, (162.400 MHZ). Fire weather forecasts will be obtained from the NWS office in Gaylord, Michigan.

In addition, fire weather for prescribed fires will be recorded by the Prescribed Burn Boss or a designee at least 14 days, and preferably 30 days, prior to the earliest ignition date of the fire. When possible, a portable, temporary weather station will be established for each prescribed fire so that NFDRS indices can stabilize before the fire. The station will be positioned, and readings will be taken, in such a way as to reflect the average peak burning period conditions within the most flammable fuel type in the unit, as well as 24 hour variations. Fire danger indices will be calculated from these portable stations, from manual on-site weather observations, and/or from the Bear RAWS Weather Station.

#### **B. THE FIRE MONITORING HANDBOOK**

This handbook, developed by the National Park Service (NPS, 2003) outlines protocols for monitoring fire weather, behavior and effects, and describes in detail all aspects of a comprehensive monitoring program. These protocols have been adopted at Sleeping Bear Dunes National Lakeshore.

#### **C. FIRE MONITORING PLAN**

The Sleeping Bear Dunes National Lakeshore Fire Effects Monitoring Plan will be attached when completed as Appendix F to this Plan. It defines, for the Lakeshore, fire monitoring goals and objectives; minimum qualification standards for fire monitors; monitoring levels; and minimum acceptable standards for documenting fire weather, behavior and effects. Monitoring protocols may follow those described in the Fire Monitoring Handbook (NPS, 2003), or additional protocols may be used if they more effectively monitor the specified prescribed fire objectives

## IX. PUBLIC SAFETY

### A. ISSUES AND CONCERNS

Safety of the visiting public and firefighters is always the primary concern. Safety issues related to fire will be treated in two parts, island issues and mainland issues.

#### 1. Island Issues

Due to the backcountry nature of the islands an unexpected fire can threaten the safety of visitors. Under extreme conditions, entrapment on the island is possible although most campgrounds and developed areas are close to the Lake Michigan shore. On the south island, the current ferry schedule could allow removal of people from the island. The north island is another issue as the ferry stays only long enough to reload and return to Leland. In both locations visitors could go to the village areas for safety.

#### 2. Mainland Issues

On the mainland, the primary threat is to those camping or hiking within the unit. Area residents are also at risk from fires occurring adjacent to Lakeshore boundaries. To a lesser degree there is a hazard from smoke on the highways traversing the Lakeshore. For the most part the roads are narrow and winding and carry a heavy traffic load, especially during the summer months. Movement away from fire areas should not be difficult. Management of residential traffic may require assistance from local or county authorities.

### B. MITIGATION

In order to make employees and the general public aware of hazards, the following mitigation measures will be considered:

- General public will be made aware of wildland fires and prescribed fires through press releases, informal contacts with park employees and general interpretive presentations. Patrols will be assigned on all fires to prevent public visitors from entering the burn area and to keep them at a safe distance for any observation activities. The general public will not be allowed access to any areas affected by fire until hazards to public safety, such as smoldering stump holes and snags, have been mitigated.
- Trails providing access to areas involved in fire activity will be closed to public use if fires present unacceptably hazardous conditions to these visitors.
- Backcountry camping permits will not be issued for areas determined to be hazardous due to fire activity.
- Safety briefings will be conducted for NPS personnel prior to any participation in wildland suppression or prescribed fires.
- Appropriate regulatory and/or enforcement agencies will be notified prior to any prescribed fires to assist in safely managing pedestrian, equestrian or vehicular traffic. Warning signs will be posted along roads and trails as necessary
- Employees will wear standard safety clothing when involved in monitoring or

suppression actions, or whenever inside an actively burning area.

- All fire personnel will be reminded of the "18 Situations That Shout Watch Out" and will be expected to comply with the "10 Standard Fire Orders".
- Radios will be assigned to all fire crews and monitors. Special permission must be obtained from the Resource Management Specialist for monitors to work alone on actively burning fires. The Incident Commander will know the position of all personnel on the prescribed fire at all times.
- Smoke warning signs will be placed along park roads to warn drivers of low visibility areas. Roads will be closed or traffic guided as necessary, in conjunction with local county authorities.
- Initial attack or monitoring team members will determine the proximity of visitors and neighbors to the fire and inform them if a potential hazard exists. Those in need will be assisted in their evacuation if necessary.

## **X. PUBLIC INFORMATION AND EDUCATION**

### **A. CAPABILITY AND NEEDS**

An excellent opportunity is available for fire information dissemination at each visitor contact area. To further public information and education, the following guidelines will be followed:

- Timely and accurate information will be provided to the media and Lakeshore visitors regarding the status of fire actions and suppression efforts. Safety messages will be incorporated in fire management information disseminated at visitor contact points, and by the Public Information Officer. Interpretive programs and literature will contain fire safety messages, and information listing fire location, behavior, expected dangers, areas to avoid, and precautions to be taken. These will be posted on park bulletin boards and at the visitor center. This information will also be given to park concessionaires to be disseminated to guests.
- Informational handouts explaining the fire management program will be prepared and updated as necessary. During periods when prescribed or wildland use fires are burning, these handouts will be distributed to both visitors and local residents.
- The prescribed fire program will be discussed in informal contacts with employees, neighbors and visitors.
- Adjacent landowners will be notified when fire, particularly wildland fire, is a threat to off-unit residential areas, private inholdings and use and occupancy properties.
- The Lakeshore website will also be available for information dissemination.

### **B. RESPONSE TO INCREASING FIRE ACTIVITIES**

When the local staffing class is at SC-4 or SC-5, information will be prominently displayed at visitor contact points and on the Lakeshore's website. Patrol activity on both mainland and islands units may be increased to detect potential fires and to monitor visitor activity. At SC-5 it may become necessary to close portions of the Lakeshore to protect the public. Refer to the Step-up Plan and Staffing Levels tables in Appendix H.

## XI. PROTECTION OF SENSITIVE RESOURCES

### A. ARCHEOLOGICAL/CULTURAL/HISTORIC RESOURCES

Several categories of ethnographic resources and traditional places important to Native Americans (e.g. Ottawas, Ojibways and Potawatomis) have been identified within Sleeping Bear Dunes National Lakeshore, several of which are likely significant for the preservation of traditional cultural practices among Native Americans who are affiliated with the park. Under the direction of the National Environmental Policy Act (NEPA), the National Historic Preservation Act (NHPA), the Native American Graves Protection and Repatriation Act of 1990 (NAGPRA), the Executive Order on Sacred Sites, the 2001 National Park Service (NPS) Management Policies, NPS guidelines (DO-2 and DO-28), and other relevant laws, policies and guidelines, ethnographic resources (e.g. critical components of Native American heritage) will be protected and negative or irreversible impacts avoided. Figure 6 is a map of the known cultural resources in the Lakeshore.

Sleeping Bear Dunes National Lakeshore's archeological and historical resources are a limited, fragile, and nonrenewable part of the environment that must be protected; when disturbed, the 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 in Sleeping Bear Dunes National Lakeshore 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. Completion of these surveys is therefore of the greatest importance.

Because complete inventories and surveys are not yet completed for the park, and because the effects of fire on these resources and places not yet well understood, park managers and staff will seek greater involvement of regional office cultural anthropologists in the Applied Ethnography Program, as well as traditionally associated tribal representatives regarding fire activities and potential impacts to significant traditional resources or places. Through an ongoing process of consultation and data collection, further information will be obtained on the ethnographic dimensions of the landscape for managers to incorporate into fire management activities. Ethnographic resources will be protected during fire fighting, cleanup and rehabilitation, and all currently undocumented ethnographic sites and traditional cultural properties discovered during a fire activity will be protected and reported. The park also contains significant historical buildings and cultural landscapes, as previously described in this plan. Considerations for protection of these resources will be included in the development of any prescribed fire plans, and associated smoke management.

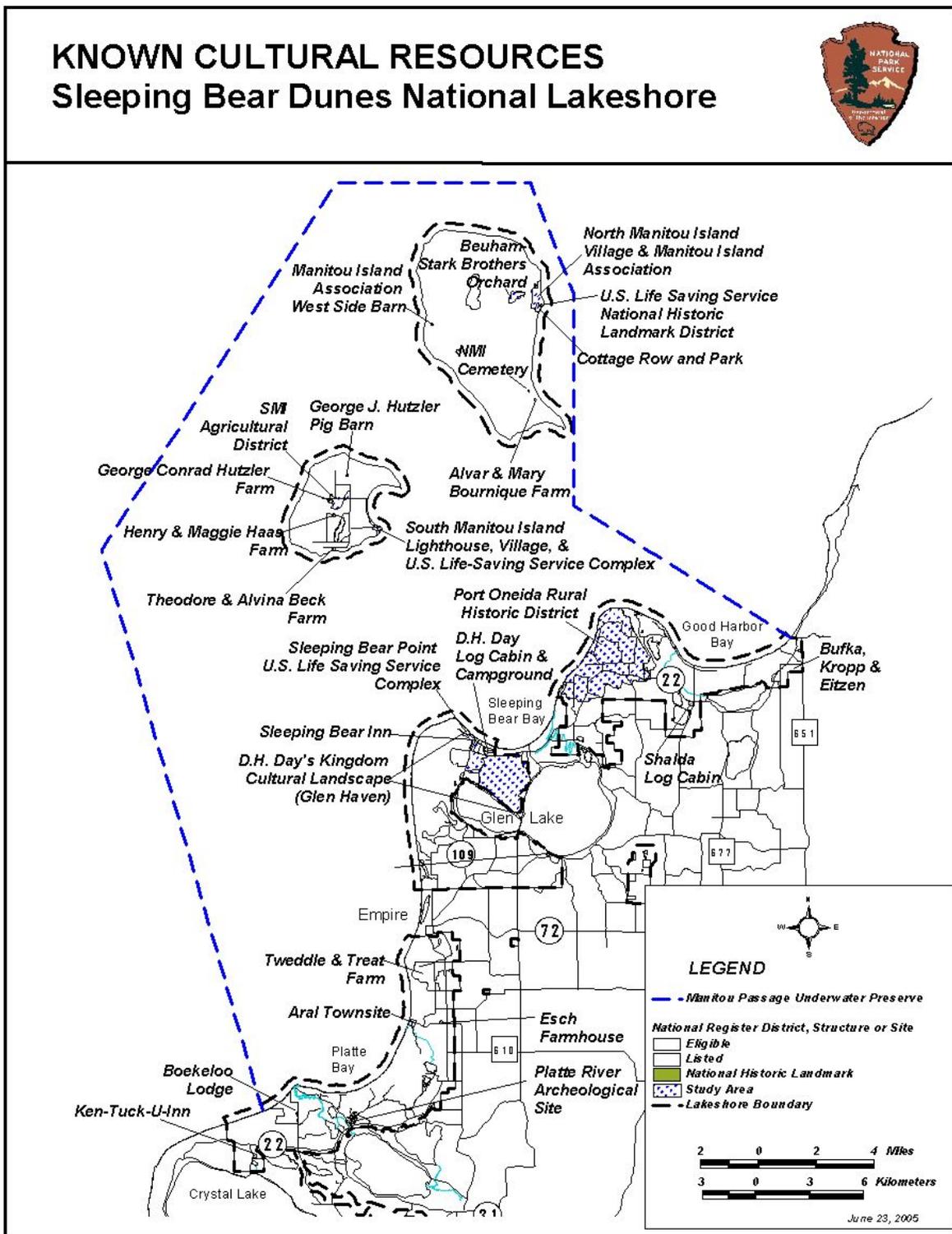
While archeological inventories are incomplete, there are considerable data available to understand the distribution of archeological sites across the park. The work already completed to inventory these cultural resources has resulted in a series of site/restoration databases, such as the Archeological Sites Management Information System (ASMIS) and others. These databases can be located in the park GIS computer and Cultural Resources Office as well as the NPS Midwest Archeological Center. An Archeological Overview and Assessment is currently being developed for the park by the Midwest Archeological Center, and that document will provide a synthesis of archeological work conducted at the park to date along with an updated listing and description of all the park's archeological sites. It is anticipated that numerous archeological sites will be added to ASMIS at SLBE as part of this effort. Certain landforms and topographic settings contain most of the known prehistoric sites. A very large number of sites occur at or near the 600' contour. Some sites are also located on flat benches on the valley edges in upland settings, including on glacial moraines. Therefore even where inventory coverage is sparse, there are data available to predict where other sites are likely to occur. The extensive sloping uplands, and steep portions of dunes do not contain any known prehistoric sites. Extensive acreage within the park is therefore not expected to contain any prehistoric archeological sites. Historic sites are more widely distributed (especially in the uplands) than prehistoric sites, but many of the "unrecorded" prehistoric site locations can be predicted from historic maps and other documents. Inventory coverage and site locations are now in GIS format, and that will greatly assist our ability to avoid adverse impacts to sites during fire fighting activities.

Minimum Impact Suppression Techniques will be used to the greatest extent possible. MIST guidelines are found in the Wildland Fire Management Manual RM-18 (NPS, 2001) Chapter 9, Exhibit 5. Fire management activities that of necessity disturb the ground in any way, such as fireline construction using hand tools or heavy equipment, in Sleeping Bear Dunes National Lakeshore will strive to use paraprofessional and professional archeologists working in cooperation with firefighters and pre-burn preparation crews to prevent needless cultural resource destruction. It must be recognized that during an unwanted wildland fire the highest priorities are safety and controlling the fire. In most cases damage to cultural resources can be avoided. During fire suppression, prescribed fire, and rehabilitation activities:

- Resource base maps showing archeological and historical site locations, if available, will be given to archeologists and incident commanders on the firelines;
- When numerous cultural resources are threatened by a fire, it would be desirable to have archeologists present to help mitigate the impacts of fire suppression and rehabilitation on cultural resources;
- Priority will be given to monitoring heavy equipment through all aspects of the suppression and rehabilitation efforts;
- Archeologists serving on a fireline as technical specialists must hold a current red card to perform their specific advisory duties. If their duties do not require them to be on the actual fireline, then a red card is not required;

- Fireline archeologists will be equipped with appropriate standard fire fighting 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;
- The Cultural Resource Management Specialist will coordinate all activities of fireline archeologists with fire overhead.
- Historic buildings and recognized cultural landscapes will be pretreated wherever possible to preclude their involvement in any wildland fire. This may involve hazard fuel reductions or other modifications that do not compromise the historic integrity of the resource.
- Historic buildings and identified cultural landscape features such as fences, orchards, windbreaks and former garden sites will be protected by firelines (hand or foam) and isolated from burnable fuels where possible. This may entail use of fire to blacken a safe area around these resources.
- Individual burnable features such as buildings and fence posts may be pretreated with foam applications to prevent burning.

Figure 6 – Known Cultural Resources



## **B. NATURAL RESOURCES**

### 1. Resources

The natural resources most at risk from wildland fire at Sleeping Bear Dunes National Lakeshore are the mainland and island dune vegetation, and the cedar grove on South Manitou. Plant species that are listed as threatened or endangered will be protected when locations are known. No T&E wildlife species are at significant risk. Although there is some potential impact to eagle nests and Pitcher's thistle plants, these species are not likely to be adversely affected. Most species listed in the Michigan Natural Features Inventory as threatened, endangered or of special concern in Benzie and Leelanau Counties are found in areas of wetlands or along the shore areas where fire occurrence is less likely. Possibly the greatest risk to natural resources would be continued fire exclusion.

### 2. Mitigation

Minimum Impact Suppression Tactics (Wildland Fire Management Reference Manual, RM-18 (NPS, 2001) Chapter 9, Exhibit 5) are the primary procedures for protecting natural resources in the Lakeshore during suppression and holding activities. Ignitions in dune vegetation will be managed with the least disturbance possible.

## **C. INFRASTRUCTURE/INHOLDINGS**

### 1. Improvements

On the islands the majority of improvements are historic structures although there are some private inholdings to be protected. Some of the infrastructure to be protected includes buildings, power generation and water treatment facilities, and a radio tower.

On the mainland, there are numerous inholdings and use and occupancy tenants, historic resources, and park facilities. The main federal facilities include the maintenance area, facilities in developed campgrounds, and the Federal Aviation Administration radar facility. Table 2 lists real properties at risk in the Mainland Unit.

### 2. Mitigation

On the islands, hazard fuel reduction projects will be implemented in an effort to create defensible spaces and to reduce the risk that unwanted wildland fire will adversely affect these facilities. For mainland facilities, hazard fuel reduction efforts will also be the main method of mitigation. Efforts will continue to accomplish WUI projects to reduce risks to developed areas and land values. This applies to both government and privately owned property. Other general efforts to protect these resources will include prevention awareness and public information, priority for initial attack, and aggressive suppression actions.

## XII. FIRE CRITIQUES AND ANNUAL PLAN REVIEW

### A. INTRODUCTION

#### 1. Scope

All wildland fires and fire-related incidents will be reviewed. All prescribed fires will be reviewed.

#### 2. Reviews

Reviews are conducted for one or more of the following purposes:

- To examine the progress of an on-going fire incident and to confirm effective decisions or correct deficiencies;
- To identify new or improved procedures, techniques or tactics;
- To compile consistent and complete information to improve or refine park, regional or national fire management programs;
- To examine anomalous fire-related incidents in order to determine cause(s), contributing factors, and where applicable, recommend corrective actions. If negligence is indicated, the circumstances will be reported and investigated in accordance with applicable regulations, policies or guidelines;
- To determine the cost effectiveness of a fire operation.

#### 3. Authority

The authority to convene a fire review rests with the park Superintendent, Regional Director, or the Associate Director, Park Operations and Education. It is the clear responsibility of the Superintendent to call for a review, to insure timely completion, and to implement recommended actions. The Regional Director has responsibility to follow-up with the Superintendent: that reviews are established and completed in a timely manner, and that recommended actions are completed. The Superintendent may request technical support from Fire Management Program Center, regional, park or interagency personnel with the appropriate expertise.

#### 4. Incident Types

All wildland fire incidents which result in human entrapment, fatalities, or serious injuries, or result in incidents with potential, will be investigated and reviewed.

#### 5. Associate Director

The Associate Director, Park Operations and Education, will convene an ad-hoc team to review Service-wide fire management programs subsequent to the occurrence of any significant, controversial or unusual wildland fire management activities.

## 6. Purpose

All reviews will be conducted as constructive critiques aimed at determining the facts related to the specific fire or fire management program. They will identify commendable actions, techniques and decisions as well as areas which need improvement. Reviews are intended to resolve operational issues, not impose punitive actions.

### **B. FIRE REVIEWS**

#### 1. "Hotline" Review

The purpose of the hotline review is to examine the progress of an on-going fire incident, regardless of size. The review will provide a confirmation of the decisions being made daily in the Wildland Fire Situation Analysis or determine where the decision process has been faulty and corrective actions are needed.

The "hotline" review is normally conducted by the Park's Fire Management Officer (or an official who has designated fire program management responsibilities) in conjunction with the incident commander on the fire.

These reviews require no special reporting. Documentation of "hotline" reviews should be included in the normal fire report narrative.

#### 2. Incident Management Team (IMT) Closeout and Review

The park Superintendent or his/her designee will conduct a closeout review with the IMT prior to their release from the fire incident. The purpose of this review is to ensure complete transition of the incident management back to the unit and to evaluate the status of any incomplete fire business. RM 18, Chapter 13, Exhibit 1 contains a sample Close-Out Review with Incident Management Team.

#### 3. Unit Level Review

The Superintendent or his/her designated representative should conduct the unit level review. The Superintendent will appoint other qualified persons, including the unit fire management officer (or an official who has designated fire program management responsibilities) to be a part of the review. The purpose of this review is to provide the Superintendent with information to recognize commendable actions and to take needed corrective action(s). Costs associated with the review will be charged to the account assigned to the fire with the approval of the Regional Fire Management Officer. A copy of the complete report will be sent to the Regional Fire Management Officer, who will review it and, if appropriate, forward a copy to the Fire Management Program Center.

#### 4. Regional Level Review

A regional level review may be conducted for any fire that:

- Crosses a park's boundary into another jurisdiction without the approval of an interagency agreement;
- Results in adverse media attention;

- Involves serious injury to less than 3 personnel, significant property damage, or an incident with potential;
- Results in controversy involving another agency.

The regional level review normally will be conducted at the unit where the fire occurred. The Regional Fire Management Officer or his/her designated representative will convene the review. Attendees will include the Superintendent of the Lakeshore, the Lakeshore's fire coordinator, the Indiana Dunes FMO, the incident commander(s) for the fire, and other individuals agreed upon by the Regional Director and Superintendent. If possible, the review team should visit the actual fire site as part of the review. A copy of the review report will be sent to the Fire Management Program Center. Costs associated with the review will be charged to the account assigned to the fire.

#### 5. National Level Review

A national level review may be conducted for any fire that involves Service-wide or national issues, including:

- Significant adverse media or political interest;
- Multi-regional resource response;
- A substantial loss of equipment or property;
- A fatality, or multiple, serious fire-related injuries (three or more personnel);
- Any other fires that the Associate Director, Park Operations and Education, wants reviewed.

The national level review normally will be conducted at the unit where the fire occurred. The National Fire Management Officer or his/her designated representative will convene it. It will be attended by the Superintendent of the unit, the unit's fire coordinator (or an official who has designated fire program management responsibilities), the Indiana Dunes FMO, the Regional Fire Management Officer, the incident commander(s) for the fire, and other individuals agreed upon by the National Fire Management Officer and the Regional Director. If possible, the review team should visit the actual site of the fire as part of the review. All costs associated with the review will be charged to the account assigned to the fire.

An outline for final reports of fire reviews may be found in RM 18, Chapter 12, Exhibit 2. Exhibit 3 provides a checklist of sample questions, which might be asked during a fire review. These two documents should be used for unit, regional and national level reviews.

#### 6. Entrapment and Fire Shelter Deployment Review

Fire shelter deployment is defined as the use of a fire shelter for its intended purpose in any situation other than training. Use of the terms "precautionary deployment", "practice deployment" and "entrapment deployment" are not

acceptable or recognized. Entrapments and fire shelter deployments will be reviewed in order to gather complete and accurate information to determine the reasons for the deployment. Corrective recommendations will be developed to minimize future situations which might lead to other shelter deployments. All entrapments and fire shelter deployments will be reported to the Regional Fire Management Officer, who will be responsible for developing the review team in cooperation with the Fire Management Program Center. The appointed team leader will contact the Superintendent for reporting information. See RM 18, Chapter 3 for investigation and reporting requirements.

All entrapments and fire shelter deployments will be investigated as soon as possible after the deployment incident. RM 18, Chapter 13, Exhibit 4 provides specific directions for conducting an entrapment or shelter deployment review. RM 18, Chapter 13, Exhibit 5 provides an outline format for final reports on entrapment and fire shelter deployment reviews.

### C. PROGRAM REVIEWS

#### 1. Operations Evaluations

Operations evaluations of NPS units and regions may include review of fire management programs to assure compliance with established Service standards.

#### 2. Annual Fire Program Review

The park Superintendent or his/her designee will convene an ad-hoc team to review park fire activity during any year in which significant, unusual or controversial fire activity occurs. This review team should analyze the reports from any reviews to determine what, if any, operational changes should be initiated. The review team will develop findings and recommendations and establish priorities for action.

#### 3. FIREPRO Review

Annually, the PFC, in conjunction with the Area FMO, will conduct a FIREPRO audit and review of the park values at risk and research, equipment and project needs.

#### 4. Fire Readiness Review

Fire readiness or preparedness reviews, utilizing the Interagency Fire Readiness Review Guide as adapted for park-specific needs, should be conducted annually prior to the established fire season by park fire management staff.

### **XIII. CONSULTATION AND COORDINATION**

The following individuals and groups were consulted during the preparation of this plan.

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KellyAnn Gorman, former Great Lakes Fire Ecologist, Voyageurs National Park, International Falls, MN  
Louis Hartjes, Area Fire Management Officer, Indiana Dunes National Lakeshore  
Dave Soleim, Area Fire Management Officer, Border Waters Complex, Voyageurs National Park, International Falls, MN  
Empire Fire Department, Empire, Michigan  
Glen Arbor Fire Department, Glen Arbor, Michigan  
Solon/Centerville Volunteer Fire Department, Cedar, Michigan  
Homestead Fire Department, Honor, Michigan  
City of Frankfort Fire Department, Frankfort, Michigan  
Lake Township, (Benzie County)  
Michigan Department of Natural Resources (DNR)  
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P. Charles Goebel, Ohio State University, Wooster, Ohio  
Dusty Shultz, Superintendent, Sleeping Bear Dunes National Lakeshore (SLBE)  
Tom Ulrich, Assistant Superintendent, SLBE  
Roger Moder, former Chief Ranger, SLBE  
Larry Johnson, Chief Ranger, SLBE  
Steve Yancho, PFC, Chief of Natural Resources, SLBE  
Bill Herd, Park Ranger Interpretation, SLBE  
Kim Mann, Historical Architect, SLBE  
Mike Duwe, Environmental Protection Specialist, SLBE.

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Common names of plants found at (<http://plantsdatabase.com/>)

Cultural Resource Management references  
(<http://archnet.asu.edu/archnet/topical/crm/crmusdoc.html>)

Endangered Species Act of 1973 (<http://endangered.fws.gov/esa.html>)

Fire Effects Information System for common names of plants found at  
(<http://www.fs.fed.us/database/feis/>)

History & Ecology of Fire in Michigan  
([http://www.michigan.gov/dnr/0,1607,7-153-10367\\_11851-24038--,00.html](http://www.michigan.gov/dnr/0,1607,7-153-10367_11851-24038--,00.html))

National Fire Plan (<http://www.fireplan.gov/>)

National Historic Preservation Act (<http://www4.law.cornell.edu/uscode/16/470.html>)

National Park Service DO-18, Wildland Fire Management  
(<http://www.nps.gov/fire/fire/policy/do18/do18.htm>)

National Park Service RM-18, Wildland Fire Management  
(<http://www.nps.gov/fire/fire/policy/rm18/index.htm>)

University of Wisconsin Herbarium for common names of plants at  
(<http://wiscinfo.doit.wisc.edu/herbarium/>)

U.S. Department of Agriculture Plants Database for plant information and common names at (<http://plants.usda.gov/>)

U.S. Geological Survey, Northern Prairie Research Center herbarium listing for common names of plants at  
(<http://www.pwrc.usgs.gov/history/herbarium/category.htm>)