APPENDIX A

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BIBLIOGRAPHY

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APPENDIX B

GLOSSARY OF TERMS

Glossary of Terms

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

BI - Burning Index: A number related to the contribution that fire behavior makes to the amount or effort needed to contain a fire in a particular fuel type within a rating area. An Index for describing Fire Danger.

Catastrophic Wildfire: A large scale, high-intensity wildland fire that could result in high plant mortality, removal of the majority of ground cover over a large area, possibly damage or destroy structures and other property, and/or severely impact water and air quality.

Closed Area: An area in which specified activities or entry are temporarily restricted to provide for to public safety or to reduce risk of human-caused fires.

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

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

Ecosystem: An interacting system of interdependent organisms.

Expected Weather Conditions: Weather conditions indicated as common, likely, or highly probable based on current and expected trends when compared to historical weather records.

Experienced Severe Weather Conditions: The most severe, though infrequent, weather conditions that have been observed on the fire site area during the period weather records have been kept. These conditions can be used in making fire behavior forecasts for different scenarios.

Fire Effects: The physical, biological, and ecological impacts of fire on the environment.

Fire Management: Activities required for the protection of burnable wildland values from fire and the use of prescribed fire to meet land management objectives.

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

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

Fire Regime: A combination of fire frequency, fire timing and fire behavior characteristics operating in an ecological system.

Fire Retardant: Any substance except plain water that by chemical or physical action reduces flammability of fuels or slows their rate of combustion.

Fire Use: The combination of wildland fire use and prescribed fire applications to meet resource objectives.

Fuel Complex: Combinations of material that burn in a fire including organic soils, duff, litter, grass, dead branch wood, snags, logs, stumps, brush and to a limited degree, live tree foliage. Thirteen standard fuel models have been developed and are used to predict fire behavior within fuel complexes.

Fuel Loading: The amount of dead fuel present on a particular site at a given time; the percentage of fuel available for combustion changes with the season.

Hazard: A fuel complex defined by kind, arrangement, volume, condition, and location that forms a special threat of ignition and resistance to control.

Hazardous fuels: See Hazard.

Hazard Fuel Reduction: **Any treatment of living and dead fuels that reduces the threat of ignition and spread of fire.**

Heavy fuels: **Fuels of large diameter such as snags, logs, large limbwood, which ignite and are consumed more slowly that flash fuels.**

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

Mitigation Actions: Actions taken by Park officials to reduce the severity of a wildland fire.

National Wildfire Coordinating Group (NWCG): A group formed under the direction of the Secretaries of Interior and Agriculture to improve the coordination and effectiveness of wildland fire activities, and provide a forum to discuss, recommend appropriate action, or resolve issues and problems of substantive nature.

Natural Fires: Fires resulting from lightning or other forms of natural ignitions.

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

Prescribed Fire: Any fire ignited by management actions to meet specific objectives. A written, approved prescribed fire plan must exist, and NEPA requirements must be met, prior to ignition.

Prescribed Fire Plan: A plan required for each fire application ignited by managers. It must be prepared by qualified personnel and approved by the appropriate agency administrator prior to implementation. Each plan will follow specific agency direction and must include critical elements described in agency manuals.

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

Wildfire: An unwanted wildland fire.

Wildland Fire: any nonstructural fire, other than prescribed fire, that occurs in the wildland. *This term encompasses fires previously called both wildfires and prescribed natural fires.*

Wildland Fire Management Program: The full range of activities and functions necessary for planning, preparedness, emergency suppression operations, and emergency rehabilitation of wildland fires, and prescribed fire operations, including fuels management to reduce risks to public safety and to restore and sustain ecosystem health.

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

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

Wildland Fire Use: The management of naturally ignited wildland fires to accomplish specific prestated resource management objectives in predefined geographic areas outline in FMP's.

Wildland – Urban Interface: The location where homes and other structures are co-mingled with wildland fuel complexes.

APPENDIX C: NEPA COMPLIANCE

Environmental Assessment

For The

A. Fire Management Plan

Indiana Dunes National Lakeshore

APPENDIX D

NHPA COMPLIANCE

SECTION 106 DOCUMENTATION WILL BE INSERTED IN FINAL DRAFT AFTER PUBLIC REVIEW PERIOD

APPENDIX E

LISTING OF FEDERAL AND STATE LISTED THREATENED AND ENDANGERED SPECIES

AND

GUIDELINES FOR MANAGING FOR THE KARNER BLUE BUTTERFLY

GUIDELINES FOR PRESCRIBED FIRE MANAGEMENT

Background:

In an amendment to the Environmental Assessment for the Fire Management Plan for Indiana Dunes National Lakeshore (September 30, 1992), the U.S. Fish and Wildlife Service established guidelines necessary to afford adequate protection for the Karner blue butterfly (*Lycaeides Melissa samuelis*).

The Karner blue butterfly (KBB) is both fire sensitive and fire dependent. A wildfire or management ignited prescribed fire can eliminate the eggs or larva, but the larva feed exclusively on lupine, which requires a fire-maintained ecosystem. Lupine requires full sunlight in order to thrive. If all fires are suppressed and without prescribed fires, black oaks will invade or resprout, shading out and eventually extirpating the lupine. A fire management policy that does not include fire as a treatment to the resources is almost certain to eliminate lupine and the KBB. Therefore, it is necessary that a prescribed fire program be maintained in order to protect and enhance the KBB populations in Indiana Dunes National Lakeshore.

A prescribed fire must be carefully planned, executed, and monitored if it is to enhance the KBB. In the summer of 1992, a noted expert on the KBB, Dale F. Schwitzer, conducted a study on the populations within the national lakeshore and made recommendations concerning the management of the KBB. Many of the following guidelines resulted from Schwitzer's study and report.

Guidelines:

1. No more than 1/3 of the habitat of a KBB population will be burned in any one year. If the entire habitat area of a population is scheduled to be burned, the area will be broken into three to five units and they will be burned in different years.

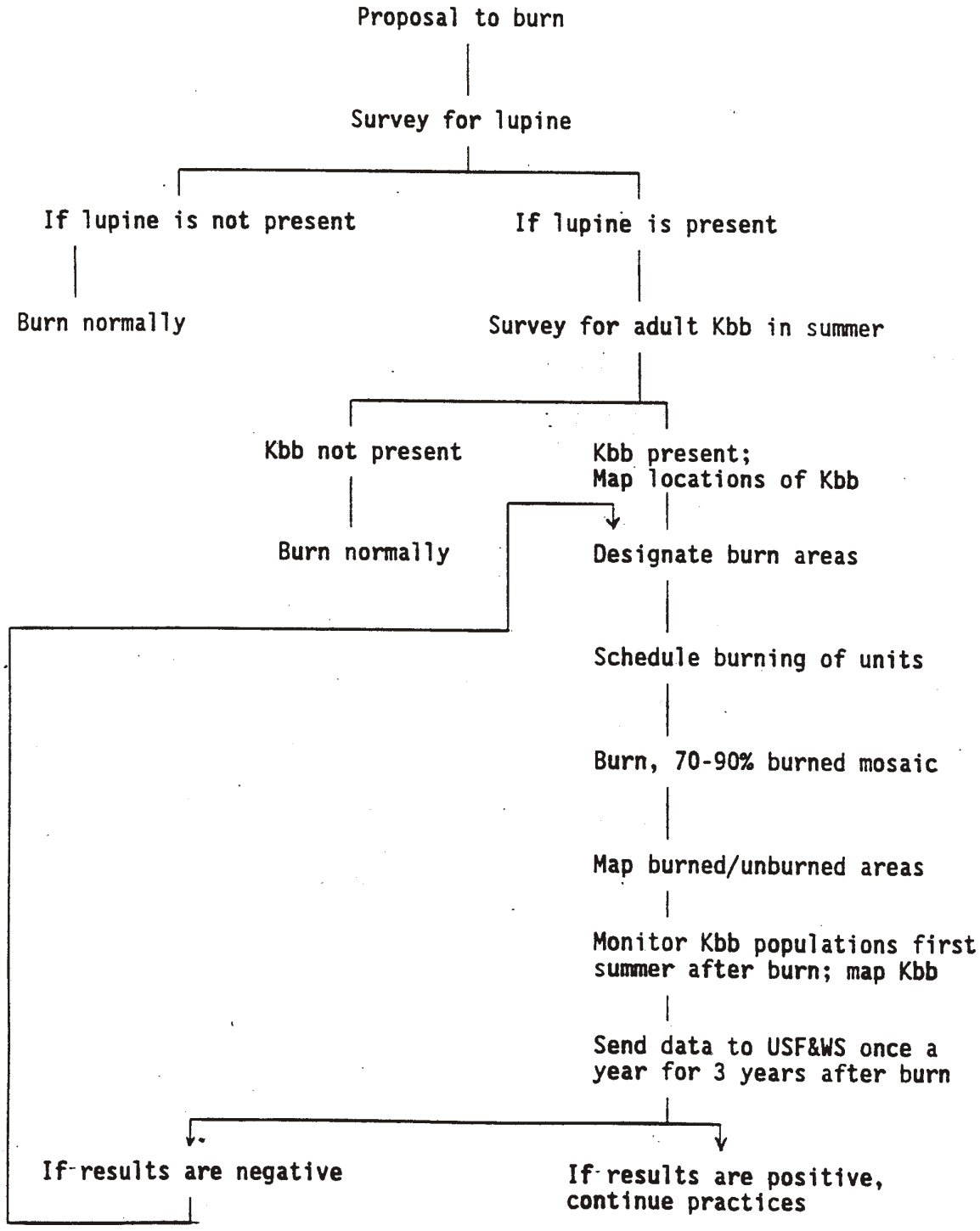
2. Within each burn unit containing KBB, at least one large prairie opening and its edge lupine will be selected to remain unburned.

3. Adjacent burn units with KBB will not be burned in consecutive years.

4. The stated objectives for prescribed fires in KBB areas will specify a mosaic burn pattern. For example: No more than 90% of the area will be burned.

5. Proposed prescribed fire burn blocks will be surveyed for lupine and KBB before the burn plan is written. If KBB is found, the above procedures will be followed. In addition, a walk-through survey will be conducted prior to the burn to establish the number of KBB present, as well as their locations. The populations will also be monitored for three years after the burn. The pre-burn and post-burn monitoring data for three years will be sent to the U.S. Fish and Wildlife Service.

HOW KARNER BLUE BUTTERFLY WILL AFFECT MANAGEMENT IGNITED PRESCRIBED FIRE PLANNING



APPENDIX F

FIRE HISTORY

INDIANA DUNES NATIONAL LAKESHORE
FIRE HISTORY (1982 -2003)

Year	Wildfires		Acres	Largest	Rx	Acres	Support Actions	False Alarms	Lightning
	Park	Mutual Aid							
1982	19	1	216.5	60				1	
1983	23	4	70.5	37					1
1984	25	3	538.2	182					
1985	25	0	161.5	51			3		
1986	23	4	1331.3	654	3	45.2	3		
1987	30	2	1180.2	228	5	288.1	7	1	
1988	33	2	616.8	125	2	47.5	12	4	1
1989	32	2	247.1	60	1	30	3	1	
1990	34	2	310.7	109	2	32.8	8	3	
1991	27	7	72	40			8	3	
1992	49	32	192.6	47.7	1	65	3	7	
1993	34	16	408	341.6	5	298.4	1	16	
1994	42	40	547.4	191.5	5	303.6	19	19	2
1995	52	43	738.3	253	6	440.3	2	17	
1996	40	43	466	244.1	5	466.8	8	24	1
1997	22	9	33.5	23.7	8	895.7		10	1
1998	28	17	72.4	48.5	8	485.4	3	3	2
1999	57	48	363.6	70	5	200.1	4	4	1
2000	25	17	488.9	119.8	5	221	16		
2001	31	16	334.9	170	9	576.7	13	1	
2002	16	10	512.1	396	3	289	23		
2003	19	1	660.6	204.9	8	632	26		

THIS TABLE WAS COMPILED FROM DATA OBTAINED FROM THE SHARED APPLICATION COMPUTER SYSTEM (SACS)

APPENDIX H

FIRE PREVENTION ANALYSIS

FIRE PREVENTION ANALYSIS

The major causes of wildland fires at Indiana Dunes National Lakeshore are starts from the numerous railways which crisscross through the lakeshore as well as from human caused fires, be it an escape from a refuse/debris burn, fireworks, children or arson. This grouping accounts for over 95% of the fires which occur at the Lakeshore.

The largest proportions of wildland fires occur in the West Unit. Most of these are started by railroads or are intentionally set by humans. There are three ways that railroads start fires in the national lakeshore: hot brake shoes sparking or disintegrating, hot carbon particles in the exhaust, and maintenance activity on the tracks, such as track grinding. A national study from the early 1990's determined that of the fires caused by railroads, 55% were caused by brake shoes and 35% were caused by exhaust. The West Unit of the park is also located in a higher populated area. This higher concentration of population presents a greater number of children and transient individuals. Children playing with fire, unattended fires left by transients, and arson are suspected to be the leading causes of our human caused fires.

Many of the railroad caused fires are preventable, such as the exhaust and track grinding fires. Exhaust caused fires can be prevented if the spark arrestors are cleaned regularly. Brake caused fires can be prevented by regular inspections. It is difficult to prove beyond reasonable doubt that a particular fire was caused by a specific train traveling a heavily used track. Along the railroads through the national lakeshore it is difficult to find a 10 square meter area that does not have brake shoe fragments. Future efforts will be made to improve relationships and contacts with railroad maintenance departments to insure that the procedures outlined in the Railroad Fire Prevention Field guide are followed. Every attempt will be made to accurately determine the cause of every fire.

GENERAL ACTIONS

The following items have been identified as elements in the national lakeshore's overall fire prevention program. They are designed specifically to address human caused and railroad fires, the 2 major causes of wildland fires at the national lakeshore.

HUMAN CAUSED

1. Patrols will be increased during periods of very high and extreme fire danger (see step-up plan for specifics)

   Responsible person: Assistant Fire Management Officer and Fire Management Officer. (On Going)

2. The cause and origin will be determined on every fire.
Follow up investigations will be conducted as necessary.

Responsible person: Incident Commander, Assistant Fire Management Officer, and Fire Management Officer. (On Going)
Law Enforcement personnel will be called upon for investigations as Necessary.

3. Every attempt will be made to prosecute and collect damages (the cost of suppression as well as actual damages) on any fire in which an investigation can determine the actual cause of the fire.

Responsible person: Law Enforcement, the Assistant Fire Management Officer and the Fire Management Officer.

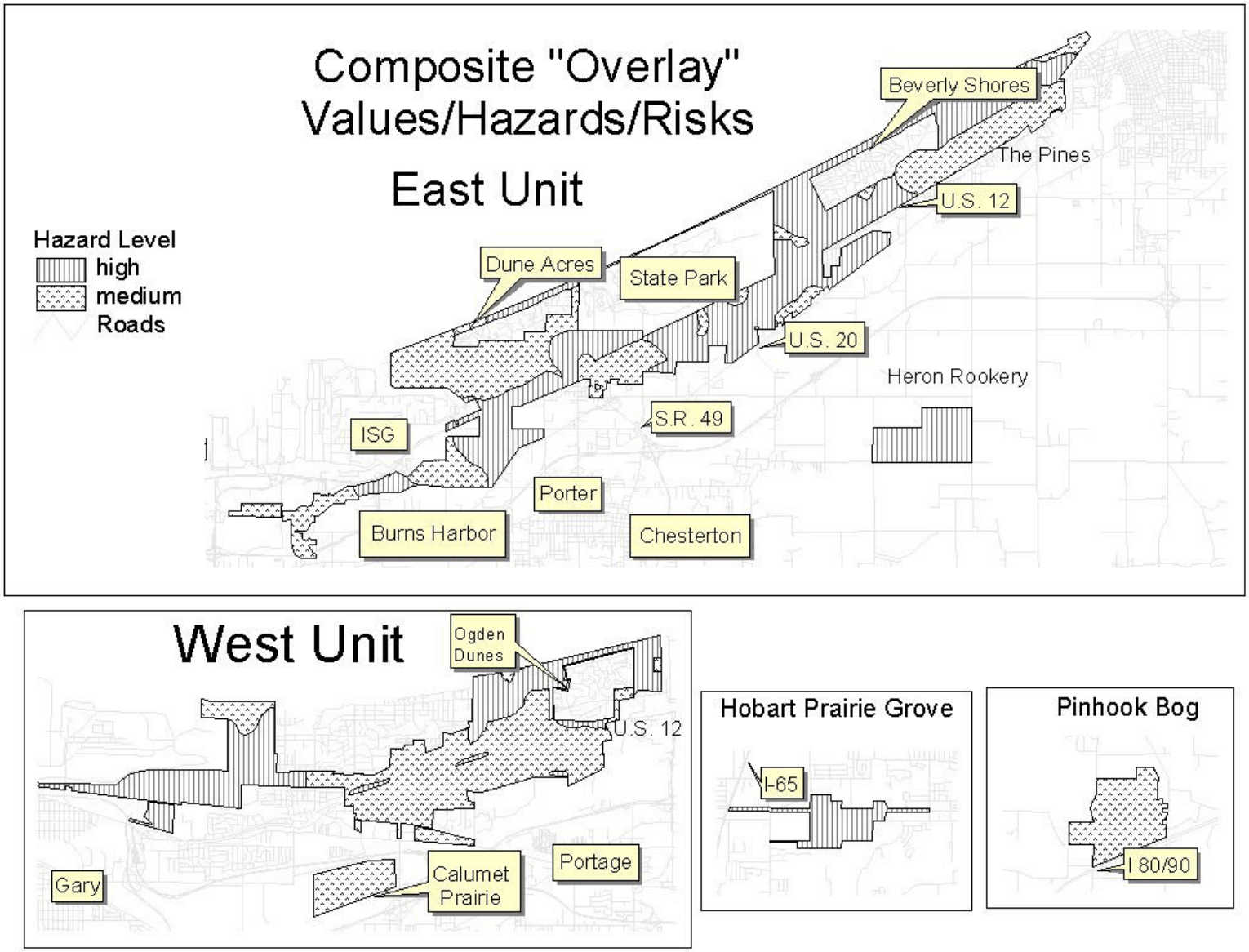
RAILROAD

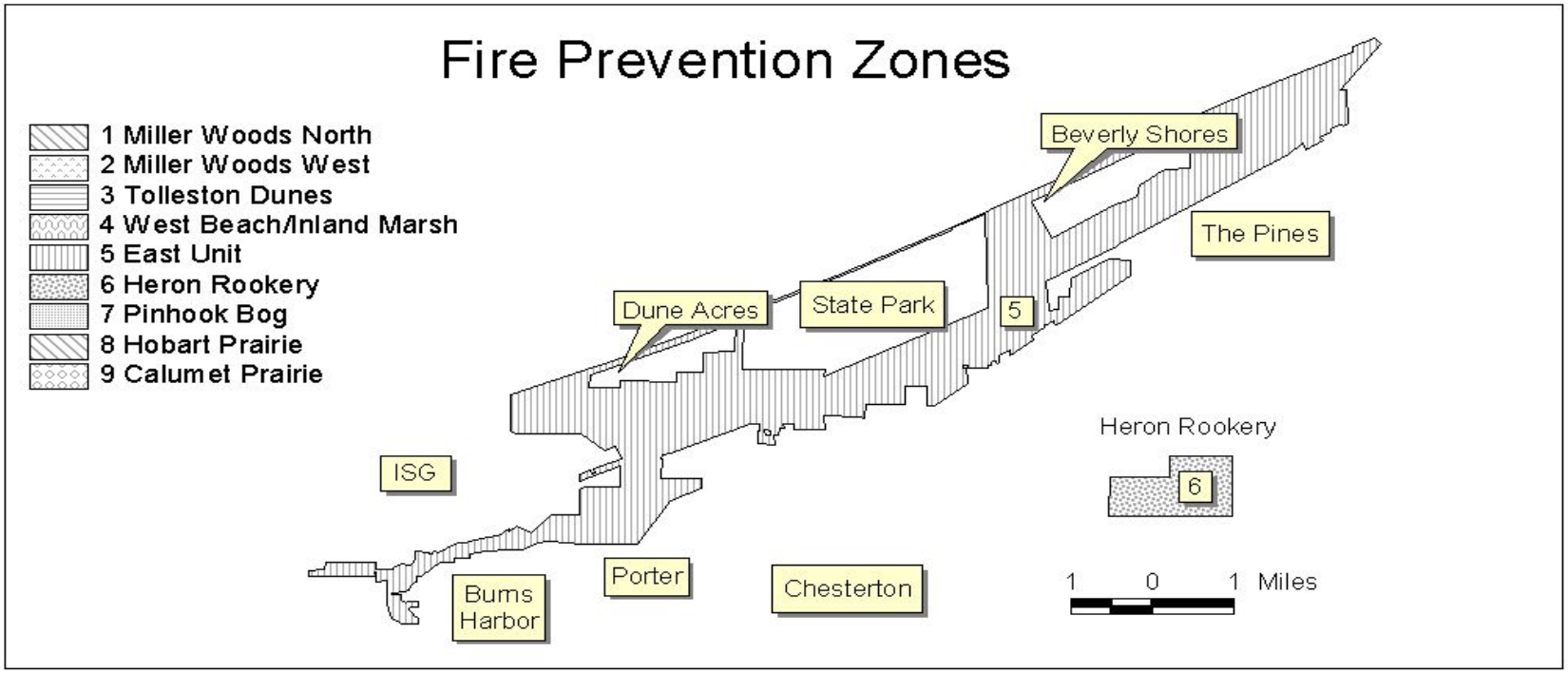
1. Efforts will be made to further coordinate with the railroad companies in regards to mutually beneficial fuels treatment programs along the railroad corridors to help ensure a reduction in not only number of starts but intensity of fires as well.

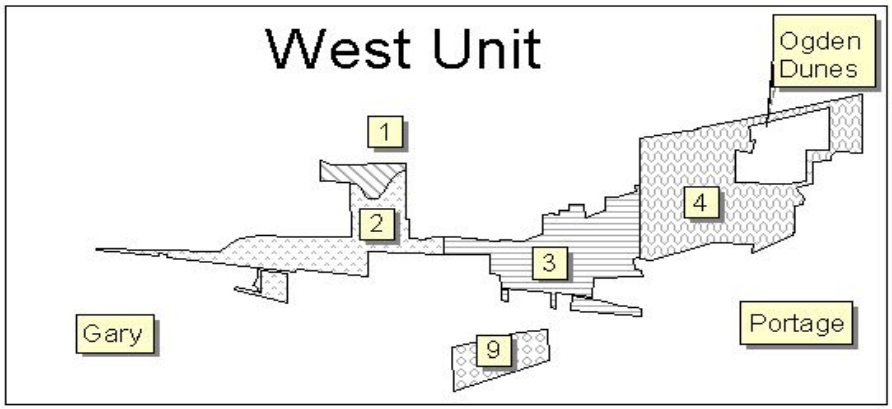
Responsible person: The Assistant Fire Management Officer and Fire Management Officer

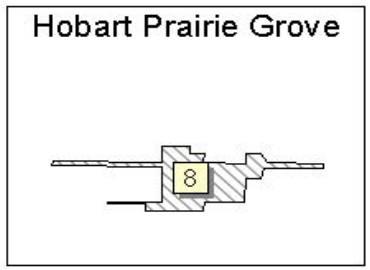
2. The lakeshore may pursue methods to recuperate the loss of funds in suppressing wildland fires on NPS lands as a result of starts from the railroads.

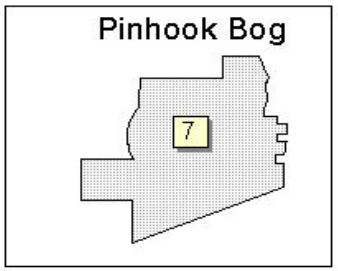
Responsible person: The Fire Management Office (FMO & AFMO) as well as Law Enforcement.


Composite "Overlay"
Values/Hazards/Risks
East Unit
Hazard Level
high
medium
Roads
Beverly Shores
The Pines
U.S. 12
Dune Acres
State Park
U.S. 20
Heron Rookery
S.R. 49
ISG
Porter
Burns Harbor
Chesterton
West Unit
Ogden Dunes
U.S. 12
Gary
Calumet Prairie
Portage
Hobart Prairie Grove
I-65
Pinhook Bog
I 80/90


Fire Prevention Zones
1 Miller Woods North
2 Miller Woods West
3 Tolleston Dunes
4 West Beach/Inland Marsh
5 East Unit
6 Heron Rookery
7 Pinhook Bog
8 Hobart Prairie
9 Calumet Prairie
Beverly Shores
The Pines
Dune Acres
State Park
5
ISG
Heron Rookery
6
Porter
Chesterton
Burns Harbor
1 0 1 Miles


West Unit
Ogden Dunes
1
2
3
4
9
Gary
Portage


Hobart Prairie Grove
8


Pinhook Bog
7

FIRE PREVENTION ZONE 1 - MILLER WOODS, NORTH OF GRAND CALUMET RIVER

HAZARD

Low — Mixed open dunes, intradunal ponds, and grasses. The grasses are classified as moderate; they are primarily on the southwest side.

VALUE

Low — No structures or natural resources that would be threatened by wildfire.

RISK

High — The historical fire occurrence is high from children or incendiary causes.

SPECIFIC FIRE PREVENTION ACTIONS REQUIRED

1. Regular patrols at all times during fire season, especially when in staffing level 4 or 5.

2. Continue developing a public education program oriented specifically toward the local residents that would emphasize fire education as well as prevention.

Responsible person: Assistant Fire Management Officer, Interpretation Staff, Douglas Center Environmental Education Supervisor, Fire Management Officer.

FIRE PREVENTION ZONE 2 – MILLER WOODS, WEST OF GRAND AND NORTH OF THE B & O RAILROAD TRACKS

HAZARD

Moderate — Oak savanna, grasses, intradunal ponds with some small cattail areas.

VALUE

Low — There are no structures or other resources that would be threatened by wildfire within the national lakeshore boundary. There are two areas where structures are just outside the boundary, north of the Douglas Center and north of the intersection of the Harbor Belt and the Conrail railroad.

RISK

High — The historical fire occurrence is extremely high, with the causes being railroad and incendiary.

SPECIFIC FIRE PREVENTION ACTIONS REQUIRED

1. Regular patrols along the three railroads, Harbor Belt, Conrail, and the B&O, during fire season, especially when the staffing level is 3 or higher.

2. Continue developing a public education program oriented specifically toward the local residents that would emphasize fire education as well as prevention.

3. Concentrate on railroad fire prevention.

Responsible person: Assistant Fire Management Officer, and the Fire Management Officer.

FIRE PREVENTION ZONE 3 – TOLLESTON DUNES AND LONG LAKE WETLAND WEST OF COUNTY LINE ROAD (LAKE & PORTER CO RD)

HAZARD

Moderate — Oak Savanna, grasses, with some cattails

VALUE

Low — There are no significant structures or natural resources in the fire prevention zone that would be threatened by wildfire. There are structures just outside the national lakeshore boundary.

RISK

Moderate — Risks are associated with human activity, automobiles, and railroads.

SPECIFIC FIRE PREVENTION ACTIONS REQUIRED

1. Regular patrols along the three railroads, Harbor Belt, Conrail, and the B&O, during fire season, especially when the staffing level is 3 or higher.

2. Continue developing a public education program oriented specifically toward the local residents that would emphasize fire education as well as prevention.

3. Concentrate on railroad fire prevention.

Responsible person: Assistant Fire Management Officer, and the
Fire Management Officer.

FIRE PREVENTION ZONE 4 – WEST BEACH / INLAND MARSH

HAZARD

Moderate Grasses, oak savanna, oak forest, wetlands, dunes, and cattails.

VALUE

High Recreational values, structures, and mesophytic pockets.

RISK

Moderate Risks are associated with the high recreation use, the South Shore railroad, human activity, and numerous trails.

SPECIFIC FIRE PREVENTION ACTIONS REQUIRED

1. Fire prevention messages will be maintained on the bulletin boards at West Beach and Inland Marsh..

2. Continue developing a public education program oriented specifically toward the local residents that would emphasize fire education as well as prevention.

3. Increased patrols during periods when staffing levels are 3 or higher.

4. On-going hazard fuel reduction around developments.

Responsible person: Assistant Fire Management Officer, and the
Fire Management Officer.

FIRE PREVENTION ZONE 5 – EAST UNIT

HAZARD

Moderate Grasses, oak forest, oak savanna, wetlands, with some cattails

VALUE

High	Residences within and adjacent to national lakeshore boundary: mesophytic pockets.

RISK

High	Risks are associated with human activity (Indiana Dunes St Park, local communities/residences, campground, beaches, trails), automobiles along roadways, and railroads.

SPECIFIC FIRE PREVENTION ACTIONS REQUIRED

1. Post fire prevention posters on bulletin boards at the campground, Kemil Beach, the visitor center, Mt Baldy, all trail heads and parking lots.

2. Continue developing a public education program oriented specifically toward the local residents that would emphasize fire education as well as prevention.

3. Schedule daily engine patrols especially during periods of staffing level 4 or 5.

4. Perform hazard fuel reduction around developments and the campground

Responsible person: Assistant Fire Management Officer, Fire Management Officer, and the Interpretation staff.

FIRE PREVENTION ZONE 6 – HERON ROOKERY

HAZARD

Low	Wetlands, mesophytic forest

VALUE

High	Mesophytic forest (should not be burned until more research is conducted to evaluate effects.) Residences adjacent to lakeshore property.

RISK

Low	Very little human visitation or risk, some fishermen & canoeists on the Little Calumet River.

SPECIFIC FIRE PREVENTION ACTIONS REQUIRED

1. Post fire prevention posters on bulletin board.

2. Continue developing a public education program oriented specifically toward the local residents that would emphasize fire education as well as prevention.

3. Schedule daily engine patrols during periods of staffing level 5.

Responsible person: Assistant Fire Management Officer, Fire Management Officer.

FIRE PREVENTION ZONE 7 – PINHOOK BOG

HAZARD

Moderate	Grasses, with some cattails

VALUE

Low	All low except for residences outside the national lakeshore boundary.

RISK

Low	All low except for residences outside the national lakeshore boundary.

SPECIFIC FIRE PREVENTION ACTIONS REQUIRED

1. Post fire prevention posters on bulletin board.

2. Continue developing a public education program oriented specifically toward the local residents that would emphasize fire education as well as prevention.

3. Schedule daily engine patrols during periods of staffing level 5.

Responsible person: Assistant Fire Management Officer, Fire Management Officer.

FIRE PREVENTION ZONE 8 – HOBART PRAIRIE

HAZARD

Moderate Grasses, oak savanna, forest, and some cattails.

VALUE

Moderate Due to the potential to reestablish a oak savanna and the proximity of residential structures surrounding the area..

RISK

Moderate Recent history has documented 20 fires on this parcel of land from 1997 till 2003. The area sees a high use of off road all terrain vehicles (ATV's)

SPECIFIC FIRE PREVENTION ACTIONS REQUIRED

1. Post fire prevention posters along access points.

2. Continue developing a public education program oriented specifically toward the local residents that would emphasize fire education as well as prevention.

3. Schedule daily engine patrols during periods of staffing level 4 or 5.

Responsible person: Assistant Fire Management Officer, Fire Management Officer.

FIRE PREVENTION ZONE 9 – CALUMET PRAIRIE

HAZARD

Low Wetland prairie, (scrub) forest, and some cattails.

VALUE

Low All low, currently has farm residence on south east corner, and NIPSCO power line corridor across the northern boundary

RISK

Low Very little human visitation or risk.

SPECIFIC FIRE PREVENTION ACTIONS REQUIRED

1. Post fire prevention posters along access points.

2. Continue developing a public education program oriented specifically toward the local residents that would emphasize fire education as well as prevention.

3. Schedule daily engine patrols during periods of staffing level 4 or 5.

Responsible person: Assistant Fire Management Officer, Fire Management Officer.

PROCEDURE USED TO DEVELOP THE FIRE PREVENTION ANALYSIS

The guidelines in the National Park Service **Wildland Fire Prevention Analysis Handbook** were followed. Overall assessments were made of the entire national lakeshore, specifically looked at were hazards, values and risks. These three assessments were combined into a composite product. Utilizing a Geographic Information System (GIS) layers representing existing road systems, vegetation, slope, aspect, structures, topographical, and NFFL fuel models were placed on a map of the park to create polygons of areas determined to be similar as associated with fire behavior.

HAZARD ASSESSMENT

The assessment consisted primarily of ranking park lands by fuel model. The fuels at the national lakeshore in some cases do not fit easily into the standard NFFL fuel models. The fuels, and other resources were put into three classes: low, moderate, and high.

LOW: wetlands, paved areas, roads, sand, fuel model 8 or 9 with less than 20% slope, fuel model 8 or 9 with greater than 20% slope with an aspect of northwest, north, or northeast.

MODERATE: fuel models 1,2,3,4,5; developed areas, fuel model 8 or 9 with greater than 20% slope and aspects of west, southwest, south, southeast and east.

HIGH: cattails, fuel model 6,7,10,11,and 12.

VALUE ASSESSMENT

The values assessment was an attempt to identify areas where fire is not acceptable, such as plant species that would suffer long-term damage, or improvements such as buildings. The only categories used were high and low.

HIGH: all structures, including a 200 foot buffer around each one, campgrounds, rare threatened or endangered species, private land within the lakeshores NPS boundary.

LOW: Everything which was not covered by the high category.

RISK ASSESSMENT

"Risk" is the measure of the chance of an ignition, based on past history of fires and what kind of human made features are in the area.

HIGH: the Conrail, B&O, South Shore railroads including 15 meters on each side, within 300 meters of NIPSCO land, 100 meters from every structure, within 5 meters of trails, within 15 meters of roads, all beaches, Miller Woods west of Grand Avenue.

MODERATE: the communities of Beverly Shores, Dune Acres, and Ogden Dunes including a 100 meter radius inside the national lakeshore, from 5 to 200 meters from all hiking trails, 100 meters from all beaches.

LOW: all areas not included in the high and moderate categories.

The next step was to combine all three assessments as if they were three overlays using a "weight" program to assign relative importance, or points, to the different values of hazards, values, and risks. This was done according to the following chart.

	HAZARDS	VALUES	RISKS
LOW	0	0	0
MODERATE	1	2	1
HIGH	2	3	2

The category "values" was given more weight due to the relative importance of keeping fire away from the identified areas. The computer was then instructed to assign the following adjectives according to the total number of points:

LOW	0
MODERATE	1-2
HIGH	3+

After combining the overlays, it became apparent that there were too many very small areas in the final map. This would be true using computers or any system. To deal with this, another computer program was used called "Neighbors" which caused the very small areas to drop out and be absorbed by the neighboring or surrounding area. This resulted in the map "composite overlay". The last step was to draw the fire prevention unit boundaries on the map by hand using the composite overlay map and local knowledge of the area as the primary sources of information to select logical unit boundaries according to the hazards, values, and risks as they relate to fire behavior.

APPENDIX I

PREATTACK PLAN

PRE-ATTACK PLANNING CHECKLIST

COMMAND

Pre-attack WFSA (if appropriate)
Pre-positioning needs
Draft delegation of authority
Management constraints
Interagency agreements
Evacuation Procedures
Structural protection needs
Closure procedures

OPERATIONS

Helispot, helibase locations
Flight routes, restrictions
Water sources
Control line locations
Natural barriers
Safety Zones
Stagging area locations

LOGISTICS

ICP, base, camp locations
Road, trails (including limitations)
Utilities
Medical facilities
Stores, restaurants, service stations
Transportation resources location
Rental Equipment sources (by type)
Construction contractors'
Sanitary facilities
Police, fire departments
Communications (radio, telephone)
Sanitary landfills
Portable water sources
Maintenance facilities

PLANNING

Park base map
Topographic maps
Infrared imagery
Vegetation/ fuel maps
Hazard locations (ground & aerial)
Archeological / cultural base map
Endangered species critical habitats
Sensitive plant populations
Special visitor use area
Land status

Will be inserted in final draft

APPENDIX J

DISPATCH PLAN

STANDARD OPERATING PROCEDURES
Communications Center – Fire Dispatch Procedure
Revised December 5th, 2003

SCOPE:

This SOP applies to all Indiana Dunes National Lakeshore emergency service providers including firefighters, law enforcement rangers, and Communications Center personnel.

All wildland fires within Indiana Dunes National Lakeshore boundary are the responsibility of INDU wildland fire response. Response to wildland fires outside of Indiana Dunes National Lakeshore may be made if an official request from the responsible fire department is made.

PURPOSE:

To establish wildland and structural fire dispatch procedures for emergency personnel.

WHEN A FIRE IS REPORTED:

All reports of fire will come through Indiana Dunes National Lakeshore Communications Center (dispatch). Reports from other agencies, phone reports from citizens, and reports overheard from monitoring other agencies radio frequencies will immediately be reported to the Communications Center. The Comm Center will contact other agencies to confirm and document any request for assistance.

The Communications Center will record pertinent information on an Interagency Report of Incident and Dispatch Action (IRIDA) form that serves as an ongoing log and record of the incident.

The Communications Center will notify emergency personnel by activation of the alert tone and/or a general radio announcement on both channels such as:

> "Attention all Fire and Law Enforcement Personnel. We have a report of a wildland fire at…."

Fire personnel will respond with direction from the AFMO or Fire Captain to initiate an Initial Attack response. If those individuals are not available, any fire unit "in-service" should be contacted for the Initial Attack. The FMO will in be contacted by the AFMO, Fire Captain or Incident Commander and appraised of the situation.

Law enforcement rangers will be dispatched at the direction of the shift supervisor to start an initial investigation of each fire. First arriving units will give dispatch initial size up and exact location of the fire.

COMMUNICATIONS CENTER NOTIFICATION OF PRIMARY AGENCY:

A. **Wildland or vegetation fires**

The national lakeshore has responsibility for all wildland or vegetation fires within the park's authorized boundary.

If a wildland fire is in close proximity to structures, dispatch will notify the local structural fire department, and follow the protocol below.

CONTACTING NPS EMERGENCY RESPONDERS WHEN OFF-DUTY:

If the Communications Center receives a fire report when fire personnel are not on duty the following individuals, in order, should be notified by telephone, cell phone or pager until receiving a response. Once one fire employee is contacted, the law enforcement personnel will be next.

- Assistant Fire Management Officer (AFMO)
- Fire Management Officer (FMO)
- Any Fire Captain
- Lead Fire Effects Monitor
- Law enforcement supervisor or patrol ranger

The fire individual first contacted by Communications Center will be responsible for:

- Dispatching appropriate equipment and personnel
- Notifying the Communications Center of the names and number of fire personnel being called to the station
- Assigning the Incident Commander

Upon leaving the station the Incident Commander will:

- Notify the Communications Center and verify that the engine is in route to the fire.
- Upon the engine's arrival at the fire, give a brief size up and order additional resources as necessary

The fire management office will give advance notification to the Communications Center of any major change in the availability of the FMO or AFMO (i.e. out of the area on annual leave, government travel, fire assignment etc.).

FIRST ALARM:

A **First Alarm** is called for when the Incident Commander on-scene determines there is a need for additional fire fighting resources. A First Alarm is a call-out for available on and off duty FirePro funded staff and selected collateral duty firefighters with specialized skills or positions. The IC may make a specific request for mutual aid assistance from area fire departments or assistance from the Resource and Visitor Protection Division. The Communications Center will contact needed resources.

The Communications Center will activate the alert tone and announce over the appropriate park radio frequencies that a First Alarm has been called for (name of fire) at (location) to notify park personnel.

The Communications Center will contact permanent fire personnel via Nextel or a hard line phone.

The Communications Center will contact collateral duty firefighters with First Alarm pagers by calling 219-929-9476, following the recorded instructions and entering the appropriate pager response code as directed.

PAGER RESPONSE CODES:

911 Fire – report to fire station
311 Contact Communications Center

Personnel responding to the call-out will contact the Communications Center with information that they are responding, and will assemble at Fire Station #1 to await further instructions.

Communications Center will contact the Fire Management Officer by telephone, cell phone or pager and provide that individual with an initial status report on the fire.

For all First Alarm wildland fire responses involving NPS resources the Fire Pro funded position "Resource Coordinator" will report to the Communications Center to assist with "dispatching" duties in regards to the on going wildland fire response. The Communications Center supervisor or LE supervisor has the authority to request additional dispatcher (s) if the need arises. Notification of the IC (or Logistics if utilized) is required.

SECOND ALARM:

A **Second Alarm** is a call-out for additional firefighters who carry pagers or who monitor the park's two-way radio. It may also include a specific request for mutual aid assistance from area fire departments or assistance from the Resource and Visitor Protection Division.

The Communications Center will activate the alert tone and announce over the park radio frequencies that a Second Alarm has been called for (name of fire) at (location) to notify park personnel.

The Communications Center will contact collateral duty and Emergency (AD) firefighters with pagers by calling 219-928-2756 (note this is a different number than the first alarm), then following the recorded instructions and entering the appropriate pager response code as directed.

Personnel responding to the call-out will contact the Communications Center with information that they are responding, and will assemble at Fire Station #1 to await further instructions.

Communications Center will contact (in order) the following individuals by telephone, cell phone or pager and provide that individual with a status report on the fire:

- Fire Management Officer
- Chief of Resource Management
- Chief Ranger

THIRD ALARM:

A **Third Alarm** is a call-out for available firefighters. It may also include activating additional mutual aid requests, and/or requests for out-of-area resources through the Indiana Interagency Coordination Center.

The Communications Center will activate the alert tone and announce over the park radio frequencies that a Third Alarm has been called for (name of fire) at (location) to notify park personnel monitoring their two-way radios.

The Communications Center will then proceed to contact firefighters by radio, telephone or cell phone.

Personnel will assemble at Fire Station #1, contacting the Communications Center upon their arrival, and await further instructions.

B. Structure/ Vehicle fires

All non-vegetation fires within the park's authorized boundary are the responsibility of local fire departments.

The Communications Center receives the fire report and the dispatcher will immediately call and notify the local fire department giving all the information recorded on the IRIDA form.

The Communications Center will notify emergency personnel by activation of the alert tone and/or a general radio announcement such as:

> "Attention all Fire and Law Enforcement personnel, we have a report of a Structure/ vehicle fire at…."

The law enforcement shift supervisor will direct a law enforcement response.
A fire unit will be assigned by the AFMO or FMO and dispatched by the communications center to respond.

Off Duty Structural/Vehicle Fires

The Communications Center receives the fire report and the dispatcher will immediately call and notify the local fire department giving all the information recorded on the IRIDA form.

If the Communications Center receives a structure fire report when Park personnel are not on duty the following individuals, in order will be notified.

Local Fire Department

AFMO or FMO

On call LE ranger

Chief Ranger

Chief of Resource Management

The on call LE ranger will respond to investigate, confirm location and nature of the fire. A Fire unit may be assigned by the AFMO and dispatched by the communications center to respond and size-up the situation. No suppression activities will occur by park personnel on vehicle/structure fires. County/City/local fire units will be called upon to suppress all vehicle and structural fires.

The AFMO or FMO, if not responding will be notified, if the responding resources determine that the vehicle/structure fire has the potential to spread into surrounding vegetation and become a wildland fire.

Under no circumstances will a law enforcement ranger or wildland firefighter attempt to ventilate or enter the structure for the purpose of suppressing the fire.

APPENDIX K

WILDLAND FIRE SITUATION ANALYSIS
AND
DRAFT DELEGATION OF AUTHORITY

WILDLAND FIRE SITUATION

A. ANALYSIS

Incident Name: _____

Jurisdiction: _____

Date and Time Completed: _____

This page is completed by the Agency Administrator(s).

Section I, WFSA Information Page

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

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

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

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

E. Fire Name: Self-explanatory.

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

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

H. Date/Time Prepared: Self-explanatory.

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

I.	Wildland Fire Situation Analysis
To be completed by the Agency Administrator(s)	
A. Jurisdiction(s)	**B. Geographic Area**
C. Unit(s)	**D. WFSA #**
E. Fire Name	**F. Incident #**
G. Accounting Code:	
H. Date/Time Prepared _____@_____	
I. Attachments	
- Complexity Matrix/Analysis *	_____
- Risk Assessment/Analysis *	_____
Probability of Success *	_____
Consequences of Failure *	_____
- Maps *	_____
- Decision Tree *	_____
- Fire Behavior Projections *	_____
- Calculations of Resource Requirements *	_____
- Other (specify)	_____
* Required	

This page is completed by the Agency Administrator(s).

Section II. Objectives and Constraints

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

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

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

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

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

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

II. Objectives and Constraints

To be Completed by the Agency Administrator(s)

A. Objectives (Must be specific and measurable)

1. *Safety*

   - Public

   - Firefighter

2. *Economic*

3. *Environmental*

4. *Social*

5. *Other*

B. Constraints

This page is to be completed by the Fire Manager and/or Incident Commander.

Section III. Alternatives

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

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

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

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

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

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

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

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

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

III.	Alternatives		
To be completed by FMO / IC			
	A	**B**	**C**
A. Wildland Fire Strategy			
B. Narrative			
C. Resources Needed Handcrews Engines Dozers Airtankers Helicopters			
D. Final Size			
E. Est. Contain/ Control Date			
F. Costs			
G. Risk Assessment **- Probability of success** **- Consequence of failure**			
H. Complexity			

I.	Attach maps for each alternative

This page is completed by the Agency Administrator(s), FMO and/or Incident Commander.

Section IV. Evaluation of Alternatives

A. Evaluation Process: Conduct an analysis for each element of each objective and each alternative. Objectives shall match those identified in Section II.A. Use the best estimates available and quantify whenever possible. Provide ratings for each alternative and corresponding objective element. Fire effects may be negative, cause no change, or may be positive. Examples are: 1) a system which employs a "-" for negative effect, a "0" for no change, and a "+" for positive effect; 2) a system which uses a numeric factor for importance of the consideration (soils, watershed, political, etc.) and assigns values (such as -1 to +1, - 100 to +100, etc.) to each consideration, then arrives at a weighted average. If you have the ability to estimate dollar amounts for natural resource and cultural values, this data is preferred. Use those methods that are most useful to managers and most appropriate for the situation and agency. To be able to evaluate positive fire effects, the area must be included in the resource management plan and consistent with prescriptions and objectives of the fire management plan.

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

IV. Evaluation of Alternatives

To be Completed by the Agency Administrator(s) and Fire Manager / Incident Commander

A. Evaluation Process	A	B	C
Safety Firefighter Aviation Public			
Sum of Safety Values			
Economic Forage Improvements Recreation Timber Water Wilderness Wildlife Other (specify)			
Sum of Economic Values			
Environmental Air Visual Fuels T & E Species Other (specify)			
Sum of Environmental Values			
Social Employment Public Concern Cultural Other (Specify)			
Sum of Social Values			
Other			

This page is to be completed by the Agency Administrator(s) and Fire Manager and/or Incident Commander.

Section V. Analysis Summary

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

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

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

V. Analysis Summary

To be Completed by the Agency Administrator(s) and Fire Manager / Incident Commander

Alternatives	A	B	C
A. Compliance with Objectives Safety Economic Environmental Social Other			
B. Pertinent Data Final Fire Size Complexity Suppression Cost Resource Values Probability of Success Consequences of Failure			

C. External / Internal Influences

National & Geographic Preparedness Level

_____

Incident Priority

_____

Resource Availability _____

Weather Forecast (long-range)

_____

Fire Behavior Projections

_____

VI. Decision

The Selected Alternative is: _____

Rationale:

Agency Administrator's Signature	Date/Time

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

Section VII. Daily Review

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

Section VIII. Final Review

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

VIII. Daily Review

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

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

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

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

VIII. Objectives Final Review

The elements of the selected alternative were met on: _____ _____
Date Time

By:_____

(Agency Administrator(s)

A GUIDE FOR ASSESSING FIRE COMPLEXITY

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

Use of the Guide:

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

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

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

4. Factor H should be considered after all the above steps. If more than two of these items are answered "yes," and three or more of the other primary factors are positive responses, a Type I team should be considered. If the composites of H are negative, and there are fewer than three positive responses in the primary factors (A-G), a Type II team should be considered. If the answers to all questions in H are negative, it may be advisable to allow the existing overhead to continue action on the fire.

GLOSSARY OF TERMS

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

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

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

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

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

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

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

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

FIRE COMPLEXITY ANALYSIS

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

1. Burning Index (from on-site measurement of weather conditions). ___

___
Predicted to be above the 90% level using the major fuel model in which the fire is burning.

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

___

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

___

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

___

Total ___

___

B. RESOURCES COMMITTED

1. 200 or more personnel assigned. ___

___

2. Three or more divisions. ___

___

3. Wide variety of special support personnel. ___

___

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

___

5. Majority of initial attack resources committed. ___

___

Total ___

___

C. RESOURCES THREATENED

1. Urban interface. ___

___

2. Developments and facilities. ___

___

3. Restricted, threatened or endangered species habitat. ___

___

4. Cultural sites. ___

___

5. Unique natural resources, special designation zones or

wilderness. ___

6. Other special resources. ___

Total ___

D. SAFETY

1. Unusually hazardous fire line conditions. ___

2. Serious accidents or facilities. ___

3. Threat to safety of visitors from fire and related operations. ___

4. Restricted and/or closures in effect or being considered. ___

5. No night operations in place for safety reasons. ___

Total ___

E. OWNERSHIP **Yes/ No**

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

Total ___

F. EXTERNAL INFLUENCES

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

Total ___

G. CHANGE IN STRATEGY

1. Change in strategy to control from confine or contain. ___
2. Large amount of unburned fuel within planned perimeter. ___
3. WFSA invalid or requires updating. ___

Total ___

H. EXISTING OVERHEAD

1. Worked two operational periods without achieving initial objectives. ___
2. Existing management organization ineffective. ___
3. IMT overextended themselves mentally and/or physically. ___
4. Incident action plans, briefings, etc., missing or poorly prepared. ___

Total ___

Signature_____

Date_____ **Time**_____

Indiana Dunes National Lakeshore
Porter, Indiana

DELEGATION OF AUTHORITY

As of (time) , (Date) , I have delegated authority to manage the (Fire Incident Name), (Fire Number) , Indiana Dunes National Lakeshore to Incident Commander (Name) and his/her Incident Management Team.

I am assigning (Name) as the Line Officer's Representative to act as liaison and provide any help you need. (S)he is authorized to speak for me in the event a decision is needed.

My specific considerations for management of this fire are:

1. Ensure the safety of firefighters, visitors, and neighbors.

2. Protect private and refuge property to the extent possible.

3. Minimize damage to environmental resources.

4. Key resource considerations are: protecting rare, threatened, and endangered species; protecting historical and cultural resources; and limiting degradation of the Lakeshore's aesthetic values.

5. Manage the fire in accordance with the guidelines established in the WFSA, specifically…

6. Restrictions for suppression actions are no earthmoving equipment (dozers, plows) without approval from me or the Fire Management Officer or his/her assistant.

7. Manage the fire cost-effectively consistent with the values at risk.

8. Provide training opportunities for National Park Service personnel is requested to strengthen our organizational capabilities.

_____ _____
Superintendent, Indiana Dunes NL Date

APPENDIX L

TEN YEAR
FUELS MANAGEMENT PLAN

FUELS MANAGEMENT PLAN

This plan is the preferred alternative from the Indiana Dunes National Lakeshore Environmental Assessment (EA) and responds to the public's issue regarding the need to apply prescribed fire on more acreage within the national lakeshore. Under this plan, fire management activities would include prescribed fire and mechanical fuel reduction. The prescribed fire program would include 4 expanded units and **19 new** burn units. Burns Ditch West would be expanded from 29 acres to 125 acres to include all of Burns Ditch. Kintzele prescribed fire unit would be expanded to 101 acres. The Inland Marsh and Kansas Avenue units would also be expanded by 7 acres and 160 acres respectively to incorporate any newly acquired Reservation of Use (ROU) houses. New burn units would include: Calumet Dune (53 acres), Calumet Prairie (145 acres), Enterprise Zone (51 acres), Cowles Bog (350 acres) Dunes Ridge (110 acres), Woodlake Dune Savanna (81 acres), Glenwood Dune (160 acres), Grand Boulevard (53 acres), Hobart Prairie Grove (90 acres), Marquette Trail (39 acres), and SW Miller Woods (236 acres) (see Figure 2-4, Table 2-3). The goals of these new units would be to reduce hazardous fuels and to restore historically occurring fire-dependent habitats. There would be no manual thinning in the Calumet Dune unit. Under this alternative, an average of 6 prescribed fires would be ignited each year, which would burn **approximately 700** acres per year.

Table 2-3 Indiana Dunes National Lakeshore Prescribed Fire Units – Alternative 3

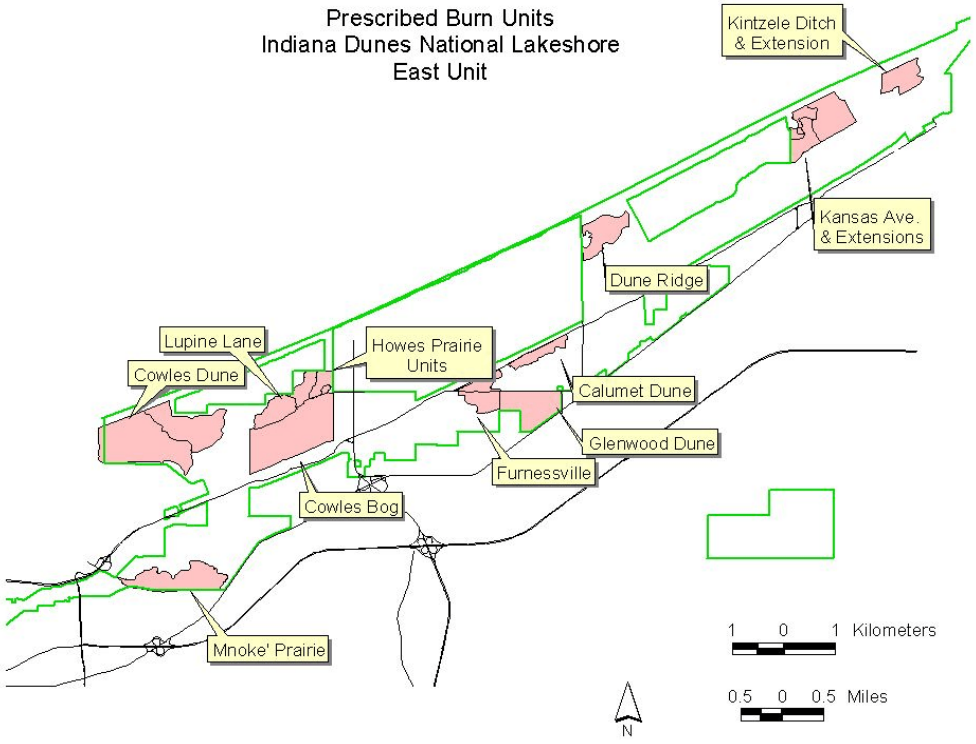
Prescribed Fire Unit	**Acreage of Prescribed Fire Unit**	**Timing of Prescribed Fire**	**Description**
Burns Ditch	125 acres	Burned every 3-10 years when resources and favorable condition are available.	The Burns Ditch prescribed fire unit consists of oak forest with open grassy areas located between Midwest Steel and the community of Ogden Dunes in the west unit of the park.
Calumet Dune	53 acres	Fall 2004	The Calumet Dune prescribed fire unit primarily consists of black oak forest and is located along Highway 12, near the Visitor's Center in the east unit of the national lakeshore. It is on stabilized dunes
Calumet Prairie	145 acres	Burned every 3-10 years when resources and favorable condition are available.	The Calumet Prairie prescribed fire unit is 145 acres of native prairie that was previously a state nature preserve. It is located just west of highway 51 in Lake Station, Indiana.
Enterprise Zone	51 Acres	Burned every 3-10 years when resources and favorable condition are	This prescribed fire unit is located in Gary, Indiana, north of US Highway 12/20, just north of the 'Elgin-Joliet and Eastern' railway. The northern boundary of the site is at the 'CSX

Prescribed Fire Unit	Acreage of Prescribed Fire Unit	Timing of Prescribed Fire	Description
		available.	Transportation' rail line. The vegetation consists of oak savanna/woodland on the dunes with marshes between.
Cowles Bog	350 acres	Burned every 3-10 years when resources and favorable condition are available.	The Cowles Bog prescribed fire unit is a wetland dominated by cattails located east of Mineral Springs road north of Hwy 12 and south of Dune Acres.
Cowles Dune	511 acres	Spring 2003	Cowles Dunes prescribed fire unit is covered by oak savanna and dune vegetation types. It also contains some of the steepest topography in the national lakeshore. The project area is located on the Tolleston and recent dune complexes, along Lake Michigan.
Douglas Center	6 acres	Every fall	The Douglas Environmental Education Center is located in Miller Woods, an area of oak savanna and oak forest, also the area of Indiana Dunes National Lakeshore with historically the highest fire frequency. It is located between a set of railroad tracks (Conrail RR) and an old railway grade covered with gravel called the Harbor Belt.
Dunes Ridge	110 acres	Burned every 3-10 years when resources and favorable condition are available.	The Dunes Ridge prescribed fire unit is oak woodland located approximately 1 mile north of Hwy 12 east of Kemil Road.
Furnessville	100 acres	Spring 2006	The Furnessville prescribed fire unit is located in the east unit of the national lakeshore. Bounded on the north by Route 12 it is one of the more public prescribed fire units in the national lakeshore. The Furnessville prescribed fire unit consists primarily of oak woodland, but also contains some oak savanna and prairie.
Woodlake Dune Savanna	81 acres	Burned every 3-10 years when resources and favorable condition are available.	This prescribed fire unit is located in Gary, Indiana, just east of County Line Road, between Lake and Porter Counties, south of Hwy. 12. This unit consists of a complex of oak savanna and cattail marshes with aspen/willow transitional areas.
Glenwood Dune	160 acres	Burned every 3-10 years when resources and favorable condition are available.	Glenwood Dune prescribed fire unit is a savanna/woodland complex located south of Furnessville Road in the east unit.
Grand Boulevard	53 acres	Burned every 3-10 years when resources and favorable condition are available.	The Grand Boulevard prescribed fire unit is located in Miller, south of the Marquette Trail and north of the Norfolk Southern (old Conrail) railroad, and east of Grand Boulevard. The unit consists of oak savanna with sedge meadows and cattail marshes.
Hobart Prairie Grove	90 acres	Burned every 3-10 years when resources and favorable	The Hobart Prairie prescribed fire unit is located near Liverpool Road in Hobart, Indiana. The area is considered a high quality oak

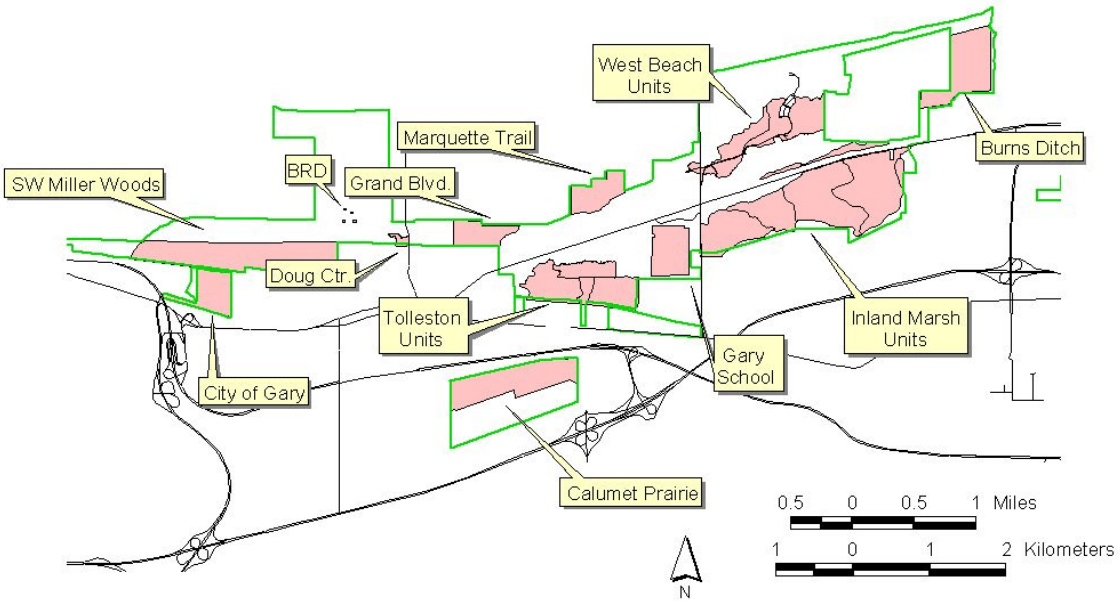
Prescribed Fire Unit	Acreage of Prescribed Fire Unit	Timing of Prescribed Fire	Description
		condition are available.	savanna.
Howes Prairie	84 acres	Spring 2003 & 2006	The project area is located between Mineral Springs Road and Waverly Road approximately ½ mile north of Route 12 and adjacent to the town of Dune Acres and the community of Porter Beach. The area contains high dune ridges encircling Howes Prairie. Oak savanna and oak woodland cover the ridges and the bowls or low areas encircled by the ridges contain a mosaic of wet and dry prairie.
Inland Marsh	446 acres	Subunit 1: Fall 2002 & 2006 Subunit 2: Spring 2004 Subunit 3&4: Fall 2005 Subunit 5: Spring 2003 & 2007	The Inland Marsh prescribed fire unit consists of 5 subunits, which are located on the Tolleston Beach Ridge. The ridge formed four to five thousand years ago and had a pre-historic natural burn interval of three to ten years. The units consist of a complex of oak savanna and cattail marshes with aspen transitional areas. They are located southwest of the town of Ogden Dunes and east of County Line Road. Unit 5, commonly known as Long Lake prescribed fire unit, is not contiguous with the other units.
Kansas Avenue	219 acres	Spring 2005	The Kansas Avenue prescribed fire unit consists of oak woodland, oak savanna, and one corner contains a wet marshy area of grasses and shrubs. It is located east of Beverly Shores to Central avenue, between Montana and Kansas Avenues north of Beverly Drive in Porter County.
Kintzele	101 acres	Spring 2004	This unit is located east of the town of Beverly Shores, bounded by East Lake Park Ave. to the west (an old sand road), open sand dunes and Lake Michigan to the north, Beverly Drive to the south, and east to the Mt. Baldly hiking trails. The area consists of oak woodland with a small component of oak savanna and five old homesites which have had the houses removed and the basements filled in with sand.
Lupine Lane	74 acres	Spring 2003 & 2006	The project area is located between Mineral Springs Road and Waverly Road approximately ½ mile north of Route 12 and adjacent to the town of Dune Acres and the community of Porter Beach. The area contains high dune ridges nearly encircling Lupine Lane. Oak savanna and oak woodland cover the ridges and the bowls or low areas encircled by the ridges contain a mosaic of wet and dry prairie.
Marquette Trail	39 acres	Burned every 3-10 years when resources and favorable condition are available.	The Marquette Trail prescribed fire unit is an oak savanna and sand mined area along the Marquette Trail in the west unit of the park

Prescribed Fire Unit	Acreage of Prescribed Fire Unit	Timing of Prescribed Fire	Description
Mnoké Prairie	181 acres	Fall 2003 & 2006	In pre-settlement times, Mnoké Prairie (formerly known as Indian Boundary Prairie) was part of an extensive high quality prairie that extended for miles to the south. In more recent times the area had been plowed and used as an agricultural field. The cultivation of this land ended approximately 30 years ago. Currently, Mnoké Prairie is a degraded tallgrass prairie dominated by non-native, low quality native, and undesirable woody plant species. The prairie also contains some wet prairie areas and the bluff slope north of the prairie contains oak forest with seeps and fens between the bluff base and the Little Calumet River.
SW Miller Woods	236 acres	Burned every 3-10 years when resources and favorable condition are available.	Located north of Highways 12 and 20. East of US Steel in Gary and west of the town of Miller. Between the CSX railroad and the Norfolk Southern (old Conrail) railroad. South of the Grand Calumet River Lagoon. The area's topography is dune and swale with oak savanna/woodland on the dunes with marshes between.
Tolleston Dunes	179 acres	Subunit 1: Fall 2003 Subunit 2: Fall 2005 Subunit 3: Fall 2004	The Tolleston Dunes prescribed fire unit consists of 3 subunits, which are located on the Tolleston Beach Ridge. The ridge was formed four to five thousand years ago and had a pre-historic natural burn interval of three to ten years. The units consist of oak savanna, aspen and willow thickets, cattails, grassland, and bare sand. They are located southwest of the intersection of Route 12 and County Line Road in Lake County near the community of Inland Manor.
West Beach	156 acres	Subunits 4&9: Fall 2002 Subunits 7&8: Fall 2002; Spring 2006 Subunits 1,6, &10: Spring 2004 Subunits 3&5: Spring 2005 Subunit 2: Spring 2006	This prescribed fire complex is made up of ten units totaling 156 acres that may be burned individually or a few of them may be combined and burned together. The burns are located in the West Beach recreation area, a high use area of Indiana Dunes National Lakeshore utilized for swimming, hiking, and picnicking. Which is located north of Route 12 in Porter and Lake Counties in the west unit of the national lakeshore between the community of Miller and the town of Ogden Dunes. The West Beach prescribed fire units consist of oak forest and savanna, disturbed sand mined areas, and wet shrublands.

Prescribed Burn Units
Indiana Dunes National Lakeshore
East Unit



Prescribed Burn Units
Indiana Dunes National Lakeshore
West Unit



UNIT NAME	Project Type	Size (acres)	FY & season of Last Treatments	FY 2003		FY 2004		FY 2005		FY 2006		FY 2007		FY 2008		FY 2009		FY 2010		FY 2011		FY 2012	
				F	S	F	S	F	S	F	S	F	S	F	S	F	S	F	S	F	S	F	S
Miller Woods Area																							
Douglas Center	WUII	10	RX:F01,F02											RX								RX	
BRD Research	Research	2	RX:F02			RC	RX	RX	RX														
Burns Ditch West	WUII		RX:S98						RX						RX								RX
Marquette Trail 1 & 2	WUII	60	RX;F97					RX						RX							RX		
Tolleston Dunes Area																							
Tolleston Dunes Unit 1	WUII	30	W:F96,RX:F99					RX						RX									
Tolleston Dunes Unit 2	WUII	59	W:F97,W:S01,S02,W:F04									RX							RX				
Tolleston Dunes Unit 3	WUII	70	RX:F97,F01							RX						RX							
West Beach Area																							
West Beach Unit 1	WUII	15.1	RX:F00				RC						RX						RX				
West Beach Unit 4	WUII	37.5	RX:S03		RC														RX				
West Beach Unit 5	WUII	34.9	RX:S00,S02																RX				
West Beach Unit 3	WUII	53.2	RX:S98,S02										RX										RX
West Beach Unit 6	WUII	5.2					RC						RX										RX
West Beach Unit 2	WUII	3.5										RX					RX						
West Beach Unit 7	WUII	1.9	RX:S03		RC							RX					RX						
West Beach Unit 8	WUII	0.4	RX:S03		RC							RX					RX						
West Beach Unit 9	WUII	1.5	RX:S03		RC							RX					RX						
West Beach Unit 10	WUII	2.8	RX:F00				RC					RX					RX						
Inland Marsh Area																							
Inland Marsh Unit 1	WUII	119	RX:S96,S03		RC									RX									RX

Inland Marsh Unit 2	WUII	102	RX:F99					RX										RX						
Inland Marsh Unit 3/4	WUII	196	RX:F98,F02									RX											RX	
In Marsh Unit 5 Long Lake	WUII	29	RX:S97/99,S01,S03		RC								RX								RX			
Enterprise	WUII	51	#MX:S02 W:S03	MC	W	MC	MX	MX	MX	RX								RX						
Woodlake Dunes Savanna	WUII	81	#MX:S02	MC	MC	MC	MX	MX	MX	RX							RX							
Howes Prairie/Lupine LaneEast	WUII	164	RX:S03		RC						RX								RX					
Cowles Dunes	WUII	488	RX:S95,S97				RC						RX								RX			
Mnoke Prairie	WUII	196	RX:F97/98,F99,F01			RC					RX					RX							RX	
Furnessville	WUII	99	RX:S97,S99,S02										RX											
Kansas Avenue	WUII	86	RX:S96,S98,S02												RX									
Kintzele	WUII	70	RX:S00			RC												RX						
Number of RX Projects					4	2	3	4	2	3	2	3	4	4	2	2	2	3	3	2	2	2	3	

UNIT NAME	Project Type	Size (acres)	FY & season of Last Treatments	FY 2003		FY 2004		FY 2005		FY 2006		FY 2007		FY 2008		FY 2009		FY 2010		FY 2011		FY 2012	
				F	S	F	S	F	S	F	S	F	S	F	S	F	S	F	S	F	S	F	S
Dune Acres 2	WUII	20	New					#MX				#MX											
Dune Acres	WUII	20	MX:S01																				
Mnoke Prairie	WUII	50			MC		MX		MX		MX		MX										
Beverly Shores	WUII	75	New									P											
Miller Woods	WUII	20	MX:S01,S03, W:S02		MC	MX		MX		MX		MX											
West Beach	WUII	75	MX:S01		MC				MX				MX										
Marquette Trail	WUII	25	New																				
Harbor Belt	WUII	10	W03																				
Douglas Center	WUII	1	Annually																				
Bailly Chelburg	WUII	2	Annually																				
Historic Structures	WUII	10	Annually																				

APPENDIX M

MONITORING PLAN

PRESCRIBED FIRE MONITORING PLAN

INDIANA DUNES NATIONAL LAKESHORE

NOVEMBER, 1994

Prepared By: _____

Botanist, Resource Management Division
Indiana Dunes National Lakeshore

Reviewed: _____

Fire Management Officer,
Indiana Dunes National Lakeshore

Recommended: _____

Superintendent,
Indiana Dunes National Lakeshore

Concurred: _____

Regional Fire Management Officer,
Midwest Region

Approved: _____

Fire Technology Specialist,
Branch of Fire and Aviation Management
Boise, Idaho Office

PEER REVIEWS

Reviewed: _____

Noel B. Pavlovic, Plant Ecologist
Lake Michigan Ecological Station,
National Biological Survey

Reviewed: _____

Paul Reeberg, Program Manager
Western Region Fire Monitoring Manager,
Western Regional Office

INTRODUCTION

Indiana Dunes National Lakeshore is located in Northwest Indiana along the southern tip of Lake Michigan. Composed of active and stabilized sand dunes, interspersed with wetlands, the national lakeshore contains significant natural resources within a mixed urban and rural setting. The dunes

area serves as a meeting place of northern boreal, tallgrass prairie, and eastern deciduous forest species. The park contains over 1400 species of plants, ranking the national lakeshore third with respect to floral diversity within the National Park Service. Populations of over 25% of the State of Indiana's listed Threatened, Endangered, Rare, and Watch List plant species can be found within the national lakeshore.

Fire has played a significant role in the shaping of the vegetative communities within the Indiana Dunes National Lakeshore. Wildfires, ignited by either lightning or Native Americans, frequently burned the area pre-settlement times (before 1845 AD). Early residents and historical records from the area show extensive prairies, pine forests, sedge meadows, and other fire dependent plant communities which are now very rare within the park. Although all wildfires are currently suppressed within the national lakeshore, excellent examples of remnant fire-dependent plant communities such as oak savannas, sedge meadow, and tallgrass prairies still remain. Fire suppression associated with settlement, continued ecosystem fragmentation, encroachment of fire-sensitive hardwoods, and exotic species invasions, however, all threaten these remaining remnant communities.

The Fire Management Plan for the national lakeshore was revised and approved in 1992. Prior to this most recent revision, the use of prescribed fire at the national lakeshore was limited to narrowly defined research burns and utility corridor maintenance burns. The results of this research, however, has clearly demonstrated the benefits derived through fire reintroduction in maintaining and/or restoring the fire-adapted plant communities within the park. These results have also identified a distinct need for the establishment of a broader based, long-term program utilizing management ignited prescribed fires (MIPF) at the national lakeshore. The 1992 Fire Management Plan has approved the use of prescribed fire as a routine management tool at Indiana Dunes. A specific objective of the prescribed burn program at the national lakeshore is to establish a fire monitoring program to assist in identifying long-term fire effects.

FIRE MANAGEMENT UNITS

There are three fire management units (FMU) for the national lakeshore which are spread over two geographic park management units (East Unit and West Unit). Table 1 provides a brief summary of the three FMU's at Indiana Dunes National Lakeshore.

Table 1. Fire Management Units and Description at Indiana Dunes National Lakeshore.

	FIRE MANAGEMENT UNIT		
	Savanna/Prairie	Dune Forest	Morain Forest
ACRES	2238	7672	2160
PREDOMINANT VEGETATION	Black oak sand savanna; dry & mesic sand prairies; marshes, sedge meadows	Prairie/savanna to moist forested dune slopes; jack pine pockets, marshes, panes, sedge meadow, cattails, cottonwood, aspen	Oak-hickory; remnant mesic silt loam prairies.
HISTORIC FIRE FREQUENCY	4-8 years	3-7 years	S. Bailly: 3-5 N. Bailly 20 -100 years
LONG-RANGE MANAGEMENT OBJECTIVE	Maintain open savannas, prairies, and wetlands	Thin aspen ash, and cottonwood; maintain savanna/prairie openings and marshes; encourage white pines	Rookery: put out all fires; Pinhook: do research first
RECOMMENDED FIRE FREQUENCY	2-4 years	Savanna and prairie openings: 3-5 years Elsewhere: 5–20 years	Bailly Chellberg and south of Little Calumet River: 3-5 years Elsewhere: 20-100 years

Currently, there are 68 permanent park-wide fuel monitoring plots, plus an additional 22 plots within Howes Prairie, that are being monitored on an as-time-allows basis. This plan serves to assist with the implementation of a park-wide fire monitoring program at the national lakeshore.

MONITORING PROTOCOLS

Vegetation Types to be Monitored and Plot Requirements:

Monitoring plots will be established within five distinct vegetation types at the national lakeshore as noted in Table 2.

Table 2. Vegetation Types and Monitoring Plot Requirements.

Vegetation Type	Plot Requirements	Monitoring Type Variables	RX Burn Objectives
1) Black Oak (BO) Forest	75% or greater tree dominance by BO with 50% or greater canopy closure	BO density, canopy cover	Reduce woody species density and canopy by 20-35%
2) Black Oak Savanna	75% or greater tree dominance by BO with 25-50% canopy closure	BO density, canopy cover, relative cover of herb/woody understory species	Reduce woody species density and canopy by 15-30%; Increase lupine and nectar plants by 15-30%
3) Mesic Sand Prairie	30% or less woody species cover with 50% or greater herbaceous cover	Woody species density, relative cover of native forb and grass species	Reduce woody species density 15-30%; Increase native herbs by 20-35%
4) Aspen Grove	75% or greater tree dominance by aspen with 50% or greater canopy closure	Aspen density, canopy cover, relative cover of herbaceous understory species	Reduce aspen density and cover by 20-35%; Increase native herbs/grasses by 20-35%
5) Sedge Meadow Wet Prairie	30% or less woody species cover with 50% or greater herbaceous cover	Woody species density, relative cover of native forb, sedge, and grass species	Reduce woody species density by minimum of 15%; Increase native forb, sedge, grass species by minimum of 20%

A total of up to 10 monitoring plots will be established initially within each of the identified vegetation types. Plot numbers may be increased or reduced dependent on personnel availability and the amount of time required to sample each plot. To assist with the monitoring of long-term vegetational change and fire effects, up to five additional control (non-treatment) plots will also be established for each community type within areas that will remain unburned.

Monitoring Plot Restrictions:

Monitoring plots will not be established within 20 meters of roadways, utility corridors, or trails in order to avoid unwanted vandalism of plot markings or trampling of plots. Plots will not be established within 10 meters of distinct changes in vegetational cover in order to avoid edge effects and ecotone conditions associated with changes in fuel types.

Plot Locations:

The park's Geographical Information System (GIS) will be used to identify potential monitoring plot locations based on the desired vegetation type, plot requirements, and plot restrictions; and to randomly identify plot origin points within areas meeting the above requirements. Field reconnaissance will be used to verify appropriateness of areas for monitoring plot establishment.

Monitoring Protocols and Data to be Collected:

Monitoring protocols for data collection will follow those outlined within the Western Region Fire Monitoring Handbook (1992) for both the forested (Black Oak Forest, Black Oak Savanna, and Aspen Grove) and grassland (Mesic Sand Prairie and Sedge Meadow/Wet Prairie) vegetation types. Table 3 identifies specific variables that will be monitored within the forested habitats.

Table 3. Forested Plot Specifications by Variable

Variable	Plot Size or Transect Length	Location
Overstory Trees	Plot 20 x 50 m	Quarters 1,2,3,4
Sapling Trees	Plot 10 x 25 m	Quarter 1
Seedling Trees	Plot 5 x 10 m	Portion of Quarter 1
Dead & Downed Fuel Array	Transect: four, 50 ft each	Quarters 1,2,3,4
Brush & Herbaceous Layer	Transect: one, 50m	Outer Portions of Quarters 1,2,3,4
Brush Density	Transect: 1m (w) x 50m (1)	Outer Portions of Quarters 1,2,3,4

All plants will be identified by species. Overstory trees (>9.0cm dbh) will be tagged with an identification number and measured for diameter at breast height (dbh). The 9 cm diameter was selected for the lower limits for overstory trees due to the diversity of tree species and plant community types present at Indiana Dunes and also to provide data that is comparable to previously collected fire effects data from the national lakeshore. Existing fire scars will be measured for height and direction. Sapling tree (>2.5cm < 9.0cm) heights and brush density measurements will also be made and recorded by species.

Grassland plots will be established using a single line transect with a length of 30.3 meters. Herbaceous and shrub species will be measured using the "point line-intercept" method as outlined within the Western Region Fire Monitoring Handbook in order to obtain number of transect hits, relative cover, and percent of non-native species data. A belt transect (5m width) will be used to measure shrub density within the grassland/brush vegetation types in order to increase the ability to perceive changes in these vegetation types as a response to fire. In addition to the required monitoring variables, herbaceous species density measurements will be made for herbaceous species of specific concern (i.e. Kbb larval host plants, adult Kbb nectaring plants, and rare plant species). Brush and herbaceous layer heights data will be collected.

Plots within each of the vegetational community types will be monitored under both pre-burn and post-burn conditions. Plots will be monitored the year prior to a scheduled prescribed burn and during the next two growing seasons immediately following the prescribed burn event. After that time, plots will be monitored on a subsequent rotational basis dependent upon future planned burns with no more than two years passing between any given monitoring event. If time and personnel availability permit, herbaceous components within each plot will ideally be measured twice per year so as to include both early season and late season species. Permanent photostations will be established at all monitoring plots to provide visual comparisons of vegetational change.

Management Ignited Prescribed Burn Monitoring Parameters:

Individual MIPF burn plans will be prepared prior to any prescribed burn within the national lakeshore. The following variables will be measured/documented during each prescribed burn event: (1) ambient conditions (topography and weather variables), (2) fire characteristics (rate and direction of spread, flame length and height, fire intensity), and (3) smoke characteristics (visibility, direction, and rate of dispersal). Measurements will be made as close as possible to an established monitoring plot(s) as safety considerations will allow.

Special Concerns:

To date, only one federally listed endangered animal species, the Karner blue butterfly (Kbb), is known to be a permanent resident at the national lakeshore. Over the last 100 years the Kbb has suffered a 90% decline in numbers as compared to its historic abundances. The species is highly dependent upon savanna and prairie habitats for survival, with the wild lupine plant serving as the sole food source for larva. Direct habitat destruction and fire suppression serve as the primary factor's contributing to the species decline.

While the Kbb is highly dependent upon fire to maintain its habitat, the species itself is fire sensitive. A wildfire or MIPF can eliminate the eggs and larva of the Kbb, but the larva feed exclusively on the wild lupine, which requires a fire-maintained system. Because of these factors, the following guidelines have been established, with consultation from the United States Fish and Wildlife Service (USFWS), for MIPF at Indiana Dunes:

1. No more than ½ of the habitat of a known Kbb population will be burned in any one year.

2. Within each burn unit containing Kbb, at least one large prairie opening and its edge lupine will be selected to remain unburned.

3. Adjacent burn units with Kbb will not be burned in consecutive years.

4. The objectives for MIPF's in Kbb areas will specify a mosaic burn pattern (no more than 90% of the area will be burned).

5. Proposed MIPF's will be surveyed for lupine and Kbb before the burn plan is written. If Kbb are found the above procedures will be followed. Any area undergoing a MIPF that is known to support Kbb will be monitored both prior to the burn and for three years after the burn with copies of both pre- and post-burn data being sent to the USFWS.

In addition to standard reasons for a professional-quality fire monitoring program, this program will also enable the park to be in compliance with the guidelines established by the USFWS for MIPF and monitoring Kbb habitat at the national lakeshore.

Proposed Schedule for Monitoring Plot Establishments:

It is anticipated that establishment of all initial monitoring plots will be completed within three years, requiring funding for three temporary employees (two GS-5's and one GS-6) for a total of 9 to 11 pay periods

per year. Beginning with the fourth year, only one, full-time position (GS-7) will be needed to continue the fire monitoring program.

The Fire Monitoring Plan has been developed to provide guidance to the national lakeshore in establishing sound fire monitoring protocols and should remain a working document, allowing for modification as deemed necessary. Similarly, the monitoring results should serve as feedback to the park's Fire Management Plan by assisting in refining MIPF burn prescriptions within specific vegetational habitats and in the establishment of burn objectives. Care should be taken, however, to avoid making hasty management decisions based upon only a few years worth of data. Effective long-term fire management will require a comprehensive understanding of the various interactions between vegetation and fire. This level of understanding can only be obtained from long-term monitoring and data analysis.

To be updated by the fire effects staff at INDU

APPENDIX N

CALL OUT LIST

DUE TO INDIVIDUAL PRIVACY CONCERNS, THIS CALL OUT LIST WILL BE ATTACHED TO THE FINAL DRAFT OF THE FIRE MANAGEMENT PLAN WHICH WILL BE KEPT IN THE FIRE MANAGEMENT OFFICE.

APPENDIX O

FIRE AGREEMENTS

Indiana Dunes National Lakeshore is in the process of updating all of its cooperative agreements or Memorandum of Understandings (MOU's) with all of our cooperator agencies. The previous agreements were established with the previous Fire Management Plan (dated 1992).

The following is a list of MOU's in the process of being updated. MOU's should be in place by the end of calendar year 2005 (January 2006)

Indiana Dunes State Park
Hoosier National Forest
Medewin National Forest
Indiana Interagency Coordination Center (IICC)
Porter County
Lake County
LaPorte County
Porter County Fire Association
Porter Fire Department
Chesterton Fire Department
Ogden Dunes Fire Department
Burns Harbor Fire Department
Pines Fire Department
Beverly Shores Fire Department
Gary Fire Department
Hobart Fire Department
Michigan City Fire Department
Portage Fire Department
Lake Station Fire Department
U.S Steel Fire and Security
ISG Steel (Wackenhut Coorporation)
Northern Indiana Public Service Company (NIPSCO)

CSX
Conrail

Northern Indiana Commuter Transportation District

Will be inserted as they are updated and completed

APPENDIX P

INTERAGENCY CONTACTS

Beverly Shores Fire Department
Emer. Phone#: 219-872-1544
Bus. Phone#: 219-872-9104

Burns Harbor Fire Department
Emer. Phone#: 219-787-9411
Bus. Phone#: 219-787-8591

Chesterton Volunteer Fire Department
Emer. Phone#: 219-926-7635
Bus. Phone#: 219-926-7162

Gary Fire Department
Emer. Phone#: 219-881-5252
Bus. Phone#: 219-881-4782

Hebron Fire Department
Emer. Phone#: 219-996-2121
Bus. Phone#: 219-996-2550

Hoosier National Forest
Bedford Office: 812-275-5987
Bloomington Office: 812-837-9453

ISG – Burns Harbor
Emer. Phone#: 219-787-3501
Bus. Phone#: 219-787-3795

Indiana Dunes State Park
Emer. Phone#: 219-926-7569
Bus. Phone#: 219-926-1952

Indiana Interagency Coordination Center
Bus. Phone#: 812-454-4001
Emer. Phone#: 812-547-9250

Kouts Volunteer Fire Department
Emer. Phone#: 219-766-3333 (911)
Bus. Phone#: 219-766-2114

Lake Eliza Fire Department
Emer. Phone#: 219-462-3532
Bus. Phone#: 219-464-1128

Lakes of the Four Seasons Fire Department
Emer. Phone#: 219-988-2121
Bus. Phone#: 219-988-4309
Station 2 Phone#: 219-662-7576

Liberty Township Fire Department
Emer. Phone#: 219-926-1325 (911)
Bus. Phone#: 219-926-5215

Michigan City Fire Department
Emer. Phone#: 219-872-5511 (911)
Bus. Phone#: 219-873-1440

Midewin National Tallgrass Prairie
Bus. Phone#: 815-423-6370

Morgan Township Fire Department
Emer. Phone#: 219-463-5555
Bus. Phone#: 219-462-1665

Pine Township Volunteer Fire Department
Emer. Phone#: 219-874-7515
Bus. Phone#: 219-872-2796

Portage Fire Department
Emer. Phone#: 219-762-3113 (911)
Bus. Phone#: 219-762-7404

Portage Township (South Haven) Fire Department
Emer. Phone#: 219-759-3611
Bus. Phone#: 219-759-3919

Porter County Fire Dispatcher
Emer. Phone#: 219-926-1241
Bus. Phone#: 219-465-1515 (ask for “radio”)

Porter Volunteer Fire Department
Emer. Phone#: 219-926-1241
Bus. Phone#: 219-926-1226

Porter Township Volunteer Fire Department
Emer. Phone#: 219-462-1403
Bus. Phone#: 219-464-2711

Union Volunteer Fire Department
Emer. Phone#: 219-759-2611
Bus. Phone#: 219-759-3321

U S Steel Industries Inc.
Chesterton Office Phone#: 219-983-9925
Gary Office Phone#: 219-888-4925

Valparaiso Fire Department
Emer. Phone#: 219-462-2131
Bus. Phone#: 219-462-8325

Washington Township Volunteer Fire Department
Emer. Phone#: 219-462-1516
Bus. Phone#: 219-464-3015

APPENDIX Q

CULTURALLY SIGNIFICANT RESOURCES

10 YEAR FUELS MANAGEMENT PLAN Cultural Resource Goals and Objectives

Indiana Dunes National Lakeshore comprises some 15,169 acres on the southern shore of Lake Michigan in northwest Indiana. The national lakeshore extends 20 miles along the lakefront, incorporating portions of Lake, Porter, and LaPorte counties. The enabling legislation established the park to

". . . preserve for the educational, inspirational, and recreational use of the public certain portions of the Indiana Dunes and other areas of scenic, scientific, and historic interest and recreational value in the State of Indiana . . ."

Goal 1
Protect historic structures located on National Park Service lands within the legislative boundaries of the park from the adverse impacts of wildland fire through fuel reduction.

Mitigation Objective: Within 5 years the national lakeshore will provide a minimum of at least 30' defensible space around key historic structures through the use of prescribed fire and mechanical fuel reduction, while taking into consideration Cultural Landscape values.

Maintenance Objective: Establish a cyclic fuel reduction program to maintain the defensible space in an effort to prevent potential damage from wildland fire. This will be accomplished through the use of prescribed fire and low level mechanical fuel reduction, i.e. mowing and hand cutting.

Goal 2
Protect historic structures located on and adjacent to National Park Service lands within the legislative boundaries of the park from the adverse impacts of wildland fire through education programs specific to historic structures.

Objective: Implement an initial response wildland fire suppression program specific to historic structures. This will include cooperation with local and state agencies, providing guidelines and constraints on appropriate suppression tactics, and providing appropriate training and equipment to said agencies when funding permits.

Objective: Implement an aggressive wildland fire prevention program including public education and Interpretive programs.

Please note, as the national lakeshore acquires other historic structures, not currently listed in the matrix, each will be evaluated for wildland fire protection and fuels management.

Historic Context	Resource	Resource Components	GPS Coordinates	Elements	Values at Risk	Risk Conditions or Activities	Inventory Metho Proposed
Prehistory							
Paleo	Archeological Sites	Debitage (chert flakes) Projectile Point Fragments	NA	Debitage (chert flakes) Projectile Point Fragments	Debitage (chert flakes) Projectile Point Fragments	Heavy equipment on site. Fireline cut through site.	Determined by Midwe Archeological Center (MWAC)

Archaic	Archeological Sites	Debitage (chert flakes) Fire Cracked Rock Projectile Point Fragments	NA	Debitage (chert flakes) Fire Cracked Rock Projectile Point Fragments	Debitage (chert flakes) Fire Cracked Rock Projectile Point Fragments	Heavy equipment on site. Fireline cut through site.	Determined by Midwe Archeological Center (MWAC)
Woodland	Archeological Sites	Debitage (chert flakes) Fire Cracked Rock Projectile Point Fragments Tool Fragments Ceramic Sherds	NA	Debitage (chert flakes) Fire Cracked Rock Projectile Point Fragments Tool Fragments Ceramic Sherds	Debitage (chert flakes) Fire Cracked Rock Projectile Point Fragments Tool Fragments Ceramic Sherds	Heavy equipment on site. Fireline cut through site.	Determined by Midwe Archeological Center (MWAC)

Historic Context	Resource	Resource Components	GPS Coordinates	Elements	Values at Risk	Risk Conditions or Activities	Inventory Metho Proposed
Euro-American Settlement 1820s-1860s							
Early Exploration	Archeological Sites	Buttons Glass Ceramic Dishware	NA	Buttons Glass Ceramic Dishware	Buttons Glass Ceramic Dishware	Heavy equipment on site. Fireline cut through site.	Determined by Midwe Archeological Center (MWAC)

Early Settlement	Homestead – i.e. Bailly Homestead and the Bailly Cemetery	Log Building with Wood Siding i.e. Main House	Bailly Homestead 492134 E, 4607898 N Bailly Cemetery 492376 E,4609033 N	Concrete Block Foundation, Logs, Chinking, Lumber, Wood Siding, Wood Shingles	Concrete Block Foundation, Logs, Chinking, Lumber, Wood Siding, Wood Shingles	Adjacent fuels. Heavy equipment on site. Back firing operations.	NA
		Log Buildings i.e. Chapel Two-Story Cabin Fur Trader's Cabin		Brick and/or Stone Foundations, Logs, Chinking, Lumber, Wood Shingles	Brick and/or Stone Foundations, Logs, Chinking, Lumber, Wood Shingles	Adjacent fuels. Heavy equipment on site. Back firing operations.	NA
		Brick Building i.e. The Brick House		Brick Foundation, Brick Walls, Lumber, Wood Shingles	Brick Foundation, Brick Walls, Lumber, Wood Shingles	Adjacent fuels. Heavy equipment on site. Back firing operations.	NA
		Cemetery		Concrete Block Walls and Earthen Backfill	Concrete Blocks, Mortar, Earthen Backfill	Adjacent fuels. Heavy equipment on site. Back firing operations.	Cultural Landscape F

	Resource	Resource Components	GPS Coordinates	Elements	Values at Risk	Risk Conditions	Inventory Metho

Historic							
Context						or Activities	Proposed
Euro-American Settlement 1820s-1860s Early Settlement (cont.)	Associated Structures – Hermes Miller House	Log and Wood Frame Building with Wood Siding i.e. House	Hermes Miller House 491987 E, 4608296 N	Brick and/or Concrete Block Foundation, Logs, Chinking, Lumber, Wood Siding, Shingles	Brick and/or Concrete Block Foundation, Logs, Chinking, Lumber, Wood Siding, Shingles	Adjacent fuels. Heavy equipment on site. Back firing operations.	Determination of Elig
		Wood Frame Buildings i.e. Barn Garage		Brick, Stone, and/or Concrete Block Foundation, Wood Siding, Lumber, Shingles	Brick, Stone, and/or Concrete Block Foundation, Wood Siding, Lumber, Shingles	Adjacent fuels. Heavy equipment on site. Back firing operations.	Determination of Elig
Agricultural Development: 1860's - 1970's	Archeological Site – i.e. Borg Farm	Brick Ruins	Borg Farm 493198 E, 4608438 N	Brick and/or Stone Foundation, Brick, Lumber, Shingles	Brick and/or Stone Foundation, Brick, Lumber, Shingles	Adjacent fuels. Heavy equipment on site. Back firing operations.	NA
	Farmsteads/ Homesteads – Swedish Historic District	Wood Frame Buildings i.e.	Chellberg Farm	Brick, Stone and/or	Brick, Stone and/or Concrete Block	Adjacent fuels. Heavy equipment on site. Back firing operations.	NA

	i.e. Chellberg Farm, Sugar Bush, Sears House, Wahl House, Irene Nelson House, Lundeen House	Chellberg Chicken Coop Chellberg Corn Crib Chellberg Granary Chellberg Pump House Irene Nelson Workshop Irene Nelson Corn Crib Irene Nelson Chicken Coop Irene Nelson Barn Irene Nelson Summer Kitchens (2) Irene Nelson Wood Shed Irene Nelson Privy Sugar Bush Guesthouse Sugar Bush Workshop	492581E,4608353 N Sugar Bush 492811 E, 4608389 N Sears House 491958 E, 4608331 N Wahl House 492297 E, 4607631 N	Concrete Block Foundations, Wood Siding, Lumber, Wood Shingles, Shingles	Foundations, Wood Siding, Lumber, Wood Shingles, Shingles		

			Irene Nelson House 490930 E, 4608628 N Lundeen House 492553 E,4609124 N				
	Resource	**Resource Components**	**GPS Coordinates**	**Elements**	**Values at Risk**	**Risk Conditions**	**Inventory Metho**

Historic							
Context						or Activities	Proposed
Agricultural Development: 1860's - 1970's (cont.)	Farmsteads/ Homesteads – Swedish Historic District (cont.)	Heavy Timber Buildings i.e. Chellberg Barn Wahl Barn		Brick, Stone and/or Concrete Block Foundations, Wood Timbers, Wood Siding, Lumber, Wood Shingles, Shingles	Brick, Stone and/or Concrete Block Foundations, Wood Timbers, Wood Siding, Lumber, Wood Shingles, Shingles	Adjacent fuels. Heavy equipment on site. Back firing operations.	NA
		Log Buildings with Wood Siding or Asphalt Shingle Siding i.e Wahl House Irene Nelson House Lundeen House		Brick, Stone and/or Concrete Block Foundations, Logs, Chinking, Wood Siding, Asphalt Shingle Siding, Lumber, Shingles	Brick, Stone and/or Concrete Block Foundations, Logs, Chinking, Wood Siding, Asphalt Shingle Sidiing, Lumber, Shingles	Adjacent fuels. Heavy equipment on site. Back firing operations.	NA
		Brick Buildings i.e. Chellberg House Sugar Bush House		Brick and/or Stone Foundations, Brick, Lumber, Wood Shingles, Shingles	Brick and/or Stone Foundations, Brick, Lumber, Wood Shingles, Shingles	Adjacent fuels. Heavy equipment on site. Back firing operations.	NA

		Concrete Block Buildings i.e. Chellberg Sugar Shack Irene Nelson Garage		Concrete Blocks, Mortar, Lumber, Shingles, Sheet Metal Roof	Concrete Blocks, Mortar, Lumber, Shingles, Sheet Metal Roof	Adjacent fuels. Heavy equipment on site. Back firing operations.	NA
		Landscape		Orchards i.e. Chellberg Farm Irene Nelson House	Fruit Trees	Adjacent fuels. Heavy equipment on site. Back firing operations.	Cultural Landscape Reports
	Resource	**Resource Components**	**GPS Coordinates**	**Elements**	**Values at Risk**	**Risk Conditions**	**Inventory Metho**

Historic							
Context						or Activities	Proposed
A.							
B. Recreation/Residential Development 1890's – 1940's	Porter Beach – Solbeck Cottage	Wood Frame Building	Solbeck Cottage 494390 E, 4612000 N	Concrete Block Foundation, Lumber, Asphalt Shingles	Concrete Block Foundation, Lumber, Asphalt Shingles	Adjacent fuels. Back firing operations.	Determination of Elig
C. Architectural Design 1930's – 1970's	Beverly Shores -Century of Progress Architectural District - i.e. Wieboldt-Rostone House Florida Tropical House Cypress Log Cabin and Guest House House of Tomorrow Armco-Ferro House NOTE: The Century of Progress houses are occupied residences under a leasing program. **Assess the sites for probable locations of**	Steel Frame Building with Rostone Sheathing i.e. Wieboldt-Rostone House	Wieboldt-Rostone House 499861 E, 4614706 N Florida Tropical House 499898 E, 4614729 N Cypress Log Cabin 500012 E, 4614721 N House of Tomorrow 499979 E, 4614713 N Armco-Ferro House 499897 E, 4614675 N	Concrete Foundation, Rostone (Synthetic Stone), Steel, Concrete, Lumber, EDPM (Rubber) Roofing	Concrete Foundation, Rostone (Synthetic Stone), Steel, Concrete, Lumber, EDPM (Rubber) Roofing	Adjacent fuels. Back firing operations.	Cultural Landscape F

	automobiles, barbecue grills with propane tanks, lawn mowers, and any other equipment that requires a fuel source.						
		Wood Frame Building with Concrete Stucco i.e. Florida Tropical House		Concrete Foundation, Lumber, Stucco, EDPM (Rubber) Roofing	Concrete Foundation, Lumber, Stucco, EDPM (Rubber) Roofing	Adjacent fuels. Back firing operations.	Cultural Landscape F
		Wood Frame Buildings with Log Siding i.e. Cypress Log Cabin Cypress Guest House		Half Log Siding, Lumber, Wood Shingles, Stone and Brick Chimney, Mortar	Half Log Siding, Lumber, Wood Shingles, Stone and Brick Chimney, Mortar	Adjacent fuels. Back firing operations.	Cultural Landscape F
	Resource	**Resource Components**	**GPS Coordinates**	**Elements**	**Values at Risk**	**Risk Conditions**	**Inventory Metho**

Historic							
Context						or Activities	Proposed
	Beverly Shores -Century of Progress Architectural District (cont.)	Steel, Concrete and Wood Frame Building with Copper Sheathing i.e. House of Tomorrow		Concrete Foundation, Steel, Concrete, Lumber, Copper Siding, Felt and Tar Roof	Concrete Foundation, Steel, Concrete, Lumber, Copper Siding, Felt and Tar Roof	Adjacent fuels. Back firing operations.	Cultural Landscape F

Architectural Design 1930's – 1970's (cont.)							
		Steel Frame Building with Steel Enameled Panels i.e. Armco-Ferro House		Concrete Foundation, Steel, Enameled Panels, Felt and Tar Roof	Concrete Foundation, Steel, Enameled Panels, Felt and Tar Roof	Adjacent fuels. Back firing operations.	Cultural Landscape F
	Soloman House Please note, two other Soloman houses will be added at a later date.	Concrete Block Buildings with Stucco	Soloman House 503168 E, 4616428 N	Concrete Foundations, Concrete Block, Mortar, Lumber, EDPM (Rubber) Roofing	Concrete Foundations, Concrete Block, Mortar, Lumber, EDPM (Rubber) Roofing	Adjacent fuels. Back firing operations.	National Register Nomination
	Harry Weese House – Artist-in-Residence	Wood Frame Building	Harry Weese House 503380 E, 4616526 N	Concrete Foundation, Wood Siding, Lumber, Shingles	Concrete Foundation, Wood Siding, Lumber, Shingles	Adjacent fuels. Back firing operations.	NA (at this time)
Recreation/Summer Camp 1940's – 1970's	Camp Buildings – i.e. Good Fellow Club Youth Camp Including: Gatehouse and Entry Wall Caretaker's House and Garage Historic Lodge Pump House Staff Cabin Director's Cabin Pool House Pool Utility Shed	Stone Building i.e. Gatehouse	Good Fellow Club 491637 E, 4608317 N	Stone, Mortar, Lumber, Shingles	Stone, Mortar, Lumber, Shingles	Adjacent fuels. Back firing operations.	Historic Structures Re

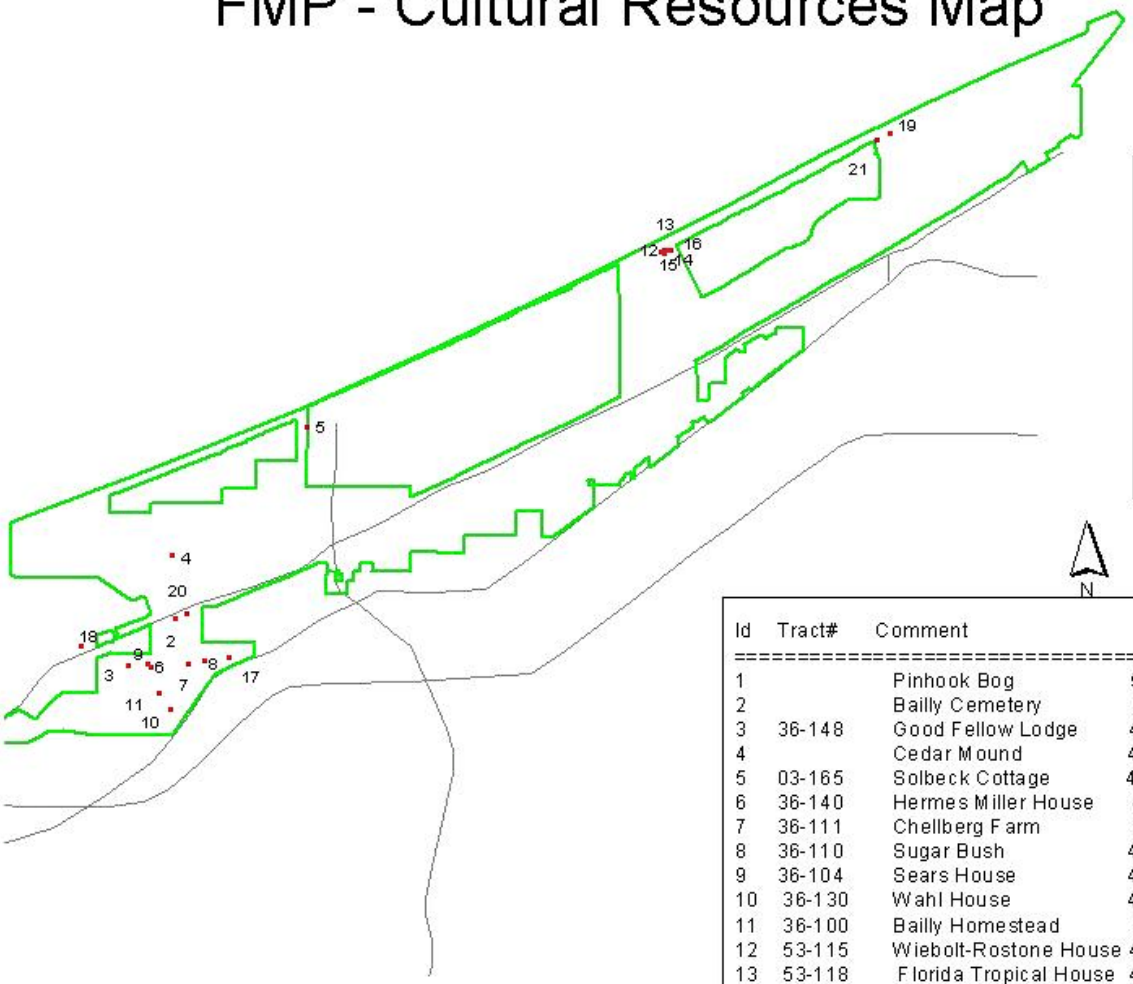
	Resource	**Resource Components**	**GPS Coordinates**	**Elements**	**Values at Risk**	**Risk Conditions**	**Inventory Metho**

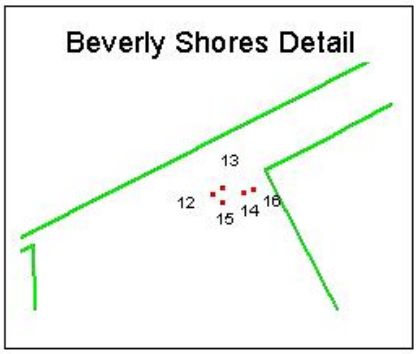
Historic							
Context						or Activities	Proposed
Recreation/Summer Camp 1940's – 1970's (cont.)	Camp Buildings – i.e. Good Fellow Club Youth Camp (cont.)	Wood Frame Buildings i.e. Caretaker's House and Garage Pump House Staff Cabin Director's Cabin		Brick and/or Stone Foundations, Wood Siding, Lumber, Shingles	Brick and/or Stone Foundations, Wood Siding, Lumber, Shingles	Adjacent fuels. Back firing operations.	Historic Structures Re
		Wood and Steel Frame Building i.e. Historic Lodge		Brick, Stone, and/or Concrete Block Foundation, Wood Siding, Lumber, Steel Frame, Shingles	Brick, Stone, and/or Concrete Block Foundation, Wood Siding, Lumber, Steel Frame, Shingles	Adjacent fuels. Back firing operations.	Historic Structures Re
		Concrete Block Buildings i.e. Pool House Utility Shed		Concrete Blocks, Mortar, Lumber, Shingles	Concrete Blocks, Mortar, Lumber, Shingles	Adjacent fuels. Back firing operations.	Historic Structures Re
		Swimming Pool		Steel Pool, Concrete Patio, Chain Link Fence	Steel Pool, Concrete Patio, Chain Link Fence	Adjacent fuels. Heavy equipment on site. Back firing operations.	Cultural Landscape R

		Landscape		Stone Wall and Chain Link Fence at Entrance Concrete Pads (from Historic Cabins) Concrete Pad (checker board)	Stone and Mortar Chain Link Fence Concrete	Adjacent fuels. Back firing operations.	Cultural Landscape F
	Resource	**Resource Components**	**GPS Coordinates**	**Elements**	**Values at Risk**	**Risk Conditions**	**Inventory Metho**

Historic Context						**or Activities**	**Proposed**
D.							
E. Scientific Study Late 19th Century – present	Cowles Bog – A National Natural Landmark	White Cedar Grove Mound	492312 E, 4610024 N	White Cedar Trees Mound With Vegetation	White Cedar Trees Mound With Vegetation	Adjacent fuels. Fireline cut through site. Back firing operations. Crown fire.	NA
F.	Pinhook Bog – A National Natural Landmark	Bog	512760 E, 4607361 N	Bog	Bog	Adjacent fuels. Fireline cut through site. Back firing operations. Peat fire.	NA

FMP - Cultural Resources Map





1 0 1 2 Kilometers

1 0 1 2 Miles

N

Id	Tract#	Comment	UTMe	UTMn
1		Pinhook Bog	512760	4607361
2		Bailly Cemetery	492376	4609033
3	36-148	Good Fellow Lodge	491637	4608317
4		Cedar Mound	492312	4610024
5	03-165	Solbeck Cottage	494390	4612000
6	36-140	Hermes Miller House	491987	4608296
7	36-111	Chellberg Farm	492581	4608353
8	36-110	Sugar Bush	492811	4608389
9	36-104	Sears House	491958	4608331
10	36-130	Wahl House	492297	4607631
11	36-100	Bailly Homestead	492134	4607898
12	53-115	Wiebolt-Rostone House	499861	4614706
13	53-118	Florida Tropical House	499898	4614729
14	53-119	House of Tomorrow	499979	4614713
15	53-121	Armco-Ferro House	499897	4614675
16	65-107	Cypress Log Cabin	500012	4614721
17	36-145	Borg Farm	493198	4608438
18	100-11/12	Nelson House	490930	4608628
19	86-148	Weese House	503380	4616526
20	34-109	Lundeen House	492553	4609124
21	86-206	Soloman House	503168	4616428