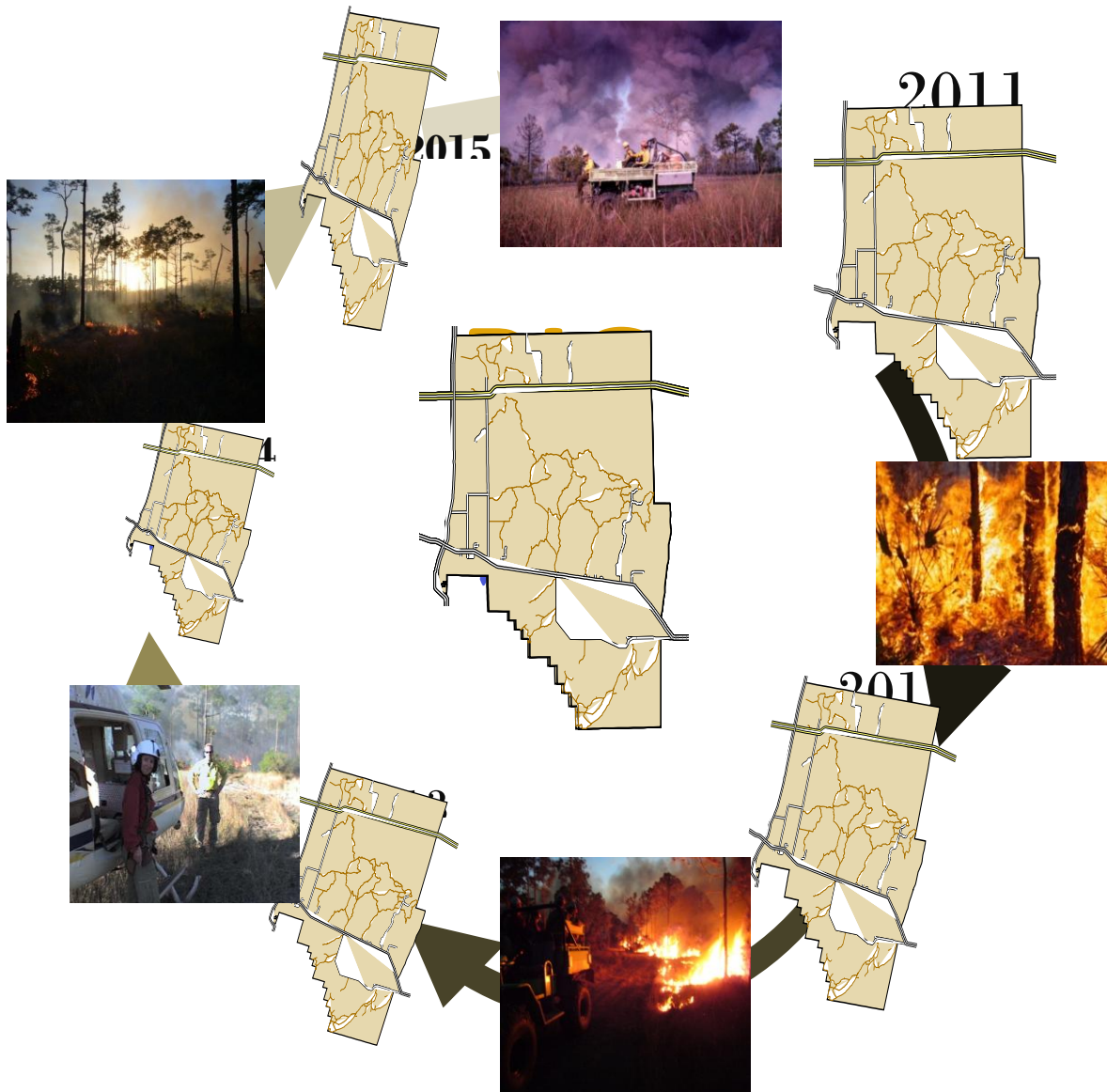


# BIG CYPRESS NATIONAL PRESERVE



# FIRE MANAGEMENT PLAN 2010

**07.20.2010**  
**Revised 01.31.2013**

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## CHAPTER 1 – INTRODUCTION

The Fire Management Plan (FMP) provides long-term direction for achieving The Big Cypress National Preserve (Preserve) goals for protection of life, property and ecosystem management. It outlines a comprehensive fire program including wildland fire response and fuels management utilizing prescribed fire. The plan also satisfies the requirements and direction given in policy, legislative authority, Preserve purpose statements, higher-level planning documents, and natural and cultural resource management objectives.

This plan outlines those actions that will be taken by the Preserve in meeting the fire management goals for the Preserve, including the requirement as stated in Director's Order 18 (DO18):

As an important part of fulfilling its mission, the National Park Service manages wildland fire to protect the public; park communities and infrastructure; conserve natural and cultural resources; and maintain and restore natural ecosystems and processes. The risks and expenses associated with planning and implementing fire management activities require exceptional skill and attention to detail. The highest priority under all circumstances is firefighter and public safety. All plans, project implementation, and responses to wildland fire must demonstrate this commitment.

DO18 goes on to state:

Wildland fire may contribute to or hinder the achievement of park management objectives. Therefore park fire management programs will be designed to meet resource management objectives prescribed for the various areas of the park and to ensure that firefighter and public safety are not compromised. Each park with burnable vegetation must have an approved Fire Management Plan that will address the need for adequate funding and staffing to support its fire management program.

Parks having an approved Fire Management Plan and accompanying National Environmental Policy Act (NEPA) compliance may utilize wildland fire to achieve resource benefits in predetermined fire management units. Parks lacking an approved Fire Management Plan may not use resource benefits as a primary consideration influencing the selection of a suppression strategy, but they must consider the resource impacts of suppression alternatives in their decisions

This 2010 FMP revision will update and supersede the 2004 version of Big Cypress National Preserve's FMP. This update is necessary due to recent changes in National Park Service fire policy and national interagency fire policy and terminology. Minor changes from the 2004 plan include a realignment of Fire Management Unit (FMU) boundaries and a reevaluation of the indices that will influence the Step-Up Plan. The fire management strategy implemented in this FMP was subject to NEPA review which resulted in a memo to file from the 2004 FMP. That memo to file indicates that there were no significant effects beyond those described in the 2004 EA. This finding of NEPA compliance will be documented in a Memorandum to file. (*see Appendix B*).

A programmatic Environmental Assessment (EA) specific to fire management activities was prepared in May 2005 for the 2004 FMP and considered a wide range of management alternatives. Also addressed were potential effects of the various alternatives to cultural and natural resources, including threatened and endangered (T&E) species. Per the Sec. 7 consultation requirements for the Florida panther, red-cockaded woodpecker, Cape Sable seaside sparrow, and Indigo snake, an annual report will be

prepared and submitted to the Fish and Wildlife Service for compliance. This report will include previous accomplishments, observations and the next year's planned areas. The NPS has selected Alternative C contained in the 2005 EA for implementation.

Under Alternative C, all unplanned ignitions will be designated as wildfires and response will be initiated. Unplanned ignitions will be managed under a strategy that includes aggressive suppression and modified suppression responses, including confinement and containment. Alternative C also employs prescribed fire techniques to mimic the timing, frequency, and ecological effects of historic fire regimes on the Preserve.

This FMP will address the need for prescribed fire and management of wildfire to accomplish the following: 1) replicate human and natural historic fire regimes to sustain flora and fauna that depend on fire for habitat improvement and maintenance, and 2) reduction of hazard fuel loadings, thereby diminishing threats from catastrophic fire to life, property, and resources. This FMP will guide the Preserve's fire management program until revised. The FMP will be reviewed for adequacy annually and will be revised as needed, and consultation reinitiated if substantial changes are indicated.

## 1.1 General Description of the Preserve

Big Cypress National Preserve is in southern Florida, centrally located between Miami and Naples.

- The northern boundary of the Preserve, approximately seven miles north of I-75, is shared with Big Cypress Seminole Indian Reservation and private lands.
- The western boundary parallels State Highway 29, Fakahatchee Strand Preserve State Park (FSPSP) and The Florida Panther National Wildlife Refuge.
- The eastern boundary is shared with the Miccosukee Indian Reservation and State Water Conservation Area 3A.
- The southern boundary is shared with the northern boundary of Everglades National Park.

The Big Cypress National Preserve (729,000 acres) was established to protect the watershed values of the Big Cypress Swamp while integrating multiple uses with conservation and preservation including:

- a dynamic mixture of tropical and temperate plant communities that are home to a diversity of wildlife. There are 33 T&E animal and 120 T&E plant species. (Appendix H,I)
- serving as home and refuge to many people throughout time including the Miccosukee Tribe of Indians of Florida, the Seminole Tribe of Florida and early settlers.
- wildland urban interface with over 200 single-family dwellings and backcountry camps, that include over 1500 structures, registered and permitted to remain under the restrictions of the Preserve's enabling legislation.
- 26 American Indian villages and home sites occupied by Miccosukee, Seminole, and Independent Indians in the Preserve.
- the largest single in-holding, the Dade-Collier Training and Transition Airport, whose initial construction was a major impetus for creating the Preserve. (See [Figure 1](#))

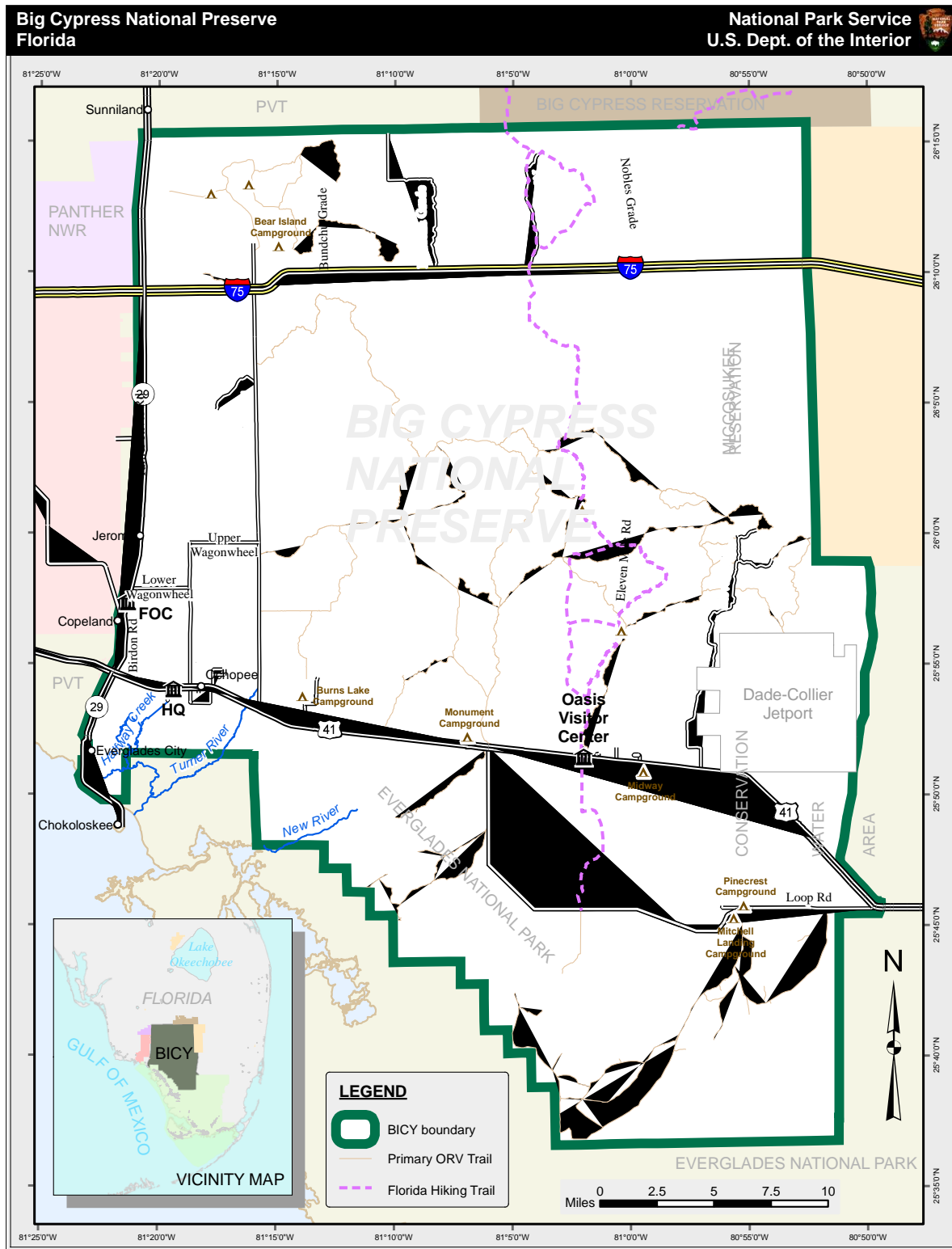


Figure 1: Big Cypress National Preserve and vicinity

## CHAPTER 2 – POLICY, LAND MANAGEMENT PLANNING AND PARTNERSHIPS

When Congress passed Public Law 93-440, in 1974, to establish Big Cypress National Preserve, the concept of a "National Preserve" was a new one. The intent was to protect the ecological integrity and recreational values of the area while allowing certain private land uses to the extent those uses do not interfere with the basic purpose of the Preserve.

The House and Senate reports identify the natural flow of freshwater as a fundamental resource in the Preserve. Freshwater flow is the key to the survival of the Preserve and the integrity of the entire South Florida ecosystem. Further, the reports cited the natural, scenic, floral, and faunal values of the Preserve as being worthy of national recognition and protection on their own merit. Recreation was addressed along with the natural values because the natural resources provide opportunities for recreational pursuits.

The act states that the Preserve, as a unit of the National Park system, is to be administered in a manner that will ensure "...the preservation, conservation and protection of the natural, scenic, hydrologic, floral and faunal, and recreational values of the Big Cypress Watershed in the State of Florida and to provide for the enhancement of public enjoyment thereof..." The act further directs development of rules and regulations for limiting and managing the following uses:

- motorized vehicles
- exploration for extraction of oil, gas and other minerals
- grazing
- the draining or constructing of works or structures that alter natural watercourses
- other uses that may need to be limited or controlled

Furthermore, the act permits the Miccosukee Tribe of Indians of Florida and members of the Seminole Tribe of Florida, subject to reasonable regulations "to continue their usual and customary use and occupancy" including hunting, fishing, and trapping on a subsistence basis and traditional tribal ceremonies.

Authority for carrying out a fire and fuels management program originated with the Organic Act of the National Park System, August 25, 1916. This Act states that the primary goal of the National Park Service is to preserve and protect the natural and cultural resources found on lands under its management in such manner as will leave them unimpaired for future generations. Additional authorities for fire management activities include: 31 U.S. Code 665 (E) (1) (B) which provides the authority to exceed appropriations due to wildland fire management activities; Section 302 (c) (2) of the Federal Property Administration Services Act of 1949, as amended; and Chapter VIII of the 1983 Supplemental Appropriations Act (P.L. 97- 257) which deals with contracting for fire protection; and The Reciprocal Fire Protection Act, Act of May 27, 1955 (42 U.S.C. 1856) that authorizes reciprocal agreements with federal, state, and other wildland fire protection organizations.

This plan is a detailed program of action to implement these fire management policies and to meet natural resource management objectives, consistent with the natural and historic role of fire as defined through scientific study.

## 2.1 Fire Policy

This plan implements fire management policies and helps achieve resource management and fire management goals as defined in:

### **Federal Wildland Fire Management Policy and Program Review**

This plan is written to implement those resource and fire management goals identified in the 1995 Federal Fire Management Policy and Program Review as revised by the 2001 Federal Fire Management Policy update.

### **Managing Impacts of Wildfires on Communities and the Environment (USDO/USDA)**

Managing Impacts of Wildfires on Communities and the Environment and Protecting People and Sustaining Resources in Fire Adapted Ecosystems – A Cohesive Strategy (USDO/USDA) is designed to address management of wildland fire impacts on communities and to sustain resources in fire-adapted ecosystems.

### **A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment: 10-Year Comprehensive Strategy Implementation Plan.**

As part of the implementation of the National Fire Plan, the Department of the Interior has developed a standard process for fuels treatment project selection and funding. This process has been outlined in the Memorandum to Bureau Directors; “Fuel Treatment Project Selection Process” dated March 20, 2002.

### **Guidance for Implementation of Federal Wildland Fire Management Policy**

In February 2009, this guidance replaced the Interagency Strategy for Implementation of Federal Wildland Fire Management Policy (June 2003).

The National Park Service Organic Act of 1916 (Title 16 U.S.C. Chapters 1, 2, 3, and 4) and amendments thereto provide the authority for implementation of this plan.

The statutes cited in Departmental Manual 620 Section 1.1. “Authorize and provide the means for managing wildland fire on lands or threatening lands under the jurisdiction of the Department of the Interior, or lands adjacent thereto.”

The FMP is an action plan derived from the General Management Plan (GMP). The Preserve’s Resource Management Plan (RMP) provides direction for implementation of portions of the (GMP). Each of these plans included interdisciplinary input and review as part of their development, review, and approval processes.

The FMP meets all National Environmental Policy Act and National Historic Preservation Act requirements. The plan complies with Section 106 of the National Historic Preservation Act of 1966 and Section 7 of the Endangered Species Act (as amended in 1973).

The fire management strategy implemented in this FMP is subject to National Environmental Policy Act (NEPA) review, and compliance is documented in a Memorandum to File initiated January 10, 2010. The memorandum indicates that there were no significant effects beyond those described in the 2005 Environmental Assessment (EA). (See: [Appendix 2](#)).

Policy directives for the management of wildland fire on National Park Service lands include the following:

1. Director's Order 18 / Reference Manual 18, Fire and Aviation Management, January 01, 2008.
2. United States Department of the Interior, Departmental Manual.
3. The National Park Service Management Policies, August 31, 2006.
4. Review and update of the 1995 Federal Wildland Fire Policy, January 2001.
5. Federal Wildland Fire Management Policy, February 2009.
6. Interagency Standards for Fire and Fire Aviation Operations (Red Book), January 2010.
7. National Interagency Mobilization Guide.
8. Interagency Incident Business Management Handbook.
9. Interagency Prescribed Fire Planning and Implementation Procedures Reference Guide.
10. Interagency Fire Program Management Qualifications Standards and Guide.

## 2.2 Land/Resource Management Planning

The General Management Plan (approved October, 1991) contains a "Vision" statement that summarizes the values to be protected: "The National Park Service envisions the Preserve as a nationally significant ecological resource - a primitive area where ecological processes are restored and maintained and where cultural sites are protected from unlawful disturbance." Visitors have the opportunity to appreciate the natural resources, to relax in a natural setting, to explore the landscape and test backcountry skills, and to learn more about the natural environment. The GMP further establishes that fire is an integral part of the ecology of South Florida, and that most plant communities are not only susceptible to fire but in fact depend on periodic burning for their survival."

The Planning Issues and Management Concerns section of the GMP continues by identifying that the Preserve's current FMP concentrates on suppression activities, the use of "prescribed fire" to reduce hazardous fuel levels in high arson areas, maintenance of pastures on lands leased for grazing (all cattle grazing leases have ended) and habitat protection for endemic, federally endangered species such as the Red-cockaded woodpecker and the Cape Sable seaside sparrow.

The planning objectives of the GMP as they pertain to fire management include:

1. Protect public and private property and provide for visitor safety.
2. Protect important natural and cultural resources.
3. Provide for fire-dependent ecological communities and wildlife populations and restore the dynamic role of fire in the Preserve.



The 2001 RMP outlines stated and implied goals from enabling legislation, other laws and government policies, and guidelines and plans that guide management of the Preserve. The stated objectives of prescribed fire are:

- Reduce hazard fuel accumulations in the backcountry, around structures and along roadside corridors.
- Maintain character of wildlife habitat.
- Research.
- Control exotic species.
- Vista clearing and debris removal.
- Improve natural habitat.
- Maintenance of cattle pasturage was also noted, but cattle grazing no longer exists on federally managed lands within the Preserve.

The RMP identifies fire ecology as one of the 7 "key processes" integral to maintaining the long-term viability of the Preserve. It also recommends that fire in the Preserve be managed to protect and maintain the integrity of the natural system, improve wildlife habitat, and reduce hazardous fuel loadings. This FMP will support the identified need for greater application of fire as a means to reestablish natural systems where possible while protecting the public and sensitive or threatened resources.

## **2.3 Partnerships and Interagency Coordination**

In support of the National Fire Plan, the South Florida Fire Planning Unit has been established. It includes all federal land management agencies in the lower third of the peninsula. The major participants include Big Cypress National Preserve, Everglades National Park (EVER), Florida Panther National Wildlife Refuge, and Seminole Agency. Implementation of this program will require considerable interagency coordination throughout the life of this FMP in order to insure proper levels of initial attack and extended attack resources, as well as maintaining the fuels treatment program.

In 1996, Everglades, Dry Tortugas and Biscayne National Parks in addition to Big Cypress National Preserve developed the South Florida National Parks Coordinated Management Framework. This was the origination of purpose, significance and mission goal statements for each of the four South Florida parks. It also includes the collective purpose, significance and mission goals of the National Park System units within the South Florida ecosystem.

The National Park Service, US Fish and Wildlife Service, and Florida Division of Forestry have a state-wide Cooperative Agreement specific to the management of wildland fire. Also, beginning in 1999, during extended drought conditions, the State of Florida established a unified command that functions as a state-wide multi-agency coordination group. The National Park Service has been represented in this group since it was established. Such participation assures availability of extended attack and other national level resources.

The South Florida Interagency Fire Management Council is a committee of fire management organizations that have worked together for two decades. This group meets on a quarterly basis for information sharing, coordination of training opportunities, and continuing education. Big Cypress has been a member and participant of this council since its inception. This council is one of the three fire management councils established state-wide by law and under oversight of the Florida Division of Forestry.



Florida Interagency Coordination Center (FICC) provides resource ordering services to Big Cypress National Preserve. FICC is the direct link for any additional resource needs beyond the local area.

Big Cypress Preserve will continue to work with our local partners in cooperative prescribed fire, suppression, planning and field operations within the Big Cypress basin. These partners are critical to meet both specific project objectives and long-term goals. Specific agency agreements currently in place can be found in Appendix E.

Cooperator	Function
Big Cypress Seminole Bureau of Indian Affairs (BIA)	Adjacent Landowner / Fire Assistance
Collier County Bureau of Emergency Services (BES)	All Risk Management Response
Collier County Sheriff's Office (CCSO)	Roadway Assistance / Emergency Assistance
Everglades National Park	Adjacent Landowner / Fire Assistance
Florida Division of Forestry (DOF)	Fire Assistance
Florida Division of Recreation and Parks/Fakahatchee Strand Preserve State Park	Adjacent Landowner / Fire Assistance
Florida Highway Patrol (FHP)	Roadway Assistance / Emergency Assistance
Florida Panther National Wildlife Refuge	Adjacent Landowner / Fire Assistance
Miccosukee Tribe	Adjacent Landowner
National Weather Service (NWS)	Weather Information / Updates
Ochopee Fire Control District	Fire Assistance
Big Cypress Ranger Division	Internal Partner
Big Cypress Resource Management Division	Internal Partner
Big Cypress Roads and Trails	Internal Partner
Big Cypress Visitor Services	Internal Partner

Table 1: Key interagency contacts and fire cooperators

## CHAPTER 3 – Fire Management Unit Characteristics

### 3.1 Preserve-wide Management Considerations

The goals for fire management in Big Cypress National Preserve are common to all Fire Management Units across the Preserve. The goals focus on the restoration of natural fire regimes for the protection and maintenance of naturally evolved biotic communities and landscapes, while providing maximum protection of life and property.

#### Wildland Fire Management Goals

The goals of the Big Cypress National Preserve fire management program are:

- **Ensure the health and safety of firefighters, employees, and the public** - Initiate and complete fire management activities in a manner that provides for the safety and health of employees and the public.
- **Use fire in a manner that maintains a healthy and sustainable ecosystem** – Achieve a range of variation in fire return interval, fire size, fire behavior, effects, and other characteristics of the fire regime using the best available science. Perpetuate, restore, replace or replicate natural fire processes to the greatest extent possible. Encourage and support research to advance the understanding of local fire behavior, effects, and ecology.
- **Protect special values at risk** – Minimize negative impacts of fire and fire management activities within Big Cypress National Preserve. Employ strategies to suppress or manage all wildfires in a manner that will minimize resource damage to:
  - vegetation and native ecosystems.
  - 120 plant and 33 animal species of which are threatened, endangered or species of special concern
  - ~ 1,500 structures
  - 26 American Indian villages and homesteads
  - archeological and cultural sites

These specific values at risk will be protected to the highest degree possible while minimizing costs and assuring that firefighter and public safety are the first priority.

- **Maintain safe and effective fire readiness** – Ensure a responsive, efficient, safe, and accountable organization by maintaining the necessary staffing, equipment, training, and qualifications in accordance with National Wildfire Coordinating Group (NWCG) standards and National Park Service policy.
- **Continue to strengthen cooperative fire management activities** – Promote a local interagency approach to all aspects of fire management. Continue to implement and expand cooperative fire management, prevention, and education efforts with federal, state, tribal, municipal, and private entities.
- **Enhance visitor experience** – Promote public understanding of fire management programs and objectives. Provide opportunities for visitor education with regard to fire ecology and minimize negative impacts to visitor use.
- **Maintain a framework of adaptive management** – Evaluate the outcomes of fire management activities to implement improvements and changes as necessary.

Resource management and fire management teams of Big Cypress National Preserve met in June 1998 to improve management goals. A major concern of the resource management team was that fire management needed to burn more acreage for maintenance of the natural ecological function. Resource management and fire management teams, with years of local scientific knowledge of the area,

determined the following resource-based management goals for Big Cypress National Preserve.

**Prescribed Fire/Resource Management Goals**

- Obtain a wide range of effects on herbaceous, understory and overstory of Big Cypress plant communities with prescribed fires.
- Use prescribed fire as a tool to prevent uniformity in already diverse plant communities.
- Use prescribed fire as a tool to assist with the management of exotic species.
- Use prescribed fire as a tool to reduce build-up of dead fuel loading and promote new growth, thus the maintenance of the natural ecological function.

The accomplishment of these goals will reduce wildland fires within the Preserve and along our boundaries with our cooperators. Additionally, meeting these goals will mitigate and minimize potential wildland urban interface (WUI) hazards to private landowners, their property, visitors, Preserve staff and infrastructure.

**Wildland Fire Management Guidelines**

The full range of wildland fire management strategies and guidelines may be used throughout the Preserve in any FMU. The selected alternative of the Fire Management Plan Environmental Assessment (EA) recommends the use of all these strategies to achieve land management goals of Big Cypress National Preserve. Use of these strategies conforms to Guidance for Implementation of Federal Wildland Fire Management Policy 2009 and National Park Service Director's Order 18. An integrated approach, using prescribed fire, fire suppression and mechanical fuel reduction, will be our most effective response to accomplish our stated fire management goals.

Prescribed fire will continue to be an effective tool to remove hazardous fuel loads which threaten public safety and property, endangered species and habitats, and other resources, over much of the Preserve. The Preserve will remove hazardous fuel loads and reduce the potential for new unplanned ignitions. Prescribed fire will also be used to maintain fire-adapted ecosystems and mimic natural fire where unplanned ignitions might risk public and firefighter safety, property and resources. The Preserve will assist neighboring agencies in accomplishing fuel reduction where it benefits all of the units in the Big Cypress basin.

- Unplanned Ignitions – Wildland fire resulting from unplanned ignitions will be evaluated to determine the appropriate response based on the criteria designed to meet the Preserve management goals and objectives. Wildland fires will be managed for Preserve and resource benefit under a confine and contain strategy or suppressed to protect values at risk. Management strategies may consist of full suppression, monitoring with limited suppression actions or monitoring with no suppression action taken, as conditions and available resources permit. Suppression actions will continue to be accomplished using the appropriate response to wildland fire for each incident. The Wildland Fire Decision Support System (WFDSS) will be used to aid in the management decisions for fires that exceed initial attack.
- Planned Ignitions – Planned ignitions (prescribed fire) will continue to be used to meet identified resource management or hazard fuel reduction objectives. Use of prescribed fire will be guided by Preserve planning documents and by objectives developed in annual consultation with the Preserve Division of Resource Management and other subject matter experts. These treatments will be managed under an approved Prescribed Burn Plan and will be done in compliance with the Minimum Tool Analysis in wilderness areas.

- Non-Fire Applications – Non-fire treatments may be performed as needed. Their primary purpose is to achieve hazard fuel reduction in those locations where use of prescribed fire is not feasible and to protect sensitive habitat areas. These treatments vary, but could consist of mechanical, physical, chemical and biological control methods. Use of non-fire treatments will be guided by Preserve planning documents and consultation with interdisciplinary Preserve staff. The treatments will be managed under an approved treatment plan.

### 3.1.2. Common Characteristics of Big Cypress National Preserves Fire Management Units (FMU)

The Big Cypress National Preserve consists of six fire management units. The FMUs include Deep Lake, Interior Pineland and Prairies (IPP), North 75, Raccoon Point and South 41. These units were developed to delineate differences in management constraints and objectives, however, many units share common characteristics.

- **Native Vegetation**

Pine Forest: Pine forests inhabit the upland portions of the Preserve and reside on sandy soil with exposed bedrock. The pinelands are considered a sub-climax plant community maintained by fire that will succeed to a mixed hardwood forest in the absence of fire ([Duever, et al, 1986](#)). Slash pine, saw palmetto, cabbage palm and wax myrtle are the dominant fire-adapted species found in the pinelands.

Mixed Grass Prairie: The mixed grass prairies found within the Preserve are seasonally inundated with water between June and October. *Muhlenbergia* grass is the dominant herbaceous species and the primary carrier of fire.

Cypress Forest: Cypress forests within the Preserve can be divided into three categories; cypress domes, cypress strands and cypress prairies. Pond and bald cypress trees typically dominate strands and domes and dwarf cypress trees occupy wet prairies, although all species of cypress can be found in each of the formations. Generally all three communities are barriers to fire spread in normal climatic conditions. In drought years, water can become completely absent from cypress communities, allowing fire to move through the understory, often igniting ground fire. It is recognized that cypress trees and communities are fire dependent. Cypress trees have been found to have one of the most fire-resistant bark as measured by its insulating properties ([Hare, 1961](#)). It is thought that without occasional drought years and fire, cypress domes and strands can become increasingly dominated by hardwood species.

Mixed Hardwood Hammocks: Hardwood hammocks are considered to be a climatic climax community ([Davis, 1943](#); [Craighead, 1971](#)). Hardwood hammocks usually develop on elevated locations in the absence of fire. Although fire may carry through the surface litter layer, generally the root systems of hammock vegetation penetrate the sandy soils and bedrock and are protected from average fire behavior in normal climate conditions. Dominant species found in the hammocks within the Preserve include live oak, water oak, laurel oak and wild tamarind.

Marsh: Marsh vegetation is extremely varied, but a given site is usually dominated by one or two species. Among the most common are pickerel weed, arrowhead, sawgrass, fire flag, cattail, and bulrush. Marshes are maintained as sub-climax associations by fire, and ponds are often created by peat fires. In the absence of fire, shrubs rapidly invade and within 5-10 years, may

form a complete canopy. Marshes are considered a sub-climax plant community maintained by fire that will succeed to a mixed hardwood forest in the absence of fire (Duever, et al, 1986).

Vegetation Group	Acres	Fuel Model	% of Total BICY Acres
Cypress Strand/Dome	218,435	TL4	30%
Cypress Prairie	141,293	GR1	20%
Pineland	95,924	SH6 (SH8 after 5 yrs)	14%
Prairie	66,565	GR3 (GR5 after 3-5 yrs)	9%
Sawgrass	96,914	GR5 (GR8 after 3-5 yrs)	14%
Tall Sawgrass	5,234	GR8	1%
Hammock	25,858	TL6	4%
Swamp Forest	22,690	TL2	3%
Marsh	19,746	GR3	3%
Disturbed	6,458	NB1	1%
Mangrove	2,997	NB8	0.4%
Water	2,598	NB8	0.4%
<b>TOTAL BICY Acres</b>	<b>704,712</b>		<b>100.0%</b>

Table 2: Vegetation and Fuel Model acreages for the Preserve. \*Does not include Jet Port area

- Control Problems**

Control problems may exist around structures and along the boundaries of the Preserve. This most often occurs near structures that are not frequently visited or maintained by the owners. The boundaries around the Preserve are shared with multiple agencies that may not be able to execute prescribed fire, with the frequency desired, to protect their land and the land of the Preserve.

Prescribed fires will be conducted to provide and improve defensible space around structures and boundaries. Frequent prescribed fire reduces the potential for large scale fires to develop and therefore reduces the control problems that could result.

- Fuel Characteristics**

One-hour fuels are a major component of the fire environment in the fuel models of south Florida. Palmetto and wax myrtle are shrub species that also contribute to the fire behavior. The volatile makeup of these species allows them to burn year round, with varying degree of intensity. The above mentioned fuels can burn readily with an RH of 57% and wind speed of 7 miles per hour. The least extreme fire behavior is experienced in the late summer months when there is hydrologic sheet flow throughout the Preserve. During this time there is standing water in most of the vegetation types.

The Preserve contains highly varied fuel conditions ranging from extremely dry to extremely wet depending on the time of year.

Wet season (July – October): Standing water is present in all three types of cypress forest and sheet flow conditions are present in the prairies. Some pinelands may become inundated for short durations. During these time periods fire spread is generally confined to dry pinelands. Under higher wind conditions (> 15 mph) fire may move through the top

portions of prairie grasses or palmetto patches across standing water; however, the extent of wet cypress and hardwood hammock fuel breaks generally prevents large fire growth and unchecked rates of spread.

Dry season (March – May): Water may be absent from all vegetation types, and all fuels are available to burn including organic matter. Fire behavior in cypress formations is characterized by a fuel model 8 (GR2 and TL4), pinelands a fuel model 7 (SH6), and prairies a fuel model 3 (GR5 and GR8). Marshes and the deepest interiors of cypress domes and strands may continue to hold water and act as barriers to fire spread.

Season transition (November – February and June): Historically, water levels begin to rise in the cypress formations and prairies when the summer rains begin in June and subside during the fall and winter months as the rainy season tapers off in October. Fire spreads from pine stand to pine stand and across the driest portions of the mixed-grass prairies. Cypress domes, strands and cypress prairies are effective barriers to fire spread at this time.

- **Fire Season**

Human caused fire season typically coincides with dry season and increased recreational activity. Lightning fire season can range from April through August. In the early years of the Preserve, wildfires were human caused during the winter. Presently, human caused fires are during the driest months of March – June.

- **Fire Regime**

Historical fire regimes are classified based on fire frequency and severity. Due to the short fire rotation of these fuel types, fire regime class I best represents all the units. Fire regime I is defined as habitats that have a fire frequency 0-35 years and have a moderate to low burn severity. Without continued prescribed fire activity, these areas could transition towards a class II fire regime. A class II fire regime burns every 0-35 years with 75% overstory replacement.

- **Historical Weather Patterns**

The weather pattern throughout the Preserve tends to be similar across all Fire Management Units. Big Cypress generally has easterly winds most of the year. Winter months bring more frontal passages and northerly winds. During the spring months the diurnal sea breeze is felt most strongly from the east coast and west coast. The summer months are dominated by high pressure systems and tropical systems. There is a high probability of variable thunderstorm activity during this time of year. The average rainfall is 55 to 58 inches. Temperatures range from the low 40s overnight in the winter, to the high 90s in the summer months. Relative humidity (RH) can also vary widely. Low RH is considered anything under 35%. This is often experienced during the late winter months.

- **Cultural Resources**

The Preserve has identified 394 archeological sites. The RMP identifies so-called "peat fires" as a possible cause of compaction and loss or alteration of carbonized plant remains. The FMP recognizes the primary importance of protecting these sites from wildfire through prevention and hazardous fuel reduction programs and aggressive fire detection and suppression efforts utilizing minimum impact techniques.

- **Infrastructure, Resource Values at Risk, and Other Elements Common in the Preserve's Fire Environment**



The Preserve is bounded by numerous coordinated landowners previously addressed. Residential and commercial structures are located along primary transportation corridors of Interstate 75, Highway 41, and Highway 29. There are also residential structures and camps within the Preserve along secondary access roads, i.e. Turner River Road, Birdon Road, Lower Wagon Wheel and Loop Roads (See *figure 1*).

Residential properties and seasonal camps are scattered throughout the Preserve in all Fire Management Units with the greatest concentration in the Little Deer area of the FMU (IPP) Interior Pinelands and Prairies. The Sanctuary (a developed area of the FMU North I-75) has multiple infrastructures associated with it and other properties that include aboveground power lines, buried utility lines and communication facilities. Specific to Raccoon Point FMU are the oil and gas pads with auxiliary facilities in support of the development; power lines, gas lines, flow lines, trailers, and storage tanks.

- **Public Access and Recreational Use**

There are currently designated trails for hiking and private off-road vehicle (ORV) use. Currently up to 2000 off-road vehicle permits are issued per year.

- **Threatened and Endangered Species (T&E)**

The Endangered Species Act mandates that agencies including the National Park Service promote the conservation of all federally listed threatened or endangered species and their critical habitats within lands and waters administered by the agency. Several federally listed and state listed threatened or endangered species are known to exist in Big Cypress.

- **Plant Species (T&E)**

The Preserve has many fire-dependent plant communities. The Preserve has a unique mixture of temperate and subtropical species with many subtle adaptations to this transitional environment and several endemic to the South Florida area. ([Appendix 9: Threatened and Endangered Plant Species](#) for a complete list).

- **Animal Species (T&E)**

Of the threatened, endangered and rare species found within the Preserve, only four species require specific management actions according to the GMP including the Florida panther, cape sable seaside sparrow, red-cockaded woodpecker and *Liguus* tree snail. The GMP emphasizes the importance of applying prescribed fire techniques for habitat improvement and maintenance. NPS staff will continue to use fire as a management tool for restoring and maintaining native communities (GMP 1992) (See [Appendix 8: Threatened and Endangered Animal Species](#) for a complete list).



- **Exotic Vegetation**

Some 297 exotic plants have become established in south Florida (qtd. Duever, et al 1986a). Many have been reported in Big Cypress National Preserve; however, few pose long-term threat to native communities. The highest priority for exotic plant control programs within the Preserve include: Melaleuca, Brazilian pepper, Australian pine, water hyacinth, hydrilla, old world climbing fern and cogon grass.

Fire can supplement chemical treatment plans, specifically, for Melaleuca, Brazilian pepper, Australian pine, *and* Old World climbing fern. Possible benefits may be explored to determine how beneficial chemical treatments followed with fire treatment of seedlings prior to reaching one meter in height.

- **Exotic Animal Species**

According to the GMP, 60 or more exotic animals are believed to be breeding populations and at least 22 exotic species have been collected in the Preserve. Feral hogs, armadillo, and fire ants have the greatest impact of the exotic animals and will be the primary focus of management programs.

### 3.2 Fire Management Unit - Specific Descriptions

Within this portion of the FMP further detail will be added to the specific FMU's; this section should not detract from what was previously stated in section 3.1, but rather add in clarity and scope.

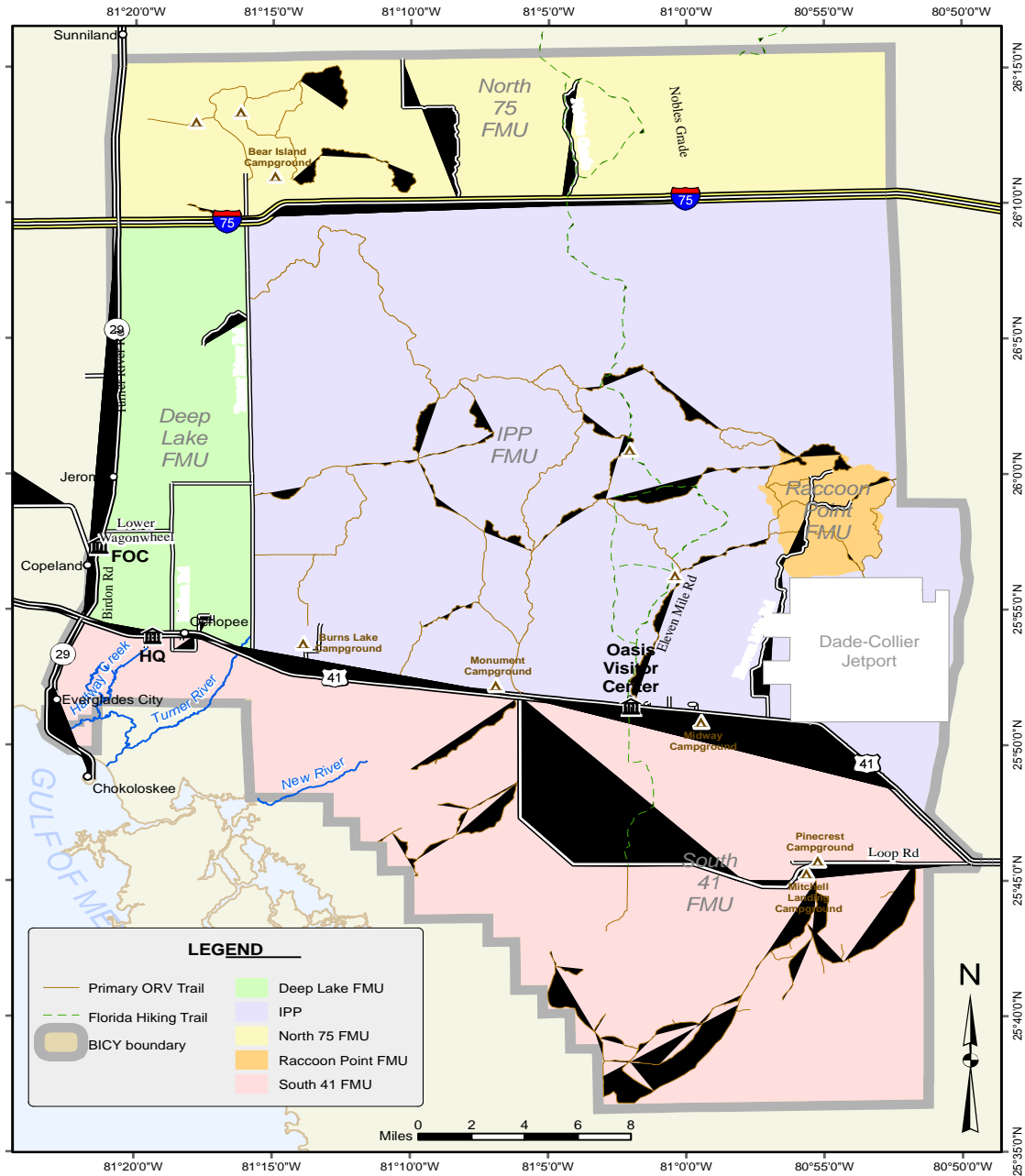


Figure 2: Fire Management Units in Big Cypress National Preserve

### 3.2.1 FMU-I: “North 75” (North of Interstate)

See [Figure 2: Fire Management Units in Big Cypress National Preserve](#) for map of all FMU's

**FMU Characteristics** – This FMU encompasses 113,738 acres and is bounded by Interstate 75 on the south, State Highway 29 on the west, L-28 Interceptor canal and Miccosukee lands on the east. The northern boundary of the unit is the Preserve's boundary between the Seminole Reservation and several agricultural areas.

The unit is divided into two burn plans (Bear Island-Cowbell, and Sanctuary) using a single prescription. These plans were chosen based on access and natural barriers. The two burn plans written for this unit focus on creating fuel breaks between the Preserve's boundary, Seminole lands, and private in-holder property. The plans also allow Preserve Fire Management the ability to maintain suitable habitat for threatened and endangered species.

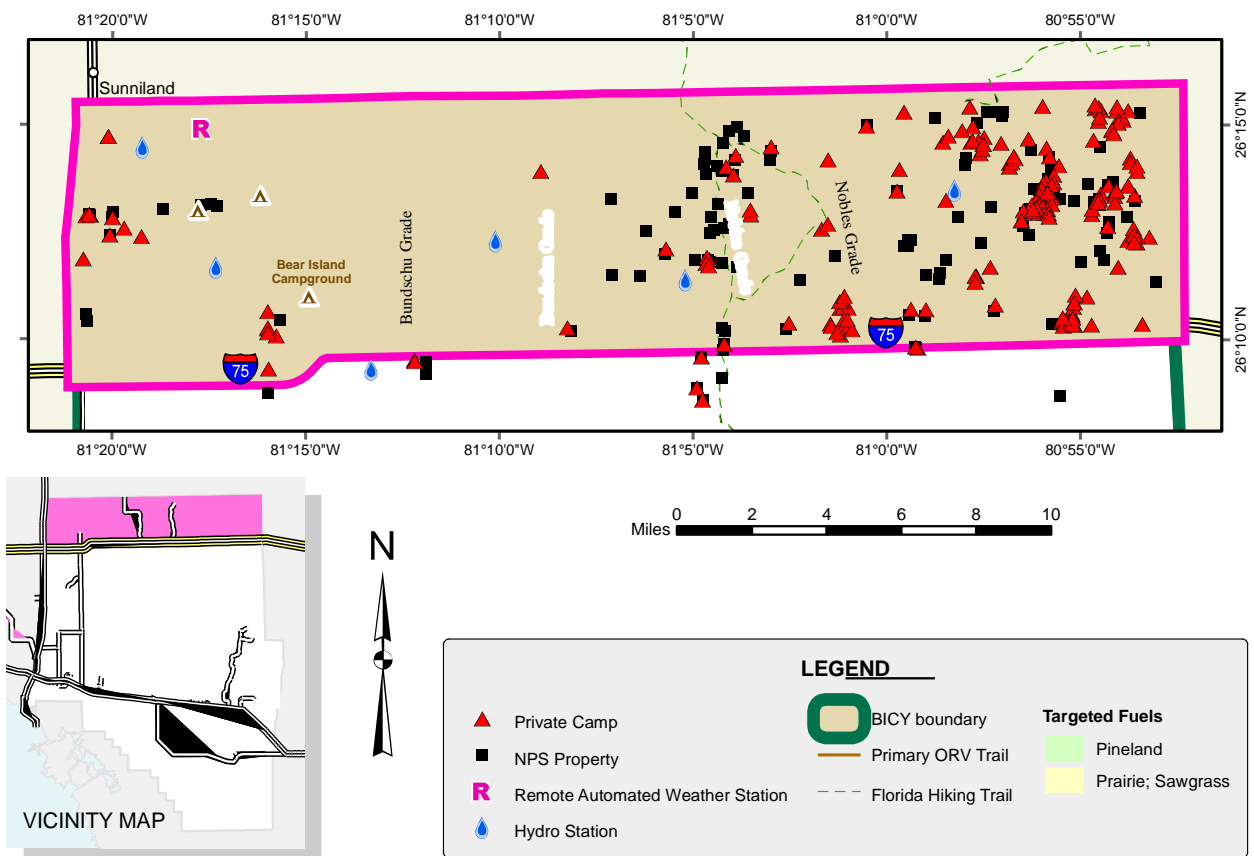


Figure 3: North 75 Fire Management Unit in Big Cypress National Preserve

**Fuel Types** – The vegetation communities represented are: pine, prairie, hardwood hammock, cypress domes, cypress strands, cypress prairies, marshes, and exotics. (See [Appendix A Figure 1: Vegetation Groups](#))

Fuels Within North 75 FMU	Fuel Model	Acres	Burnable	Targeted for treatment
Pineland	SH6 (SH8 after 5 years)	25,554	Y	Y
Prairie	GR3 (GR5 after 5 years)	12,738	Y	Y
Saw grass	GR5 (GR8 after 5 years)	7,108	Y	Y
Tall Saw grass	GR8	2,270	Y	Y
Cypress Prairie	GR2	3,158	Y	N
Hammock	TL6	7,588	Y	N
Swamp Forest	TL2	6,468	Y	N
Cypress Strand/Dome	TL4	38,285	N	N
Disturbed	NB1	2,769	N	N
Marsh	GR3	7,172	N	N
Water	NB8	628	N	N

**Values at Risk** – There are several structures along highway 29. There are many year-round residences and private in-holdings located in the northeast corner known as Sanctuary. The highest WUI concentration in the Preserve is located east of Nobles Grade. There are also three campgrounds located on the west side of the FMU. Aggressive suppression action, consistent with firefighter safety, will be taken for wildfires in proximity to private properties, highways or denning panthers.

(See [Figure 3: North 75 Fire Management Unit in Big Cypress National Preserve](#))

**Cultural and Historic Sites** – The cultural and historic sites are generally found in fire resistant vegetation types. The unit contains oil and gas developments, three semi-primitive campgrounds and numerous private in-holdings. (See [Appendix A Figure 2: Cultural Significance.](#)) The northern boundary has nearly 15 miles of private lands, agricultural fields, and the Seminole Reservation at the interface with Big Cypress. Miccosukee lands comprise the eastern boundary interface.

**Threatened and Endangered Species** – This area is habitat for the endangered Florida panther. Florida Fish and Wildlife Conservation Commission (FWCC) monitor panthers using radio telemetry. No prescribed fire activities will take place in close proximity to denning panthers. Prescribed fire activities enhance habitat for panther prey species. (See [Appendix A Figure 3: Resource Values at Risk](#))

**FMU Guidance for Desired Conditions** – Pinelands and prairies in this unit will be scheduled for prescribed burning on a 3-5 year rotation in order to manage the fuels and protect the private properties and oil developments in this area. Areas adjacent to highways 75 and 29 will also be scheduled for burning on a 3-year rotation where the fuels will support that frequency. This burning frequency conducted under varied conditions (weather, water levels, time of year) is intended to result in a diverse effect of fire in the area.

**FMU Safety Considerations and Detailed Operational Information** – Safety and operations related to the Fire and Aviation Program are discussed in further detail earlier (section 3.1) in this chapter and more thoroughly presented in Chapter 4.

(See Appendix A Figure 4: Aviation Map, Appendix A Figure 5: Repeater Locations and Appendix A Figure 4:6: Other Values at Risk)

### 3.2.2 FMU-II: “South 41” (South of Highway 41)

See Figure 2: Fire Management Units in Big Cypress National Preserve for map of all FMU's

**FMU Characteristics** – This FMU encompasses 209,376 acres and it is bounded by Highway 41 on the north, State Highway 29 on the west, Everglades National Park and Miccosukee reservation on the east. The southern boundary of the unit is also the Preserve's southern boundary that is shared with Everglades National Park.

This unit is covered by a single burn plan based on access and natural barriers, focused on creating fuel breaks between the Preserve's boundary, adjacent land agencies, and numerous in-holder properties.

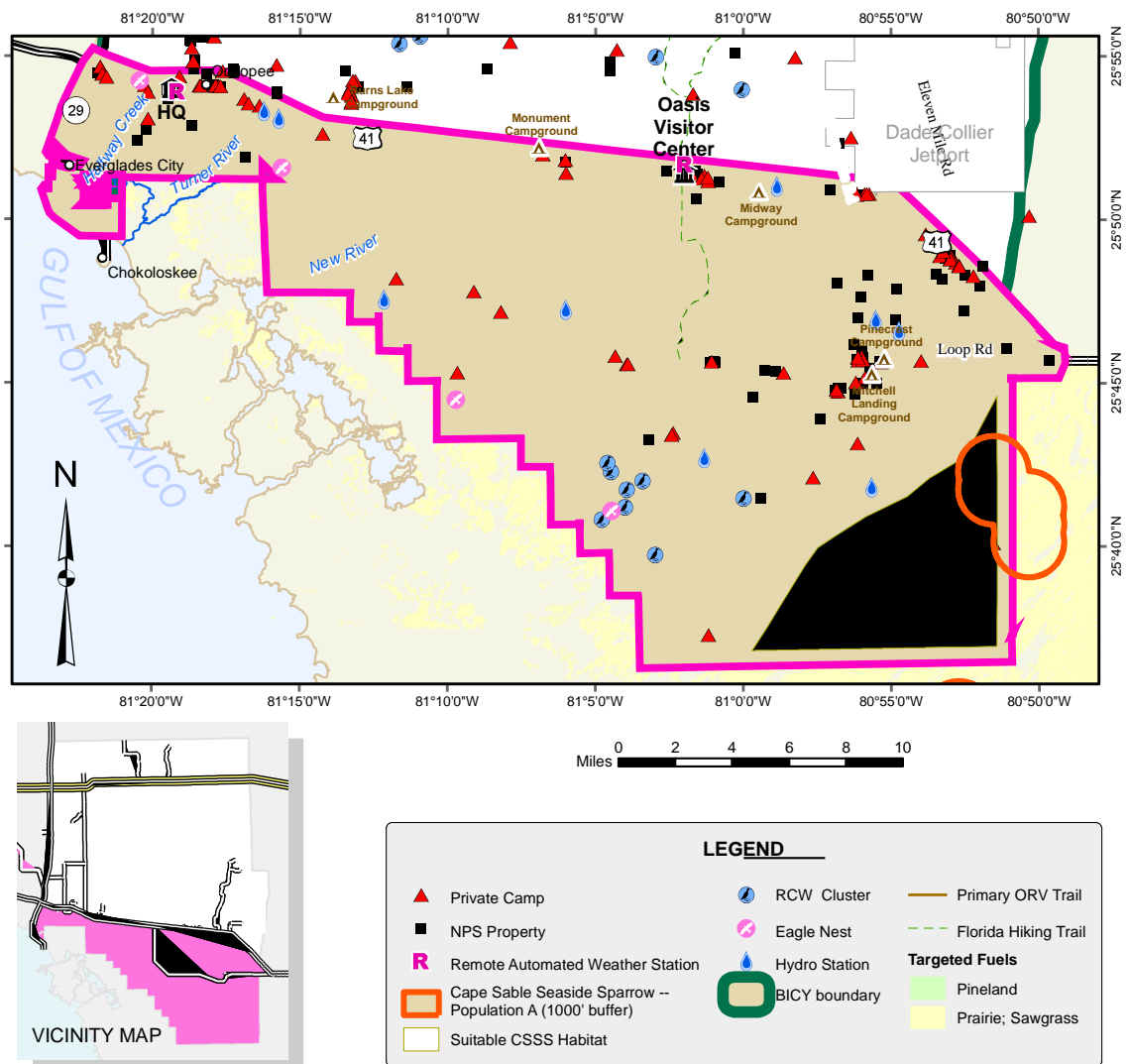


Figure 4: South 41 Fire Management Unit in Big Cypress National Preserve

**Fuel Types** – South 41 FMU consists of a complex of mangrove forests and coastal marshes along the southwest boundary of the Preserve. The forests are composed of red, black, and

white mangroves as well as buttonwood. Most of the unit is seasonally flooded. The management unit also includes several large prairies dissected by several large strands. The northern edge of the unit contains a mix of cypress strands and domes, hammocks, small pine islands and prairies. The southeastern portion of the unit contains Lostmans and Gum Sloughs and an area of sparse fuels south of Fritz Hammock that connects the two sloughs. The vegetation communities represented are: pine, prairie, hardwood hammock, cypress domes, cypress strands, cypress prairies, marshes, and exotics. (See [Appendix A Figure 1: Vegetation Groups](#))

Fuels Within South 41 FMU	Fuel Model	Acres	Burnable	Targeted for treatment
Pineland	SH6 (SH8 after 5 years)	8,984	Y	Y
Prairie	GR3 (GR5 after 5 years)	22,557	Y	Y
Saw grass	GR5 (GR8 after 5 years)	47,318	Y	Y
Tall Saw grass	GR8	1,837	Y	Y
Cypress Prairie	GR2	44,412	Y	N
Hammock	TL6	7,934	Y	N
Swamp Forest	TL2	5,210	Y	N
Cypress Strand/Dome	TL4	56,351	N	N
Disturbed	NB1	1,028	N	N
Mangrove	NB8	2,996	N	N
Marsh	GR3	9,405	N	N
Water	NB8	1,344	N	N

**Values at Risk** – There are three campgrounds (Pinecrest, Midway and Mitchell Landing) along Loop Road. Several private in-holdings, recreational sites, Native American villages and homesteads are located in this FMU. Additionally, Trail Lake Campground, Ochopee Post Office, Kirby Storter, and Monroe Station which is listed on the National Historic Register are located in this FMU. Aggressive suppression action, consistent with firefighter safety, will be taken for wildfires in proximity to private properties, highways or denning panthers. (See [Appendix A Figure 4:6: Other Values at Risk](#))

**Cultural and Historic Sites** – The cultural and historic sites are generally found in fire resistant vegetation types. Within the unit are two Native American ceremonial sites and several villages, as well as the Loop Unit no-vehicle area, Ochopee United States Post Office and Monroe Station. (See [Appendix A Figure 2: Cultural Significance](#))

**Threatened and Endangered Species** – This area is habitat for the endangered Florida panther. Resource management staff monitors panthers using radio telemetry. No prescribed fire activities will take place in close proximity to denning panthers. Prescribed fire activities enhance habitat for panther prey species. Cape Sable seaside sparrow, Liguus tree snail and RCW's are also considered and mitigated in this FMU for all fire management activities. (See [Appendix A Figure 3: Resource Values at Risk](#))

**FMU Management Guidance for Desired Conditions** – Pinelands and prairies in this unit will be scheduled for prescribed fire on a 3-5 year rotation in order to manage the fuels and protect the private properties. Areas adjacent to highway 41 will be scheduled for burning on a 3-year rotation where the fuels will support that frequency. This burning frequency conducted under varied conditions (weather, water levels, time of year) is intended to result in a diverse effect of fire in the area.

**FMU Safety Considerations and Detailed Operational Information** – Safety and operations related to the Fire and Aviation Program are discussed in further detail earlier in this chapter and more thoroughly presented in Chapter 4.

(See Appendix A Figure 4: Aviation Map, Appendix A Figure 5: Repeater Locations and Appendix A Figure 4:6: Other Values at Risk)

### 3.2.3 FMU-III: “IPP” (Interior Pinelands and Prairies)

See Figure 2: Fire Management Units in Big Cypress National Preserve for map of all FMU's

**FMU Characteristics** – This FMU encompasses 309,571 acres and is bounded by Highway 41 on the south, Turner River Road (CR 839) on the west, Interstate 75 on the north, and the Preserve boundary on the east.

The burn plan written for this unit focuses on creating fuel breaks between the Preserve's boundary, adjacent land agencies, and numerous in-holder properties. The plan also provides for maintaining suitable habitat for threatened and endangered species.

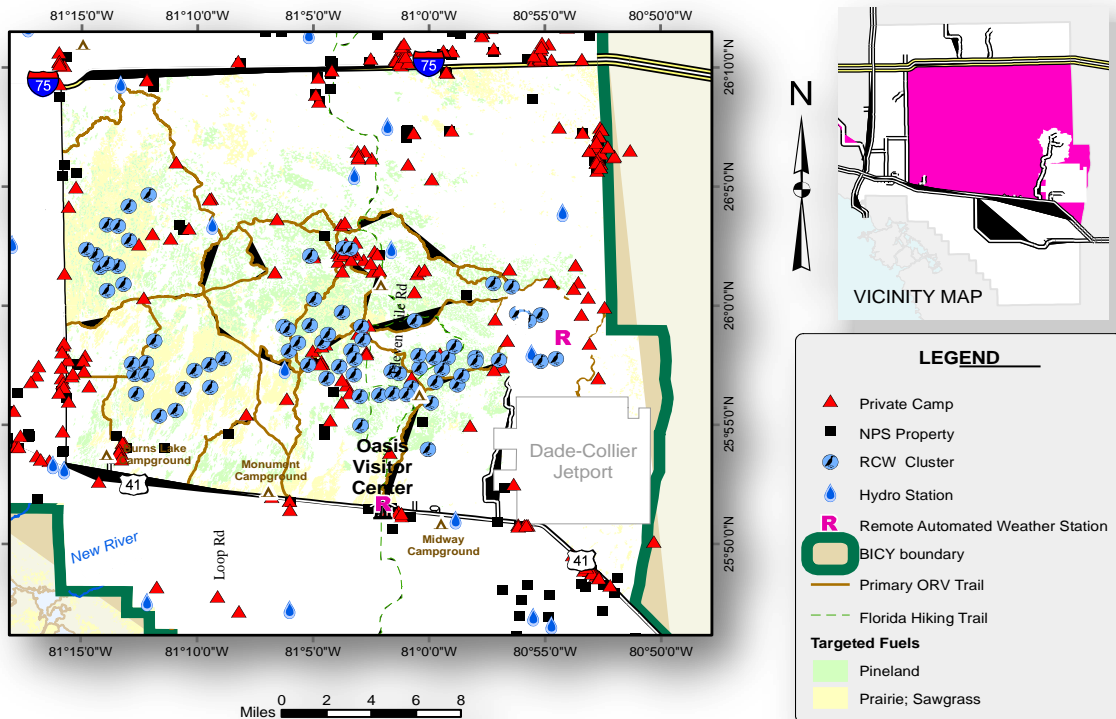


Figure 5: IPP Fire Management Unit in Big Cypress National Preserve



**Fuel Types** – Fire Management Unit III consists of large prairies with a mosaic of pine. Cypress strands also bisect the unit. The northern edge of the unit contains a mix of cypress strands, prairies and domes, hardwood hammocks, small pine islands and prairies. The western portion of the unit contains Windmill prairie and Airplane Prairie and borders the Deep Lake FMU. The unit is seasonally flooded.

Fuels Within IPP FMU	Fuel Model	Acres	Burnable	Targeted for treatment
Pineland	SH6 (SH8 after 5 years)	50,861	Y	Y
Prairie	GR3 (GR5 after 5 years)	28,667	Y	Y
Saw grass	GR5 (GR8 after 5 years)	14,159	Y	Y
Tall Saw grass	GR8	964	Y	Y
Cypress Prairie	GR2	83,615	Y	N
Hammock	TL6	8,680	Y	N
Swamp Forest	TL2	6,078	Y	N
Cypress Strand/Dome	TL4	111,744	N	N
Disturbed	NB1	2,029	N	N
Marsh	GR3	2,227	N	N
Water	NB8	547	N	N

**Values at Risk** – There are several commercial structures along highway 41. This unit also has many year-round residential locations and private in-holdings scattered throughout. Monument, Midway and Burns Lake Campgrounds are located along Highway 41. This area has the second highest number of private in-holding structures in the Preserve, second only to FMU North 75 in the Sanctuary area. There are ceremonial sites and several American Indian villages within this FMU. Aggressive suppression action, consistent with firefighter safety, will be taken for wildfires in proximity to private properties, highways or denning panthers.

**Cultural and Historic Sites** – The cultural and historic sites are generally found in fire resistant vegetation types. (see [Appendix A Figure 2: Cultural Significance](#))

**Threatened and Endangered Species** – This area is habitat for the endangered Florida panther. Resource management staff monitors panthers using radio telemetry. No prescribed fire activities will take place in close proximity to denning panthers. Prescribed fire activities enhance habitat for panther prey species. Federally endangered RCW's and state threatened fox squirrels are also in highest concentrations in this FMU. Special mitigation measures are required to protect their habitats. (see [Appendix A Figure 3: Resource Values at Risk](#))

**FMU Management Guidance for Desired Conditions** – Pinelands and prairies in this unit will be scheduled for prescribed burning on a 3-5 year rotation in order to manage the fuels and protect the private properties. Areas adjacent to highway 41 and Interstate 75 will be scheduled to be burned on a 3-year rotation where the fuels will support that frequency. This burning frequency conducted under varied conditions (weather, water levels, time of year) is intended to result in a diverse effect of fire in the area.

**FMU Safety Considerations and Detailed Operational Information** – Safety and operations related to the Fire and Aviation Program are discussed in further detail earlier in this chapter and more thoroughly presented in Chapter 4.

(See [Appendix A Figure 4: Aviation Map](#), [Appendix A Figure 5: Repeater Locations](#) and [Appendix A Figure 4:6: Other Values at Risk](#))

### 3.2.4 FMU-IV: “Raccoon Point”

See [Figure 2: Fire Management Units in Big Cypress National Preserve](#) for map of all FMU's

**FMU Characteristics** – This FMU encompasses 12,651 acres and is located 11 miles north of Highway 41 and the Dade-Collier Jetport. It is located in an area of “virgin” pine that was not logged during the 20<sup>th</sup> century. The pine and cypress contained in this unit surround five oil fields owned currently by Calumet Lubricants. Currently, more oil explorations are occurring by Calumet in this area.

This unit focuses on a long term fire-ecology research project. The project is designed to determine the effects of fire with seasonal variation. (see [Appendix A Figure 1: Vegetation Groups](#))

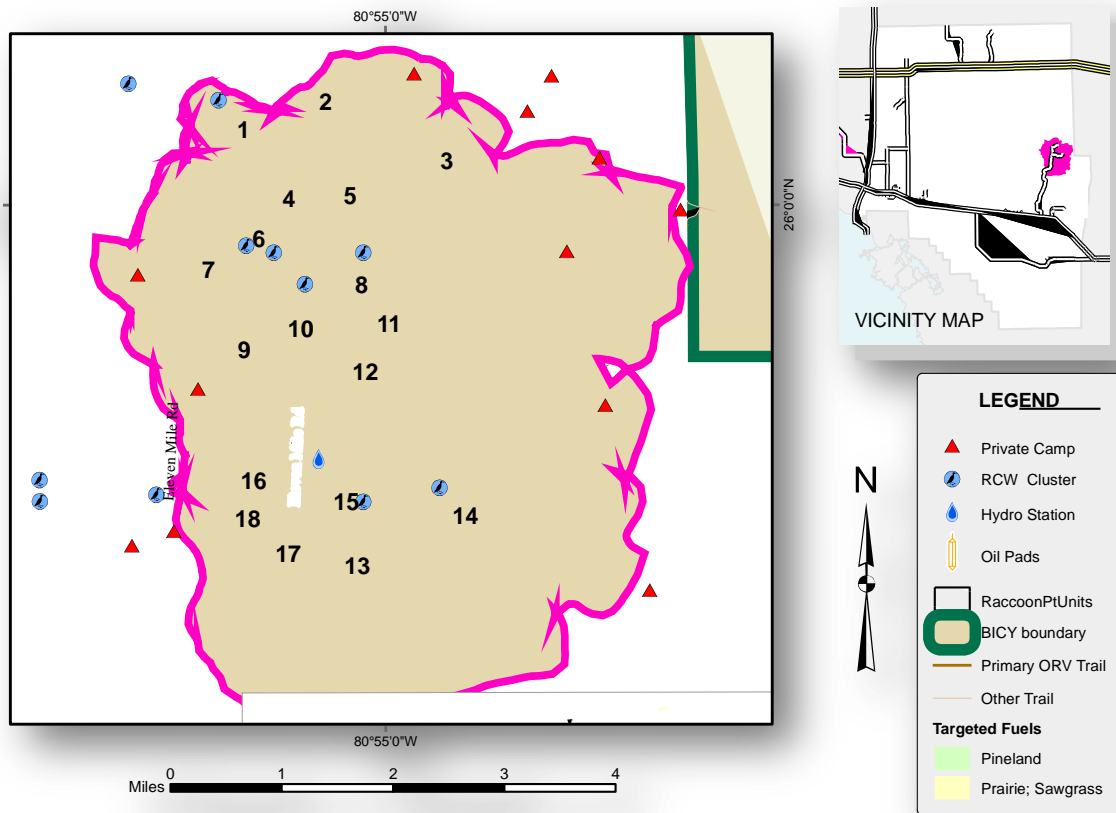


Figure 6: Raccoon Point Fire Management Unit in Big Cypress National Preserve

**Fuel Types** – Raccoon Point FMU consists of pine and cypress. The southern portion of the unit contains the area adjacent to Rock Road Trail. This area is composed of small pine pockets bisected by cypress domes and slough. Between the southern and northern portions is a vast area of cypress prairie. The northern portion of this unit is composed of cypress with scattered pinelands with mostly open understories. The unit is seasonally flooded.

Fuels Within Raccoon Point FMU	Fuel Model	Acres	Burnable	Targeted for treatment
Pineland	SH6 (SH8 after 5 years)	4,714	Y	Y
Prairie	GR3 (GR5 after 5 years)	144	Y	Y
Cypress Prairie	GR2	2,799	Y	N
Hammock	TL6	611	Y	N
Swamp Forest	TL2	4	Y	N
Cypress Strand/Dome	TL4	4,259	N	N
Disturbed	NB1	73	N	N
Marsh	GR3	47	N	N

**Values at Risk** – The primary values at risk are the oil and gas developments associated with this FMU. Several camps are also located adjacent to the FMU boundary. Aggressive suppression action, consistent with firefighter safety, will be taken for wildfires in proximity to private properties, oil pads, and denning panthers.

**Cultural and Historic Sites** – The cultural and historic sites are generally found in fire resistant vegetation types. (see [Appendix A Figure 2: Cultural Significance](#))

**Threatened and Endangered Species** – This area includes habitat for the endangered Florida panther and RCW's. Resource management staff monitors panther denning and RCW nesting. *No prescribed fire activities will take place in close proximity to denning panthers.* (see [Appendix A Figure 1: Vegetation Groups](#))

**FMU Management Guidance for Desired Conditions** – Pinelands and prairies in this unit will be prescribed burned on a 3-5 year rotation and study unit plots will be burned according to USGS burn schedule. Variations may occur in the USGS research plot areas (see [Figure 6: Raccoon Point Fire Management Unit in Big Cypress National Preserve](#)). This burning frequency conducted under varied conditions (weather, water levels, time of year) is intended to result in a diverse effect of fire in the area.

**FMU Safety Considerations and Detailed Operational Information** – Safety and operations related to the Fire and Aviation Program are discussed in further detail earlier in this chapter and more thoroughly presented in Chapter 4. (See [Appendix A Figure 4: Aviation Map](#), [Appendix A Figure 5: Repeater Locations](#) and [Appendix A Figure 4:6: Other Values at Risk](#))

### 3.2.5 FMU-V: “Deep Lake”

See [Figure 2: Fire Management Units in Big Cypress National Preserve](#) for map of all FMU's

**FMU Characteristics** – The Deep Lake FMU encompasses 59,373 acres and is located on the western side of the Preserve. The eastern boundary is Turner River Road. The southern boundary is US Highway 41. The western boundary is State Road 29. The northern boundary is Interstate 75.

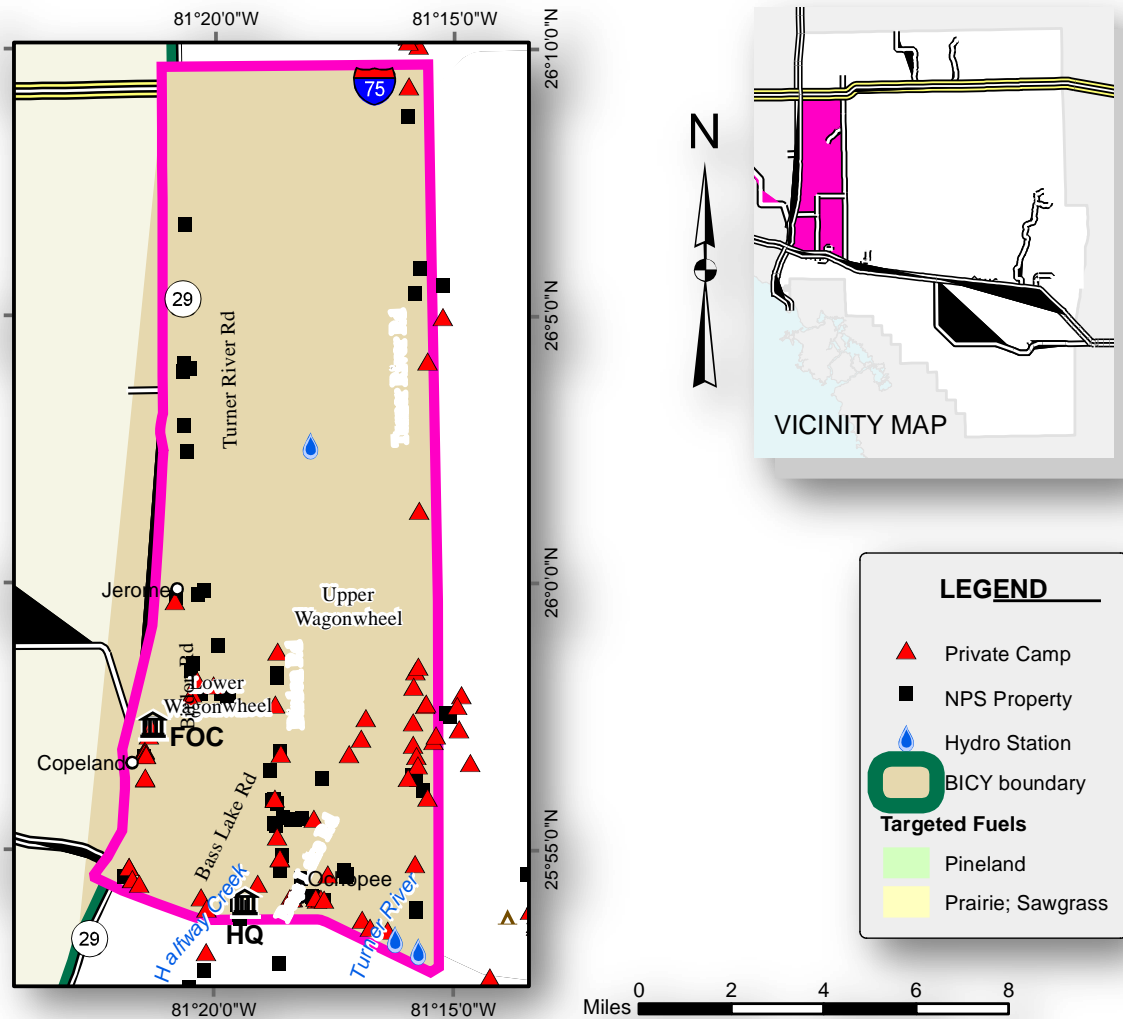


Figure 7: Deep Lake Fire Management Unit in Big Cypress National Preserve

**Fuel Types** – Fire Management Unit V consists of large prairies with a mosaic of pine. Cypress strands also bisect the unit. This unit contains a mix of cypress strands and domes, hardwood hammocks, pine islands and prairies. The unit is seasonally flooded.

Fuels Within Deep Lake FMU	Fuel Model	Acres	Burnable	Targeted for treatment
Pineland	SH6 (SH8 after 5 years)	5,810	Y	Y
Prairie	GR3 (GR5 after 5 years)	2,459	Y	Y
Saw grass	GR5 (GR8 after 5 years)	28,329	Y	Y
Tall Saw grass	GR8	163	Y	Y
Cypress Prairie	GR2	7,308	Y	N
Hammock	TL6	1,045	Y	N
Swamp Forest	TL2	4,930	Y	N
Cypress Strand/Dome	TL4	7,797	N	N
Disturbed	NB1	559	N	N
Mangrove	NB8	1	N	N
Marsh	GR3	894	N	N
Water	NB8	78	N	N

**Values at Risk** – Within Deep Lake FMU there are private in-holdings along SR 29, Highway 41, Turner River Road, Birdon Road, and Lower Wagon Wheel Road. Commercial business includes Wooten’s Airboats and there is a hydro station and the Deep Lake Fire station.

**Cultural and Historic Sites** – The cultural and historic sites are generally found in fire resistant vegetation types. (see [Appendix A Figure 2: Cultural Significance](#))

**Threatened and Endangered Species** – This area is habitat for the endangered Florida panther. *No prescribed fire activities will take place in close proximity to denning panthers.* (See [Appendix A Figure 3: Resource Values at Risk](#))

**FMU Management Guidance for Desired Conditions** – Pinelands and prairies in this unit will be scheduled for prescribed burning on a 3-5 year rotation in order to manage the fuels and protect the private properties and the boundary that is shared with Fakahatchee Strand State Preserve. This burning frequency conducted under varied conditions (weather, water levels, time of year) is intended to result in a diverse effect of fire in the area. Aggressive suppression action, consistent with firefighter safety, will be taken for wildfires in proximity to private properties, highways or denning panthers.

**FMU Safety Considerations and Detailed Operational Information** – Safety and operations related to the Fire and Aviation Program are discussed in further detail earlier in this chapter and more thoroughly presented in Chapter 4. (See [Appendix A Figure 4: Aviation Map](#), [Appendix A Figure 5: Repeater Locations](#) and [Appendix A Figure 4:6: Other Values at Risk](#))

## CHAPTER 4 – Wildland Fire Operational Guidance

Operational guidance directs all fire management activities conducted to enhance and provide resource benefit and mitigate risk from unwanted wildland fire while providing for firefighter and public safety. All actions will conform to safety policies defined in *Interagency Standards for Fire and Fire Aviation Operations* guide, *NPS Director's Order 18*, and Standards for Operations and Safety chapter in the *NPS Reference Manual 18*:

Firefighter and public safety is our first priority. This Fire Management Plan and activities defined within reflect this commitment. The commitment to and accountability for safety is a joint responsibility of all firefighters, managers, and administrators. Individuals must be responsible for their own performance and accountability. Every supervisor, employee, and volunteer is responsible for following safe work practices and procedures, as well as identifying and reporting unsafe conditions. All firefighters, fire line supervisors, fire managers, and agency administrators have the responsibility to ensure compliance with established safe firefighting practices.

### 4.1 Safety

#### 4.1.1 Safety Concerns and Mitigation Methods

Safety is the primary concern of the fire management program. All operational documents will address both public and employee safety. The potential direct and indirect effects of projects on employees and the public will be considered. Public Safety issues and concerns are described in detail in the FMP Environmental Assessment (EA). As new or modified approaches are developed, they will be incorporated. Key issues may affect transportation corridors, structures, visitor use areas, Preserve operations and neighboring communities.

Transportation Corridors — Fires have the potential to affect several transportation corridors. This includes I-75, U.S. 41, SR-29, and secondary surface roads in and adjacent to the Preserve.

Urban Interface and Preserve Infrastructure – There are over 1,500 private and NPS-owned structures in the Preserve. Structures include private residences, recreational camps, and Preserve facilities that may require protection through hazardous fuel reduction or wildland fire suppression.

Visitor Use — The primary high visitor use areas that are potentially impacted by fire include Big Cypress Visitor Center, H.P. Williams Roadside Park, Kirby Storter Roadside Park, Burn's Lake Campground, Bear Island Campground, Monument Campground, Midway Campground, Pinecrest Campground, Mitchell Landing Campground. Big Cypress National Preserve also has an extensive backcountry area accessible by airboat and fires pose potential risk to these Preserve visitors.

Preserve Operations — Preserve operations can be impacted by both wildfire and prescribed fire incidents. Impacts can include both smoke and direct fire exposure.

Preserve Neighbors — Residents of Everglades City, Copeland, Jerome, Pinecrest, and Ochopee communities are the most susceptible to smoke impacts resulting from fires near the Preserve boundary.

Fire management may use any of the following mitigation methods to reduce risk and alleviate potential concerns:

Safety Issues	Mitigation
<b>Transportation Corridors</b>	<ul style="list-style-type: none"> <li>• Post Warning Signs/Notify visitors at Preserve entrances</li> <li>• Implement appropriate level of traffic control or request assistance</li> <li>• Monitor smoke dispersal</li> <li>• Mop-up smoldering fuels</li> </ul>
<b>Urban Interface and Preserve Infrastructure</b>	<ul style="list-style-type: none"> <li>• Utilize prescribed burns to reduce hazard fuel accumulation</li> <li>• Notify and update residents and employees of proposed and/or ongoing operations</li> <li>• Relocate at-risk residents or Preserve staff</li> <li>• Respond to fires in the Mutual Response Zone</li> <li>• Implement Pre-attack plans</li> </ul>
<b>Visitor Use</b>	<ul style="list-style-type: none"> <li>• Post current fire information on websites as available</li> <li>• Time prescribed burns to minimize impacts to visitors</li> <li>• Provide and post fire information at backcountry permit stations, at visitor access points, and visitor centers</li> <li>• Limit public access during fire operations</li> <li>• Visually survey fire areas to ensure that no visitors are present</li> <li>• Suppress fires that threaten visitor use areas</li> </ul>
<b>Preserve Operations</b>	<ul style="list-style-type: none"> <li>• Post current fire information on websites as available</li> <li>• Send email notifications to Preserve staff regarding current fire information</li> <li>• Limit access to administrative use during fire operations</li> <li>• Time prescribed burns to minimize impacts to Preserve operations</li> <li>• Temporarily relocate at-risk Preserve staff</li> </ul>
<b>Preserve Neighbors</b>	<ul style="list-style-type: none"> <li>• Post current fire information on websites as available</li> <li>• Inform Preserve neighbors of wildland fires</li> <li>• Use information officer and/or Preserve public affairs to disseminate information</li> </ul>

Table 3: Mitigation Methods for Safety Issues



#### **4.1.2 Safety Program Elements**

Operational Leadership is a National Park Service Program that was developed to reduce human error. Human Error continues to be the cause of the majority of NPS accidents, mostly due to inattention, ineffective supervision, or poor judgment. Operational Leadership focuses on reducing these occurrences while improving individual and team effectiveness.

Operational Leadership introduces employees to seven critical skills necessary to reduce the probability of human error. Over a two day, interactive course, Operational Leadership changes the way we look at ourselves, our job, our team, and our organization. It does this by providing a common language and format for articulating decision and planning-making processes. Exposure to the concepts or seven critical skills will be discussed with any new firefighters in advance of attending the formal training. The seven critical skills are as follows:

##### **Leadership**

Not in the traditional sense, leadership here refers to individual and team leadership qualities. In the workplace each of us must be a leader in order to create a safer environment.

##### **Human Error & Accident Causation**

In order to reduce the probability of human error, we must first understand how and why human error occurs, and how human error leads to accidents.

##### **Mission Analysis**

Everything we do in life is a “mission;” as leaders we must be able to analyze each mission, assess its risks, mitigate those risks, and plan and act accordingly.

##### **Stress & Performance**

Once we begin the mission analysis process, we must be able to continually monitor our situation and be flexible to changing conditions. In order to do this, we must understand how stress, fatigue, and morale affect our performance.

##### **Situational Awareness**

Meeting mission demands and monitoring our mission success requires constant awareness of our surroundings, and the ability to recognize potential hazards.

##### **Decision Making**

The backbone of Operational Leadership is good decision making, and the fortitude to make those decisions and stand behind those who make them.

##### **Effective Communication & Assertiveness.**

Each of the first six skills requires team members to communicate effectively, and to be assertive about their involvement in the risk management process. Each employee is responsible for speaking up about potential hazards to the team.

In addition, JHA's, or Job Hazard Analysis forms are available for most all fire related activities. These are essential in the Situational Awareness process to inform each firefighter of any possible safety concern(s) related to an activity in advance. Safety briefings or “tailgate sessions” are conducted whenever a project lead or supervisor determines it is necessary or if our policy and regulations specify. After Action Reviews

(AAR) are also conducted on all projects and documented as appropriate so individual and team performance is enhanced through Adaptive Management. Daily crew briefings will include a Six Minute For Safety topic and the Division will hold all firefighter safety meetings once per month.

## 4.2 Management of Unplanned Ignitions

Wildland fire resulting from unplanned ignitions will be evaluated to determine a response based on the criteria designed to meet the Preserve management goals and objectives. Wildland fires will be managed for Preserve and resource benefit or suppressed to protect values at risk.

All unplanned wildland fires will be initially sized-up by the initial attack Incident Commander (IC). This size-up information (Appendix N) will be immediately communicated to Big Cypress Fire Dispatch and the Duty Officer (DO). All wildfire incidents will require managers to utilize the Wildland Fire Decision Support System (WFDSS). WFDSS will be used for all Type 3, 2, and 1 complexity incidents to assist in determining and documenting decisions regarding the management of individual ignitions.

Due to the remote nature and limited access of Big Cypress National Preserve, aviation resources are frequently used in fire management operations. Such operations are conducted in accordance with the Preserve's Aviation Management/Operations Plans.

Upon discovery of a fire, the Duty Officer should send notification to interested parties at the earliest possible time. At a minimum, this should include the Preserve Senior Staff, BICY's Interpretive Division, EVER's Fire staff and dispatch, SER FMO and AFMO for Operations, Fire Staff from Fakahatchee State Preserve, Panther Wildlife Refuge, the Miccosukee and Seminole tribes, and any affected landowners. Additional notifications should be made as determined by the DO, in consultation with the Preserve Staff, particularly in regards to wildlife and the public. Updates may be done via email, if appropriate. For a list of current contacts, see Appendix P.

Until a Public Information Officer is assigned or PIO organization created, the DO is the primary source of information for all fire-related activities. The DO should bear in mind that information dissemination is critically important, and if other duties interfere with the ability to get timely, accurate information to all concerned parties, serious consideration should be given to formally assigning those duties to someone else.

### 4.2.1 Preparedness

- Annual Training – Annual Fireline Safety Refresher Training and Work Capacity Tests are required for all personnel participating in fire suppression or prescribed fire activities that are subject to assignments on the fire line. This training is scheduled between December and January annually. This training will include National Park Service requirements and meet NWCG standards. The Fire Management Officer will assure that an annual training program is established that meets Interagency Fire Program Management (IFPM) qualification standards for fire program personnel.

The AFMO is designated as the Training Officer and is responsible for facilitating the aforementioned training needs and overseeing the management of the Incident Qualification and Certification System (IQCS). Annually, training is achieved through a combination of courses held locally, regionally, and nationally. Training will be obtained in the most cost-effective manner.

- **Readiness** – Wildland fire and aviation preparedness reviews shall be conducted annually in January, but no later than mid-February, following the Annual Fireline Safety Refresher Training. This review will identify operational, procedural, personnel or equipment deficiencies and recommend corrective actions. Standards for preparedness reviews are based on the Interagency Standards for Fire and Fire Aviation Operations and conducted according to the Fire Preparedness Review Guide. The Fire Management Officer or his designee will ensure completion of this task.
- **Fire Weather and Fire Danger** - Fire Weather and Fire Danger Indices are tracked via the Weather Information Management System (WIMS). WIMS can be accessed via the internet at: <http://fam.nwcg.gov/fam-web/>. It is the Preserve's responsibility to access WIMS. Daily access at a minimum must include entering fire weather observations. The indices may be used to determine daily observed and predicted staffing classes for use in the Preserve's Step-up Staffing during levels 4 and 5.

Current and recent weather activities are monitored via National Weather Service radar website and other public websites. Lightning strike data is available through the Bureau of Land Management and can be accessed via the internet at:

<https://www.nifc.blm.gov/cgi/nsdu/Lightning.cgi>

### Remote Automated Weather Stations (RAWS)

Big Cypress National Preserve maintains 4 remote automated weather stations. Sensor observations are uploaded hourly via satellite and relayed to the public via NOAA's Roman website, and to approve station monitors via the Famweb WIMS integrated system.

Station ID Number	RAWS ID Name	Name	Elevation	FMU	Vegetation Type
86402	RKIF1	Miles City	15	North 75	Prairie
86404	RACF1	Raccoon	7	Raccoon	Cypress
86401	OASF1	Oasis	8	IPP	Prairie
86403	OCOF1	Ochopee	7	South 41	Prairie

Table 4: General Remote Automated Weather Station Information

# RAWS Stations

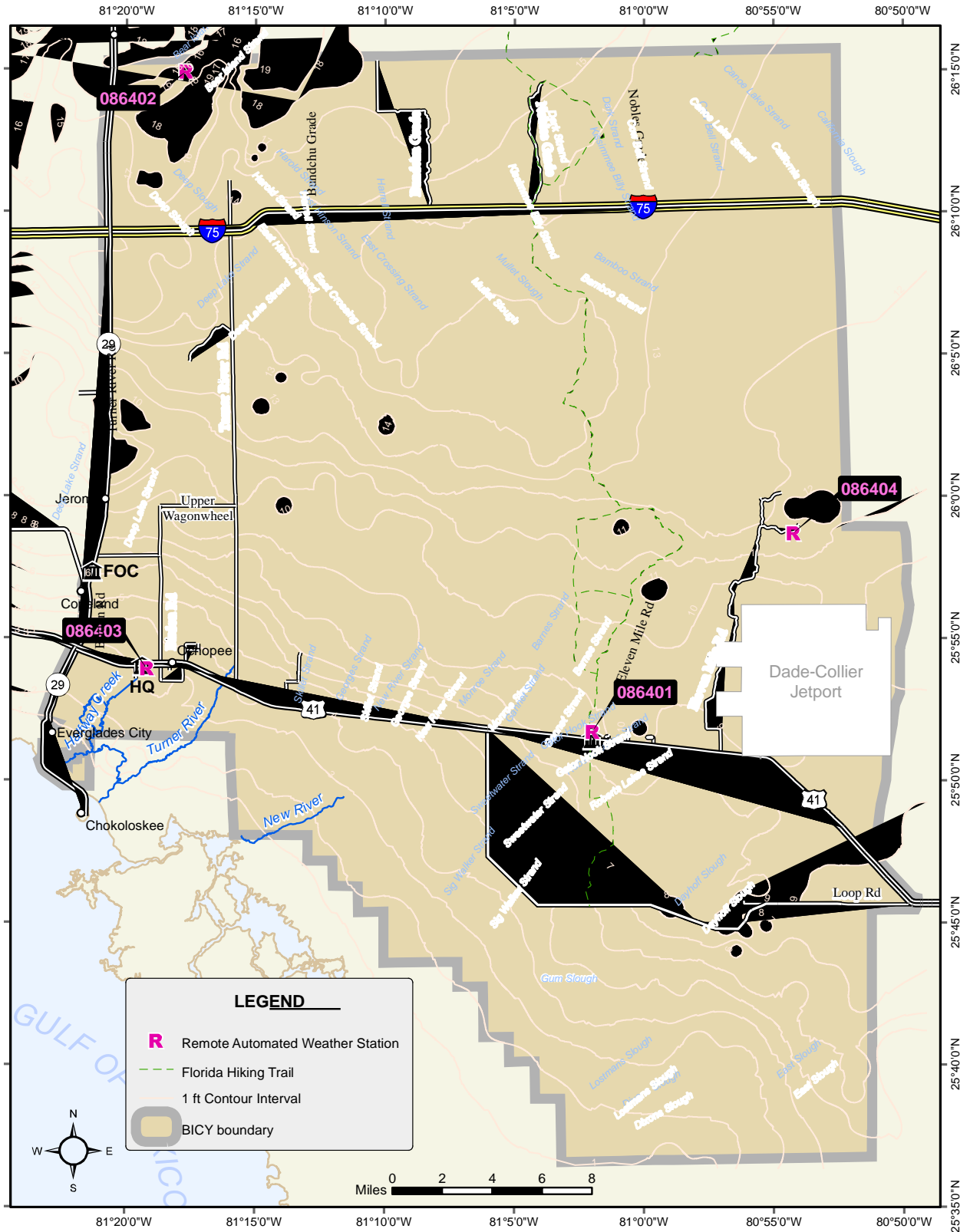


Figure 8: Remote Automated Weather Station Locations in Big Cypress National Preserve

## National Fire Danger Rating System (NFDRS)

Big Cypress National Preserve monitors both short-term fire danger and long-term drought conditions. Short-term fire danger is tracked using 1988 NFDRS Energy Release Component (ERC), Burning Index (BI) 1 hour and 10 hour fuel moistures. Hydrology levels, 1000 hr fuel moisture and KBDI are indicators of potential long term drought conditions.

Fire managers have found that multiple combinations of NFDRS components and indices can help fire managers prepare for an approaching fire season. For seasonal trending Hydrology levels, 100 hr and 1000 hr fuel moisture levels are recommended. (Table 5)

INDEX (Hydrology)	80TH PERCENTILE	90TH PERCENTILE
or		
INDEX (1000 hr fuel moisture)	90TH PERCENTILE	97TH PERCENTILE

Table 5: Short-term fire danger thresholds for Big Cypress National Preserve

Fire Danger “pocket cards” have been developed which display critical thresholds of fire danger. This is valuable to both local and out of area fire suppression resources to make them aware of local trends.

## Step-up Staffing Plan

Emergency preparedness involves actions taken to provide extra protection during very high or extreme fire danger when staffing classes 4 or 5 are in effect.

Appropriate activities for use of emergency preparedness funds include hiring of emergency temporary firefighters, placing existing staff on extended tours of duty, pre-positioning resources, increasing or initiating special detection operations, and leasing initial attack aircraft. All of these actions are aimed at ensuring prompt responses.

There are five staffing classes that describe escalations in preparedness responses to increased fire danger. See (Table 6) below for Staffing Step-Up Plan that shows the actions to be taken for each of the five staffing classes in the Preserve.

For the purpose of determining appropriate step-up staffing BICY uses a complex excel workbook that weights different indices in combination with 1000 hr fuel moisture and Hydrology to get to staffing level 4. When staffing level 4 is reached, and the Preserve seeks emergency preparedness funding, then Burn Index, ERC, and 1 and 10 hr fuel moistures become more relative because fire spread rates increase greatly with increases in BI and ERC and decreases in 1, 10 hour fuel moistures. The Duty Officer can use this information in combination with real time observations and predicted weather and other seasonal indicators to determine staffing.

Staffing Class Step-Up Plan					
Staffing Class	SC-1	SC-2	SC-3	SC-4	SC-5
Fire Danger	Low	Moderate	High	Very High	Extreme
Open Preparedness Account for extended staffing and additional resources	No	No	No	Yes	Yes
Aviation	Helo T3 w/HMGB	Helo T3 w/HMGB	Helo T3 HECM (2) ICT-4	Helo T3 HMGB (2) HECM (3) SEAT available within 1 hour Smoke patrol flights as needed	Helo T3 HMGB (2) HECM (3) SEAT at Oasis SEMG Daily fixed wing flights
Engines	1 T6	1 T6	2 Buggies	2 Buggies	2 Buggies, 1T6, 1T3
Overhead	ICT5 *  (minimum ICT4+2 when using helicopter)	ICT4 *	2 ICT4s  (May include ICT4 assigned to helo)	ICT4, TFLD  ICT3 within 1 operational period  EDRC  Check availability of additional resources	ICT3, SOFR, DIVS, TFLD(2)  Type 3 Team available within 24 hrs  EDRC  Check availability of additional resources
Support Function			Collateral Duty GIS	Collateral Duty GIS  Establish logistical support  Availability Status of collateral duty and AD employees	Dedicated GIS  Establish logistical support  Availability Status of collateral duty and AD employees
Coordination	Daily coordination of available resources within BICY	Daily coordination of available resources within BICY	Daily coordination of available resources within Big Cypress National Preserve	Daily coordination of available resources with local cooperators	Coordinate with statewide unified command and local cooperators
Management Activities			7-day coverage	7-day coverage  Duty Officer determines need for extended hours  Evaluate need for expanded incident management functions	7-day coverage  Duty Officer determines need for extended hours  Initiate daily/ incident planning meeting
Prevention Activities					Fire Danger Signs Posted  Superintendent may restrict campfires based on current activities and conditions
Miscellaneous	NFDRS Indices Daily Weather Situation Reporting	NFDRS Indices Daily Weather Situation Reporting	NFDRS Indices Daily Weather Situation Reporting	NFDRS Indices Daily Weather Situation Reporting	NFDRS Indices Daily Weather Situation Reporting

Table 5: Staffing Class Step-Up Plan

## **Incident Management**

Incident Commanders (IC) have the authority to respond to wildfires with a full range of suppression strategies between aggressive direct or indirect attack, to less impacting confinement strategy and can include surveillance and monitoring to ensure the fire spread will be limited to designated areas. When evaluating the initial response, the IC and fire management staff will consider risks to public and firefighter safety, values at risk, and the cost of various strategies and tactics.

### **Information/Variables Used in Determining Initial Action Responses**

- Public and firefighter safety
- Urban interface communities at risk
- Transportation corridors
- Preserve infrastructure
- Threatened and endangered species
- Sensitive hardwood hammocks
- Archeological and cultural sites
- Preserve boundary
- Availability of resources
- Weather conditions

### **Typical Response Times**

Response time by NPS equipment and personnel will vary depending on the location of both IA resources and fire location. Although Big Cypress National Preserve can experience wildfires 12 months a year, the following resources and response times are essential at Staffing Levels 4 and higher. Based upon the needs identified in the initial attack priority list, the following are the response times to the furthest location in each FMU. (See Appendix L)

- North 75 FMU: Helitack (launch within 15 minutes) - Due to remoteness and logistics, response times may exceed an hour.
- South 41 FMU: Helitack (launch within 15 minutes) – Response from closest station 35 minutes.
- IPP FMU: Helitack (launch within 15 minutes) – Response from closest station 3 hours.
- Raccoon Point FMU: Helitack (launch within 15 minutes) – Response from closest station 45 minutes.
- Deep Lake FMU: Helitack (launch within 15 minutes) – Response from closest station 15 minutes.

### **Restrictions and Special Concerns**

Foam may be used when deemed essential for infrastructure protection. Fire retardant and bulldozers may only be used with permission of the Preserve Superintendent.



### **Minimum Impact Suppression Tactics (MIST)**

Tactics and equipment used for suppression and for holding operations on prescribed burns will be selected to minimize the impact commensurate with values at risk. Use of retardant, bull dozers or tractor plows is prohibited except with the permission of the Superintendent. In areas closed to public motorized use, vehicles will only be used when necessary for protection of sensitive resources, life, safety and private property. Snag falling will be limited to those trees necessary to secure control lines.

### **Extended Attack and Large Fire Suppression**

The Preserve has a history of extended attack fires and is adequately prepared to manage these incidents. Additional support is typically available from the members of the South Florida Fire Planning Unit (e.g. Everglades National Park and Florida Panther National Wildlife Refuge), cooperators (Florida Division of Forestry, Ochopee Fire Rescue, Florida State Preserves) and AD hiring sources.

The Incident Complexity Analysis (Types 3, 4, 5) located in the Interagency Standards for Fire and Fire Aviation Operations guide (Red Book) will be used by the IC and Duty Officer to determine the appropriate management complexity level. In the Preserve's multi-resource, multi-agency environment, most Type 3 incidents are managed with limited support overhead.

In cases when Type 3 fires require increased levels of overhead in coordination with our neighboring federal and state partners, the Preserve has the capability of assembling a Type 3 incident management team. A Type 3 organization gives the Preserve the capability of managing most extended attack incidents encountered. The Florida Interagency Coordination Center is utilized to obtain additional resources. Additionally, senior fire management staff is actively involved with the statewide unified command process, which allows Preserve input in the prioritization for use of national resources within the State of Florida.

If a fire exceeds the capability of the Type 3 management organization, the same processes are utilized to order a Type 1 or Type 2 incident team. Guidance for determination of Type 1 or 2 complexity need will come from the extended attack transition analysis from the Interagency Standards for Fire and Fire Aviation Operations guide (2010). In addition to ordering a Type 1 or 2 management team, a resource advisor will be assigned to handle consultation with Southeastern Archaeological Center (SEAC) regarding cultural resources.

### **Implementation Plan Requirements**

A documented decision is required whenever a wildfire escapes initial attack. A fire that has escaped initial attack is considered extended attack when the fire has not been contained within the first full operational period and there is no estimate of containment or control.

The IC and Duty Officer are responsible to make this determination. The Duty Officer is responsible for initiating a complexity rating, assigning or ordering the appropriate incident commander, and initiating the WFDSS process. The documentation prepared for Type 3, 4 or 5 fires will be reviewed and approved by the FMO or designee. Type 1 or 2 fires will be approved by the Superintendent, unless financial limits are exceeded. In such cases, Regional Director or National Director approval is required (Interagency Standards for Fire and Fire Aviation Operations guide 2009). The decision document will be updated to implement significant changes in management strategies and/or objectives.

### **Delegation of Authority**

The delegation of authority for Type 4 and 5 fires is given to the FMO who then in turn delegates to the Duty Officer (DO) and/or Incident Commander (IC). A Type 3, 4, or 5 IC will receive a formal written or oral delegation of authority, and will receive a briefing describing their responsibilities and authorities from their assigned supervisor or the Duty Officer. (see [Appendix 3: Delegation of Authority for Duty Officer](#) and [Appendix 4: Delegation of Authority for Incident Commander](#).)

### **Aviation Operations**

Big Cypress National Preserve has been delegated authority through Directors Order 60 to manage the Preserve's aviation program, and is required to formulate a local Aviation Management Plan. The Fire Management Officer serves as the Aviation Manager for the Preserve. Aviation use offers the least impact and least invasive means of access to conduct research, fire and resource management, law enforcement, and search and rescue activities. Currently, the Preserve has both a fixed wing exclusive use contracted Cessna 172 and a fleet owned Bell 206 Jet Ranger helicopter. Both aircraft are used year-round.

Aircraft use occurs almost daily in Big Cypress Preserve. The complexity of the aviation program requires constant coordination and technical supervision from the division. For safe and efficient operations, there is a full-time aviation crew stationed at Oasis Visitor Center that consists of an NPS Fleet Pilot, Aviation Operations Specialist, Assistant Manager, Lead Helitack, and an Aviation Crewmember. This staff is responsible for the consistent interpretation of the Departmental, Service and Park policy to ensure a safe and efficient use of the aircraft resources. The Preserve Aviation Manager and the Aviation Operations Specialist will be the primary contacts for inter- and intra-park aviation-related projects. Project Supervisors and Project Coordinators have been identified in the Special Use Plans, which are updated annually. They will plan and coordinate directly with the aviation staff in day-to-day operations. Supervisors and managers are ultimately responsible for their employees' projects, so it is imperative that the managers and project coordinators maintain a strong presence during any aviation-related activities.

The primary aviation-related projects are various resource management activities, research data collection, fire operations, managerial/overhead flights, reconnaissance, law enforcement and search and rescue missions. All pilots and aircraft are carded to meet the qualification requirements of AMD (Aviation Management Directorate). AMD approval is required when using cooperator aircraft. Exemptions and/or waivers may be necessary when flying Senior Executive Service personnel on all missions.

Ground access and efficiency requires the use of our NPS-owned, rotor-wing aircraft landing at non-designated or unimproved landing areas. These aviation activities fall within the special use category as defined in the DM 351, DM 1.7, DO 60, and the Interagency Helicopter Operations Guide.

The fixed wing aircraft is available for all BICY and EVER programs, but is primarily shared by the two units' resource management programs. During increased fire activity Single Engine Air Tankers (SEAT) are used during initial attack and large fire incidents. These aircraft are contracted through AMD. Currently, we are able to acquire these resources directly. In addition to these aircraft, the Preserve may order additional aircraft through the Geographic Area Coordination Center (GACC) or the Florida Interagency Coordination Center for large fire support (FICC). These resources include—but are not limited to—various helicopters, air tankers, and air attack platforms, all of which are carded and approved by AMD.

All personnel involved in aviation operations for wildfire and prescribed fire operations will meet NWCG qualifications appropriate to their position and documented by a current and valid incident qualification card or “Red Card”. All non-fire aviation users will meet DOI qualification policy requirements. Currently, the Fire and Aviation division is requiring all non-fire aviation users to complete the Project Helicopter Crewmember task book before being allowed to fly without a fully qualified Helicopter Crewmember when landing at any unimproved landing site.

All Preserve personnel involved in aviation operations by virtue of their position in the organization shall meet and maintain currency of all the local safety and awareness training requirements listed in the Big Cypress Aviation Operations Plan per the policy of the National Park Service, Department of Interior, AMD and NWCG. Joint air operations with cooperator agencies may involve a diversity of aircraft and mission types and are conducted within the scope of cooperative agreements.

### **Burned Area Emergency Response Program (BAER)**

Many fires occur naturally, and some ecosystems are adapted to fires, relying on them to maintain their health. However, wildland fires can sometimes leave behind a burned landscape that threatens human safety, property, and ecosystems.

The Burned Area Emergency Response program is the NPS post-fire response program that implements Emergency Stabilization (ES) treatments to minimize threats to life or property resulting from the effects of a wildfire, or to stabilize and prevent unacceptable degradation to natural and cultural resources resulting from the effects of a fire. Damages resulting from wildfires are addressed through four activities:

- Wildfire Suppression Activity Damage Repair – Planned actions taken to repair the damages to resources, lands, and facilities resulting from wildfire suppression actions and documented in the Incident Action Plan. Fire suppression activity damage repair is not the responsibility of the BAER program. These are actions that are planned and performed primarily by the suppression incident organization as soon as possible prior to demobilization. However, some actions may need to be conducted by the local unit following containment and incident management team demobilization. For fires where the local agency administrator delegates the authority for fire suppression repair to an incident management team, the incident management team must document the fire suppression activity repair actions and those still needed to ensure that all planned actions are completed during transition back to the local unit. These actions will be paid for by account number for the suppression incident.
- Emergency Stabilization (ES) – Emergency stabilization is an extension of emergency actions. These actions may also include repair, replacement, or construction of physical improvements in order to prevent unacceptable degradation to natural and cultural resources. The objectives of emergency stabilization are to first determine the need for emergency treatments, and then to prescribe and implement the treatments. Life and property are the first priority. Cultural and natural resources treated through ES should be unique and immediately threatened. The Preserve FMO and Natural and Cultural Resources Staff will jointly assess and if necessary formulate a BAER emergency stabilization plan. The BAER plan will be submitted to the Regional BAER Coordinator through the FMO for approval within 7 days from the date the fire is declared contained. BAER project requests totaling \$500,000 or less can be approved by the Regional Director. Submissions over this amount are reviewed at the regional

level and forwarded to the NPS Fire Management Program Center for approval. Emergency stabilization actions must be taken within one year following containment of a wildfire and documented in a Burned Area Emergency Response Plan.

- **Post-fire Burned Area Rehabilitation (BAR)** – Post-fire BAR projects is the NPS post-fire response program that implements the types of long-term actions to repair or improve lands damaged directly by a wildland fire. BAR consists of nonemergency efforts undertaken to repair or improve wildfire-damaged lands unlikely to recover naturally, or to repair or replace minor facilities damaged by wildfire. The objectives of BAR are to (1) evaluate actual and potential long-term post-wildfire impacts to critical cultural and natural resources and identify those areas unlikely to recover naturally from severe wildfire damage; (2) to develop and implement cost-effective plans to emulate historical or pre-wildfire ecosystem structure, function, diversity, and dynamics consistent with approved land management plans, or if that is infeasible, to restore or establish a healthy, stable ecosystem in which native species are well represented; and (3) to repair or replace minor facilities damaged by wildfire. The Preserve FMO and the Natural and Cultural Resources Staff will jointly assess and if necessary formulate a non-emergency Burned Area Rehabilitation Plan. BAR project requests are approved as part of a competitive process within the Department of Interior and project selections are made at the beginning of each fiscal year or after an approved appropriations bill, whichever is later. The BAR plan will be submitted to the Regional BAER Coordinator through the FMO. Projects are reviewed at the regional level and forwarded to the NPS Fire Management Program Center for processing. It should be submitted by the end of the first fiscal year in order to be funded in the next fiscal year. Projects are eligible for BAR funding up to three years of the containment date of the fire. All BAR and ES projects will be documented in the National Fire Plan Operating Reporting System (NFPORS).
- **Restoration** – Continuing the rehabilitation beyond the initial three years or the repair or replacement of major facilities damaged by the wildfire.

	<b>Suppression Rehabilitation</b>	<b>Emergency Stabilization</b>	<b>Rehabilitation</b>	<b>Restoration</b>
<b>Objective:</b>	Repair Suppression Damages	Protect Life and Property	Repair Damages	Long Term Ecosystem Restoration
<b>Damage Due To:</b>	Suppression Activities	Post-Fire Events	Fire	Fire
<b>Urgency:</b>	Before Incident Close-out	1 – 12 Months	1 – 3 Years	3 + Years
<b>Responsibility:</b>	Incident Commander	Agency Administrator	Agency Administrator	Agency Administrator
<b>Funding Type:</b>	Suppression	Emergency Stabilization	Rehabilitation	Regular Program

Table 7: Burned Area Emergency Response Components

## 4.3 Management of Planned Fuels Treatments

The strategy of the Big Cypress Prescribed Fire Program is to supplement the natural role of fire as an ecosystem process and to achieve resource management objectives. Prescribed fire is used to reduce hazard fuel accumulations, reduce threats to wildland urban interface (WUI) from wildfires including I-75, SR-29, and Tamiami Trail (US-41), maintain fire dependent ecosystems, treat exotic plants, and to secure the Preserve boundary.

Protection of the developed area called Sanctuary will be maintained through prescribed fire treatments along the firebreaks (trails) used during the 2007 Big Cypress Complex Incident. The transportation corridors (I-75, US-41 and SR-29) will also be treated to prevent a large fire from impacting visibility and expensive closures. Length of time between prescribed fire treatments around all other structures, facilities, and infrastructure should not exceed 5 years.

With the exception of the historical Cape Sable Seaside Sparrow habitat in the southeast corner and the Sanctuary/northeast corner surrounding the L-28 canal, nearly all of the fire-receptive fuels in the short-interval fire regime types were treated between 2006 and 2010. This accelerated management of the primary fuels, pine-palmetto and prairies, significantly reduces the threat of large fire growth.

### 4.3.1 Planning and Documentation

The management objectives and the placement of prior fuels treatments have led to the formulation of a Five Year Fuels Treatment Projection. The illustrations shown in Appendix J depict intended patterns of planned ignitions in order to achieve the goal of a 3-to-5-year fire return interval Preserve-wide. These projections are intended to be useful for resource management, research, and other activities for which knowledge of prescribed fire implementation would provide planning benefits.

There were factors taken into consideration and influenced the areas slated in the 5-year plan. Of high priority were areas that have the greatest extent of departure from the historic fire-return interval. These areas would receive treatment in the first 2 years of implementation. Another factor in weighting the priority need for planned ignition included proximity to WUI area, values at risk, and the two east-west highways. This would require a three year interval for asset protection. Vegetation types dictated to some degree the 3, 4, or 5 year fire return with prairies scheduled more frequently on a 3-year cycle versus the pine-palmetto on a 5-year cycle. Response time for unplanned ignitions also influenced the scheduling of more frequent fire return intervals. Spatial factors weighing less but considered in scheduling included landscape mosaics and adjacency to recent burned areas.

Over the five projected years, the annual acreage from the anticipated treatment areas will be approximately 82,000 acres per year. Additional planned ignitions could be implemented if additional funding and resources are available to complete them. Treatments in cypress prairies have not been included in the five-year projection; due to the narrow burning window the availability for burning this fuel type is limited. However, given appropriate conditions and available time/resources, management may choose to introduce fire into those areas for ecological benefits.

It should be stressed that future wildfire activity, weather patterns, staffing/funding levels or institutional changes may result in alterations to this five-year plan. Annual reviews will provide the opportunity to adapt our projections based on these factors.



#### **4.3.2 Long-term Prescribed Fire Strategy**

Big Cypress Fire Management utilizes a landscape-scale adaptive management approach to manage fuels within the Preserve. This adaptive landscape scale approach to fuels management with short fire return intervals has been successful in the Big Cypress National Preserve.

On a yearly basis, fire management meets with researchers, resource management specialists and fire staff to assess whether burns are meeting objectives and to integrate current knowledge of fire and its effect on the ecosystem, specific threatened and endangered species, and exotic plants. This knowledge with the five year fuels treatment plan, and in cooperation with resource management, is used to identify the specific areas to burn.

#### **4.3.3 Fire Behavior and Fire Effects Monitoring**

The goal of the monitoring program is to provide fire and resource managers information necessary to conduct fire management activities, and to serve as a feedback mechanism to assess and evaluate the degree to which fire management objectives are being achieved. This information will be used to:

- Make decisions regarding fire management strategy and tactics
- Compare actual prescribed fire effects with stated burn objectives
- Assess/validate/refine current management prescriptions and techniques
- Identify concerns which require further research
- Ensure compliance with NEPA and ESA requirements

Short-term monitoring is conducted on all prescribed burns. Items monitored include: fire weather, fire behavior observations and smoke dispersion and is recorded by fire monitors at intervals deemed appropriate to meet objectives. Spot weather forecasts for the burn location will be received from the National Weather Service prior to, and throughout ongoing prescribed fire operations.

A Photopoint monitoring program has been established within the Preserve. Protocols include multiple photographs of ground cover and shrub height from a fixed point, and measurements of canopy, shrub height and fuel consumption. Plots are sampled pre-burn, immediately post-burn, one year post-burn and three years' post burn. At each photopoint a determination is made as to whether the fuels management objectives (hazardous fuels consumption immediately post burn) or habitat management objectives (shrubs height one year post-burn) have been met. Post-burn results are communicated to fire management personnel on a frequent basis, and tabulated in the Annual Monitoring Report. This annual Fire Ecology Program monitoring report is prepared each January following a regional template and is forwarded to the Regional Fire Ecologist for review.

Burn Severity mapping evaluations will be requested for all fires greater than 500 acres as specified in RM-18, chapter 8. The burn severity mapping products are still under development in south Florida and Preserve staff will provide feedback to the analysts generating the products in terms of accuracy. These products include spatial data files of burn severity,.pdf maps of burn severity, and .kml files of burn severity for viewing on Google Earth.

#### **4.3.4 Prescribed Fire Documentation**

In addition, the following items will be maintained by the Burn Boss and/or fire dispatcher and filed in the Fire Management records room with an individual file for each fire:

- Copy of original signed Prescribed Fire Plan
- Checklist of Pre-Burn Prescribed Fire Activities
- All reviewer comments
- All maps
- Notification Checklist
- Burn Permits
- Monitoring data
- Weather forecasts
- Agency Administrator Go-No Go Pre-Ignition Approval
- Operational Go-No Go Checklist
- Incident Action Plan(s)
- Unit logs, Daily Validation or other unit leader documentation
- Press releases, public comments, and complaints
- Smoke dispersal information
- Post fire analysis
- Fire Occurrence (DI-1202) report (Must also be reported in WFMI)

### **Prescribed Fire Burn Plan**

Big Cypress National Preserve uses landscape-scale burn plans supplemented with Incident Action Plans (IAP). Each burn plan may cover multiple burn treatments conducted in a specific fuel type. Prescription parameters will be developed for implementation of the overall landscape plan. IAPs are prepared to document specific treatment unit resource requirements and operational tactics. Prescribed Burn Plans conform to requirements found in RM-18, and are reviewed by the Resource Division for compliance with the Endangered Species Act due to the number of T & E species found within Big Cypress National Preserve. The Prescribed Burn Plan is approved by the Preserve Superintendent.

The Prescribed Burn Plan review process includes the following individuals and responsibilities:

- Prescribed Fire Specialist – Oversight and completion
- Technical Reviewer – Ensures compliance with the Interagency Prescribed Fire Planning and Implementation Procedures Reference Guide
- Fire Management Officer – Oversight
- Resource Management Division Chief – Ensures that any biological and cultural issues are identified and addressed
- Cooperator Review – on case-by-case basis on property adjoining the Preserve

### **4.3.5 Wildland Fire Transition Plan**

It is required that each burn plan include the process for declaring a prescribed fire as a wildfire.



## 4.4 Prevention, Mitigation, and Education

The objectives of the Preserve's fire prevention program are to protect the lives of firefighters and the public; proactively mitigate damages and losses from unwanted wildland fires; reduce human caused ignitions; reduce suppression costs; mitigate the risks of wildland fire to private property and natural and cultural resources. This is accomplished by working with cooperating agencies and educating Preserve employees, the public and our neighbors, not only in fire prevention, but also the natural role of fire in the Big Cypress ecosystem.

## 4.5 Public Information

When wildfires occur, information will be made available by the Duty Officer to the public and Preserve staff to the level appropriate for the incident. Preserve fire staff will provide relevant fire information to the Preserve's information officer. Local media (newspapers, radio and television) may be provided with briefings, photo and interview opportunities. Current information will be posted on the Big Cypress National Preserve Website ([www.nps.gov/bicy](http://www.nps.gov/bicy)) and/or the National Preserve Service's Fire News website ([www.nps.gov/fire/firenews](http://www.nps.gov/fire/firenews)). A fire information officer will be assigned as needed. (See Appendix P for an emergency contact list and notification procedures).

### 4.5.1 Capability and Needs

Because visitors usually visit one of the contact points in the Preserve, there is an excellent opportunity to make fire information available to the public. Since the fire program has no dedicated staff position for fire information, education, and prevention, fire management must rely upon Preserve interpretation, ranger division and Preserve public affairs to convey information to the public.

The following actions are particularly important during periods of high fire management activity:

- Timely and accurate information will be provided to the media and Preserve visitors regarding the status of fire actions and suppression efforts.
- Informational handouts explaining the fire management program will be prepared and updated as necessary. During periods when management fires are burning, these handouts will be distributed to Preserve visitors and general public.
- Ongoing fire operations will be discussed in informal contacts with Preserve personnel, Preserve neighbors and visitors.
- Adjacent landowners will be notified when fire, particularly wildland fire, is a threat to off-Preserve residential areas.
- Fire prevention and education outreach activities include participation in local community events, special presentations, on-site/off-site activities with educational groups, and participation in other interagency activities.
- Request smoke advisories to be broadcast on NOAA weather radio.

### 4.5.2 Response to Increasing Fire Activities

When the staffing class is 4 or 5 or there are multiple ongoing fires, information will be displayed in visitor contact points. Fire danger signs will be posted on Preserve roadways as needed. Patrol activity may be increased to detect potential fires and to monitor visitor activity. A fire information officer may be assigned. At staffing class 5 it may become necessary to close portions of the Preserve or limit visitor activities to protect both facilities and the public. Fire

management may increase participation with Florida Division of Forestry to support community awareness and fire prevention.

Media access to fire scenes will be facilitated when it is safe to do so. When interest is warranted, the Duty Officer or fire information officer will be designated as the contact person for all information requests. Any media access to fires will be in compliance with the Interagency Standards for Fire and Fire Aviation Operations guidelines.

## **4.6 Environmental Factors**

### **Air Quality**

Big Cypress National Preserve is a designated Class II air shed, while the adjoining Everglades National Park is a Class I area. While the 2006 NPS Management Policies (Chapter 4.5) states “Naturally ignited fire, including the smoke it produces, is part of many of the natural systems that are being sustained in parks”, air quality concerns relative to fire management exist and require active management. Air quality concerns include: the proximity of the metropolitan Miami-Dade County and Naples areas, major highways crossing the Preserve and emissions contributing to degradation of regional air quality. Therefore it is essential that fires be managed to avoid potential conflicts and problems with local residents, highway traffic, and adjacent air sheds. Wildland fire events have the potential to create air quality problems beyond human control. Judicious use of prescribed fire can reduce smoke related air quality problems by providing managers the opportunity to select the timing of burns to obtain acceptable smoke dispersion. All prescribed fires on the Preserve will meet applicable interstate, state, and local air pollution control regulation as required by the Clean Air Act, 42 U.S.C., Section 7418.

The Florida Division of Forestry (DOF) is the regulatory agency responsible for enforcing clean air standards in Collier and Monroe Counties. All prescribed fires must be authorized by DOF on a daily basis. Authorization approval is based on the Dispersion Index, Transport Wind speed, and Mixing Height, as well as the Prescribed Fire Burn Boss’s state certification level. In Miami-Dade County permits are secured through the Department of Environmental Resources Management (DERM).

The dispersion index, transport wind speed and mixing height are obtained from the daily fire weather forecast and spot weather forecast. These parameters and overnight fog potential are used in the Go/No-Go decision for each prescribed fire.

### **Smoke Management**

The greatest hazards from smoke incidents within Big Cypress would be caused by smoke on the three highways after dark. At present, avoidance and dilution strategies are used for smoke mitigation.

Each prescribed fire plan will address smoke management by using a smoke-screening system described in the Southern Forestry Smoke Management Guidebook (USDA, Forest Service), and recommended by the Florida Division of Forestry (DOF). All affected smoke sensitive or smoke critical areas will be identified for each prescribed wind direction in a plan.

No prescribed fire will be initiated unless a Burn Authorization is issued by DOF. The permitting process insures that minimally acceptable atmospheric conditions are present to insure adequate dispersal and mixing of emissions, and also provides additional protection for the Prescribed Fire Burn Boss under Florida law, if they are a state certified burner.

In addition to the weather indices, the following guidelines will also be followed:

- Direction of dispersal and duration of the smoke episode will be considered to avoid any smoke impacts on highways.
- Spot weather forecasts will be obtained daily for the duration of the fire to check that all prescription parameters are not exceeded.
- Test fires will be used to confirm smoke dispersal on all prescribed fires.

In the event that smoke from a fire obscures visibility below the state defined limit (visibility < 500'), the following process is instituted:

- The Burn Boss or IC requests that Preserve law enforcement personnel respond to the scene for traffic control.
- The Burn Boss or IC requests through Big Cypress Fire Dispatch that the Collier County S.O., State Highway Patrol, and State Department of Transportation be notified of the smoke incident, and respond personnel to the scene. If it is determined that the highway must be closed to protect public safety, the request will be made to the DOT, and the road will be closed by State law enforcement personnel.

## CHAPTER 5 – ADAPTIVE MANAGEMENT

Adaptive management processes must incorporate monitoring and evaluation data as another link in modifying and supporting management goals, objectives, strategies, and activities.

### 5.1 Monitoring

A representative sample of planned and unplanned ignitions on Big Cypress National Preserve will be monitored for their effects on the ecosystem. Information gathered during fire monitoring is needed to keep fires within predetermined criteria, to determine the appropriate management response, and to protect human life and/or property. Fire personnel will observe the fire, assess its potential and provide a historical record. Monitoring will include documenting the fire environment, fire behavior, and fire effects. Weather readings will be made periodically at the fire site and photographs may be taken. Forms for recording data will be supplied to monitors.

- **The Fire Monitoring Handbook**

This handbook—developed by the National Park Service—outlines protocols for monitoring fire weather, behavior and effects, and describes in detail all aspects of a comprehensive monitoring program. The protocols that would apply to a short fire-return-interval ecosystem have been adopted at Big Cypress National Preserve.

- **Fire Monitoring Plan**

The Big Cypress National Preserve Fire Monitoring Plan is currently under development by the Prescribed Fire staff with Regional guidance as available and will be included as an appendix when completed. The monitoring plan will define fire monitoring goals and objectives, minimum qualification standards for fire monitors, and monitoring levels and minimum acceptable standards for documenting fire weather, and behavior and effects.

Currently fire effects monitoring in the Preserve is done in accordance with the objectives defined in each burn plan. It consists of visual and written documentation at permanent photo points

within each Fire Management Unit. Protocols include multiple photographs of ground cover and shrub height from a fixed point, and measurements of canopy, shrub height and fuel consumption. Plots are sampled pre-burn, immediately post-burn, one year post-burn and three years' post-burn.

At each photo point a determination is made as to whether the fuels management objectives (hazardous fuels consumption immediately post-burn) or habitat management objectives (shrub height one year post-burn) have been met. Post-burn results are communicated to fire management personnel on a frequent basis, and tabulated in the Annual Monitoring Report.

Fire monitors are important for the early detection and eradication of invasive species in burned areas. Observations of pre-burn invasive plant infestations can help prevent further spread during fire management activities as well as giving specific locations for future monitoring. Post-burn sampling is also critical, as preventing invasive plants from becoming established is by far the most effective and least costly management approach. Annual fire effects monitoring information is provided to resource management staff to provide feedback on the success of fire utilization in meeting Preserve vegetation management goals and approaching the desired future condition of Preserve vegetation.

## 5.2 Fire Program Evaluation

All wildland fires and fire related incidents will be reviewed. Reviews are conducted for one or more of the following purposes:

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

## Unplanned Ignition Reviews

Incident reviews will follow procedures outlined in RM-18, Chapter 13, as well as the Interagency Standards for Fire and Fire Aviation Operations.

Review	Responsible Party	Timeframe
Hotline Review	FMO, IC, Burn Boss	During incident
IMT Closeout and Review	Preserve Superintendent	During transfer of command
Park Level Review	Preserve Superintendent or designee	After incident
Regional Level Review	Regional FMO	After incident
National Level Review	National FMO	After incident
Entrapment and Fire Shelter Deployment Review	Regional FMO	ASAP after incident or deployment
Fire Readiness Review	FMO	Annual
Prescribed Fire Plan Technical Review	Prescribed Fire Specialist or Qualified Burn Boss	Each plan
After Action Review (AAR)	Incident Commander or Burn Boss	Immediately post event
Escaped Prescribed Fire Review	FMO, Regional FMO, National Fire Director	After incident
Fire Management Plan Review	Preserve Superintendent, FMO	Comprehensive FMP update every 5 years and annual update of appendices

Table 8: Unplanned Ignition Reviews

### FMP and EA Reviews

Annual FMP reviews will follow standards and procedures outlined in RM-18, Chapter 4 and will be documented. (see Appendix M)

Item	Responsible Party	Recommended Review
Annual Revision Documents	FMO	September - annually
Pre-attack Plan	FMO	September- annually
Step-Up Plan	FMO, AFMO	September- annually
Long-term Fuel Treatment Plan	Prescribed Fire Specialist	October- annually
Fire Prevention Plan	FMO, AFMO	January- annually
Cooperative Annual Operating Plan	FMO	January- annually
Initial Scoping FMP/EA Update	FMO/Planning and Compliance	October 2014
EA Update	FMO/Planning and Compliance	March 2015
FMP Update	FMO	March 2015
FMP Update Approved	Preserve Superintendent	September 2015

Table 9: Fire Management Plan and Environmental Assessment reviews and updates

### 5.3 Research

Most of the Preserve is composed of fire-dependent vegetation resulting from a long history of lightning and human-caused fires. The application of prescribed fire constitutes the most pervasive resource management action in the Preserve. The RMP identifies the need for continued research and the refinement of fire behavior models unique to South Florida, to better understand the effects of different fire regimes and to further define the natural fire regime of component ecosystems. Understanding natural fire regimes of the Preserve's ecosystems is critical to developing fire management objectives that mimic historical patterns.

The ecological effects of timing, intensity, and seasonality of fire in the ecosystems comprising Big Cypress are not completely understood, particularly in communities underlain by soils high in organic matter such as cypress swamps and hammocks. In order to improve the ability of fire managers to maintain these ecosystems or restore them to a historical condition, research on the ecological effects of fire in the Preserve is encouraged. Collaborations with internal and external researchers are encouraged with the expectation that these efforts will, over time, improve fire management in the Preserve.

Fire management will participate in collaborative research efforts by conducting research burns, collecting various fire behavior and effects data, and by collating and entering past fire history information into a GIS database.

## CHAPTER 6 – DATA AND RECORDS

Checklist of Wildland Fire Documents and Reports		
Document	Revision or Preparation Frequency	Person Responsible for Completion (Filer, tracker)
DI-1202	Each incident	IC/Burn Boss/Dispatcher
ICS -201	Each incident	IC/Burn Boss
ICS-214, w/narrative	Each incident	IC and/or Unit Leader
Resource Orders	Each incident	IC/Duty Officer/ Dispatcher
Fire Map/GPS data	Each incident	IC/Fire Monitor
Archived Photographs	Each incident	All photos taken w/government equipment
WFDSS (Including periodic review)	Response levels 1-3, as needed	IC and/or Duty Officer
Burn Severity Mapping Request	Each Incident larger than 500 acres	Fire effects and Fuels staff
Spot Weather Forecast	Each operational period as needed	IC or Duty Officer
Fire Monitoring Reports (includes smoke emission and transport observations)	Required for planned/unplanned ignitions	FEMO
Incident Status Summary ICS-209	Each operational period as needed	IC/Duty Officer/Fire Dispatcher
Fire Behavior Predictions	Each operational period as needed	IC/Duty Officer
Incident Complexity Analysis	Each operational period as needed	Duty Officer/IC
Incident Action Plan (IAP)	Each operational period as needed	IC/Duty Officer
After Action Review (AAR)	Each incident	IC/Burn Boss
Cost Tracking	Each incident/daily as needed	IC/Duty Officer/FMO/FPMA

Table 10: Checklist of Wildland Fire Documentation



## CHAPTER 7 – ORGANIZATIONAL ROLES AND RESPONSIBILITIES

## 7.1 Fire Management Program Structure

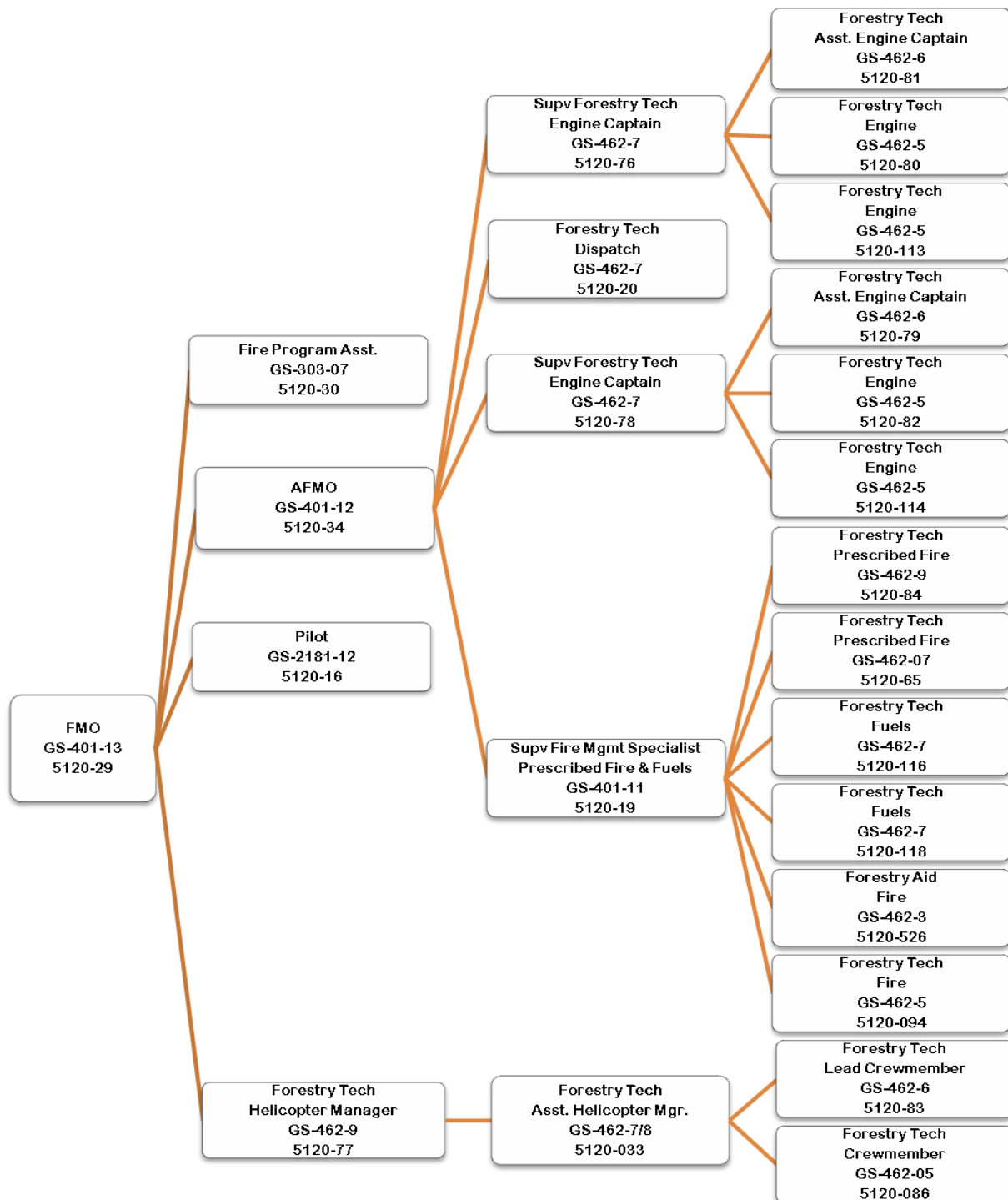


Figure 9: Big Cypress Fire Management Organization Chart

## 7.2 Fire Management Organization Roles and Responsibilities

Preserve Superintendent – The Preserve Superintendent is responsible to the Regional Director for the safe and efficient implementation of fire management activities within his/her unit, including cooperative

activities with other agencies or landowners in accordance with delegations of authorities. The Preserve Superintendent or principal acting will meet the required elements outlined in the *Management Performance Requirements for Fire Operations*.

Fire Management Officer – The Fire Management Officer (FMO) is responsible for planning, implementation and administration of all dimensions of fire management including prescribed fire, wildland fire suppression, unplanned ignitions, fire ecology, and non-fire fuel reduction. The FMO is also the Preserve Aviation Manager. The FMO supervises the Assistant Fire Management Officer, Aviation Operations Specialist, Pilot and Fire Program Management Assistant. The FMO is responsible for interagency coordination of the fire program. During periods of absence in excess of lieu days, the FMO will assure that an Acting FMO is designated, which usually defaults to the AFMO unless unavailable. The FMO is required to meet the Unit Fire Program Manager standards of the Interagency Fire Program Management Qualifications Standards (IFPM) for a moderate complexity program. FMO responsibilities are also outlined in the Interagency Standards for Fire and Fire Aviation Operations. This position is supervised by the Deputy Superintendent who has oversight responsibility for the entire program.

Assistant Fire Management Officer (AFMO) – The Assistant Fire Management Officer (AFMO) is responsible for all aspects of fire operations and provides support to wildland fire, prescribed fire and non-fire fuel treatments. Responsibilities of the AFMO include: planning and implementation of the wildland fire management training and qualification programs; maintaining fire readiness including implementation of suppression portions of the Step-Up Plan; fire prevention; maintenance and management of vehicles and equipment; and coordinates project work with other divisions. The AFMO supervises the Prescribed Fire Specialist, the Station Managers/Engine Captains (2), and Dispatch. The AFMO must be qualified to act as the FMO with full authority and responsibility of that position, except personnel actions.

Dispatcher/Flight Following – The Dispatcher is responsible for a variety of functions including daily preparation of morning weather, staffing, and activity reports; monitoring and documentation of phone and radio traffic; keeping status in ROSS (Resource Ordering and Status System) current; preparing and filling orders, and managing local incident ordering; maintaining responder experience, training, and printing red cards in IQCS (Incident Qualification and Certification System); monitoring RAWS, radar, and lightning websites for weather conditions. The Dispatcher is responsible for briefing the Duty Officer on current unplanned ignition activity and overdue aircrafts. The flight following dispatcher is responsible for providing flight following for all flights and maintains a schedule of all planned flights in the Preserve.

Prescribed Fire Specialist (PFS) – The Prescribed Fire Specialist (PFS) assists the fire program including prescribed fire, wildland fire, and non-fire fuels treatments. In coordination with Preserve staff, the PFS develops fuels treatment objectives and prescriptions, and produces plans to meet fire management goals. The PFS implements fuels treatment plans; oversees fire effects monitoring program; maintains all fire records and fire history data; responsible for maintaining all fire weather stations, weather observations, and field monitoring of fuels and other indices.

Fire Program Management Assistant (FPMA) – The Fire Program Management Assistant is responsible for budget tracking and management; payroll and timekeeping; administrative files and recordkeeping; processing personnel actions; managing travel; and fire support including logistics and dispatching. This includes assuring implementation of support portions of the Step-Up Plan.

Fire Management Staff – Although broken into various disciplines, the remaining fire management staff members support all aspects of fire and aviation management. All positions that are primary or secondary firefighters are required to meet the Training and Qualifications Standards of the IFPM for a moderate complexity program.

Duty Officer – Big Cypress Fire and Aviation utilizes a Duty Officer system to assist the fire and aviation management staff to include: coordinating daily activities; fire size-up; setting priorities; mobilizing resources; and fire management planning, approval and reporting. This is not a permanent staff position, and the Duty Officer assignment rotates among staff members. The responsibilities of the Duty Officer require a combination of fire management qualifications and fire program management skills. The Duty Officer must be well versed in Preserve policies and procedures as well as resource mobilization processes. At a minimum, the Duty Officer must be a fully qualified ICT 4, have detailed knowledge of Preserve values at risk and special resource issues, and have a working knowledge of the Fire Management Plan.

Duty Office Responsibilities:

1. Monitor unit incident activities for compliance with NPS safety policies
2. Coordinate and set priorities for unit suppression actions and resource allocation
3. Document all decisions and actions.
4. Must be available by phone 24 hours a day (1-hour call back when in Staffing Level 1-3)
5. Review, update, and distribute Daily Staffing
6. Review Step-Up-Plan requirements and ensure they are being met
7. Adjust staffing class as needed
8. Authorize extended staffing
9. Position resources
10. Prioritize incidents
11. Assign an Incident Commander
12. Approve strategy and review the complexity analysis
13. Ensure compliance with the Fire Management Plan (FMP)
14. Approve ordering of local and non-local resources for small fires. Type 3 incidents or larger need FMO/AFMO approval.
15. Ensure logistical considerations are being met.
16. Be familiar with and follow protocols for assistance with cooperators and mutual aid response.
17. Dispatch aircraft within BICY boundary or within mutual aid response. Any other operations must be approved by FMO/AFMO or Superintendent's Office.
18. Other responsibilities as may be directed by the FMO/AFMO or Superintendent's office.

## Glossary

*also see the Glossary of Wildland Fire Terminology at:*

<http://www.nwcg.gov/pms/pubs/glossary/pms205.pdf>

**Burning Index (BI)** - A numerical index related to the contribution of fire behavior to the effort of containing a fire. BI divided by 10 roughly equates to anticipated flame length at the head of a fire.

**Decision criteria checklist (Initial Go/No-Go Decision)** – A set of standard evaluation criteria to determine if the current wildland fire meets criteria to be managed for resource benefits. The completion of these criteria will lead to a “Go/No-Go” decision with management of the fire for resource benefits.

**Disturbance** – any relatively discrete event, either natural or human induced, that causes a change in the existing condition of an ecological system.

**Ecological process** – the actions or events that link organisms and their environment, such as predation, mutualism, succession development, nutrient cycling, carbon sequestration, primary productivity, and decay.

**Fire complexity analysis** – A process for assessing wildland fire organizational needs and relative complexity in terms of ICS types (I, II, III etc.).

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

**Fire dependent or fire maintained ecosystems** - an ecosystem can be called fire dependent or fire maintained if periodic perturbations by fire are essential to the functioning of the system.

**Fire monitoring** - the act of observing a fire to obtain information about its environment, behavior, and effects for the purpose of evaluating the fire and its prescription.

**Fire regime** – the fire pattern across the landscape, characterized by occurrence interval and relative intensity. Fire regimes result from a unique combination of climate and vegetation. Fire regimes exist on a continuum from short-interval, low-intensity (stand maintenance) fires to long interval, high-intensity (stand replacement) fires.

**Fire return interval** – the number of years between two successive fires occurring in a designated area.

**Fuel** - All material (whether in the ground, on the surface, or in the air) that may be burned, including duff, logs, branches, needles and twigs. Fuel is divided into four size classes:

- 1-hour time lag - < 1/4 inch (grass, litter, duff)
- 10-hour time lag - 1/4 inch - 1 inch (twigs and small stems)
- 100-hour time lag - 1 inch - 3 inches (branches)
- 1000-hour time lag - > 3 inches (large branches and stems)

**Hazard fuels** – excessive live and/or dead wildland fuel accumulations (either natural or created) having the potential for the occurrence of uncharacteristically intense wildland fires.

**Incident Commander Type 3 (ICT3)** - The Incident Commander Type 3 is responsible for incident activities of multiple resources including the development and implementation of strategic decisions, and for approving ordering and releasing resources. Depending on the size of the incident, jobs such as operations and logistics may be delegated to other personnel.

**Incident Commander Type 4 (ICT4)** - The Incident Commander Type 4 is responsible for incident activities of single resources during the initial attack stage of an incident, including the development and implementation of strategic decisions, and for approving, ordering and releasing resources.

**Initial Action** – The actions taken by the first resources to arrive at a wildfire. Initial Action may include the full spectrum of responses from monitoring to aggressive containment.

**Initial Attack** – The initial action focused on aggressive containment of the fire perimeter.

**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. This term replaces suppression.

**National Fire Danger Rating System (NFDRS)** - A system that uses weather, fuel, lightning and human-caused fire occurrence to formulate several indices. It relates only to the potential of the initiating fire. Fire danger is rated from a worst-case approach. It provides guidance for short-range planning.

**Natural ignition** – a wildland fire ignited by a natural event such as lightning or volcanoes.

**Planned Ignition** -- any fire ignited by management actions to meet specific objectives. Prescribed fires are conducted in accordance with prescribed fire plans.

**Prescription** – a set of measurable criteria that guides the selection of appropriate management strategies and actions. Prescriptions criteria may include safety, economic, public health, environmental, geographic, administrative, social, or legal considerations.

**Prescribed fire** – any fire ignited by management actions to meet specific objectives. Prescribed fires are conducted in accordance with prescribed fire plans. Also known as planned ignitions.

**Prescribed fire plan** – a plan required for each prescribed fire. Plans are documents prepared by qualified personnel, approved by the agency administrator, and include criteria for the conditions under which the fire will be conducted (a prescription).

**Response to Wildland Fire** – the response to a wildland fire is based on an evaluation of risks to firefighter and public safety, the circumstances under which the fire occurs, including weather and fuel conditions, natural and cultural resource management objectives, protection priorities, and values to the protected. The evaluation must also include an analysis of the context of the specific fire within the overall local, geographic area, or national wildland fire situation. (*This term has replaced Appropriate Management Response.*)

**Time lag** - The time necessary for a fuel particle to lose approximately 63 percent of the difference between its initial moisture content and its equilibrium moisture content.

**Unplanned Ignition** – The initiation of a wildland fire by lightning, volcanoes, unauthorized human caused fires, and escaped prescribed fires where the objective is to protect values at risk while meeting resource objectives specified in resource management plans.

**Use of Wildland Fire** – Management of either wildfire or prescribed fire to meet objectives specified in resource management plans.

**Values at Risk** - In terms of fire prevention, it is defined as natural or developed areas where loss or destruction by wildfire would be unacceptable.

**Wildfire** – Any fire (natural or human caused) burning in wildland fuels. Synonymous with wildland fire.

**Wildland Fire** – Any non-structural fire that occurs in the wildland. Two distinct types of wildland fire have been defined and include wildfire (unplanned ignitions) and prescribed fire (planned ignitions).

**Wildland Fire Decision Support System (WFDSS)** – A strategic fire management assessment and documentation process (program) used to determine the appropriate response to wildfires. This process is replacing the previously used WIFP and WFSA analysis processes.

**Wildland Urban Interface (WUI)** -- Area where an ignition can impact any structure or road within one burn period.

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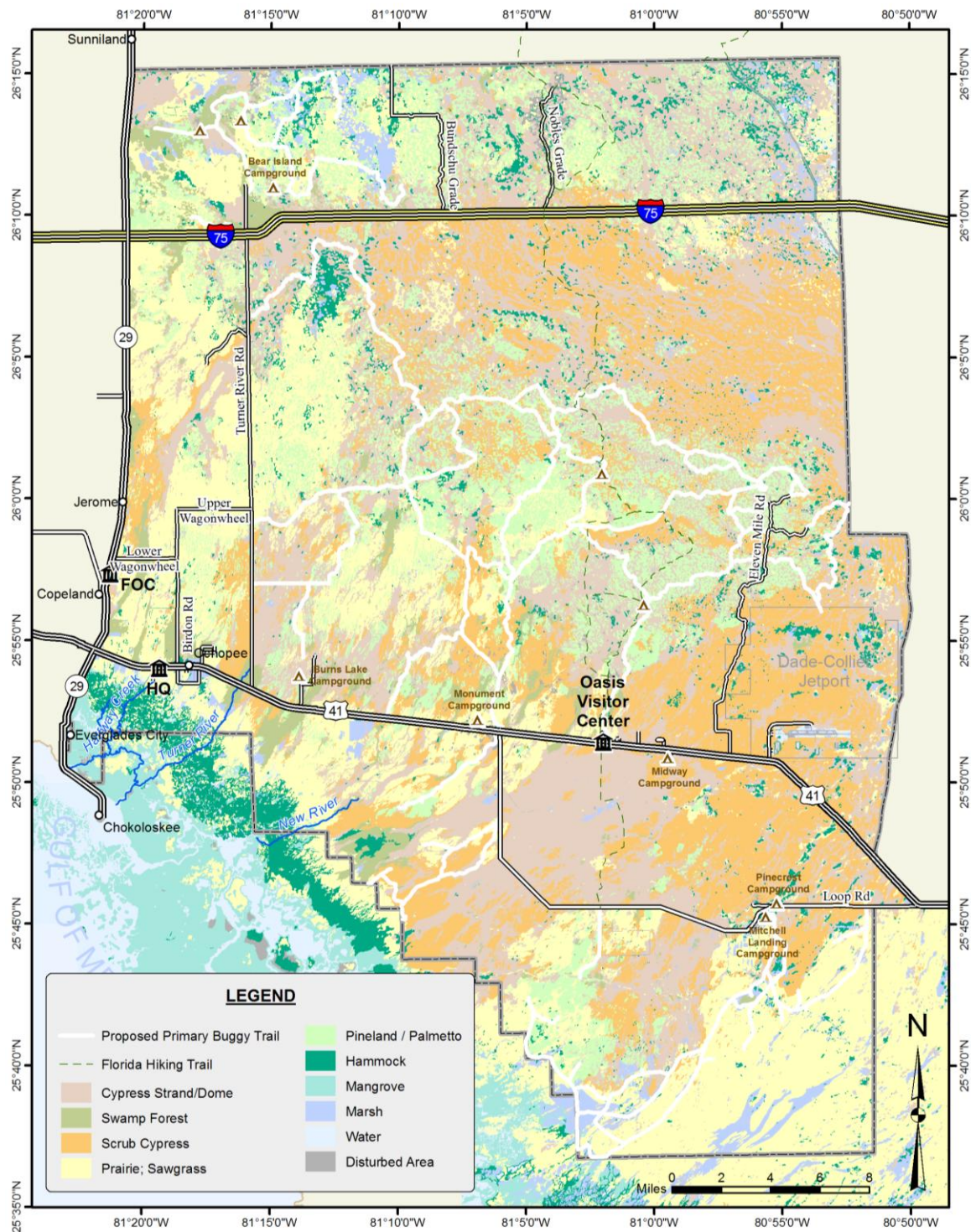
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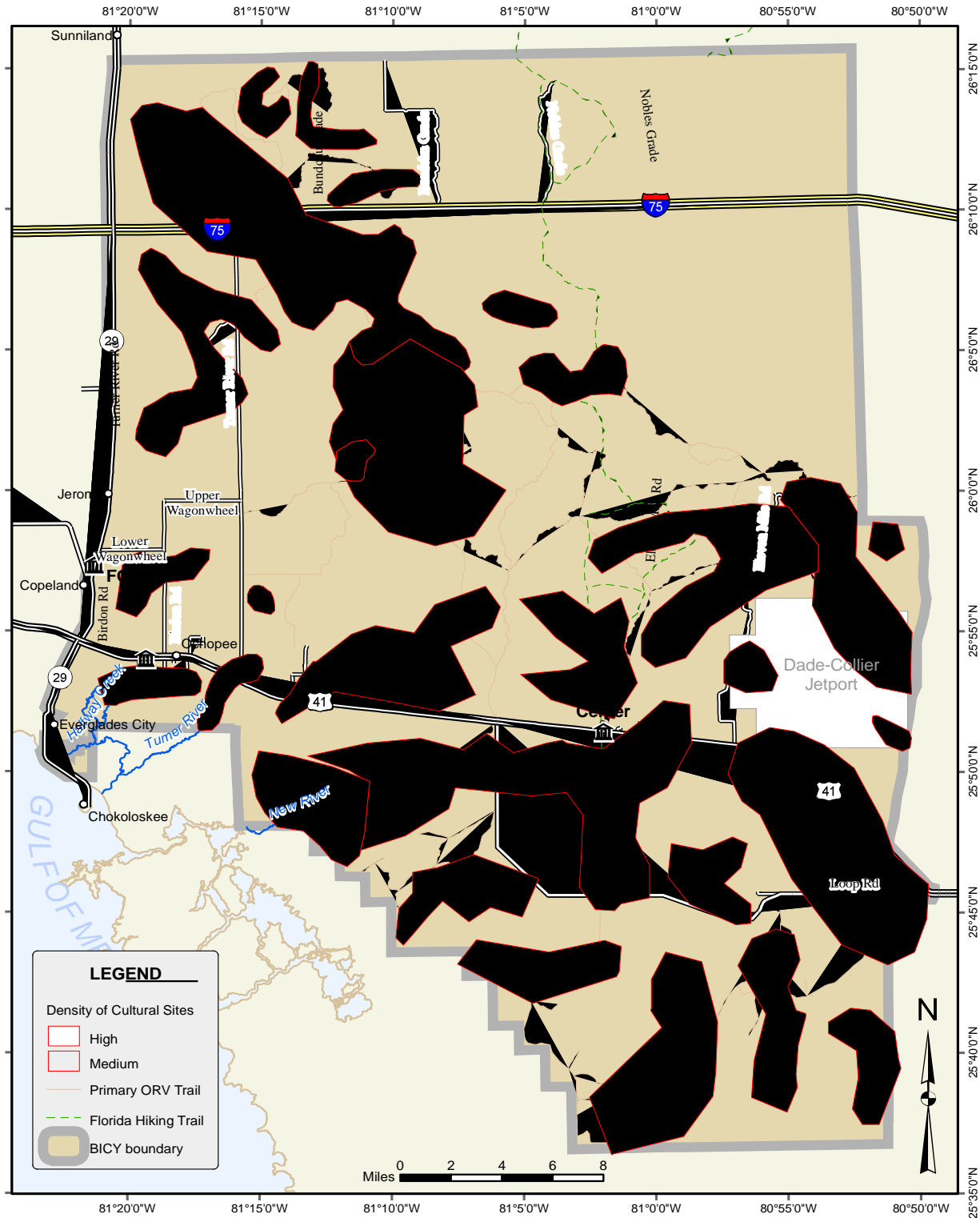
## Appendix 1: Supporting Maps

# VEGETATION GROUPS



Appendix A Figure 1: Vegetation Groups

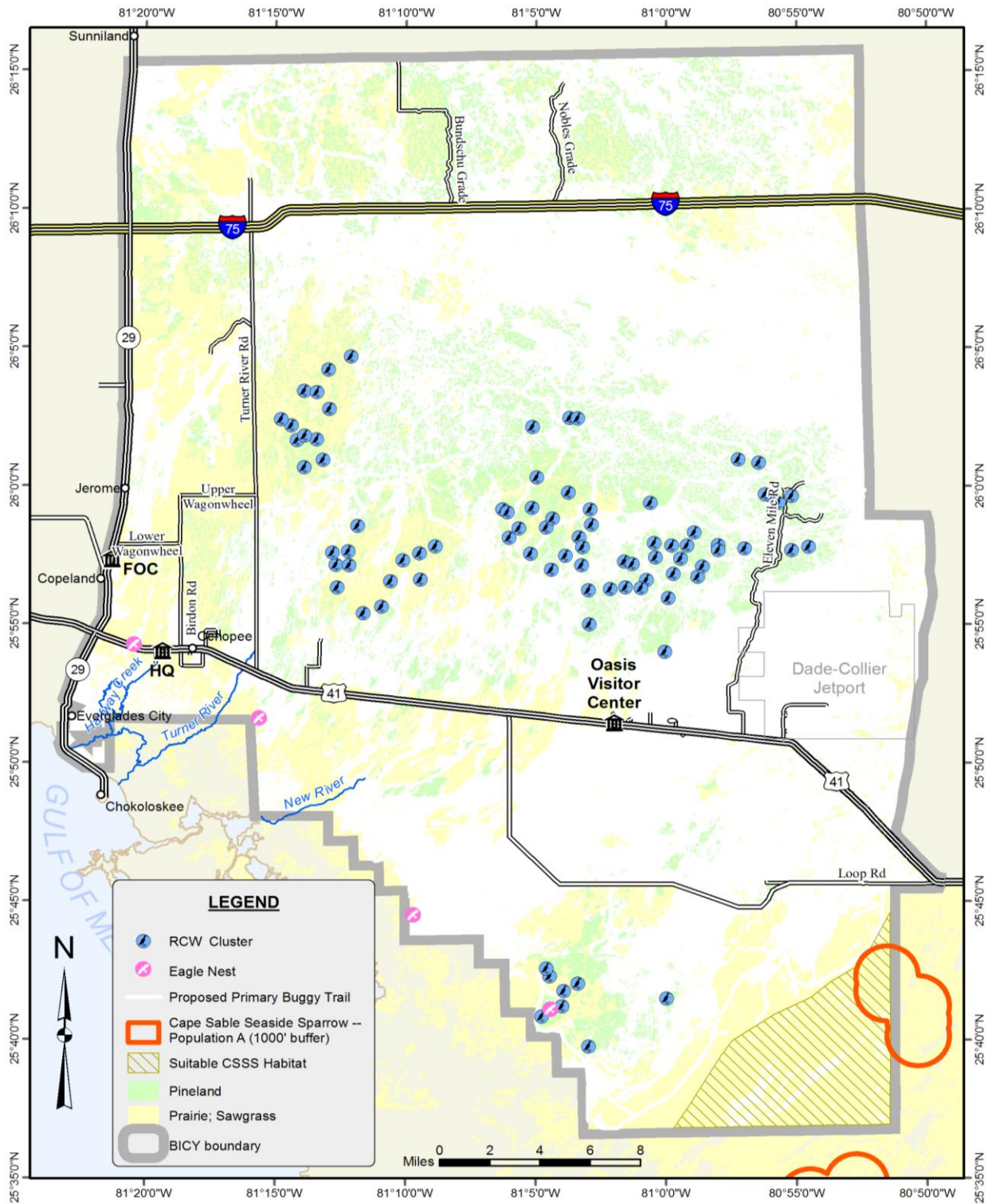
## CULTURAL SIGNIFICANCE



Appendix A Figure 2: Cultural Significance

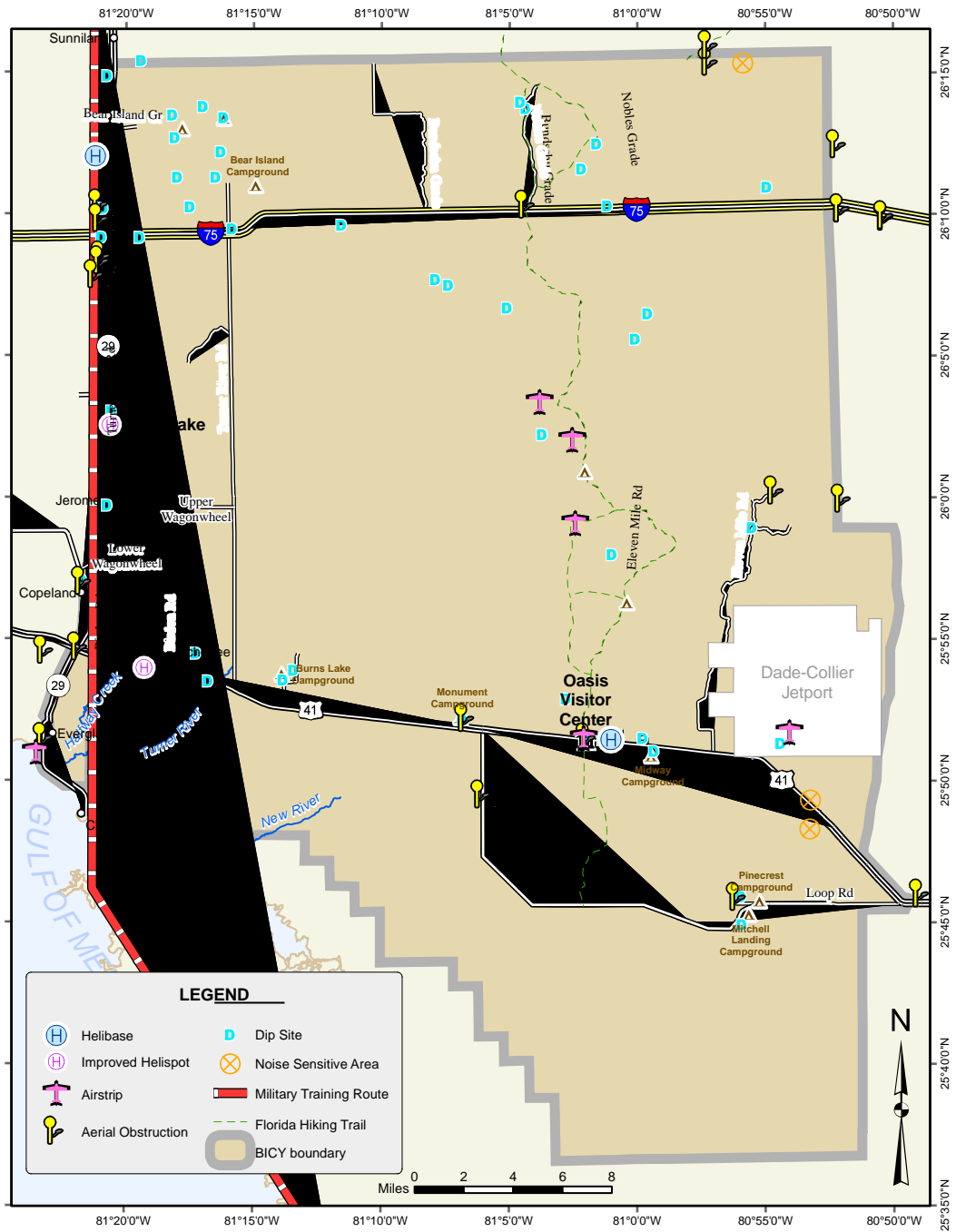


# RESOURCE VALUES AT RISK

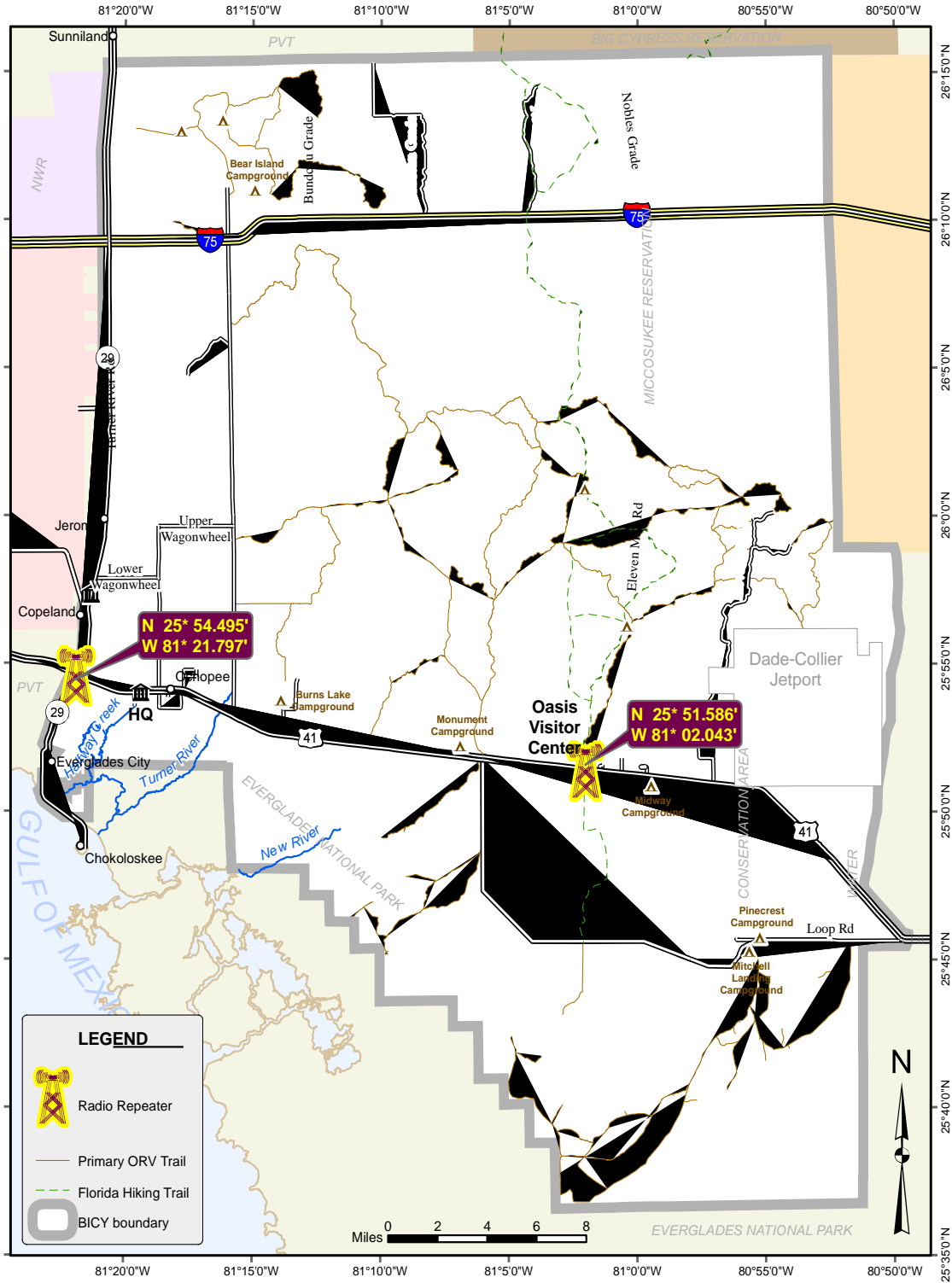


Appendix A Figure 3: Resource Values at Risk

## AVIATION

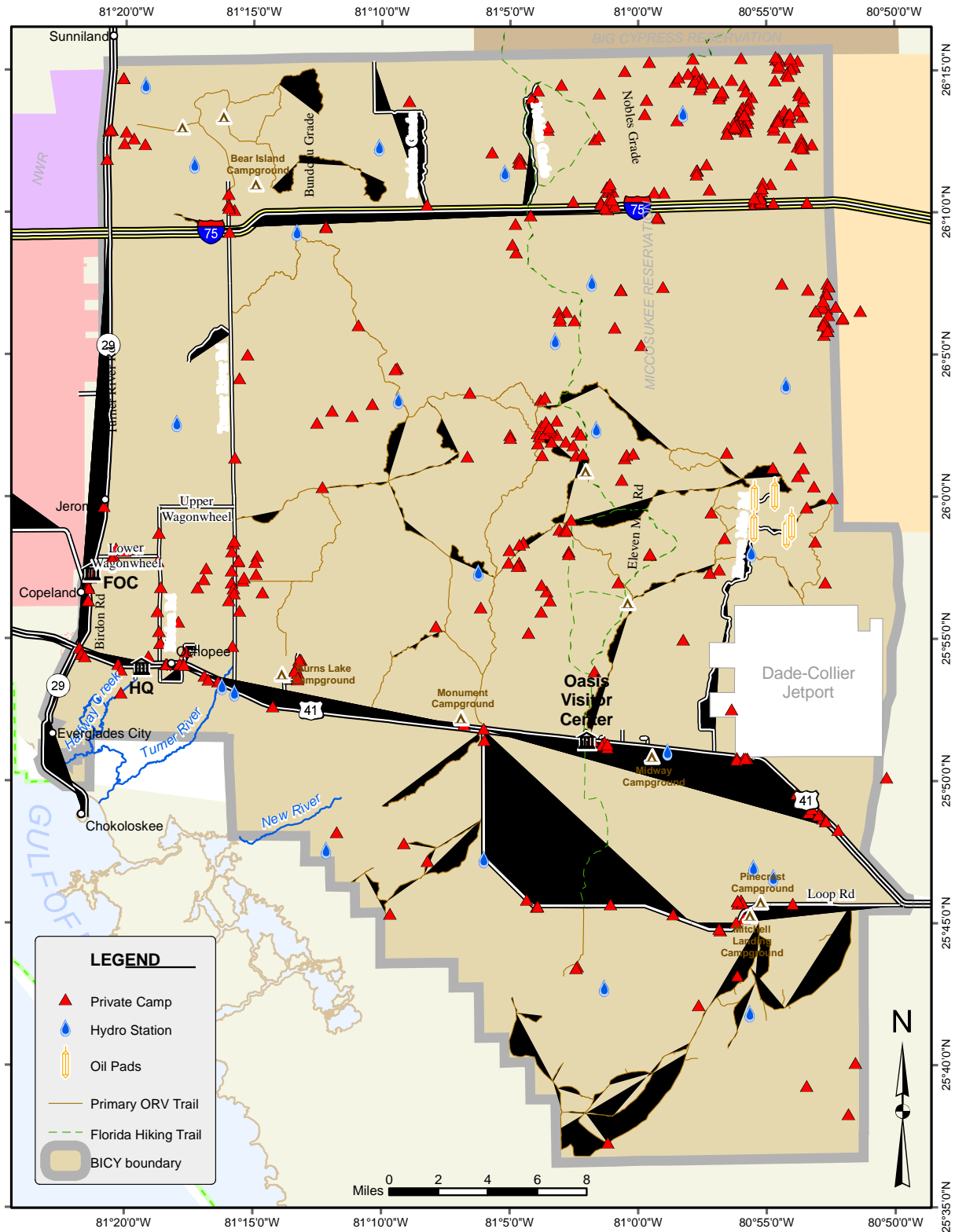


## REPEATER LOCATIONS



Appendix A Figure 5: Repeater Locations

## OTHER VALUES AT RISK



Appendix A Figure 4.6: Other Values at Risk



## Appendix 2: Environmental Assessment

### MEMORANDUM

To: Files  
From: Superintendent, Big Cypress National Preserve  
Subject: Adequacy of National Environmental Policy Act Documentation

#### PROJECT INFORMATION

Project Location: **Big Cypress National Preserve**  
PEPC Project Number: **29895** PMIS Project Number: **N/A**  
Project Title: **Update and Implement Fire Management Plan**  
Project Type: **Fire Management Plan**  
Project Location (County, State): **Collier, Monroe, Miami-Dade, Florida**  
Project Leader: **George Sheppard**  
Project Description:

In 2005 Big Cypress National Preserve updated its Fire Management Plan (FMP) as required by Director's Order #18, *Wildland Fire Management*. That plan described the activities the Preserve would undertake to: 1) replicate historic fire regimes to sustain flora and fauna that depend on fire for survival and to improve habitat and 2) reduce hazard fuel loadings, thereby diminishing fire threats to life, property, and resources. In May 2005 the Preserve released a draft Environmental Assessment (EA) describing the environmental impacts of three alternatives. A Finding of No Significant Impact was approved in November 2005 that documented the NPS' selected alternative, which included suppression of wildland fires through confinement and containment strategies and use of prescribed fire for resource protection and hazard fuel reduction.

FMPs must be updated every five years. The Fire Management staff at BICY have opted to retain the 2005 plan with updates only to terminology, technology, and national direction. There will be no change to the fire management activities of suppression strategies and prescribed fire.

#### DESCRIPTION OF PREVIOUS COMPLIANCE DOCUMENTATION

The proposed action was described and analyzed in a draft EA released in May 2005. Public scoping began in May 2004, when requests for scoping comments were distributed to agencies, tribes, organizations and individuals. A similar request for scoping comments was posted on the NPS Planning, Environment and Public Comment (PEPC) website. Comments were solicited during external scoping until September 2004. Comments to the draft EA were received through June 2005. A Finding of No Significant Impact was signed on November 17, 2005, documenting the NPS' selected alternative.

#### IMPACT ANALYSIS

The EA included a no action alternative and two action alternatives. The EA analyzed impact on ten topics: air, water, cultural resources, soils, vegetation, wildlife, special status species, visitor use/experience, health/safety, and transportation.

The NPS consulted with the Florida State Historic Preservation Office (SHPO), who concurred with the NPS' determination that the proposal would have no adverse effect on historic properties.

The environmental impacts of the selected alternative described in the 2005 FONSI were analyzed in detail in the EA. The proposed update will not change the original selected alternative. No changes to the affected environment conditions have occurred, and there have been no changes to the impacts to the resources.

#### CONCLUSION


After careful review of the 2005 EA, it has been determined that the document adequately describes and analyzes the impacts for the proposal to update the 2005 Fire Management Plan.

There is no change to overall project scope, the description of impacts (context, intensity, and duration) remains as described in the 2005 EA, and site conditions have not changed since preparation of the EA. No additional public involvement is required. Because neither the EA nor this evaluation resulted in any major adverse effects to NPS resources and values, there would be no impairment to national park system resources and values from implementation of this project.


#### SIGNATORY

Based on the environmental impact information contained in the statutory compliance file and in this memorandum, environmental documentation for this stage of the subject project is complete.

Recommended:

Compliance Specialist 	Telephone Number 239-695-1158	Date 1/19/10
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Approved:

Superintendent 	Telephone Number	Date 1/21/10
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## Appendix 3: Delegation of Authority for Duty Officer



IN REPLY REFER TO:

### United States Department of the Interior

#### NATIONAL PARK SERVICE

Big Cypress National Preserve  
33100 Tamiami Trail E  
Ochopee, Florida 34141-1000



December 20, 2012

#### MEMORANDUM

TO: Jordan McKnight, Justin Turnbo, Mike O'Leary, Jay Thatcher, Shawn Shook, Chris Richards, Adam Kunce,

FROM: J. D. Lee, Deputy Superintendent

SUBJECT: Delegation of Authority, Duty Officer, Big Cypress National Preserve

You are hereby delegated authority to serve as Duty Officer (DO) on incident activities on the Big Cypress National Preserve. You have full authority and responsibility to act within the framework of your qualifications, law, agency policy, and direction provided in this Delegation of Authority.

The required duties include:

- Monitor unit incident activities for compliance with NPS safety policies.
- Coordinate and set priorities for unit suppression actions and resource allocation.
- Keep unit agency administrators, suppression resources, and Information Officers informed of the current and expected situation.
- Plan for and implement actions required for future needs.
- Document all decisions and actions.

You will provide operational oversight of these requirements as well as any unit specific duties assigned by the FMO.

You may not fill any ICS incident command function connected to any incident.

In the event you, as DO, are required to accept an incident assignment, the FMO will assign another authorized DO that must be in place prior to your departure.

This delegation is effective immediately and will remain in effect until rescinded or December 31, 2013.

  
J.D. Lee, Deputy Superintendent

  
Date





## Appendix 4: Delegation of Authority for Incident Commander



IN REPLY REFER TO:

### United States Department of the Interior

#### NATIONAL PARK SERVICE

Big Cypress National Preserve  
33100 Tamiami Trail E  
Ochopee, Florida 34141-1000



December 20, 2012

#### MEMORANDUM

TO: Jordan McKnight, Justin Turnbo, Mike O'Leary, Jay Thatcher, Mindy Wright, Shawn Shook, Chris Richards, Matt Heinz, Kyle Myhre, Justin Phippen, Adam Kunce, Jill Waisley and Melissa Olsen

FROM: J. D. Lee, Deputy Superintendent

SUBJECT: Delegation of Authority, Incident Commander

You are hereby delegated authority to serve as Incident Commanders on wildfires on the Big Cypress National Preserve. You have full authority and responsibility for managing the fires within the framework of your qualifications, law, agency policy, and direction provided in this Delegation of Authority.

Protecting human life is your top priority, followed by protecting communities and specifically identified facilities within the Preserve.

Fires will be managed with minimum impact to the environment, with particular attention to Red-Cockaded Woodpecker habitat and Florida Panther den sites.

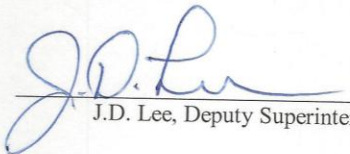
Protect all private in-holding camps, commercial infrastructure, and keep disruption of landowner access to a minimum, as safety allows.

You are authorized to expend funds within the purchasing rules and policies of the USDI-National Park Service. If a question or situation occurs outside of normal interagency business practices, coordinate with business management personnel of the appropriate jurisdictional agency.

I expect you to work closely with our cooperators on Big Cypress and mutual aid fires.

Provide training opportunities to Preserve, State, and other local federal and state fire agency personnel as possible.

This delegation is effective immediately and will remain in effect until rescinded or December 31, 2013.

  
J.D. Lee, Deputy Superintendent

12/20/12  
Date



## Appendix 5: Interagency Agreements

This summary displays the name of agencies, purpose of agreement and expiration date. Copies of the agreements are located in the Preserve's Fire Management Office. This table should be updated as part of the annual FMP update.

Agency	Objective	Expiration Date
State of Florida Department of Environmental Protection Division of Recreation and Preserves for Fakahatchee Strand Preserve State Preserve	To establish the terms and conditions under which DRP will reimburse NPS for use of its helicopter to apply prescribed fire through aerial ignition to manage fire dependent habitats in Fakahatchee Strand Preserve State Preserve.	April 2012
Ochopee Fire District	To establish the terms and conditions under which both parties will provide mutual assistance in preventing, detecting, and suppressing structural fires, within the Ochopee Fire District, the Preserve, and the immediate surrounding area.	2/15/2017
The Florida Division of Forestry Caloosahatchee District	To outline operating procedures between the participating agencies within the framework of the umbrella cooperative agreement.	January 2012
USDI, BLM USDI, NPS USDI, FWS	To provide a framework for cooperation to improve the effectiveness and efficiency in attaining our shared mission goals and to implement the objectives of improve customer service, increase operational efficiency, and enhance land stewardship, resource protection and conservation. Will maintain compliance with annual reporting and documentation.	Revised Annually
US Fish and Wildlife Service Florida Panther and Ten Thousand Islands National Wildlife Refuge	To cooperate in the full spectrum of wildland fire management activities and in non-fire emergencies as authorized, to achieve land management goals.	June 2015

## Appendix 6: Prescribed Fire Job Hazard Analysis

FS-6700-7 (2/98)			
U.S. Department of Interior	1. WORK PROJECT/ACTIVITY	2. LOCATION	3. UNIT
National Park Service- Big Cypress NP Ochopee, FL 34141	Prescribe Fire Operations	BICY	FL-BCP-FIRE
JOB HAZARD ANALYSIS (JHA)	4. NAME OF ANALYST	5. JOB TITLE	6. DATE PREPARED
References-FSH 6709.11 and -12 (Instructions on Reverse)	Justin Turnbo	Fuels Tech	9/25/09
7. TASKS/PROCEDURES	8. HAZARDS	9. ABATEMENT ACTIONS Engineering Controls * Substitution * Administrative Controls * PPE	
*Travel to, from and during project.	Motor vehicle accidents Slippery road surfaces, soft shoulders, unimproved and narrow roadways. Weather darkness, smoke.	Driving Defensively. Use seat belts. Identify road conditions during briefings. Post Road Guards. Mark hazards. Use Headlights. Perform preuse inspections on equipment. Scout roads and identify turnouts before ignition of project. Maintain communications. Provide road system map for project. Use Backers and chock vehicle tires. Have vehicles facing out.	
*Qualifications For assigned positions	Lack of Experience	All prescribed fire positions will be filled with qualified firefighters that meet age, health, and physical requirements established for regular firefighting duties.	
*Briefing	Lack of communications	Provide project briefing before burning will clarify firing order, organization responsibilities, communications, hazards, weather, and expected fire behavior.	
*Protective Clothing and equipment	Injuries, burns and death	Wear Hard hat with chin strap, safety glasses, Nomex Fire resistant pants and shirts NFPA 1977 compliant. Keep sleeves rolled down. Wear leather, lace type, boots with skid resistant soles, and tops at least 8 inches high. Carry drinking water and fire shelter. Wear OSHA approved firefighting gloves. wear hearing protection when working around equipment where noise level exceeds 90 dba.	
*Ignition Crewmembers	Injuries and death falls, snags, bees, snakes, smoke, burns, rolling material.	Maintain LCES. Follow the Standard Fire Orders and Watch Out Situations. Always have an escape route. Maintain communications with other Lighters and RX Firing Boss. Hand held radios shall be provided to all Igniters. Do not fill drip torches near ignition sources. Do not spill burn mix on clothing.	
*Fuel Mixing	Burns, spills, fuel saturated clothing and boots.	No smoking within 25 feet of mixing and filling area. Do not fill or mix in pick up beds with bed liners. Avoid the use of cellular telephones in and around fill or mixing area. Avoid fuel contact with bare hands, clothing and boots. Provide pour spouts. Use only approved fuel containers. Follow fuel mixture ratio in the Health and safety Code Handbook.	
*Holding/Mop Up/Patrol Crewmembers	Smoke, burns, Falls, back injuries, bees, poison oak, snags, rolling material, eye injuries. Heat Stress. Dehydration CO Poisoning	Wear PPE's listed above. LCES, Follow Standard Fire Orders and Watch out Situations. Receive briefing from Holding Boss. Identify hazards in work area. Flag hazards for others. Use warning lights and provide traffic control on roadways during smoky and night operations.  Drink lots of fluids before, during and after work.	

		<p>Periodically rotate crews from work sites with high smoke levels to areas of less smoke or smoke free areas. Protective clothing and equipment shall be the same as required for firefighting. Crews shall follow all guidelines in the NWCG Fireline Handbook Chapter 5 Firefighting Safety ( Rev. 9/98 ).</p> <p>Maintain communications with the Burn Boss.</p>
*Emergency Evacuation Procedures (EEP)	Serious illness injuries	<p>Notify Burn Boss, request medical response from the responsible medical first responders. Provide type of injury, location, access, number of patients. Follow BICY Fire EMS protocol. On site NPS Engines shall have Basic 1<sup>st</sup> Aid equipment to initiate Basic 1<sup>st</sup> Aid until responsible medical first responders arrive. Burn Injury Kits will also be aboard all NPS Engines on scene. Identify EMT's and available medical equipment on project during briefing.</p>
10. LINE OFFICER SIGNATURE & DATE		12. PROJECT / ANALYST SIGNATURE & DATE:
11. TITLE:: Fire Management Officer		13: TITLE:: Fuels Technician
Previous edition is obsolete		(over)



JHA Instructions (References-FSH 6709.11 and .12)	Emergency Evacuation Instructions (Reference FSH 6709.11)	
<p>The JHA shall identify the location of the work project or activity, the name of employee(s) writing the JHA, the date(s) of development, and the name of the appropriate line officer approving it. The supervisor acknowledges that employees have read and understand the contents, have received the required training, and are qualified to perform the work project or activity.</p>	<p>Work supervisors and crew members are responsible for developing and discussing field emergency evacuation procedures (EEP) and alternatives in the event a person(s) becomes seriously ill or injured at the worksite.</p>	
<p><b>Blocks 1, 2, 3, 4, 5, and 6:</b> Self-explanatory.</p>	<p>Be prepared to provide the following information:</p>	
<p><b>Block 7:</b> Identify all tasks and procedures associated with the work project or activity that have potential to cause injury or illness to personnel and damage to property or material. Include emergency evacuation procedures (EEP).</p>	<ul style="list-style-type: none"> <li>a. Nature of the accident or injury (avoid using victim's name).</li> <li>b. Type of assistance needed, if any (ground, air, or water evacuation)</li> <li>c. Location of accident or injury, best access route into the worksite (road name/number), identifiable ground/air landmarks.</li> <li>d. Radio frequency(s).</li> <li>e. Contact person.</li> <li>f. Local hazards to ground vehicles or aviation.</li> <li>g. Weather conditions (wind speed &amp; direction, visibility, temp).</li> <li>h. Topography.</li> <li>i. Number of person(s) to be transported</li> <li>j. Estimated weight of passengers for air/water evacuation.</li> </ul>	
<p><b>Block 8:</b> Identify all known or suspect hazards associated with each respective task/procedure listed in block 7. For example:</p> <ul style="list-style-type: none"> <li>a. Research past accidents/incidents</li> <li>b. Research the Health and Safety Code, FSH 6709.11 or other appropriate literature.</li> <li>c. Discuss the work project/activity with participants</li> <li>d. Observe the work project/activity</li> <li>e. A combination of the above</li> </ul>	<p>The items listed above serve only as guidelines for the development of emergency evacuation procedures.</p>	
<p><b>Block 9:</b> Identify appropriate actions to reduce or eliminate the hazards identified in block 8. Abatement measures listed below are in the order of the preferred abatement method:</p> <ul style="list-style-type: none"> <li>a. Engineering Controls (the most desirable method of abatement). For example, ergonomically designed tools, equipment, and furniture.</li> <li>b. Substitution. For example, switching to high flash point, non-toxic solvents.</li> <li>c. Administrative Controls. For example, limiting exposure by reducing the work schedule; establishing appropriate procedures and practices.</li> <li>d. PPE (least desirable method of abatement). For example, using hearing protection when working with or close to portable machines (chain saws, rock drills portable water pumps)</li> <li>e. A combination of the above.</li> </ul>	<p><b>JHA and Emergency Evacuation Procedures Acknowledgment</b> We, the undersigned work leader and crew members, acknowledge participation in the development of this JHA (as applicable) and accompanying emergency evacuation procedures. We have thoroughly discussed and understand the provisions of each of these documents:</p>	
<p><b>Block 10:</b> The JHA must be reviewed and approved by a line officer. Attach a copy of the JHA as justification for purchase orders when procuring PPE.</p>	<p><b>SIGNATURE</b> <b>DATE</b></p>	<p><b>SIGNATURE</b> <b>DATE</b></p>
<p><b>Blocks 11, 12 and 13:</b> Self-explanatory.</p>	<p>_____</p> <p><b>Work Leader</b></p>	<p>_____</p>
	<p>_____</p>	<p>_____</p>
	<p>_____</p>	<p>_____</p>
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	<p>_____</p>	<p>_____</p>
	<p>_____</p>	<p>_____</p>
	<p>_____</p>	<p>_____</p>
	<p>_____</p>	<p>_____</p>

## Appendix 7: Radio Communication Frequencies

### Group 1

### Fire Mixed

Channel	Label	Rx Freq	CG	NAC	Tx Freq	CG	NAC
1	Big Cypress Local	172.42500	0.0	0659	172.42500	0.0	0659
2	Oasis Repeater	172.42500	103.5	1035	171.62500	103.5	1035
3	Carnestown Repeater	172.42500	103.5	1035	170.10000	103.5	1035
4	Big Cypress TAC	167.95000	0.0	0659	167.95000	0.0	0659
5	Panther Local	168.20000	0.0	0659	168.20000	0.0	0659
6	Panther Repeater	164.62500	0.0	0115	163.15000	118.8	0115
7	Red	154.26500	0.0	0659	154.26500	0.0	0659
8	White	154.28000	0.0	0659	154.28000	0.0	0659
9	Blue	154.29500	0.0	0659	154.29500	0.0	0659
10	Division of Forestry Repeater	159.45000	0.0	1273	159.45000	0.0	1273
11	Division of Forestry Mobile	159.31500	0.0	0659	159.31500	0.0	0659
12	TAC 9TE	151.23500	0.0	0659	151.23500	0.0	0659
13	TAC 10E	151.29500	0.0	0659	151.29500	0.0	0659
14	Bureau of Indian Affairs Repeater	167.12500	103.5	0659	166.32500	103.5	0659
15	Bureau of Indian Affairs Local	167.12500	0.0	0659	167.12500	0.0	0659
16	Air Guard	168.62500	0.0	0659	168.62500	0.0	0659

### Group 2

### Fire Digital

Channel	Label	Rx Freq	CG	NAC	Tx Freq	CG	NAC
1	Big Cypress Local	172.42500	0.0	0659	172.42500	0.0	0659
2	Oasis Repeater	172.42500	103.5	1035	171.62500	103.5	1035
3	Carnestown Repeater	172.42500	103.5	1035	170.10000	103.5	1035
4	Big Cypress TAC	167.95000	0.0	0659	167.95000	0.0	0659
5	Panther Local	168.20000	0.0	0659	168.20000	0.0	0659
6	Panther Repeater	164.62500	0.0	0115	163.15000	118.8	0115
7	Red	154.26500	0.0	0659	154.26500	0.0	0659
8	White	154.28000	0.0	0659	154.28000	0.0	0659
9	Blue	154.29500	0.0	0659	154.29500	0.0	0659
10	Division of Forestry Repeater	159.45000	0.0	1567	159.45000	0.0	1273
11	Division of Forestry Mobile	159.31500	0.0	0659	159.31500	0.0	0659
12	TAC 9TE	151.23500	0.0	0659	151.23500	0.0	0659
13	TAC 10E	151.29500	0.0	0659	151.29500	0.0	0659
14	Bureau of Indian Affairs Repeater	167.12500	0.0	0659	166.32500	103.5	0659

15	Bureau of Indian Affairs Local	167.12500	0.0	0659	167.12500	0.0	0659
16	Air Guard	168.62500	0.0	0659	168.62500	0.0	0659

**Group 3 Fire Mixed**

Channel	Label	Rx Freq	CG	NAC	Tx Freq	CG	NAC
1	Big Cypress Local	172.42500	0.0	0659	172.42500	0.0	0659
2	Oasis Repeater	172.42500	103.5	1035	171.62500	103.5	1035
3	Carnestown Repeater	172.42500	103.5	1035	170.10000	103.5	1035
4	Big Cypress TAC	167.95000	0.0	0659	167.95000	0.0	0659
5	Everglades Local	172.52500	0.0	0659	172.52500	0.0	0659
6	LPK Repeater	172.52500	0.0	1365	171.72500	136.5	1365
7	Flamingo	172.52500	0.0	1365	171.62500	127.3	1273
8	Pinecrest Complex	172.52500	0.0	1365	171.62500	146.2	1462
9	Fire Local EARC	171.77500	0.0	0659	171.77500	0.0	0659
10	Fire Repeater	171.77500	0.0	1567	172.77500	156.7	1567
11	East Everglades	171.77500	0.0	1567	172.77500	127.3	1273
12	Red	154.26500	0.0	0659	154.26500	0.0	0659
13	White	154.28000	0.0	0659	154.28000	0.0	0659
14	Blue	154.29500	0.0	0659	154.29500	0.0	0659
15	Division of Forestry Mobile	159.31500	0.0	0659	159.31500	0.0	0659
16	Air Guard	168.62500	0.0	0659	168.62500	0.0	0659

**Group 4 Fire Digital**

Channel	Label	Rx Freq	CG	NAC	Tx Freq	CG	NAC
1	Big Cypress Local	172.42500	0.0	0659	172.42500	0.0	0659
2	Oasis Repeater	172.42500	0.0	1035	171.62500	103.5	1035
3	Carnstown Repeater	172.42500	0.0	1035	170.10000	103.5	1035
4	Big Cypress TAC	167.95000	0.0	0659	167.95000	0.0	0659
5	Everglades Local	172.52500	0.0	0659	172.52500	0.0	0659
6	LPK Repeater	172.52500	0.0	1365	171.72500	136.5	1365
7	Flamingo	172.52500	0.0	1365	171.62500	127.3	1273
8	Pinecrest Complex	172.52500	0.0	1365	171.62500	146.2	1462
9	Fire Local EARC	171.77500	0.0	0659	171.77500	0.0	0659
10	Fire Repeater	171.77500	0.0	1567	172.77500	156.7	1567
11	East Everglades	171.77500	0.0	1567	172.77500	127.3	1273
12	Red	154.26500	0.0	0659	154.26500	0.0	0659
13	White	154.28000	0.0	0659	154.28000	0.0	0659
14	Blue	154.29500	0.0	0659	154.29500	0.0	0659
15	Division of Forestry Mobile	159.31500	0.0	0659	159.31500	0.0	0659
16	Air Guard	168.62500	0.0	0659	168.62500	0.0	0659

**Group 5 Big Cypress Mix**

Channel	Label	Rx Freq	CG	NAC	Tx Freq	CG	NAC
1	Everglades	172.52500	0.0	0659	172.52500	0.0	0659
2	Research Repeater	172.52500	0.0	1365	171.62500	136.5	1365
3	Flamingo Repeater	172.52500	0.0	1365	171.62500	127.3	1273
4	Key Largo Repeater	172.52500	0.0	1365	171.62500	118.8	1188
5	Pinecrest Repeater	172.52500	0.0	1365	171.62500	146.2	1462
6	Gulf Coast Repeater	172.52500	0.0	1365	171.62500	156.7	1567
7	East Everglades INS	172.52500	0.0	1365	171.62500	162.2	1622
8	Biscayne Simplex	172.67500	0.0	0659	172.67500	0.0	0659
9	Elliott Key	172.67500	0.0	0659	171.67500	114.8	1148
10	Cape Florida	172.67500	0.0	0659	171.67500	123.0	1230
11	Convoy Point	172.67500	0.0	0659	171.67500	103.5	1035
12	Customs Simplex	164.77500	0.0	1000	164.77500	100.0	1000
13	Big Cypress	172.42500	0.0	0659	172.42500	0.0	0659
14	Oasis Repeater	172.42500	0.0	1035	171.62500	103.5	1035
15	Carnestown Repeater	172.42500	0.0	1035	170.10000	103.5	1035
16	Weather	162.55000	0.0	0659	Inactive	0.0	0659

**Group 6 Big Cypress Digital**

Channel	Label	Rx Freq	CG	NAC	Tx Freq	CG	NAC
1	Everglades	172.52500	0.0	0659	172.52500	0.0	0659
2	Research Repeater	172.52500	0.0	1365	171.62500	136.5	1365
3	Flamingo Repeater	172.52500	0.0	1365	171.62500	127.3	1273
4	Key Largo Repeater	172.52500	0.0	1365	171.62500	118.8	1188
5	Pinecrest Repeater	172.52500	0.0	1365	171.62500	146.2	1462
6	Gulf Coast Repeater	172.52500	0.0	1365	171.62500	156.7	1567
7	East Everglades INS	172.52500	0.0	1365	171.62500	162.2	1622
8	Biscayne Simplex	172.67500	0.0	0659	172.67500	0.0	0659
9	Elliott Key	172.67500	0.0	0659	171.67500	114.8	1148
10	Cape Florida	172.67500	0.0	0659	171.67500	123.0	1230
11	Convoy Point	172.67500	0.0	0659	171.67500	103.5	1035
12	Customs Simplex	164.77500	0.0	1000	164.77500	100.0	1000
13	Big Cypress	172.42500	0.0	0659	172.42500	0.0	0659
14	Oasis Repeater	172.42500	0.0	1035	171.62500	103.5	1035
15	Carnestown Repeater	172.42500	0.0	1035	170.10000	103.5	1035
16	Weather	162.55000	0.0	0659	Inactive	0.0	0659

**Group 7**

**VRP Mix No E**

Channel	Label	Rx Freq	CG	NAC	Tx Freq	CG	NAC
1	Everglades	172.52500	0.0	0659	172.52500	0.0	0659
2	Research Repeater	172.52500	0.0	1365	171.62500	136.5	1365
3	Flamingo Repeater	172.52500	0.0	1365	171.62500	127.3	1273
4	Key Largo Repeater	172.52500	0.0	1365	171.62500	118.8	1188
5	Pinecrest Repeater	172.52500	0.0	1365	171.62500	146.2	1462
6	Gulf Coast Repeater	172.52500	0.0	1365	171.62500	156.7	1567
7	East Everglades INS	172.52500	0.0	1365	171.62500	162.2	1622
8	Biscayne Simplex	172.67500	0.0	0659	172.67500	0.0	0659
9	Elliott Key	172.67500	0.0	0659	171.67500	114.8	1148
10	Cape Florida	172.67500	0.0	0659	171.67500	123.0	1230
11	Convoy Point	172.67500	0.0	0659	171.67500	103.5	1035
12	Customs Simplex	164.77500	0.0	1000	164.77500	100.0	1000
13	Big Cypress	172.42500	0.0	0659	172.42500	0.0	0659
14	Oasis Repeater	172.42500	0.0	1035	171.62500	103.5	1035
15	Carnestown Repeater	172.42500	0.0	1035	170.10000	103.5	1035
16	Weather	162.55000	0.0	0659	Inactive	0.0	0659

**Group 8**

**VRP Digital NO E**

Channel	Label	Rx Freq	CG	NAC	Tx Freq	CG	NAC
1	Everglades	172.52500	0.0	0659	172.52500	0.0	0659
2	Research Repeater	172.52500	0.0	1365	171.62500	136.5	1365
3	Flamingo Repeater	172.52500	0.0	1365	171.62500	127.3	1273
4	Key Largo Repeater	172.52500	0.0	1365	171.62500	118.8	1188
5	Pinecrest Repeater	172.52500	0.0	1365	171.62500	146.2	1462
6	Gulf Coast Repeater	172.52500	0.0	1365	171.62500	156.7	1567
7	East Everglades INS	172.52500	0.0	1365	171.62500	162.2	1622
8	Biscayne Simplex	172.67500	0.0	0659	172.67500	0.0	0659
9	Elliott Key	172.67500	0.0	0659	171.67500	114.8	1148
10	Cape Florida	172.67500	0.0	0659	171.67500	123.0	1230
11	Convoy Point	172.67500	0.0	0659	171.67500	103.5	1035
12	Customs Simplex	164.77500	0.0	1000	164.77500	100.0	1000
13	Big Cypress	172.42500	0.0	0659	172.42500	0.0	0659
14	Oasis Repeater	172.42500	0.0	1035	171.62500	103.5	1035
15	Carnestown Repeater	172.42500	0.0	1035	170.10000	103.5	1035
16	Weather	162.55000	0.0	0659	Inactive	0.0	0659

## Appendix 8: Threatened and Endangered Animal Species

		Designated Status		
COMMON NAME	SCIENTIFIC NAME	Federal	State of Florida (FWC)	Typically Found Habitats
Birds				
Roseate spoonbill	<i>Ajaia ajaja</i>		SSC	marsh, prairie
Cape Sable seaside sparrow	<i>Ammodramus maritimus mirabilis</i>	E	E	southern prairies (only)
Limpkin	<i>Aramus guarauna</i>		SSC	freshwater marsh and swamp, mangroves
Piping plover	<i>Charadrius melodus</i>	T	T	freshwater and estuarine banks
White-crowned pigeon	<i>Columba leucocephala</i>		T	rare; mangroves
Little blue heron	<i>Egretta caerulea</i>		SSC	freshwater and estuarine
Reddish egret	<i>Egretta rufescens</i>		SSC	freshwater and estuarine
Snowy egret	<i>Egretta thula</i>		SSC	ocean shore, estuarine, and freshwater banks
Tri-colored heron	<i>Egretta tricolor</i>		SSC	marsh
White ibis	<i>Eudocimus albus</i>		SSC	marsh
Arctic peregrine falcon	<i>Falco peregrinus tundrius</i>		E	rare; in winter only
Florida sandhill crane	<i>Grus canadensis pratensis</i>		T	fresh and saltwater marsh
Wood stork	<i>Mycteria americana</i>	E	E	freshwater marshes
Osprey	<i>Pandion haliaetus</i>		SSC	freshwater and estuarine
Brown pelican	<i>Pelecanus occidentalis</i>		SSC	ocean shore and estuarine
Red-cockaded woodpecker	<i>Picoides borealis</i>	E	SSC	open story pineland
Everglades Snail kite	<i>Rostrhamus sociabilis</i>	E	E	freshwater marsh (feed mainly on apple snails)
Caracara, Audobon's Crested	<i>Polyborus aristodemus poneanus</i>	T	T	rare
Black skimmer	<i>Rynchops niger</i>		SSC	rare; ocean shore and estuarine
Least tern	<i>Sterna antillarum</i>		T	rare; ocean shore and estuarine

Mammals				
Everglades mink	<i>Mustela vison evergladensis</i>		T	throughout - forests with direct water source
Florida bonneted bat	<i>Eumops Floridanus</i>	C	E	Throughout – roost in palms and hollow trees
Florida panther	<i>Puma concolor coryi</i>	E	E	throughout
Mountain lion	<i>Puma concolor</i>	E	E	throughout
Big Cypress fox squirrel	<i>Sciurus niger avicennia</i>		T	pinelands and hammocks
West Indian manatee	<i>Trichechus manatus</i>	E	E	ocean and canal systems
Florida black bear	<i>Ursus americanus floridanus</i>		T	throughout
Mollusks				
Florida tree snail	<i>Liguus fasciatus</i>		SSC	hammocks
Reptiles				
American alligator	<i>Alligator mississippiensis</i>	SAT	SSC	throughout - typically near freshwater source
American crocodile	<i>Crocodylus acutus</i>	T	E	rare; saltwater and estuarine
Eastern indigo snake	<i>Drymarchon corais couperi</i>	T	T	pineland
Fish				
Rivulus	<i>Rivulus marmoratus</i>		SSC	mangroves

SOURCES: USFWS 2006; Florida Fish and Wildlife Conservation Commission 2006c; Florida Natural Areas Inventory 2006.

Species in this table include those that have been documented in the Preserve; it does not include listed species for Collier County that are not present in the Preserve.

E = Endangered      S/A = Similarity of appearance to a threatened or endangered species

T = Threatened      SSC= Species of special concern

C= Candidate Species



## Appendix 9: Threatened and Endangered Plant Species

Scientific Name	Common Name	State	IRC	Fed	Scientific Name	Common Name	State	IRC	Fed
<i>Abrus precatorius</i>	Rosary-pea, Crab-eyes				<i>Lilium catesbaei</i>	Catesby's lily, Pine lily	T		
<i>Acacia auriculiformis</i>	Earleaf acacia				<i>Limnophila sessiliflora</i>	Asian marshweed			
<i>Acoelorrhaphe wrightii</i>	Paurotis palm, Everglades palm	T			<i>Linum carteri</i> var. <i>smallii</i>	Small's flax	E		
<i>Acrostichum aureum</i>	Golden leather fern	T			<i>Liparis nervosa</i>	Pantropical widelip orchid	E	SF1	
<i>Adiantum tenerum</i>	Brittle maidenhair	E			<i>Lipocarpa maculata</i>	American halfchaff sedge		SFX	
<i>Aeschynomene pratensis</i>	Sensitive joint-vetch, Meadow joint-vetch	E			<i>Lantana depressa</i> var. <i>sanibelensis</i>	West coast lantana, Sanibel shrubverbena	E		
<i>Agalinis filifolia</i>	Seminole false foxglove		SF1		<i>Leucaena leucocephala</i>	White leadtree			
<i>Agalinis linifolia</i>	Flaxleaf false foxglove				<i>Lilium catesbaei</i>	Catesby's lily, Pine lily	T		
<i>Agave sisalana</i>	Sisal-hemp				<i>Limnophila sessiliflora</i>	Asian marshweed			
<i>Albizia lebeck</i>	Woman's tongue, Rattlepod				<i>Linum carteri</i> var. <i>smallii</i>	Small's flax	E		
<i>Aletris bracteata</i>	White calic-root, bracted calic-root	E			<i>Liparis nervosa</i>	Pantropical widelip orchid	E	SF1	
<i>Alternanthera philoxeroides</i>	Alligatorweed				<i>Lipocarpa maculata</i>	American halfchaff sedge		SFX	
<i>Amorpha herbacea</i>	Clusterspike indigobush		SFH		<i>Lobelia homophylla</i>	Pineland lobelia		SF1	
<i>Anagallis minima</i>	Chaffweed		SF1		<i>Lycopodiella cernua</i>	Nodding club-moss	C		
<i>Anagallis pumila</i>	Florida pimpernel		SF1		<i>Lygodium japonicum</i>	Japanese climbing fern			
<i>Angadenia berteroi</i>	Pineland-allamanda, Pineland golden trumpet	T			<i>Lygodium microphyllum</i>	Small-leaf climbing fern			
<i>Ardisia elliptica</i>	Shoebuttan Ardisia				<i>Lyonia ferruginea</i>	Rusty lyonia, Rusty staggerbush		SFH	
<i>Asplenium erosum</i>	Eared spleenwort	E	SF1		<i>Malachra urens</i>	Roadside leafbract		SF1	
<i>Asplenium serratum</i>	Bird's-foot fern, wild bird's-foot fern	E			<i>Manilkara zapota</i>	Sapodilla			
<i>Aster tortifolius</i>	Dixie aster, Whitetop aster		SF1		<i>Maxillaria crassifolia</i>	Hidden orchid	E	SF1	
<i>Bartonia paniculata</i>	Twining screwworm		SF1		<i>Melaleuca quinquenervia</i>	Punktree			
<i>Bartonia virginica</i>	Yellow screwworm		SF1		<i>Melanthera parvifolia</i>	Pineland blackanthers	T		
<i>Bauhinia variegata</i>	Mountain ebony, orchidtree				<i>Melia azedarach</i>	Chinaberrytree			
<i>Begonia cucullata</i>	Wax begonia, Club begonia				<i>Micranthemum umbrosum</i>	Shade mudflower		SF1	
<i>Bischofia javanica</i>	Javanese bishopwood				<i>Microgramma heterophylla</i>	Climbing vine fern	E		
<i>Bletia purpurea</i>	Pinepink	T			<i>Myrcianthes fragrans</i>	Twinberry, Simpson's stopper	T		
<i>Burmannia flava</i>	Fakahatchee bluethead	E	SF1		<i>Najas wrightiana</i>	Wright's waternymph		SF1	
<i>Calopogon multiflorus</i>	Manyflowered grasspink	E			<i>Nelumbo lutea</i>	Yellow lotus, American lotus		SF1	
<i>Calyptanthus pallens</i>	Spicewood, Pale lidflower	T			<i>Nephrolepis biserrata</i>	Giant sword fern	T		
<i>Campsis radicans</i>	Trumpet vine, Trumpet creeper		SF1		<i>Nephrolepis cordifolia</i>	Tuberous sword fern			
<i>Campylocentrum pachyrrhizum</i>	Leafless bentspur orchid	E	SF1		<i>Nephrolepis multiflora</i>	Asian sword fern			
<i>Campyloneurum angustifolium</i>	Narrow strap fern, Narrow-leaved strap	E	SF1		<i>Negaudia reynaudiana</i>	Burmareed, Silkreed			
<i>Campyloneurum costatum</i>	Tailed strap fern	E	SF1		<i>Ocimum campechianum</i>	Wild basil, Wild sweet basil	E		
<i>Carex comosa</i>	Longhair sedge		SF1		<i>Oeceoclades maculata</i>	African ground orchid,			
<i>Carex gigantea</i>	Giant sedge		SF1		<i>Oncidium ensatum</i>	Florida dancinglady orchid	E	SF1	
<i>Carex verrucosa</i>	Warty sedge		SF1		<i>Ophioglossum palmatum</i>	Hand fern	E		
<i>Casuarina equisetifolia</i>	Australian-pine, Horsetail casuarina				<i>Opuntia stricta</i>	Erect pricklypear	T		
<i>Casuarina glauca</i>	Suckering Australian- pine, Gray sheoak				<i>Osmunda regalis</i> var. <i>spectabilis</i>	Royal fern	C		
<i>Catopsis berteroniana</i>	Powdery strap airplant	E			<i>Panicum repens</i>	Torpedo grass			
<i>Catopsis floribunda</i>	Florida strap airplant	E			<i>Passiflora pallens</i>	Pineland passionflower	E		
<i>Cestrum diurnum</i>	Dayflowering jessamine				<i>Pectinophila sp.</i> var. <i>caespitosa</i>	Comb polypody	E		
<i>Chamaesyce pergamena</i>	Southern Florida sandmat	T			<i>Pennisetum purpureum</i>	Napier grass, Elephantgrass			
<i>Chamaesyce portieriana</i>	Porter's sandmat	E			<i>Penstemon multiflorus</i>	Manyflower beardtongue			
<i>Chrysophyllum oliviforme</i>	Satinleaf	T			<i>Peperomia alata</i>	Winged peperomia		SF1	
<i>Chrysopsis mariana</i>	Mariana goldenaster		SF1		<i>Peperomia glabella</i>	Cypress peperomia	E	SF1	

Scientific Name	Common Name	State	IRC	Fed	Scientific Name	Common Name	State	IRC	Fed
Chrysopsis subulata	Scrubland goldenaster		SFH		Peperomia obtusifolia	Florida peperomia,	E		
Clitoria mariana	Butterfly pea, Atlantic pigeonwing	SF1			Peperomia rotundifolia	Yerba linda	E	SF1	
Colocasia esculenta	Wild taro, Dasheen, Coco-yam				Phanopyrum gymnocarpon	Savannah panicum		SF1	
Colubrina arborescens	Coffee colubrina, Greenheart	E			Phoradendron leucarpum	Mistletoe, Oak mistletoe		SF1	
Cordia globosa	Butterflybush, Curacao bush	E			Phyla stoechadifolia	Southern fogfruit	E		
Crossopetalum ilicifolium	Quailberry, Christmasberry	T			Pinguicula lutea	Yellow butterwort	T	SF1	
Croton humilis	Pepperbush	E	SF1		Pistia stratiotes	Water-lettuce			
Ctenitis sloanei	Florida tree fern, Red-hair camb fern	E			Polygala polygama	Racemed milkwort		SF1	
Cynanchum blodgettii	Blodgett's swallowwort	T			Polygala verticillata var. iracunda			SF1	
Cyperus involucratus	Umbrella plant				Polygonum setaceum	Bog smartweed		SF1	
Cyperus prolifer	Drauf papyrus, miniature Faltrodgo				Polyradicion lindenii	Ghost orchid, Palmpolly	E		
Cyrtopodium punctatum	Cowhorn orchid, Cigar orchid	E			Polystachya concreta	Greater yellowspike orchid	E		
Dalbergia sissoo	Indian rosewood				Psidium cattleianum	Strawberry guava			
Dalea carnea	Whitetassels				Psidium guajava	Guava			
Dalea carthagenensis	Florida prairieclover	E	SF1	C	Pteris bahamensis	Bahama ladder brake	T		
Desmodium floridanum	Florida ticktrefoil		SF1		Pteris vittata	China brake			
Digitaria filiformis var.	Caribbean crabgrass	T			Reimarochloa oligostachys	Florida reimargrass		SF1	
Digitaria filiformis var.	Shaggy crabgrass				Rhexia petiolata	Fringed meadowbeauty		SF1	
Digitaria longiflora	Indian crabgrass				Rhynchosyris repens	Rose Natalgrass			
Digitaria pauciflora	Everglades crabgrass,	E	SF1	C	Rhynchosia minima	Least snoutbean			
Dioscorea bulbifera	Common air-potato				Rhynchosia swartzii	Swartz's snoutbean	E	SF1	
Drypetes lateriflora	Guiana-plum	T			Rhynchospora brevifolia	Shortbristle beaksedge		SF1	
Echinodorus berteroi	Upright burrhead		SFH		Ricinus communis	Castor-bean			
Eichhornia crassipes	Common water-hyacinth				Roystonea regia	Royal palm, Florida royal palm	E		
Eleocharis albida	White spikerush		SF1		Ruellia tweediana				
Eleocharis montevidensis	Sand spikerush		SF1		Saccolola lanceolata	Leafless beaked lady's-tresses	T		
Elephantopus carolinianus	Carolina elephant'sfoot		SF1		Sageretia minutiflora	Buckthorn, Smallflower mock buckthorn		SF1	
Elytraria carolinensis	Carolina scalystem		SFH		Salvia lyrata	Lyre-leaved sage		SF1	
Encyclia cochleata	Clamshell orchid, cockleshell orchid	E			Salvia riparia	Southern River Sage		SF1	
Encyclia tampensis	Florida butterfly orchid	C			Sansevieria hyacinthoides	Bowstring-hemp, Mother-in-laws tongue			
Epidendrum anceps	Dingy-flowered star orchid	E			Schefflera actinophylla	Australian umbrellatree			
Epidendrum blanchetianum	Acuna's star orchid	E	SFX		Schinus terebinthifolius	Brazilian-pepper			
Epidendrum floridense	Umbrella star orchid	E			Schizaea pennula	Ray fern	E	SF1	
Epidendrum nocturnum	epidendrum, Night-scented orch	E			Scirpus californicus	Giant bulrush, California bulrush		SF1	
Epidendrum rigidum	Stiff-flower star orchid	E			Scleria lithosperma	Florida Keys nutrush	E		
Epipremnum pinnatum	Golden pothos				Senna pendula var. glabrata	Valamuerto			
Eragrostis hypnoides	Teal love grass		SF1		Sideroxylon reclinatum subsp.	Everglades bully			C
Eragrostis tracyi	Sanibel Island love grass	E	SF1		Solanum verbascifolium	Mullein nightshade	T		
Eugenia uniflora	Surinam-cherry				Solanum viarum	Tropical soda-apple			
Eupatorium compositifolium	Dog fennel, Yankeeweed		SF1		Spermacoce terminalis	Everglades Keys false buttonweed	T		
Euthamia graminifolia var. hirtipes	Flattop goldenrod		SF1		Spiranthes brevifolia	Texas ladiestresses	E	SFH	
Ficus altissima	Council tree				Spiranthes laciniata	Lacelip lady's-tresses	T		
Ficus microcarpa	Laurel fig, Indian laurel				Spiranthes longilabris	Longlip lady's-tresses	T		
Gaura angustifolia	Southern gaura, Southern beeblossom	E			Spiranthes torta	Southern lady's-tresses	E	SF1	
Glandularia maritima	Beach verbena, Coastal mock vervain	E	SFX		Swietenia mahagoni	West Indian mahogany	T		

Scientific Name	Common Name	State	IRC	Fed	Scientific Name	Common Name	State	IRC	Fed
Gossypium hirsutum	Wild cotton, Upland cotton	E			Syngonium podophyllum	Nepthytis, American evergreen			
Gratiola pilosa	Shaggy hedgehyssop		SF1		Syzygium cumini	Jambolan-plum, Java-plum			
Guzmania monostachia	West Indian tufted airplant	E			Syzygium jambos	Rose-apple, Malabar-plum			
Gymnopogon brevifolius	Slim skeleton grass, Shortleaf skeleton grass		SF1		Tectaria heracleifolia	Broad halbard fern	T		
Gymnopogon chapmanianus	Chapman's skeleton grass		SF1		Tephrosia angustissima var. curtissii	Curtiss' Hoarypea	E		
Habenaria nivea	Snowy orchid	T			Tephrosia spicata	Spiked hoarypea		SF1	
Harrisella porrecta	Needleroot airplant orchid	T			Terminalia catappa	Tropical almond, West Indian almond			
Helianthus radula	Stiff sunflower		SF1		Thelypteris bipinnata var. serrulata	Hairy maiden fern		SF1	
Hibiscus coccineus	Scarlet rosemallow		SF1		Thelypteris reticulata	Lattice-vein fern	E	SF1	
Hibiscus grandiflorus	Swamp hibiscus, Swamp rosemallow				Thespesia populnea	Portia tree			
Hibiscus poeppigii	Poeppig's rosemallow	E			Tillandsia balbisiana	Redland wild-pine, Northern needleleaf	T		
Hibiscus tiliaceus	Seaside mahoe, Sea hibiscus, mahoe				Tillandsia fasciculata var. densispica	Slit-leaved wild-pine, Cardinal airplant	E		
Huperzia dichotoma	Hanging club-moss	E	SF1		Tillandsia flexuosa	Banded wild-pine, Twisted airplant	T		
Hydrilla verticillata	Water-thyme				Tillandsia paucifolia	Twisted wild-pine, Palmetto airplant			
Hymenocallis amplexicaulis	Trompetilla				Tillandsia pruinosa	Hoary wild-pine, Fungus airplant	E	SF1	
Hypericum cruz-andreae	St. Peter's-wort		SF1		Tillandsia utriculata	Giant wild-pine, Giant airplant	E		
Hypericum punctatum	Spotted St. John's-wort		SF1		Tillandsia variabilis	Soft-leaved wild-pine, Leatherleaf airplant	T		
Imperata cylindrica	Congongrass, Cogongrass				Tournefortia hirsutissima	Chiggery grapes	E		
Ionopsis utricularioides	Delicate violet orchid	E	SF1		Tradescantia spathacea	Spiderplant, Maunabo-heron-lily, Devil's lily			
Ipomoea tenuissima	Rockland morningglory	E			Trichomanes holopterum	Entire-winged bristle fern	E	SF1	
Isoetes flaccida	Florida quillwort		SF1		Trichostema octandrum	Hoopvine	E	SF1	
Jacquemontia curtisii	Pineland clustervine	T			Tripsacum floridanum	Florida gamagrass	T		
Jacquemontia pentanthos	Skyblue clustervine	E			Urena lobata	Caesarweed			
Juncus repens	Lesser creeping rush		SF1		Urochloa fasciculata var. reticulata	Browntop signalgrass			
Lachnocaulon engleri	Engler's bogbutton		SF1		Urochloa mutica	Paragrass			
Lachnocaulon minus	Small's bogbutton		SF1		Utricularia juncea	Southern bladderwort		SF1	
Lactuca floridana	Woodland lettuce		SF1		Vanilla phaeantha	Leafy vanilla	E	SF1	
Lantana camara	Shrubverbena				Viola palmata	Early blue violet		SF1	
Lantana depressa var. floridana	Eastwood lantana, Florida shrubverbena	E	SF1		Wedelia trilobata	Creeping wedelia, Creeping oxeye			
Lantana depressa var. sanibelenis	Westwood lantana, Sanibel shrubverbena	E			Woodwardia areolata	Netted chain fern		SF1	
Leucaena leucocephala	White leadtree				Zephyranthes simpsonii	Rain-lily, Redmargin zephyrlily	T		

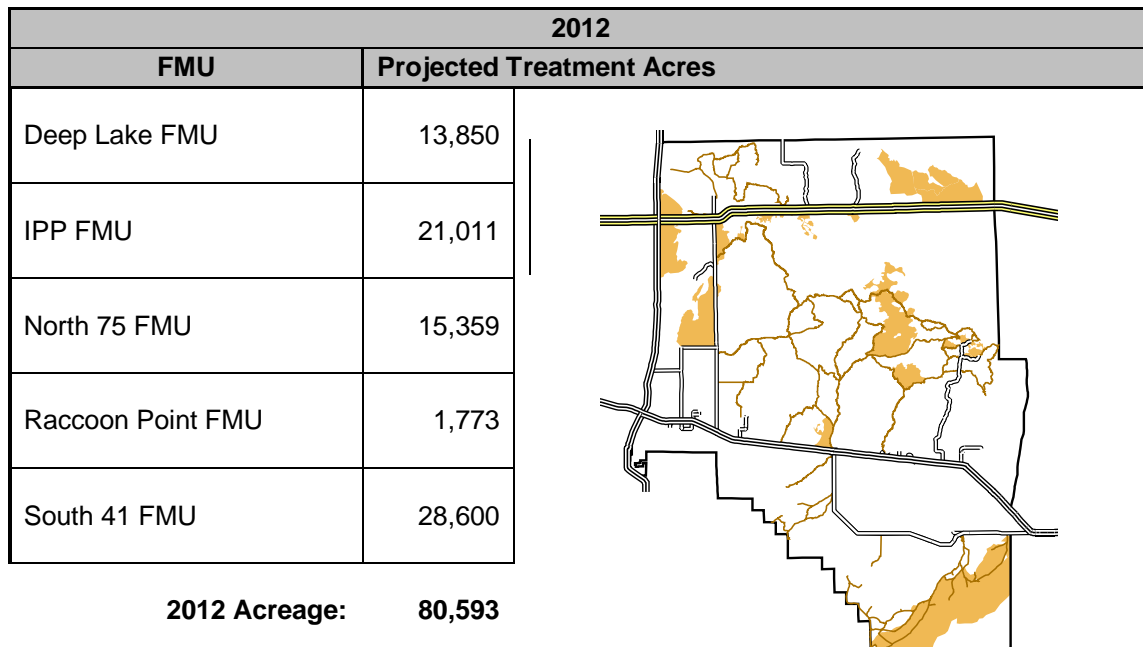
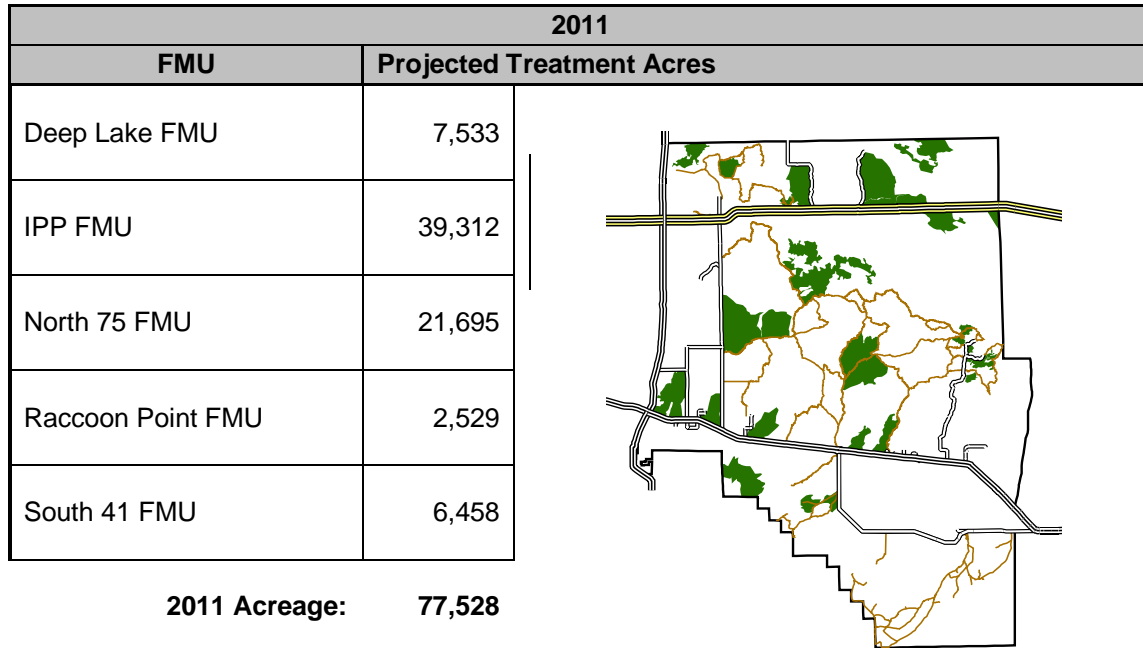
Candidate = species is a candidate for listing as threatened or endangered

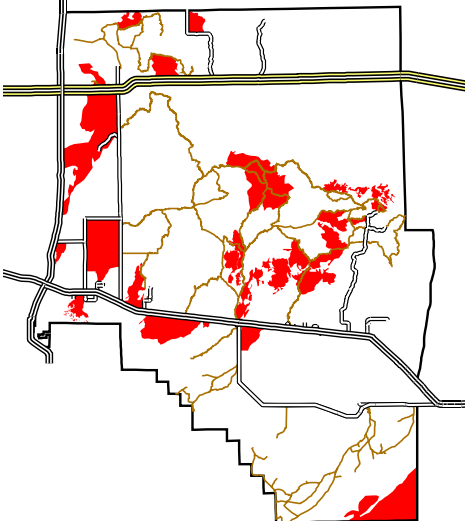
CE = Commercially exploited

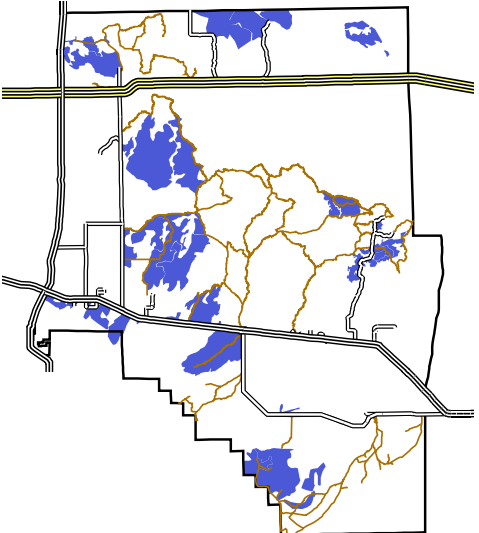
E = Endangered

## Appendix 10: 5 Year Fuel Treatment Progression

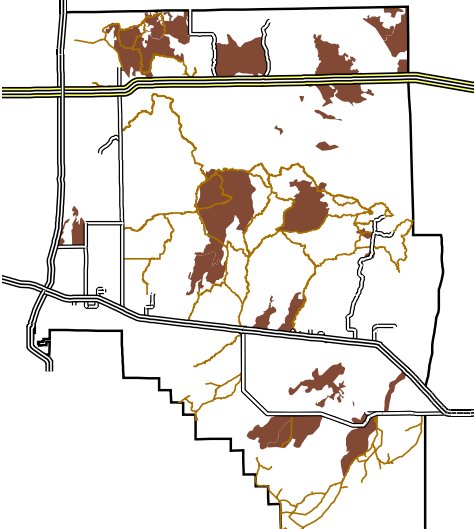
The management objectives and the placement of prior fuels treatments have led to the formulation of projected Five Year Fuels Treatment Projection. The illustrations shown in Appendix J depict intended patterns of prescribed burning in order to achieve the goal of a 3-to-5-year fire return interval Preserve-wide. These projections are intended to be useful for resource management, research, and other activities for which knowledge of fire introduction would provide planning benefits.



2013		
FMU	Projected Treatment Acres	
Deep Lake FMU	23,706	
IPP FMU	31,003	
North 75 FMU	6,732	
Raccoon Point FMU	948	
South 41 FMU	18,610	
<b>2013 Acreage: 81,000</b>		

2014		
FMU	Projected Treatment Acres	
Deep Lake FMU	0	
IPP FMU	39,634	
North 75 FMU	17,108	
Raccoon Point FMU	3,021	
South 41 FMU	22,661	
<b>2014 Acreage: 82,424</b>		

2015	
FMU	Projected Treatment Acres
Deep Lake FMU	2,291
IPP FMU	36,241
North 75 FMU	32,056
Raccoon Point FMU	688
South 41 FMU	17,685
2015 Acreage: 88,960	



## Appendix 11: "Why We Burn"

The following compilation represents the collective ideas of the Big Cypress Fire and Aviation Division demonstrating the rationale in support of planned ignitions:

- Urban interface treatments for protection of private lands & developments
- Reduced smoke emissions (improving air quality) over time vs. large fire impact, i.e. Deep Lake.
- Less expensive than wildland fire suppression
- Capture fires benefits under safer & more favorable weather conditions
- Fire ignitions typically prohibited during "natural/historic" fire season due to severity in unit or region
- Ecosystem Enhancements
- Training of fire personnel
- Visuals enhanced
- Native wildlife species habitat protected & improved (62% of turkey nests are in areas burned <2 yrs ago)
- New research indicates panthers choose to den in areas burned < 4 yrs ago.
- Restore historic fire-return interval
- Reduce competing brush/hardwood vegetation (applies to logging areas).
- Provide improved detection and access for treatment of exotic species treatment.
- Enhance recreational opportunities and improve access.
- Perpetuate fire-dependent species.
- Timing can reduce insect infestations and frequency hinders root disease in trees.
- Improved health of soil, and increase oxygenation in wetlands.
- Control exotic plants & animals
- Debris removal
- Research ecological role of fire
- Protect cultural sites
- Uncover/expose cultural sites & artifacts
- Reduce criminal fire activity (harder for arsons to ignite, & public is less motivated to start fires because the need has already been met by fire staff).

NOTE: Burning window is WIDER when your frequency is higher.

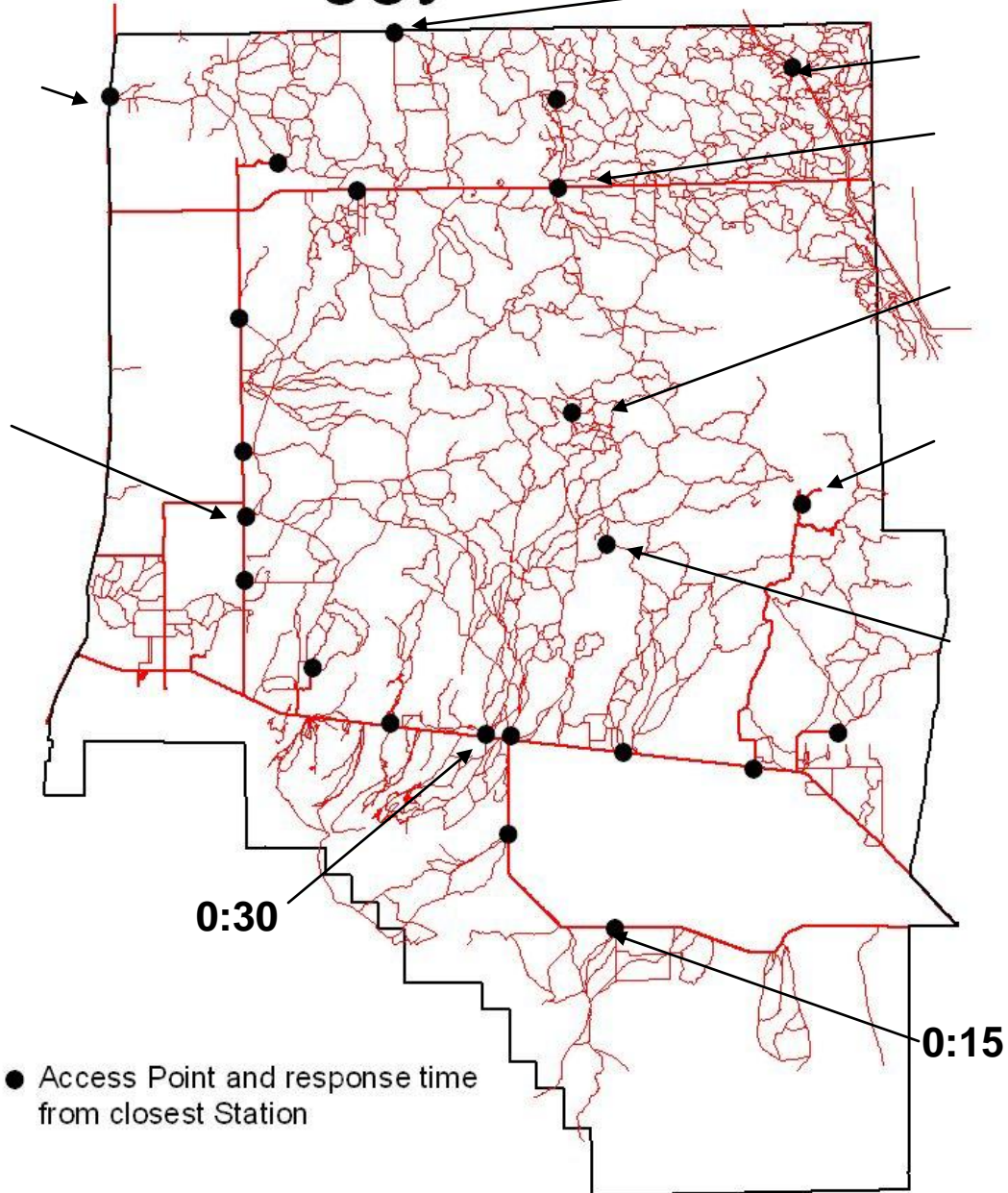
NOTE: Shrub resprouts don't need to be eliminated... they're natural part of ecosystem, source of food, etc. We are just trying to prevent succession.

*List compiled in 2008 by Big Cypress Fire Operations staff*



## Appendix L: "INITIAL ATTACK RESPONSE TIMES"

### Fire Buggy Access



## Appendix M: Annual Review Checklist

### Step 1. Terminology Reviewed

☐ No changes needed

Changes/Updates/Approvals documented via (check applicable):

☐ Memo to file

☐ Update summary sheet attached to FMP

☐ FMP updated and copies distributed

### Step 2. Decision Process References Reviewed

☐ No changes needed

Changes/Updates/ documented via (check applicable):

☐ Memo to file

☐ Update summary sheet attached to FMP

☐ FMP updated and copies distributed

### Step 3. Review Prohibitions

☐ No changes needed

Changes/Updates/ documented via (check applicable):

☐ Memo to file

☐ Update summary sheet attached to FMP

☐ FMP updated and copies distributed

### Step 4. Evaluate Changes to Scope or Effect

☐ No changes needed

Changes/Updates/ documented via (check applicable):

☐ Memo to file

☐ Update summary sheet attached to FMP

☐ FMP updated and copies distributed

## Appendix N: Fire Organizer and Strategic Fire Size-Up

<b>Incident Name</b>		
<b>Incident Number</b>		
<b>Accounting Code</b>		
<b>Other Code</b>		
<b>Unit</b>		
<b>Incident Commander</b>	<b>Time</b>	<b>Date</b>
<b>Yes</b>	<b>No</b>	<b>IC's Checklist</b>
		An Incident Complexity Analysis Has Been Completed.
		Risk Management Process Completed.
		Hazard Mitigation in Place.
		IRPG Briefing Checklist Used For All Incoming Resources and Documented.
		Work/Rest Guidelines Reviewed and Tracked.
		Personnel are Qualified for Positions.
		Performance Evaluations Completed for Resources Assigned from Outside Local Area.
		Type 3 IC Accepts No Collateral Duties Except for Unified Command and General Staff Positions.
<b>Yes</b>	<b>No</b>	<b>Management Checklist</b>
		After Incident Review by Agency Administrator, Fire Program Manager or Safety Program Manager.
		Signature: _____ Date: _____

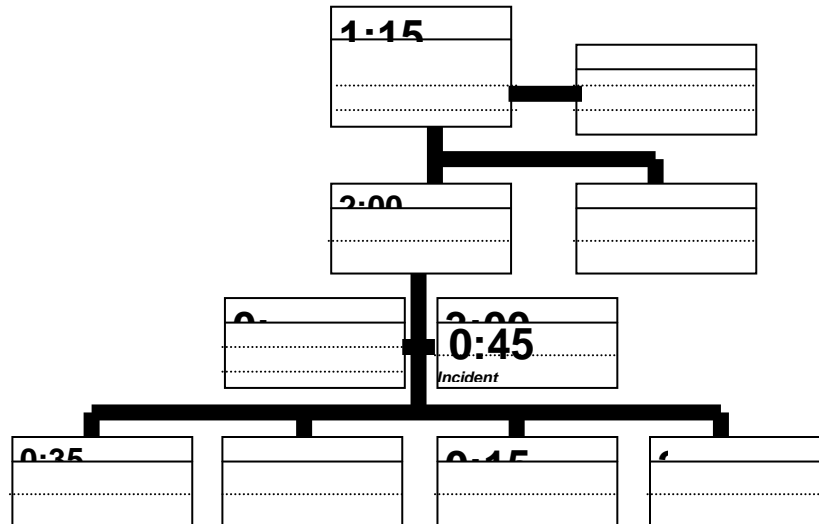
IC's Signature: \_\_\_\_\_

## Big Cypress National Preserve Fire Management Plan

Initial Attack Fire Size Up				
Fire Name:	Fire Number:		DOI:	
		USDA:		
IC Name		State:		
Arrival Date:		Arrival Time:		
Descriptive Location:				
Latitude:		Longitude:		
Reported By:				
Estimated Size in Acres:		Ownership:		
Estimated Containment	Date:		Time:	
Estimated Control	Date:		Time:	
Fire Investigator Needed?		If Yes, Name:		
Resources Responding (show how many of each)				
Engines (Type )	Handcrew (Type )		Handcrew (Type )	
Engines (Type )	Helicopter (Type )		Air Attack	
Engines (Type )	Air Tanker (Type )		Number of Loads:	
Water Tender (Type )	Air Tanker (Type )		Number of Loads:	
Initial Fire Size Up				
Are Any Structures Threatened?		If Yes-Specify		
Resistance to Control -    Low       Moderate       High       Extreme				
Hazard(s):				
Spread Potential -       Low       Moderate       High       Extreme				
Character of Fire:	Smoldering    Running    Torching		Crowning/Spotting	
	Creeping       Spotting    Crowning		Erratic	
Slope at Head of Fire	0-25%	26-41%	42-55%	56-75%    >76%
Position on Slope	Canyon Bottom		Lower 1/3	Middle 1/3
	Upper 1/3		Ridge Top	Saddle
	Flat/Rolling		Mesa/Plateau	
Fuel Type	1	2	3	4
	5	6	7	8
	9	10	11	12
Wind Speed in mph :				
Wind Direction:				
Relative Humidity:				

\* CALL INTO Big Cypress Fire IMMEDIATELY \*

Incident Objectives	Planning Check				
1. Firefighter and Public Safety.	Is there a life safety or evacuation problem?	No	Limited	Yes	In Progress
2.	Structure loss potential?	None	Possibly	High	Already Involved
3.	Environmental or archaeologically sensitive areas?	No	Limited	Yes	Unknown
4.	Resistance to Control?	None	Some	Moderate	High
Your goal is to manage the incident and not create another.	Multi-Agency	No	1	2	3+
	Do you have enough resources?	Yes	To be Determined	Not Sure	No
	Probability of success?	High	Moderate	Low	Poor



Radio Frequencies	
Net	Frequency
Command	Rx
	Tx
Support/Dispatch	Rx
	Tx
Air-to-Ground	Rx
	Tx
Air-to-Air	Rx
	Tx
Tac 1	Rx
	Tx
Tac 2	Rx

Phone Numbers	
Name	Number

---

Work-Rest Ratio Documentation Worksheet					
<p>This worksheet is designed to help IC's document and calculate the amount of rest required to meet the 2:1 Work/Rest guidelines.</p> <ul style="list-style-type: none"> <li>Initial Attack operational period is not to exceed 24 hours except if Agency Administrator approves if; 1) accomplishment of immediate and critical objectives or 2) address immediate and critical firefighter or public safety issues.</li> <li>The operational period commences when the employee comes on duty that morning. Subsequent operational shifts are not to exceed 16 hours.</li> <li>Rest Time is defined as time when the employee has the opportunity to sleep!</li> </ul>					
Date	Resource	Operational Period Start Time	Operational Period Stop Time	Total Hours Worked	Rest Time (document hours when employee or module rested)
Approval for shift lengths exceeding 16 hours given by:			Date/Time Approval Given:		
IC Signature:			Date:		



[illegible]

[illegible]

Situation Status		
	Current Status	Projected Status
SITUATION		
RESOURCES		

		Risk Level - Assessment Matrix		
		Hazard Probability		
		High	Moderate	Low
Potential Consequences	High	High		Low
	Moderate	Moderate		
	Low	Low		

#### Hazard Probability

- (H) **High**..... May occur frequently or requires continuous peak performance of resources implementing the project.
- (M) **Moderate** ..... May occur sometimes or requires sporadic peak performance of resources implementing the project.
- (L) **Low** ..... Is possible but improbable to occur or requires no increased performance of resources implementing the project.

#### Potential Consequences

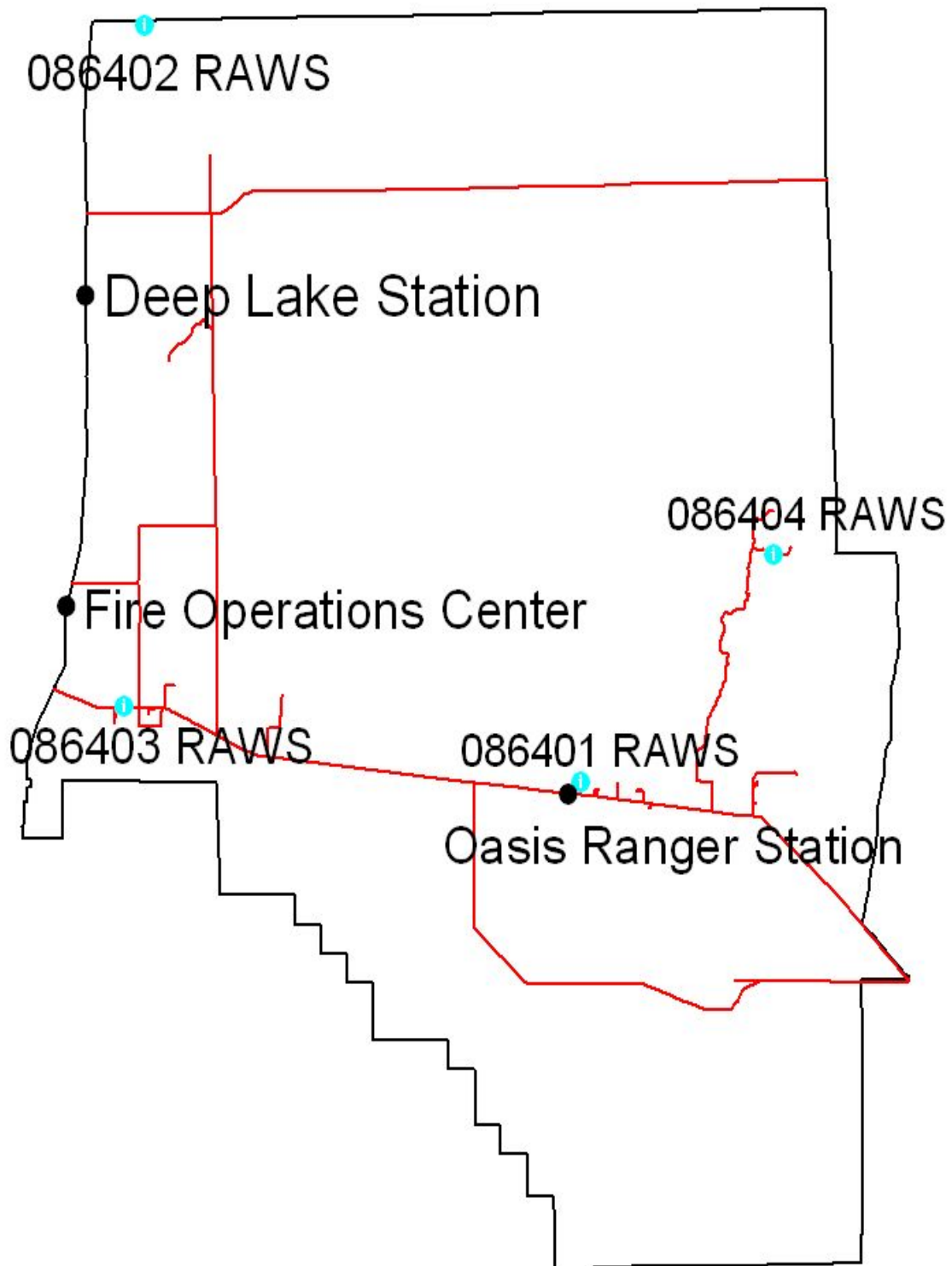
- (H) **High**..... Major resource loss, significant property damage, permanent or partial disability to personnel or loss of life.
- (M) **Moderate** ..... Minor resource loss, minor property damage, lost time injury or illness to personnel.
- (L) **Low** ..... Negligible resource loss or property damage, possible first aid treatment to project personnel.

#### Risk Levels

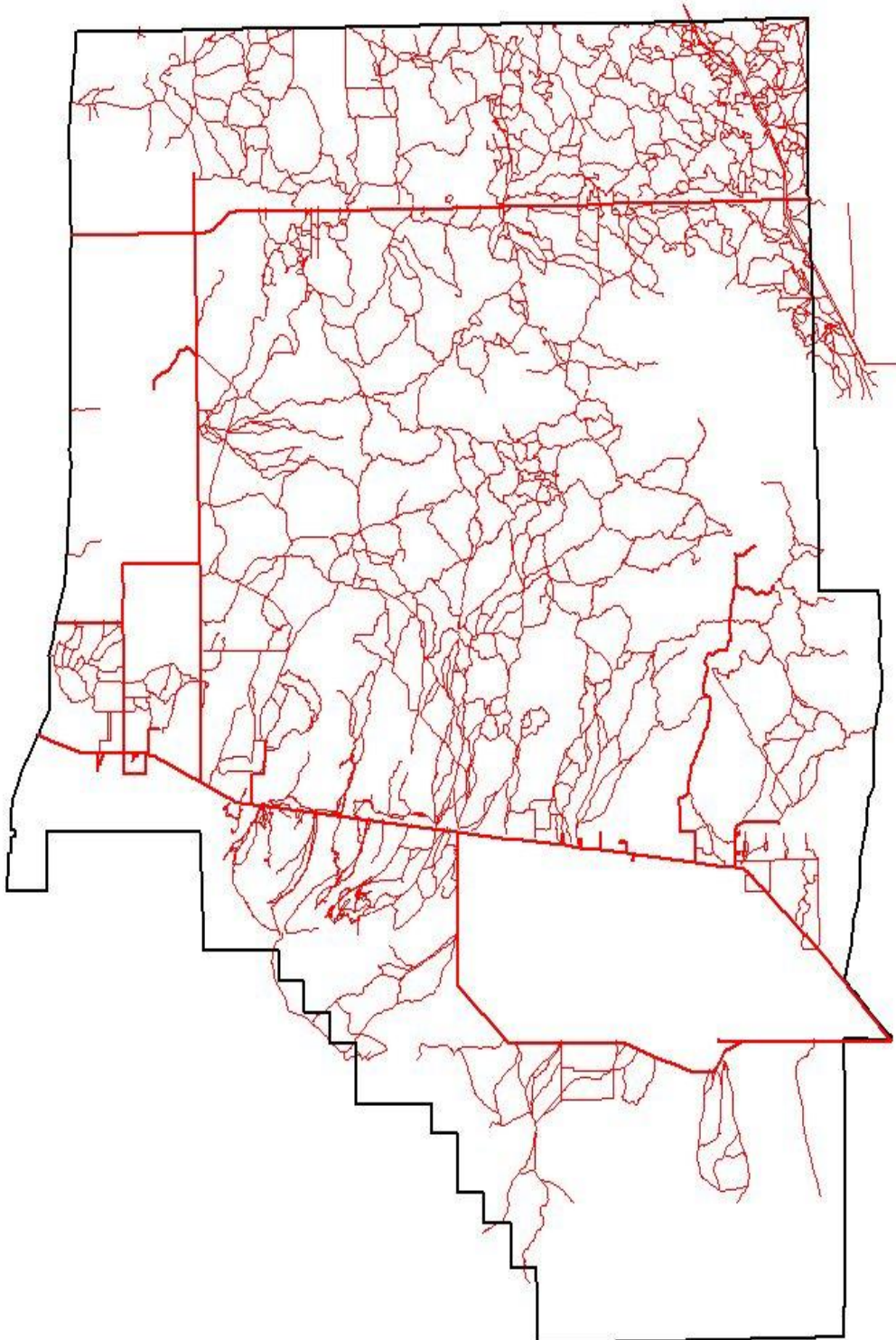
- High** ..... Impact or loss to park or public resources is unacceptable. Likely to have programmatic level impact and includes the loss of ability to accomplish prescribed fire at the unit level and potentially at the national level.
- Moderate**..... Impact or loss to park or public resources is controversial but tolerated.
- Low** ..... Impact or loss to park or public resources is negligible. Little or no impact on the park prescribed fire program.

**L**ookouts **C**ommunications **E**scape Routes **S**afety Zones

# BICY Fire Stations



# Primary Trails



(Optional for Mutual Aid Fires)

[illegible]

Mark point of origin with red "X"

SCALE: 1 BLOCK= \_\_\_\_\_ mile(s)

Submitted by (Signature):		Approved by (Signature):	
Title:	Date:	Title:	Date:



Spot Weather Observation and Forecast Request									
1. Name of Project:			2. Control Agency:		3. Request Made:				
					Date:		Time:		
4. Location (Lat and Long):			5. Drainage Name:		6. Exposure/Aspect:				
7. Size of Incident or Project:  <div style="text-align: right;">Acres</div>			8. Elevation		9. Fuel Type		10. Fire Behavior: <small>Ground, Crown, Surface, etc...</small>		
			Top: <div style="text-align: right;">Feet</div>	Bottom: <div style="text-align: right;">Feet</div>					
11. Weather Conditions at Incident or Project or from RAWS:									
Location	Elev.	Date/ Time	Wind Direction/Speed		Dry Bulb	Wet Bulb	RH	DP	Sky Condition
			20' or Eye Level						
The Weather Forecaster will furnish the information for Block 12							Date/Time:		
12. Discussion and Outlook:									

## After Action Review

**Incident Name:**

**IC:**

Date:

**IC Type:**

**Resources:**

**Critiqued By:** (list Names of Attendees)

**AAR Leader Signature:**

Date:

Reviewed By:

Date:

**Comments:**

(Refer to Page 16 of the IRPG for Recommended Format of AAR Questions. Comment as Applicable.)

## Appendix O: Official Document for Extended Work Shift And/OR Deviation From 2:1 Work/Rest Policy

Date:	Time:	Incident Number:	Incident Name:	Unit:
Incident Type:	Operational Period:	Incident Commander:	IC Type (1-5)	
<b>Justification</b>				
<b>Name of Individual(s) or Crew:</b>				
<b>Description of Situation:</b>  Shifts in excess of 16 hours on _____ was due to: <ul style="list-style-type: none"> <li><input type="checkbox"/> Travel Time not administratively controllable.</li> <li><input type="checkbox"/> Mobilization and travel of resources to incident location or relocation to incident Facilities.</li> <li><input type="checkbox"/> Establishing and maintaining administrative, planning and logistical support for incident.</li> <li><input type="checkbox"/> Evacuation, triage, structure protection or emergency rescue.</li> <li><input type="checkbox"/> Establishing initial control lines of the fire.</li> <li><input type="checkbox"/> Extended attack efforts to control potentially devastating incident activity.</li> <li><input type="checkbox"/> Incident unable to provide personnel with adequate food and lodging.</li> <li><input type="checkbox"/> Other/Additional:</li> </ul>				
Extended hours:	Date:	Work Hours:	Total Hours:	
<b>Rational:</b> <ul style="list-style-type: none"> <li><input type="checkbox"/> Emergency mobilization of resources to and from incident or facilities.</li> <li><input type="checkbox"/> Efforts required setting up, supporting and undertaking incident control actions.</li> <li><input type="checkbox"/> Imperative operational defensive actions to prevent loss of life, resources and property damage.</li> <li><input type="checkbox"/> Other/Additional:</li> </ul>				
<b>Mitigation Measures</b>				
<b>Actions taken to reduce impact on firefighter and reduce fatigue:</b> <ul style="list-style-type: none"> <li><input type="checkbox"/> Rest extended into the following operational period by _____hrs. by:</li> <li><input type="checkbox"/> Other:</li> </ul>				
Mitigation hours:	Date:	Hours:	Total Hours:	

\_\_\_\_\_  
Incident Supervisor and Date

## Appendix P: Notification List for Wildfires

Current as of 1/8/2013:

Willie	Adams	willie_j_adams_jr@nps.gov
Rick	Anderson	rick_anderson@nps.gov
Lisa	Andrews	Lisa_Andrews@nps.gov
Dennis	Bartalino	Dennis_Bartalino@nps.gov
Jeffery	Brice	jeff_brice@nps.gov
Jim	Burch	jim_burch@nps.gov
Clayton	Camblin	clayton_camblin@nps.gov
Gary	Carnall	gary_carnall@nps.gov
Nikita	Carty	nikita_carty@nps.gov
Christine	Clark	christine_clark@nps.gov
Ron	Clark	Ron_Clark@nps.gov
Tina	Collins	tina_collins@nps.gov
Bob	DeGross	bob_degross@nps.gov
Chris	Derman	christopher_derman@nps.gov
Leslie	Dillard	leslie_dillard@nps.gov
Damon	Doumlele	damon_doumlele@nps.gov
Randy	Effert	randy_effert@nps.gov
David	Fireman	david_fireman@nps.gov
Don	Hargrove	don_hargrove@nps.gov
Melissa	Henneman	melissa_henneman@nps.gov
Sasha	Herrin	sasha_herrin@nps.gov
Steve	Houseknecht	Steve.Houseknecht@dep.state.fl.us
Deborah	Jansen	deborah_jansen@nps.gov
Isobel	Kalafarski	isobel_kalafarski@nps.gov
John	Kellam	john_kellam@nps.gov
Samuel	Larry	samuel_larry@nps.gov
J	Lee	J_D_Lee@nps.gov
Robert	Leonard	robert_leonard@nps.gov
Kyle	Myhre	kyle_myhre@nps.gov
Cass	Palmer	cass_palmer@fws.gov
Pedro	Ramos	pedro_ramos@nps.gov
Alika	Seay	alika_seay@nps.gov
James	Snyder	jim_snyder@usgs.gov
William	Snyder	william_snyder@nps.gov
Ryan	Stubblebine	ryan_stubblebine@nps.gov
Roberto	Trincado	roberto_trincado@fws.gov
Jill	Waisley	jill_waisley@nps.gov
Michael	Ward	michael_d_ward@nps.gov
Jackson	weer	jackson_weer@nps.gov
Leslie	Wells	leslie_wells@nps.gov
Jill	Wilson	jill_e_wilson@nps.gov
Paul	Ryan	paul_ryan@fws.gov