FIRE MANAGEMENT PLAN

For

National Key Deer Refuge

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1. INTRODUCTION

1.1. PURPOSE OF THE FIRE MANAGEMENT PLAN (FMP)

This 2010 update to the Fire Management Plan for National Key Deer Refuge is written to meet the U.S. Department of Interior (DOI) and Fish and Wildlife Service (FWS) requirement that every area with burnable vegetation have an approved Fire Management Plan (FMP). It complies with a Service requirement that National Wildlife Refuges review and/or revise FMPs at a minimum of five year intervals or when significant changes are proposed, such as might occur if significant land use changes are made adjacent to FWS lands.

The goal of wildland fire management is to plan and make decisions that help accomplish the mission of the National Wildlife Refuge System. That mission is to administer a national network of lands and waters for the conservation, management, and, where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.

The current approved fire management program strategy for National Key Deer Refuge is described in the 2009 Lower Florida Keys Refuges Comprehensive Conservation Plan (CCP):

> Prescribed fire and mechanical or manual vegetation treatments would be used as habitat management tools to reduce wildland fuels and restore desirable habitat features where appropriate. Predictive modeling and fire effects monitoring would be used on all prescribed-fire treatments in an adaptive management approach to develop site-specific burn prescriptions and to determine whether objectives were met. Research on fire behavior, fuels response, and fire history will be conducted (p. 289).

This update to the 2000 FMP incorporates National and Service policy revisions and integrates all wildland fire management and related activities with the 2009 CCP goals, objectives, and strategies. It provides program guidance for managing wildland fires and to assure that wildland fire management goals and overall refuge management goals are coordinated. No changes to implementation practices from the 2000 FMP are included in this update and any such changes will be developed in conjunction with the development of a habitat management step-down plan.

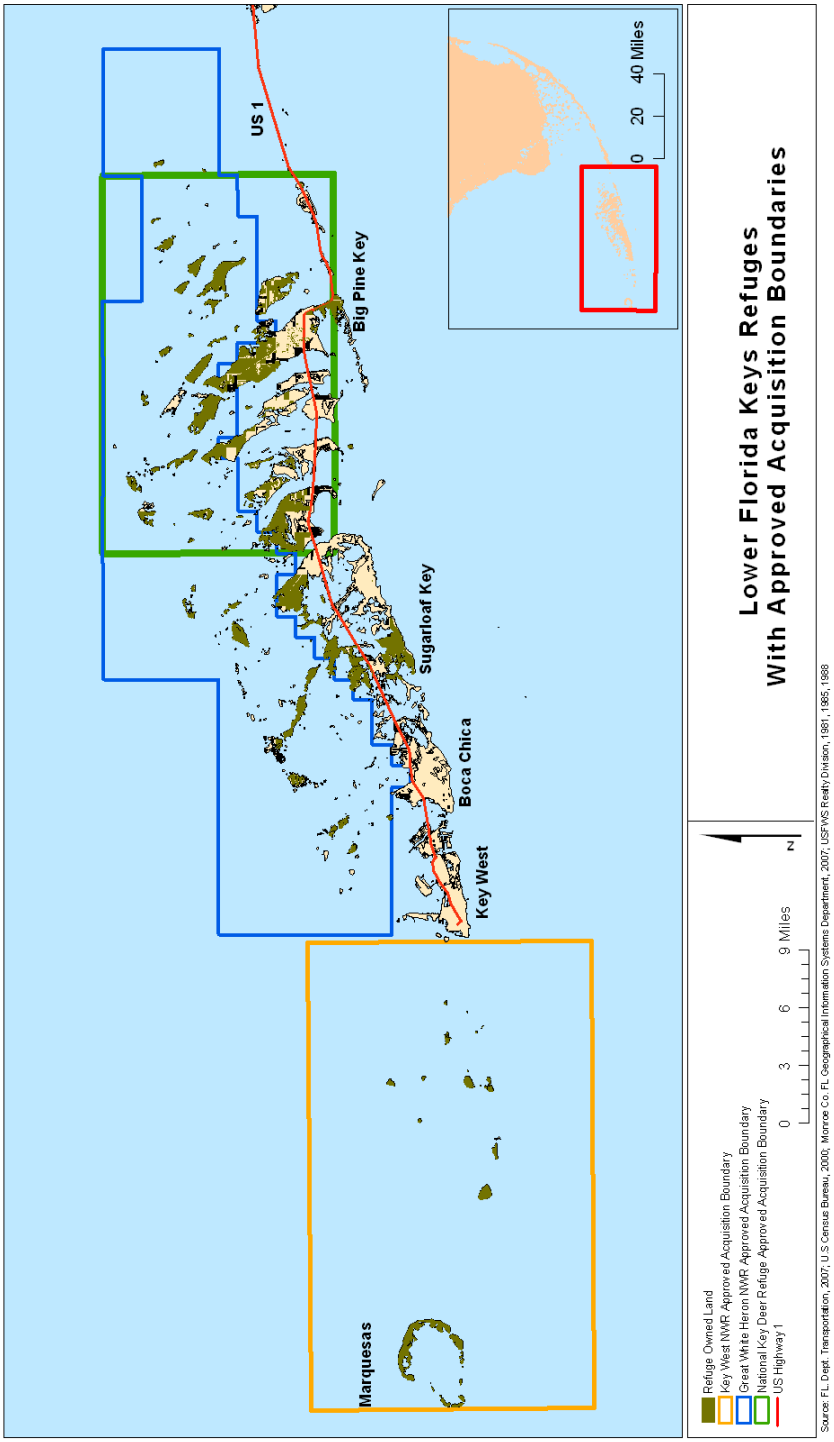
1.2. GENERAL DESCRIPTION OF THE AREA IN THE FIRE MANAGEMENT PLAN

The 2010 National Key Deer Refuge FMP update identifies and integrates all wildland fire management and related activities within the context of the approved CCP for the Lower Florida Keys Refuges which includes National Key Deer Refuge (NKDR). It defines a program to manage planned and unplanned wildland fires (wildfire and prescribed fire). Its purpose is to assure that wildland fire management goals and components are coordinated with land and resource management goals and objectives.

National Key Deer Refuge includes approximately 8,500 acres held in fee title (Figure 1), and also manages other lands under agreement as part of the refuge: approximately 500 acres of Florida Conservation and Recreation Lands in the Coupon Bight/Key Deer Project, and approximately 50 acres of Monroe County Land Authority property. Currently, there are about 680 tracts ranging in size from 1/10 acre to approximately 1,087 acres on twenty-two of the Lower Florida Keys surrounding Big Pine Key. These lands extend from Ohio Key in the east to

Lower Sugarloaf Key in the west. Some of the tracts abut each other and form larger habitat blocks, while other tracts are intermingled with developed private lands resulting in a non-contiguous configuration creating complicated fire management scenarios (Figures 2-8, p.25-34).

Figure 1. Map of National Key Deer Refuge within Lower Florida Keys Refuges and Vicinity



1.3. SIGNIFICANT VALUES TO PROTECT

Various communities and refuge infrastructure occurs in the wildland urban interface of the National Key Deer Refuge. The communities and refuge infrastructure and associated maps are addressed within the specific Fire Management Units (Chapter 3, beginning on p.13).

There are five federally listed endangered and threatened species and five candidate species in National Key Deer Refuge, including the Key Deer, Lower Keys Marsh Rabbit, Garber's Spurge, and the Silver Rice Rat. The FWS website http://www.fws.gov/verobeach/ provides species accounts for the many bird, plant and animal species of concern.

Two Fire Management units include Federally-designated Wilderness Areas; FMU #5 for Little Pine Key and FMU #7 for the backcountry islands of NKDR. There are a number of known archeological and historical sites throughout the Refuge that also warrant special consideration in the implementation of wildland fire management.

2. POLICY, LAND MANAGEMENT PLANNING AND PARTNERSHIPS

2.1. IMPLEMENTATION OF FIRE POLICY

2.1.1. FEDERAL INTERAGENCY WILDLAND FIRE POLICY

The following guidelines will be used to provide consistent implementation of federal wildland fire policy. Further guidance is provided in the Federal Wildland Fire Management Fire Policy section of the Guidance for Implementation of Federal Wildland Fire Management Policy. This FMP implements these guiding principles of federal wildland fire policy:

- Firefighter and public safety is the first priority in every fire management activity.
- Wildland fire is a general term describing any non-structure fire that occurs in the wildland. Wildland fires are categorized into two distinct types:
    - Wildfires – Unplanned ignitions or prescribed fires that are declared wildfires.
    - Prescribed fires – Planned ignitions.
- The role of wildland fire as an essential ecological process and natural change agent has been incorporated into the planning process. Federal agency land and resource management plans set the objectives for the use and desired future condition of the various public lands.
- Fire management plans, programs, and activities support land and resource management plans and their implementation. Management response to a wildland fire on federal land is based on goals, objectives, and strategies established in the applicable Land/Resource Management Plan and/or the Fire Management Plan.
- Sound risk management is a foundation for all fire management activities. Risks and uncertainties relating to fire management activities must be understood, analyzed, communicated, and managed as they relate to the cost of either doing or not doing an activity.
- Fire management programs and activities are economically viable, based upon values to be protected, costs, and land and resource management objectives,

- Fire management plans and activities are based upon the best available science.
- Fire management plans and activities incorporate public health and environmental quality considerations.
- Federal, State, tribal, local, interagency, and international coordination and cooperation are essential.
- Standardization of policies and procedures among federal agencies is an ongoing objective to facilitate effective collaboration among cooperating agencies.
- Agencies and bureaus will review, update, and develop agreements that clarify the jurisdictional inter-relationships and define the roles and responsibilities among local, state, tribal and federal fire protection entities.

2.1.2. NATIONAL FIRE PLAN

This FMP meets the policy and direction in the National Fire Plan because it emphasizes the following primary goals of the *10 Year Comprehensive Strategy* and *Cohesive Strategy for Protecting People and Sustaining Natural Resources.*

- Improving fire prevention and suppression,
- Reducing hazardous fuels,
- Restoring fire-adapted ecosystems,
- Promoting community assistance.

2.1.3. DEPARTMENT OF INTERIOR (DOI) POLICY

This FMP meets DOI policy found in 620 DM 1 by making full use of wildland fire as a natural process and as a tool in the planning process.

- Management response to wildland fire on federal land is based on goals, objectives, and strategies established in the applicable Land/Resource Management Plan and/or the Fire Management Plan.
- When two or more wildland fires burn together, they will be handled as a single wildland fire and will be managed based on the Land/Resource Management Plan direction.
- Managers will use a decision support process to guide and document wildfire management decisions. The process will provide situational assessment, analyze hazards and risk, define implementation actions, and document decisions and the rationale for those decisions. The system in use currently is known as Wildland Fire Decision Support System (WFDSS).
- Once a prescribed fire is no longer meeting those resources objectives stated specifically in the prescribed fire plan or project level NEPA and is converted to a wildfire, it receives the same reassessment and selection of response objectives as any other wildfire event given the location, current conditions (fuels, weather, etc.), and identified management considerations.
- Responses to wildland fire will be coordinated with all impacted levels of government regardless of the jurisdiction at the ignition source.

2.1.4. U.S. FISH AND WILDLIFE SERVICE FIRE POLICY

This FMP addresses a full range of potential wildland fires and considers a full spectrum of tactical options (from monitoring to intensive management actions) for response to wildland fires to meet Fire Management Unit (FMU) objectives. It fully applies procedures and guidelines in the Service *Fire Management Handbook* and the *Interagency Standards for Fire and Fire Aviation Operations* and affirms these key elements of FWS fire policy:

- Firefighter and public safety is the first priority of the wildland fire management program and all associated activities.
- Only trained and qualified leaders and agency administrators will be responsible for, and conduct, wildland fire management duties and operations.
- Trained and certified employees will participate in the wildland fire management program as the situation requires, and non-certified employees will provide needed support as necessary.
- Fire management planning, preparedness, wildfire and prescribed fire operations, other hazardous fuel operations, monitoring, and research will be conducted on an interagency basis with involvement by all partners to the extent practicable.
- The responsible agency administrator has coordinated, reviewed, and approved this FMP to ensure consistency with approved land management plans, values to be protected, and natural and cultural resource management plans, and that it addresses public health issues related to smoke and air quality.
- Fire, as an ecological process, has been integrated into resource management plans and activities on a landscape scale, across agency boundaries, based upon the best available science.
- Wildland fire is used to meet identified resource management objectives and benefits when appropriate.
- Prescribed fire and other treatment types will be employed whenever they are the appropriate tool to reduce hazardous fuels and the associated risk of wildfire to human life, property, and cultural and natural resources and to manage our lands for habitats as mandated by statute, treaty, and other authorities.
- Response to wildland fires will consider firefighter and public safety, cost effectiveness, values to protect, and natural and cultural resource objectives.
- Staff members will work with local cooperators and the public to prevent unauthorized ignition of wildfires on our lands.

2.1.5. REFUGE-SPECIFIC FIRE MANAGEMENT POLICY

This plan is an updated and revised fire management plan to the 1971, 1983, and 2000 fire management plans and is categorically excluded from the environmental impact review process. The Federal Register, Volume 62, No.11, January 16, 1997 provides the following National Environmental Policy Act direction under 1.4 as Categorical Exclusions, B. Resource Management: (4) The use of prescribed burning for habitat improvement purposes, when conducted in accordance with local and State ordinances and laws. (5) Fire management

activities, including prevention and restoration measures, when conducted in accordance with departmental and Service procedures. (10) The issuance of new or revised site, unit, or activity-specific management plans for public use, land use, or other management activities when only minor changes are planned. Earlier Fire Management Plans for NKDR are available for review at Refuge Headquarters on Big Pine Key, FL.

2.2. LAND / RESOURCE MANAGEMENT PLANNING

NKDR was established on August 22, 1957 in order to provide protection and habitat for endangered Key deer. The 2009 Comprehensive Conservation Plan (CCP) directs and integrates all refuge operations and activities (such as fire management, backcountry management, etc.) and assesses the cumulative effects of combined operations and activities. The Fire Management Plan presented here updates the 2000 FMP to reflect changes in Federal and Service wildland fire policy and incorporate the goals, strategies, and objectives from the CCP for pine rocklands. NKDR's fire management obligations begin when the U.S. Fish and Wildlife Service either takes title to lands or develops land management agreements with other entities (e.g., State of Florida, Monroe County).

2.2.1. LAND/RESOURCE PLANNING DOCUMENTS

The Comprehensive Conservation Plan for the Lower Florida Keys Refuges, which includes National Key Deer Refuge, was published in October 2009. In addition, National Key Deer Refuge was each established under various legislative and executive authorities, as described below.

NATIONAL KEY DEER REFUGE

- "... to protect and preserve in the national interest the Key deer and other wildlife resources in the Florida Keys." 71 Stat. 412, dated Aug. 22, 1957.
- "... to conserve (A) fish or wildlife which are listed as endangered species or threatened species .... or (B) plants ..." 16 U.S.C. § 1534 (Endangered Species Act of 1973).
- "... suitable for— (1) incidental fish and wildlife-oriented recreational development, (2) the protection of natural resources, (3) the conservation of endangered species or threatened species ..." 16 U.S.C. § 460k-1.

2.2.2. COMPLIANCE WITH REGULATORY ACTS

All prescribed fires must comply with National Environmental Policy Act (NEPA) requirements. This plan is an updated and revised fire management plan to the 1971, 1983, and 2000 fire management plans and meets the categorical exclusions originally published in the Federal Register, Volume 62, No.11, January 16, 1997. These categorical exclusions provide the following National Environmental Policy Act direction for fire management activities such as proposed in this plan (suppression of unwanted wildfires, and use of prescribed fire for habitat improvement) are categorically excluded as outlined in 516 DM 8.5, (effective date 05/27/2004) :

- The use of prescribed burning for habitat improvement purposes, when conducted in accordance with local and State ordinances and laws.
- Fire management activities, including prevention and restoration measures, when conducted in accordance with departmental and Service procedures.

According to 516 DM 2 (Appendix 1) (1.12) the use of prescribed fire for hazardous fuels reduction is categorically excluded for projects less than 4,500 acres in size. Mechanical fuel reduction projects less than 1,000 acres are also categorically excluded. FWS compliance form 3-2185 (NEPA Checklist) has been completed for this plan revision as well (Appendix J). The 1971, 1983, and 2000 Fire Management Plans for NKDR are available for review at Refuge Headquarters on Big Pine Key, FL.

This plan complies with Section 106 of the National Historic Preservation act as discussed in the 2009 CCP and accompanying Environmental Assessment, p. 316"

> ...management actions require review by the Service's Regional Archaeologist in consultation with the State of Florida's Historic Preservation Office, as mandated by Section 106 of the National Historic Preservation Act. The Service will also coordinate with the Seminole Tribe of Florida, the Seminole Nation of Oklahoma, the Muscogee (Creek) Nation of Oklahoma, the Poarch Band of Creek Indians of Alabama, and the Miccosukee Indian Tribe for information on and input into the management of important cultural and sacred sites located within the refuges. Therefore, the determination of whether a particular action within an alternative has the potential to affect cultural resources is an on-going process that would occur during the planning stages of every project.

An IntraService Section 7 consultation to comply with the Endangered Species Act of 1973 was completed for specific pine rockland burns planned in 2008 in addition to the consultation for the 2009 CCP, both of which include the management guidance provided in this update to the 2000 FMP. In both consultations, the Ecological Services unit of the Service concluded that actions described in these documents would not have adverse affects. Mitigations and constraints from this consultation are detailed in Chapter 3.1.1 (p. 13)

2.3. FIRE MANAGEMENT PARTNERSHIPS

2.3.1. INTERNAL PARTNERSHIPS

The fire program at National Key Deer Refuge is part of the District 6 Fire Management Program within Region 4 of the Service, supervised by the District Fire Management Officer (FMO) located at the Florida Panther NWR. Additional fire support comes from the staff for the District 6 units, and staff located at Loxahatchee NWR where the fire program forestry tech (GS 9) is partially funded by NKDR as of 2009. The District FMO also provides clarification on and answers questions related to policy guidance in the FWS Fire Management Handbook and the Red Book. The District FMO and Prescribed Fire Specialist at Loxahatchee NWR participated to a great extent in the preparation of this plan.

The local NKDR fire management team includes the entire NKDR staff in some capacity. Depending on the need, a mix of personnel funded by both fire and non-fire sources can be pulled together to meet a variety of both wildfire and prescribed fire situations. The levels of expertise and qualifications vary as staff members change, but participation of all refuge staff in a variety of ICS capacities is a programmatic goal. Training and development opportunities for fire and non-fire funded staff will be provided to meet this goal. A list of fire team members and their qualifications can be found in Appendix C of this plan and is updated annually.

The Florida Interagency Coordination Center (FICC) headquartered in Tallahassee, FL oversees the mobilization of emergency resources within the State of Florida, and links with the

Southern Area Coordination Center in Atlanta, GA.

The Southern Area Coordination Center (SACC) is headquartered in Atlanta, GA and collaboratively manages wildland fire and other incident management activities such as natural disaster relief efforts. The SACC prioritizes resource allocation during times of multiple incidents, and oversees the mobilization of emergency resources.

The refuge is also under the auspices of the Southern Area Coordination Group (SACG), the National Multi-Agency Coordination Group (NMAC), and the National Interagency Coordination Center (NICC) located in Boise, ID. The Southern Area Coordination Group (SACG) has overall responsibility for prioritizing resource allocation during times of multiple incidents, overseeing the mobilization of emergency resources as a whole, developing incident management teams, and coordinating information and intelligence within the Southern Area.

The National Multi-Agency Coordinating Group (NMAC) consists of representatives from the US Department of Interior, Bureau of Land Management (BLM), Bureau of Indian Affairs (BIA), US Fish & Wildlife Service (FWS), National Park Service (NPS), USDA Forest Service (USFS), US Fire Administration (USFA) , and the National Association of State Foresters ((NASF) and provides an essential management mechanism for national level strategic coordination to ensure that firefighting resources are efficiently and appropriately managed in a cost effective manner. The NMAC establishes National and Geographic Area MAC business practices, ensuring timely national level incident information and firefighting resource status. The NMAC establishes national priorities among Geographic Areas to meet NMAC priorities, anticipating and identifying future firefighting resource requirements, and coordinates and resolves firefighting resource policy issues.

Federal land management agencies have been directed to implement phase 2 of a fire planning analysis (FPA) beginning in fiscal years 2008 and 2009. FPA is a fire management workload analysis system that uses simulation and modeling tools to project fire workload for fire planning units (FPUs). Interagency cooperation is fostered to meet National Fire Plan goals and specific agency fire program budget needs. The refuge falls into the South Florida FPU. Federal partners include the National Park Service and the Bureau of Indian Affairs that work collaboratively with the FWS to implement this plan and meet National Fire Plan goals for wildland fire protection, landscape restoration, and hazard fuel mitigation measures.

This plan was developed through direct collaboration with refuge management and staff. The Comprehensive Conservation Plan, which is the guiding document for this fire management plan, was developed after an extensive review by Fish and Wildlife Service management and the public.

2.3.2. EXTERNAL PARTNERSHIPS

Relationships with the interagency fire management community are at the local, state and regional levels. Prevention and suppression efforts will be led by state and local fire agencies guided by the approved MOU's and supporting annual operating plans under development with state and local agencies. Development and implementation of these annual operating plans will be guided by the Southeast Region's Division of Fire Management and will improve prevention and suppression response of local resources to fires on Service owned lands. The primary responding agencies to wildfires National Key Deer Refuge is the Florida Division of Forestry,

Monroe County Fire and Rescue, and local volunteer fire departments. The Refuge Dispatch Plan lists resources and telephone numbers (Appendix L). Memorandum of Understanding (FWS Agreement #401813K006) between the US Department of Interior (Fish & Wildlife Service and National Park Service) and the Florida Department of Agriculture and Consumer Services (Division of Forestry) details the specifics of the working relationship between the organizations (Appendix D).

The Southern Wildfire Risk Assessment is the cooperative effort of the Southern Area State Foresters in response to the *National Fire Plan*, *10-Year Comprehensive Strategy*, and *Cohesive Strategy for Protecting People and Sustaining National Resources* to identify Communities at Risk (CAR) and Communities of Interest (COI) that might be influenced by wildland fire. These communities are identified in the NFPORS database and this process is the linkage to funding for a variety of cooperative projects within the Wildland Urban Interface.

In addition, a listing of Florida Communities at Risk (CAR) (Appendix I) was prepared in 2004 by the Florida Division of Forestry. This assessment also provides supporting linkage for Wildland-Urban Interface (WUI) fuels management projects on the complex. The Refuge also partners and contracts with non-governmental organizations including the Nature Conservancy and a variety of educational institutions to conduct monitoring, fire and habitat related research, assist with planned treatments, and jointly conduct WUI programs and risk assessments. NKDR is currently working with scientists and fire experts to identify a long-term strategic planning framework for the resources on Refuge managed lands which will provide a basis for future Habitat Management and Fire Management planning efforts (Appendix H).

3. FIRE MANAGEMENT UNIT CHARACTERISTICS

A fire management unit (FMU) is an area that shares common objectives, physiological/biological/social characteristics and constraints, that result in desired conditions as stated in land management plans (i.e. CCP, HMP), which set it apart from the characteristics of an adjacent FMU.

Considering fire history, occurrence, staff limitations, and the characteristics stated above, the wildland fire program at NKDR is of moderate complexity. In the event of multiple fire starts, priority will be given to areas of the unit with the greatest public safety issues, refuge infrastructure protection, protection of private property adjacent to the units, and with the highest natural resource values at risk. It should also be noted that the entire refuge is primarily managed for wildlife benefit.

3.1. AREA WIDE MANAGEMENT CONSIDERATIONS

3.1.1. MANAGEMENT GOALS, OBJECTIVES, AND CONSTRAINTS IN CCPS

Attainment of the Florida Keys National Wildlife Refuges Complex's CCP goals related to wildland fire management at NKDR (see 2.2.1. Land/Resource Planning Documents) requires specific program objectives and strategies for each component of the fire management program. By accomplishing these goals, great strides will be made toward accomplishing the goals and direction listed in the *10-Year Strategy* and the *National Fire Plan*.

Goals, Discussion, Objectives, and Strategies from the 2009 CCP which apply to this fire management plan update are reproduced below.

Goal 1. Maintain, restore, and enhance the natural diversity and integrity of habitats for native plants and animals.

Discussion (second paragraph): Habitats on the mainline islands within the National Key Deer Refuge have been irreversibly altered and fragmented since the 1950s by commercial and residential development and associated roads, canals, and mosquito ditches. These impaired habitats are further stressed by introduced exotic plants, human encroachment, wildfires, fire suppression, as well as by the natural disturbances of hurricanes and sea level rise. Consequently, strategies in this plan for maintaining habitats within National Key Deer Refuge are focused on direct intervention where operationally feasible and ecologically appropriate. Prescribed fire is an effective tool for maintaining the fire-dependent pine rocklands and desired features of fire-adapted plant communities. Given current habitat conditions and limited fiscal resources, it may take up to 20 years of deliberative and strategic burning in priority areas to re-establish a consistent fire regime that maintains the ecological integrity and protects the wildland-urban interface from catastrophic wildfire. Other habitat management tools include mechanical treatment, replanting, control of invasive exotic plants, and other restoration methods.

Objective 1: Implement habitat management actions that foster biological diversity and ecosystem resiliency while perpetuating viable populations of endangered, threatened and candidate plant and animal species.

Strategies:

- Develop and implement a step-down Habitat Management Plan that will guide habitat management on the refuges, using a structured decision-making process to ensure the integration of strategic landscape conservation and adaptive management principles.
- Update and implement the step-down Fire Management Plan to incorporate new scientific information, altered habitat conditions, and climate change.

Objective 2: Manage pine rocklands to maintain structural integrity and biological diversity to support endangered, threatened, candidate, and other imperiled species.

Strategies:

- Update and implement the step-down Fire Management Plan to incorporate new scientific information, altered habitat conditions, and climate change considerations in regard to restoring and maintaining pine rocklands.
- Refine current prescribed burning practices via an adaptive-management approach. This approach is based on research, pre- and post-burn monitoring, and evaluation in order to improve subsequent burns. Data collection would include species composition and structural variables, such as slash pine, palm and hardwood densities, litter depth, pine diameter-at breast- height (DBH) and tree height, and post-fire pine survival by size classes.
- Implement prescribed fire in pine rocklands. Consider factors such as: the amount of time since the last fire in the burn unit; fire return intervals at a landscape level; fire intensity and severity; fuel loads; and seasonality in order to affect persistence of desired species.
- Identify alternative treatments for maintaining stands of pine rocklands and reducing organic fuels where prescribed burning is no longer feasible due to adjacent, high-density neighborhoods.
- Expand collection and analysis of peat and sediment cores to sample for pollen and charcoal. This is done to determine historic fire frequency and species composition.

• Maintain all firebreaks as necessary to ensure safe and efficient prescribed burning projects and to protect adjacent residential areas from the potential spread of wildfire.
• Maintain the organic fuels in the wildland-urban interface (WUI) at a level which precludes the danger of a wildfire spreading to nearby residences or threatening native habitats.
• Continue participation in the Lower Florida Keys Wildfire Hazard Reduction Initiative, Lower Keys Community Wildfire Protection Plan, and South Florida Pine Rockland Working Group.

Goal 2. Protect, restore, and enhance populations of endangered, threatened, and candidate plants and animals within their native habitats.

Objective 3: Key deer – Maintain the population viability of the Key deer.

Strategies:

• Continue to assess the benefits and impacts of habitat management techniques, such as prescribed fire and mechanical clearing, in a scientific framework.
• Apply research findings on forage distribution, quality, and quantity, forage biomass and nutritional ecology to adaptively apply management strategies, such as using prescribed fire to enhance habitat, and reducing artificial feeding and watering in urban areas.
• Conduct studies to delineate potential problems associated with the spatial and temporal dynamics of prescribed fire in an over-browsed environment.

Objective 10: Other reptiles – Protect endemic reptile species.

Strategies:

- Implement mitigation measures to protect reptiles from direct impacts from prescribed burning and other habitat management strategies.

Objective 11: Lepidoptera – Maintain or restore refuge populations of Lepidoptera of special conservation concern, particularly Bartram's hairstreak, Florida leafwing and Miami blue butterflies.

Strategies:

- Monitor effects of prescribed burning on host and nectar plants to evaluate effectiveness of enhancing their abundance and vigor to the benefit of butterflies.
- Assess the current distribution and abundance of host and nectar plants for species of concern.

Objective 15: Maintain and expand populations of the threatened Garber's spurge.

Strategies:

- Monitor the status of Garber's spurge in coastal dune and pine rockland habitats to document its distribution and abundance to identify any threats to this species.
- Evaluate management options for maintaining and enhancing habitat features that support this species.
- Monitor and evaluate the impacts of management actions on Garber's spurge. Collect information on species distribution (i.e., presence/absence before and after burns), abundance and demographic information on individual plants.

Objective 16: Maintain and expand populations of candidate plant species, including Wedge spurge, Big Pine partridge pea, Blodgett's silverbush, sand flax, Cape sable thoroughwort, and Florida semaphore cactus.

Strategies:

- Complete baseline inventories to document the distribution and abundance and identify any threats to candidate species and their respective habitats.
- Implement and evaluate land management techniques for maintaining and enhancing habitats that support these plant species.

REQUIREMENTS, CONSTRAINTS AND MITIGATIONS FOR FIRE MANAGEMENT IN 2009 CCP AND SUPPORTING DOCUMENTS

Soils

- Prescribed fires conducted under carefully selected environmental conditions would be managed to move quickly through the forest to reduce fine fuels and minimize pine mortality (p. 306).

Air Quality

- All fire management activities must comply with the national air ambient air quality standards established under the Clean Air Act to protect public health and the environment, and require authorization by the Florida Division of Forestry. Air quality impacts will be temporary and minimal due to careful planning of prescribed burning operations when environmental conditions (e.g. wind speed and direction, humidity, fuel moistures) are most optimal to minimize smoke production and movement (p. 307).

Pine Rocklands

- ...an inventorying and monitoring plan would establish baseline data on the extent and health of the pine rockland ecosystem and top-priority species associated with this habitat type (p. 308).
- Prescribed fire would be implemented as an adaptive habitat-management tool with emphasis on top priority species (p. 309).
- Data obtained from fire management and sea-level rise studies would be used to prioritize protection and restoration efforts (p. 309).

Wildlife and Protected Species

- Prescribed burning in pine rockland tracts would be conducted according to a fire management plan for National Key Deer Refuge, with pre- and post-burn monitoring performed to gauge plant and animal responses, particularly candidate plant and rare butterfly species (p. 312)

Federally Listed and Candidate Species (from IntraService Consultation, CCP Appendix G)

Actions to be taken based on internal consultation under Section 7 of the Endangered Species Act to reduce potential adverse effects on threatened, endangered, and candidate species within NKDR:

Lower Keys marsh rabbit and silver rice rats--During fireline maintenance and prescribed burning, visual searches will be conducted to flush individuals from the area. Implementation of habitat management will be scheduled to avoid peak nesting periods. The use of heavy machinery will be minimized in habitats suitable to both species to avoid injury or death to individuals.
Eastern indigo snakes--Eastern indigo snakes are extremely rare and were believed to be locally extirpated from Lower Florida prior to a 2010 reported sighting. They are not likely to be impacted by proposed activities. Visual searches will be conducted prior to habitat management to ensure no individuals are in the area. In the unlikely event that an individual is observed, the individual will be temporarily removed from the area or activities will be postponed.
Garber's spurge--Due to the plant's current rarity, a pre-burn search for this species will be made. If found, plants on site will be protected. If warranted, an experimental design may be applied to evaluate the use of fire on small test sites incorporating pre- and post-burn monitoring of test sites.
Sand flax--Due to the plant's extreme rarity, a pre-burn search for this species will be made. If found, plants on site will be protected. Possible measures include pre-burn mechanical fuel reduction in the vicinity of the plants to allow post-burn pioneering into burned areas.
Bartram's hairstreak--Given the rarity of this butterfly and pineland croton [its obligate host plant], a search for both species will be undertaken prior to a prescribed burn. If significant numbers of either species are found, measures to preserve them (e.g., pre-burn black lining or mechanical fuel reduction) will be considered to allow pioneering into burned areas.
Florida leafwing-- Given the rarity of this butterfly and pineland croton, a search for both species will be undertaken prior to a prescribed burn. If significant numbers of either species are found, measures to preserve them (e.g., pre-burn black lining or mechanical fuel reduction) will be considered to allow pioneering into burned areas.

3.1.2. MANAGEMENT GOALS, OBJECTIVES, AND CONSTRAINTS FROM OTHER SOURCES

Basic operational standards found in the Service manual (095 FW 3):

- An initial action and management response to a wildland fire is required for every wildfire on or threatening our lands.
- The range of responses to wildland fires may include direct or indirect attack of high and/or low intensities, or surveillance and monitoring to ensure fire spread will be limited to a designated area.
- Surveillance is a response to a wildfire if so designated in an approved FMP or selected through an appropriate analysis process such as Wildland Fire Decision Support System (WFDSS).
- If a prescribed fire changes so it will not meet objectives listed in operational plans (prescribed fire plan), it may be declared a wildfire, have a new strategy selected through a new analysis process (WFDSS), and receive a response in accordance with the selected response action.
- Wildfires in wilderness or other special reserved areas will receive a response that includes consideration of wilderness values and completion of a minimum tool analysis in support of the response actions.

Cost Effectiveness

- Maximizing the cost effectiveness of any fire operation is the responsibility of all involved;

including those that authorize, direct, or implement those operations. Cost effectiveness is the most economical use of the suppression resources necessary to accomplish mission objectives. Accomplishing fire operations objectives safely and efficiently will not be sacrificed for the sole purpose of "cost saving". Care will be taken to ensure that suppression expenditures are commensurate with values to be protected, while understanding that other factors may influence spending decisions, including the social, political, economic and biophysical environments. Cost containment Goals are:

- An existing MOU between the Service and the State of Florida discusses cost sharing and is included as an appendix to this document. (Appendix D)
- Fire Program Analysis will be used to determine integrated risk and cost management.

3.1.3. CHARACTERISTICS OF THE FIRE MANAGEMENT UNITS

FMU #Name	Wildland Fire Response Strategy	Acres (Burnable)	Fuel Models Scott and Burgan	Fuel Models NFFL
Big Pine FMU #1	Minimize Fire Size	5,000	SH9,GR8, GR5, TL2	1, 3, 4, 7
No Name FMU #2	Confine contain	500	TU3, TL2, GR5,SH9	4, 7, 8, 9
Cudjoe FMU #3	Confine contain	750	TL2,SH9, GR5	3, 4, 7, 9
Sugarloaf FMU #4	Confine contain	750	TL2,SH9, GR5	4, 7, 8, 9
Little Pine FMU #5	Monitor	300	TL2,SH9, GR5	4, 7, 8, 9
FMU #6 intentionally unassigned for future FMP				
Back Country FMU #7	Monitor	1,000	TL2,SH9, GR5	4,7,8,9

Table 1. Fire Management Units

THREATENED AND ENDANGERED SPECIES

Extreme southern Florida and the Keys have a unique mixture of tropical flora and temperate fauna. Vegetation of the West Indies colonized the area but the animals are North American. This has resulted in many subtle adaptations, and several species are endemic to southern Florida and the Keys. The Key deer, Lower Keys marsh rabbit (*Syvilagus palustris hefneri*), and silver rice rat (*Oryzomys argentatus*) are examples of a temperate species that have adapted to the Keys environment and evolved into separate subspecies. Some species, notably Key deer, require periodic application of fire to maintain their habitat requirements. Key tree-cactus (*Philocereus robinii*), Garber's spurge (*Chamaesyce garberi*), and the Eastern indigo snake (*Drymarchon corais couperi*) are additional species that occur on NKDR and are listed as endangered or threatened.

TOPOGRAPHY

The topography of NKDR is flat, with elevations ranging from 1 to 4 feet above mean sea level. Due to the flatness of the Refuge, slope and aspect have no significant role in fire intensity, severity or direction. However, this condition does affect hydro period that in turn affects the ability of fuels to ignite.

VEGETATION

The vegetation of the refuge is made up of tidal mangrove wetlands, a buttonwood transition zone, tropical hardwood hammocks, pine rocklands, and freshwater sawgrass wetlands.

Fire has been a critical force in shaping the diverse landscapes of Florida for thousands of years from both natural (lightning) and human ignitions (Fowler and Konopik 2007, Kimmerer and

Lake 2001). Radiocarbon dating on soil samples taken from two water holes on Big Pine Key in National Key Deer Refuge reveal repeated, local fires during the past ca. 450–500 years, documenting the long importance of fire in the Florida Keys pine rocklands (Horn 2008). Indigenous groups on mainland Florida frequently used fire for land clearing, vegetation control, and hunting game (Robertson 1954). Members of the Tequesta and Calusa cultures likely used fire during their occupation in the Florida Keys as well. Later settlers burned regularly to flush deer from the woods to facilitate hunting and to support an active buttonwood charcoal industry at various periods from the early 1800s to the 1950s (Klimstra 1986, Williams 1991). Historically, fire movement across the landscape was unimpeded by barriers, such as roads and canals, allowing fire to spread between plant communities. The National Key Deer Refuge has consequently used prescribed fire sporadically for maintaining the fire-dependent pine rocklands and select areas of open grassland to benefit Key deer (Klimstra 1986). However, the fire management program has fallen behind in maintaining adequate fire intervals due to various management issues, such as personnel turnover and storm damage. With the lack of consistent prescribed burning, fuel loads have also increased to hazardous levels in many areas, which could result in a catastrophic wildfire that threatens the refuge's ecological integrity as well as human lives and property.

PINE ROCKLAND

The pine rockland community of southern Florida is globally endangered. Pine rockland is a globally endangered plant community found only in the Lower Florida Keys, Everglades National Park, and in scattered parcels in Miami-Dade County, representing less than 3 percent of its original extent due to conversion to other land uses, significant ecological degradation, and outright destruction (Noss et al. 1995). Big Pine Key, Little Pine Key, No Name Key, Cudjoe Key, and Sugarloaf Key harbor pine rocklands. Development reduced acreage of pine rocklands on Big Pine by 33% between 1955 and 1989 (Folk 1991).

Pine rocklands occur in local upland areas of limestone bedrock bordered primarily by transitional ecotones and hardwood hammocks. Pine rocklands are the "highest elevation plant community," usually six feet or more above sea level (Folk 1991) and are usually underlain by a freshwater lens. Even though higher than other plant communities, pine rocklands near the coast, especially in the Florida Keys, are subject to saltwater storm surges during severe hurricanes and are intolerant to saltwater.

Pine rocklands consist of an open canopy of slash pines with patchy understory and groundcover layers. The south Florida slash pine (*Pinus elliotii* var. *densa*) and palms (*Coccothrinax argentata, Thrinax morrisii, Thrinax radiata,* and *Serenoa repens*) are fire-adapted and dependent on periodic fires for their long-term persistence (Snyder et al. 1990). Sub-canopy layers include a diverse assemblage of tropical and temperate shrubs, palms, grasses, and herbs (Folk 1991).

The pine rocklands of the Lower Keys are a small but biologically important representative of South Florida pine rocklands. Pine rocklands have the highest plant diversity of all plant communities in the Florida Keys. A total of 250 species of plants has been identified in the pine rocklands of south Florida and the Lower Keys. This community contains 14 herbs endemic to south Florida, 5 of which occur only in these Lower Keys settings (Avery and Loope 1980). Two endemic butterfly taxa, the Florida leafwing and Bartram's hairstreak also occur in pine rocklands. The larval food plant of both butterflies is *Croton linearis,* a pine rockland herb that

has become increasing rare, with fire suppression an apparent contributing factor.

HARDWOOD HAMMOCK

Hardwood hammocks are considered a climax community characterized by diverse woody flora (Davis 1943, Craighead 1971). Climax hardwood hammocks become insulated from fire because hammocks are typically a closed canopy, high humidity, and fires usually do not burn in this vegetation type. During severe drought, fire destroys these hammocks through the consumption of the organic materials in the soil and root systems.

Hardwood hammock forests on NKDR include mainly tropical species. Woody growth within the hammock interior is typically dense with 75-90 percent canopy cover. Many hammocks have a perimeter composed of a shrub zone where more dense vegetation is dominant (Duever et al. 1975, 1986).

BUTTONWOOD TRANSITION WETLAND

This plant community develops adjacent to and between salt marshes and upland habitats such as hardwood hammocks and pine rocklands. Buttonwood transition wetlands contain salt tolerant plants and are higher than the mangrove wetlands occasionally influenced by tides. The overstory is dominated by buttonwoods and other salt-tolerant woody plants such as joewood (*Jaquinia keyensis*), poisonwood (*Metopium toxiferum*), wild dilly (*Manilkara bahamensis*), mayten (*Maytenus phyllanthoides*), black torch (*Erithalis fruiticosa*), saffron plum (*Bumelia celastrina*), and black mangrove (*Avicennia germinans*). The understory consists mainly of key grass (*Monanthochloe littoralis*), sea daisy (*Borrichia frutescens*), saltwort, (*Batis maritima*), dropseed (*Sporobolus spp*.), sea oxeye (*Borrchia arborescens*), and cordgrass (*Spartina spartinae*).

MANGROVE WETLANDS

This community consists of red mangroves (*Rhizophora mangle*), white mangroves (*Languncularia racemosa*) and black mangroves (*Avicennia germinans*). Mangroves are salt-tolerant species found on the fringes of most keys, and in and around salt-water ponds.

FRESHWATER MARSH

Scattered throughout central Big Pine Key are areas of periodically inundated freshwater wetlands (Ross et al. 1992). These wetlands are characterized by sawgrass (*Cladium jamaicensis*) and buttonwood (*Conocarpus erecta*). Other species typically found in this area are white mangrove (*Languncularia racemosa*), saline aster (*Aster tenuifolius),* and marsh fimbry (*Fimbristylis castanea)*.

CLIMATE

The tropical maritime climate of the Florida Keys is a function of geographical location, and the moderating effects of warm marine waters and the coastal Gulf Stream. This area, between the latitudes of 24° 30' and 25° 30' north, is nearer the equator than any other part of the continental United States. Moreover, these islands are relatively small and surrounded by either the Atlantic Ocean or the Gulf of Mexico. Mean annual sunshine is 10% greater in the Florida Keys than the Florida mainland. These and other factors are responsible for climatic conditions that differ drastically from other areas of the country.

Mean annual temperature for the Keys between 1951-1980 was about 25° C (Thomas 1974). Temperatures recorded in Key West range from an annual mean minimum of 23°C to a mean annual maximum of 28°C. Highest normal daily temperature (NDT) is 32°C and usually occurs in July and August; lowest NDT is 19° and usually occurs in February (N.O.A.A. 1996).

In the Lower Keys, temperatures below 4° C are unusual due to the low latitude and the moderating effects of the warm marine waters and the coastal Gulf Stream. Freezing temperatures and frost have never been recorded. Mean average relative humidity is 75%, with no significant variation among months. Relative humidity is highest during early morning and lowest in the late afternoon. With an annual average precipitation of only 124.5 cm, the Florida Keys are the driest area in Florida, and the Lower Keys are drier than the Upper Keys (Ross et al. 1992).

Mean annual rainfall in the Lower Keys is only 99.l cm. with a normal range of 87-112 cm (Hanson 1980). Eighty percent of Lower Keys rainfall occurs from May through October. Since there is only slight elevation change over NKDR and barriers to air flow is minimal, the influences of weather applies equally to all portions of NKDR with the exception of isolated thunderstorms.

3.1.4 GENERAL WILDLAND FIRE RESPONSE STRATEGIES TO BE IMPLEMENTED

All wildland fires require initial action that may transition to extended attack if not successful. Initial action on human-caused wildfire will be to suppress the fire at the lowest cost with the fewest negative consequences with respect to firefighter and public safety. Responding fire resources will provide full support to protecting life and property. Direct attack will be the preferred action but indirect attack may be used on refuge lands to protect natural resource values if life and property is not at risk from either fire behavior or smoke impacts.

Federal wildland fire management policy allows a full range of response actions based on objectives established in the applicable Land/Resource Management Plan or Fire Management Plan. Wildland fires may be concurrently managed for one or more objectives, and those objectives can change as the fire spreads across the landscape, encountering new fuels, weather, social conditions, and governmental jurisdictions.

Prescribed fire will be the preferred fuel reduction treatment on National Key Deer Refuge's FMUs #1-4 (Table 1) where fuels and weather conditions allow. Mechanical or hand treatments will be used in areas of the refuge where prescribed fire is not an option if local values are at risk from an escaped fire, specifically on small (< 1 acre) discrete publically-owned parcels located within the matrix of residential subdivisions and commercial zones in FMU #1. Mechanical or hand treatment around individual resources at risk (e.g. mature pine seed tree, host plant for imperiled butterfly larva, etc.) may also be employed in conjunction with prescribed fire as deemed necessary on a unit by unit basis.

3.2 FIRE MANAGEMENT UNIT CHARACTERISTICS

3.2.1 NATIONAL KEY DEER REFUGE FMU #1 - BIG PINE KEY

FMU #1 BIG PINE KEY - DESCRIPTION

This FMU is defined by its wildland urban interface and its hazardous fuels complex. It contains the largest remaining stands of fire-dependent pine rockland habitats in the Florida Keys,

intermixed with salt marsh and freshwater marsh habitats. Fuels are currently modeled as a FM4 or SH9 however these models tend to under predict potential fire behavior. Research is currently under way to develop new fuel models which better represent fire behavior on these refuges.

Fires in this FMU will move across a landscape checker-boarded by ownerships and endangered species habitat. Access to all areas in this FMU is good, there are numerous barriers to low to mid level intensity fire spread; however as intensity increases expect long range spotting which will negate the effectiveness of barriers.

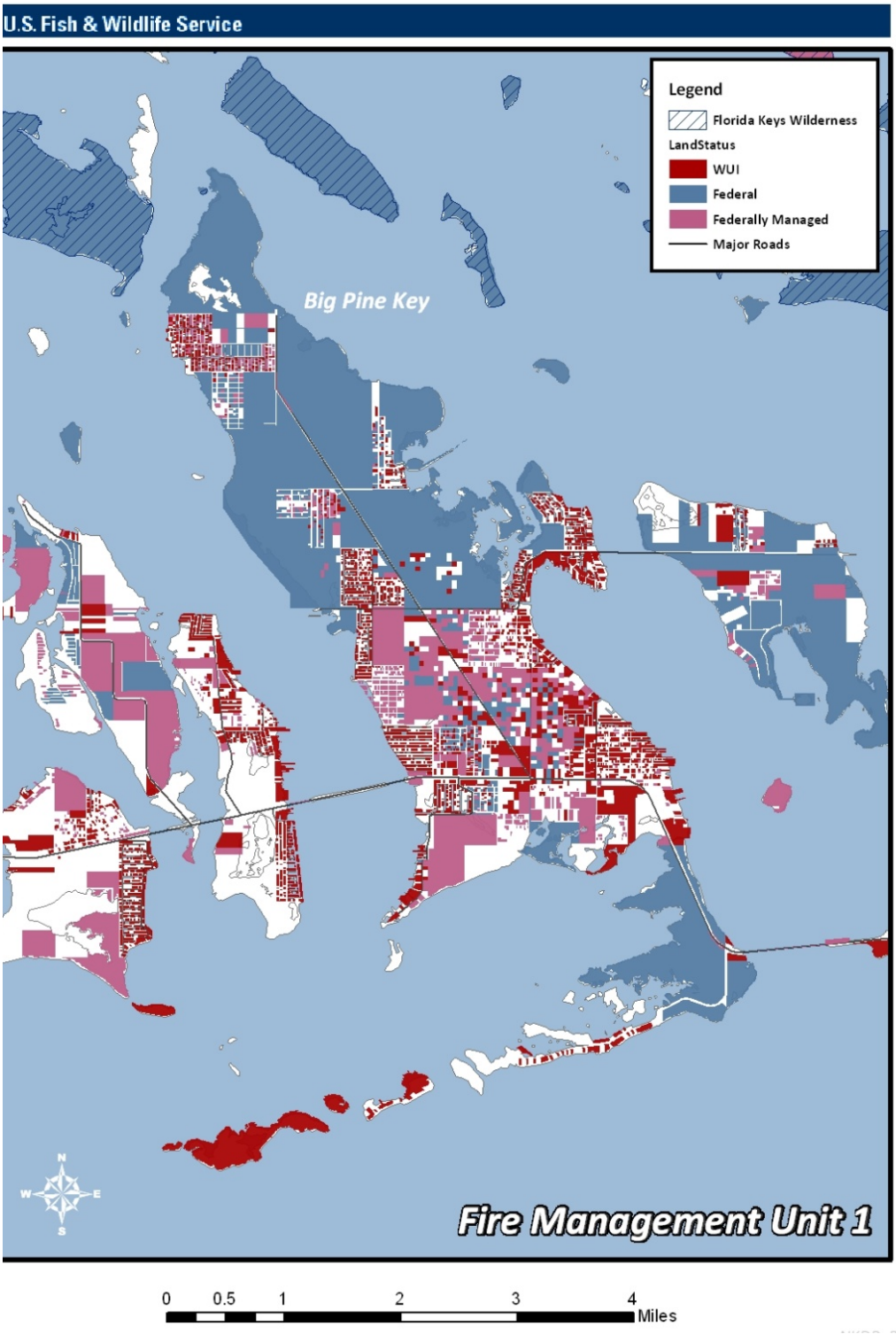
FMU #1 BIG PINE KEY - VALUES TO PROTECT

- Key Deer, Lower Keys Marsh Rabbit, and Silver Rice Rat Habitat
- Pine rockland-obligate candidate plants and butterflies
- Big Pine Key is considered a Community at Risk (CAR) and this FMU is intermixed within the community. Many of the structures, predominantly private residences, in this FMU lack good defensible space.
- As established by the name of the FMU this island is covered with pine, a rarity at this latitude. Care should be taken in wildfire/prescribed fire operations to minimize negative impacts to the pines. Pine basal area values are an integral part of the monitoring plan for the refuge. This island was over washed and large stands of pine were killed by salt water during Hurricane Wilma in 2005; however, healthy stands of pine remain along the higher elevated portions of the island.
- Water is an issue on this island. Potable fresh water is transported from the mainland via an 18 inch diameter pipe to the Florida Keys. Wet hydrants maintained by Monroe County are available along US Highway 1 and primary access roads. Salt water is generally not utilized because it damages not only fire equipment but will also kill vegetation not adapted to salt water. Mosquito ditches are a good source for drafting water. There is also a large inactive gravel pit on the island which is used for a helicopter dipping source.

Table 2. Big Pine Key Refuge Facilities and Replacement Costs

Refuge Real Property	Replacement Value
Refuge Headquarters Buildings and Generator	$3,291,951.37
Employee Quarters (6)	$1,506,818.85
Refuge Shop Buildings (Nut Farm)	$456,930.81
Blue Hole & Watson Interpretive Sites	$2,488,630.44
Watson Boat Dock	$134,075.91
Refuge Entrance & Boundary Signs	$50,000
Convault Fuel Tank	$55,000
TOTAL	$7,983,407.38

Figure 2. FMU#1 - Big Pine Key



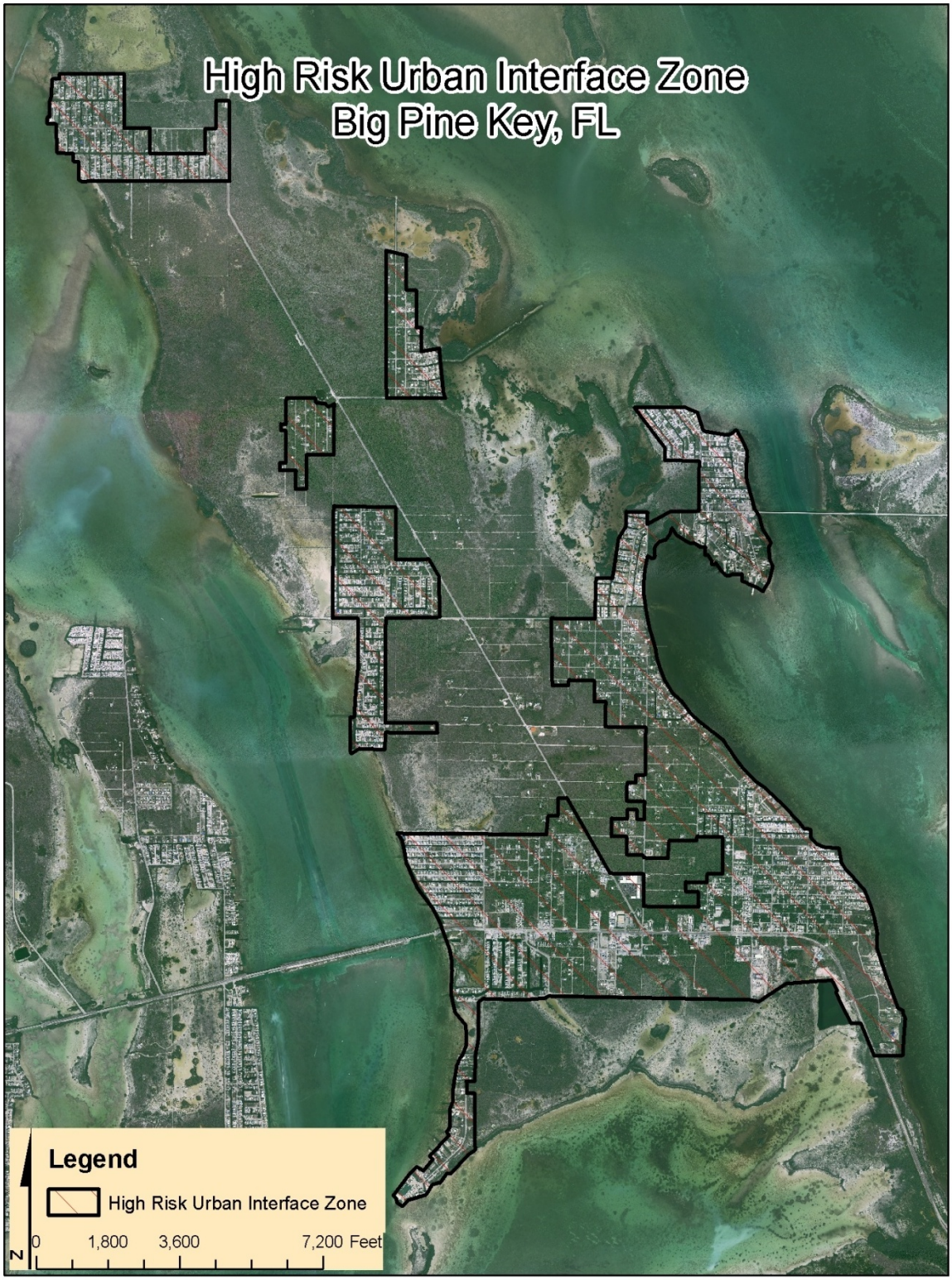


Figure 3. FMU #1 Big Pine Key High Risk WUI Zone

3.2.2 NATIONAL KEY DEER REFUGE FMU #2 - NO NAME KEY

FMU #2 NO NAME KEY - DESCRIPTION

This FMU has WUI throughout the island, predominantly on the northern half (see map). This area is surrounded by roads and hardwood hammock vegetation that, for the most part will resist active fire spread. Fires burning in this FMU will likely remain on agency owned land. There is a large active fresh water rock quarry in the center of the island which can be used as a helicopter dip site. There is another quarry with freshwater on the north side of the island. Both are privately owned and permission to use them for suppression operations shall be verified annually with the local Florida Division of Forestry office (see Appendix C for contact information). Wildfire managers will focus on containing fire spread south of the main road which bisects the island.

FMU #2 NO NAME KEY - VALUES TO PROTECT

- Key Deer, Lower Keys Marsh Rabbit, and Silver Rice Rat Habitat
- Care should be taken in wildfire/prescribed operations to minimize negative impacts to the pines. Pine basal area values are an integral part of the monitoring plan for the refuge. This island was over washed and almost all pine killed by salt water during Hurricane Wilma in 2005. There is a small healthy stand of live pines to the south of the quarry that could serve as a viable seed source to restore live pines.
- There is no refuge infrastructure on this island except for boundary signs and wood barriers along the main road. Estimated replacement cost of signs and barriers is $18,908.00.

There are no utilities on this island. Dry hydrants maintained by Monroe County are present. The only water source is the rock quarry in the center of the island. Managers should identify safety procedures for working near this pit in the event it is utilized as a water source.

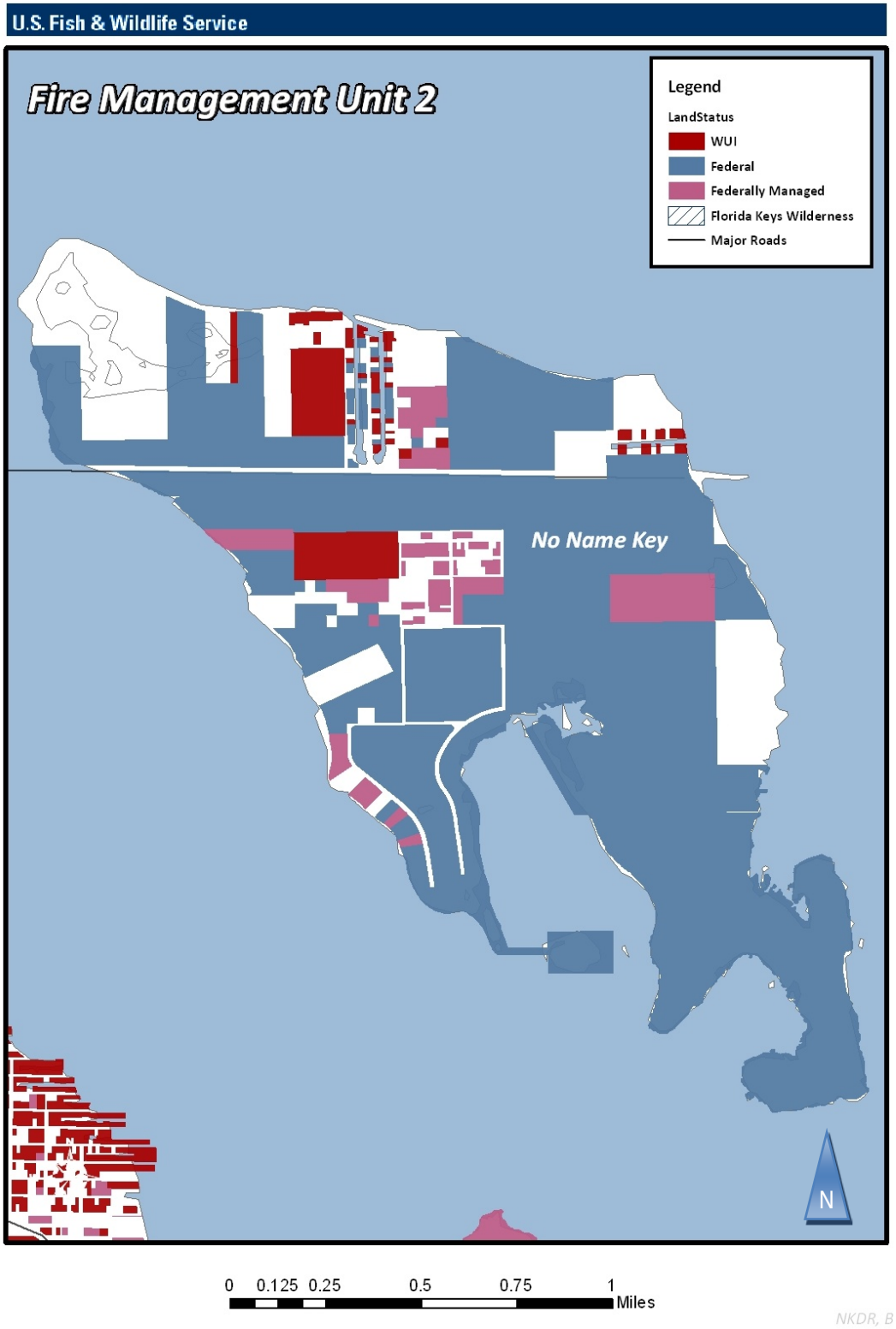


Figure 4. FMU #2 No Name Key

3.2.3 NATIONAL KEY DEER REFUGE FMU #3 - CUDJOE KEY

FMU #3 CUDJOE KEY - DESCRIPTION

This FMU has a small WUI area to the west of agency land. This FMU also has a radio tower nearby and a naval facility to the northwest which has a large blimp suspended several hundred to thousands of feet above ground level secured by a tether. Aerial operations must coordinate with the Navy at this site. This island was over washed and almost all pine killed by salt water during hurricane Wilma (2005). The result is a fuels complex that can only be described as a FM4/SH9 20-30 feet deep. Fire will be impossible to attack directly. Instead fire managers should consider burning off of pre-established firelines. Expect long term burning of the duff, smoke will be an issue for several days.

FMU #3 CUDJOE KEY - VALUES TO PROTECT

- Key Deer, Lower Keys Marsh Rabbit, and Silver Rice Rat Habitat
- Garber's spurge
- Care should be taken in wildfire/prescribed operations to minimize negative impacts to live pines. Pine basal area values are an integral part of the monitoring plan for the refuge. This island was over washed and most of the pine was killed by salt water during Hurricane Wilma in 2005. There are scattered live pines and a healthy stand of live pines along the southern unit boundary that could serve as viable seed sources.
- The residential subdivision of Cudjoe Acres lies directly to the west of refuge lands

Table 3. Cudjoe Key Refuge Facilities and Replacement Costs

Refuge Real Property	Replacement Value
Refuge Boundary Signs and Gates	$18,908.00
Government Quarters (1)	$201,540.00
TOTAL	$220,448.00

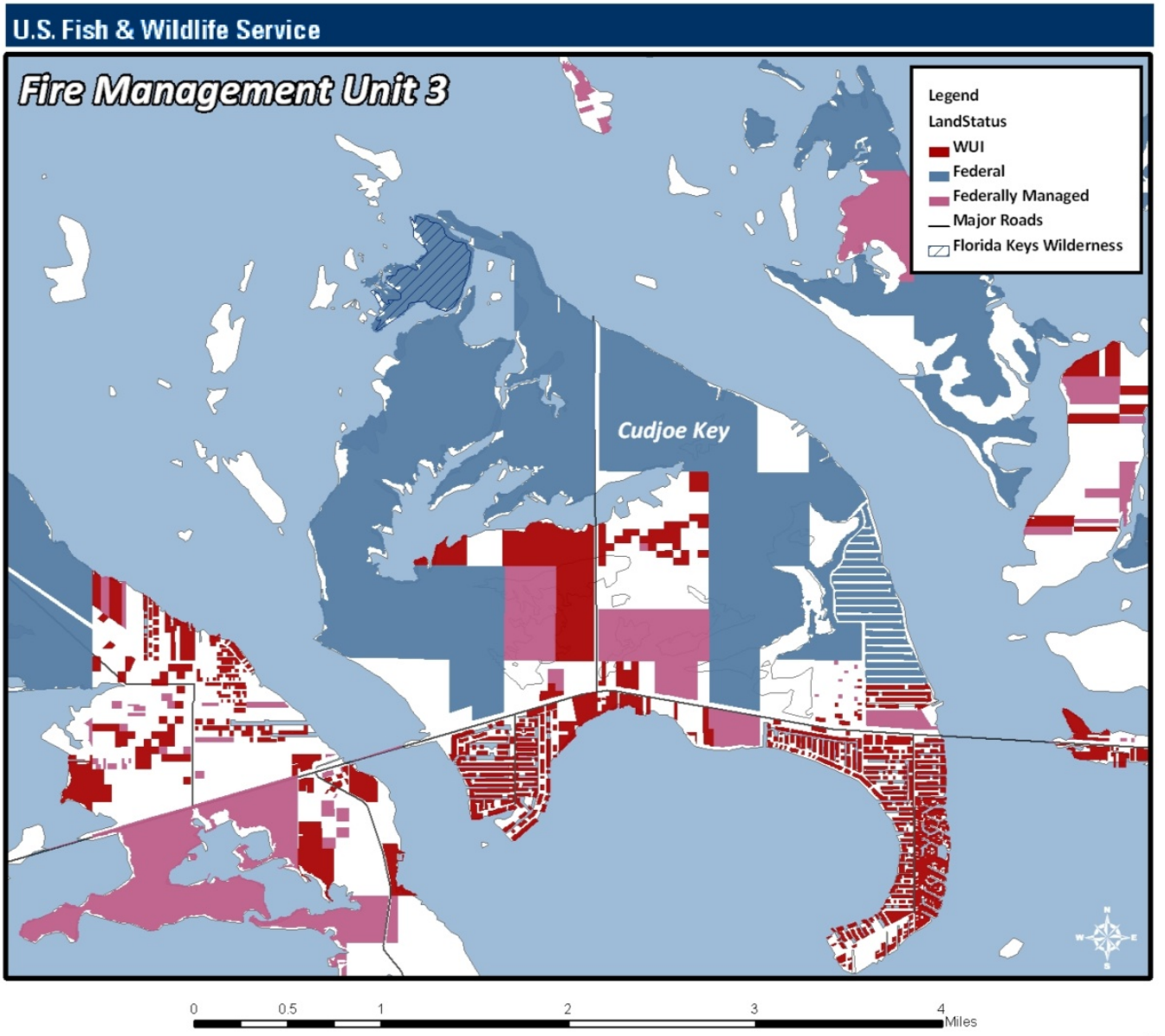


Figure 5. FMU #3 Cudjoe Key

3.2.4 NATIONAL KEY DEER REFUGE FMU #4 - SUGARLOAF KEY

FMU #4 SUGARLOAF KEY - DESCRIPTION

The WUI in this FMU is concentrated north and south of US 1 (see map). This area is surrounded by roads and vegetation that, for the most part will resist active fire spread. Fires burning in this FMU will likely remain on agency owned land. Wildfire managers should focus on containing fire spread north of the tropical hardwood hammock (FM8) which bisects the island.

This island was over washed and almost all pine killed by salt water during hurricane Wilma. The result is a fuels complex that can only be described as a FM4/SH9 20-30 feet deep. Fire will be impossible to attack directly. Instead fire managers should consider burning off of pre-established firelines. Expect long term burning of the duff, smoke will be an issue for several days.

FMU #4 SUGARLOAF KEY - VALUES TO PROTECT

- Key Deer, and Silver Rice Rat Habitat
- Care should be taken in wildfire/prescribed operations to minimize negative impacts to live pines. Pine basal area values are an integral part of the monitoring plan for the refuge. This island was inundated with salt water during Hurricane Wilma in 2005 and most of the pine was killed. There are scattered live pines that could serve as viable seed sources. More direct intervention (seeding, plant seedlings) in conjunction with prescribed fire and mechanical fuels treatments may be required to restore this pine rockland.
- There is no refuge infrastructure in this FMU except for boundary signs and wood barriers along the main access road, with an estimated replacement value of $15,000.

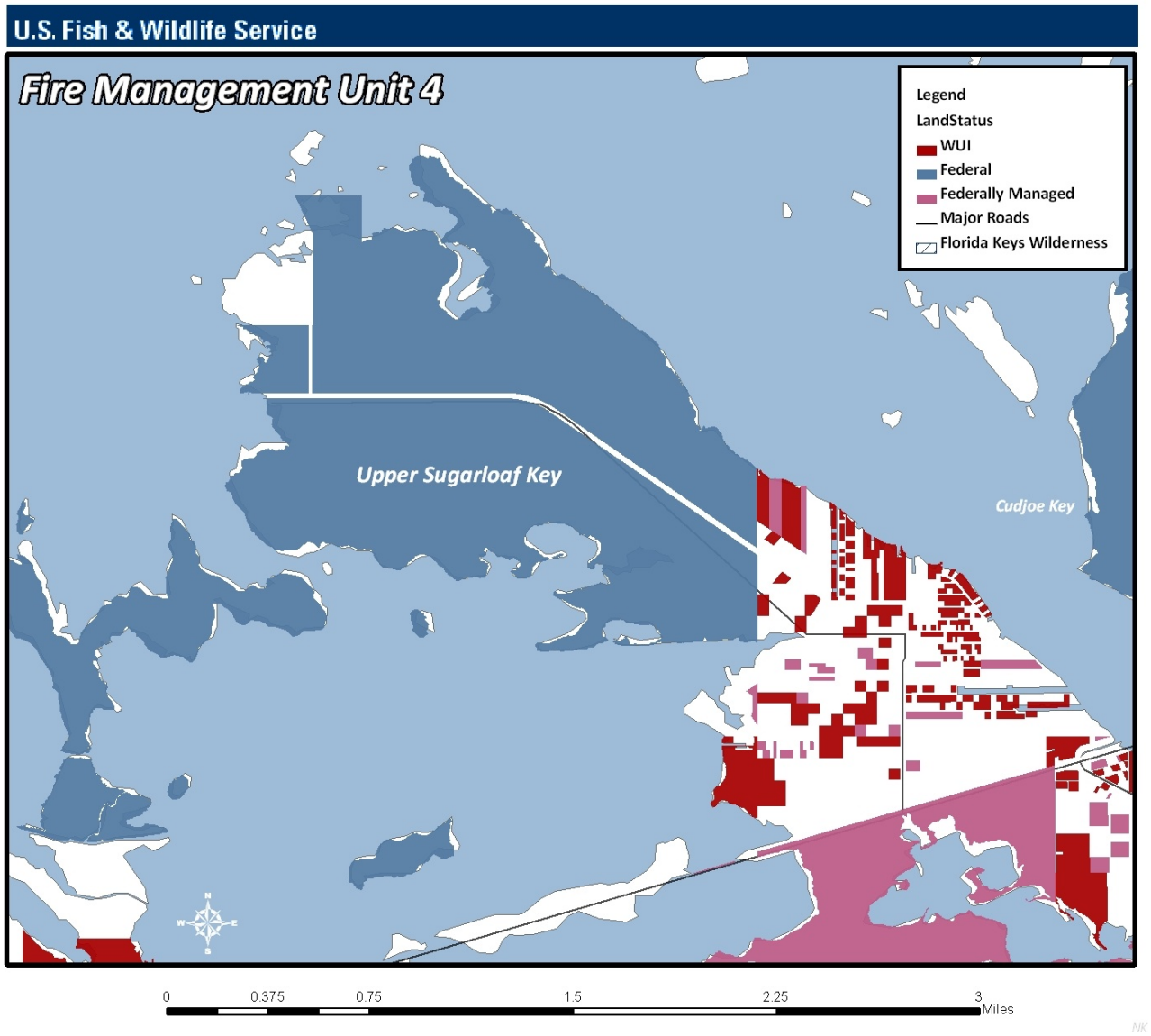


Figure 6. FMU #4 Sugarloaf Key

3.2.5 NATIONAL KEY DEER REFUGE FMU #5 - LITTLE PINE KEY

FMU #5 LITTLE PINE KEY - DESCRIPTION

FMU #5 is a designated wilderness area. The island is dominated by pine rocklands. These pinelands are isolated from human-inhabited islands by an over-water distance of 2.5 miles. In the case of a wildfire on this island, no fire suppression will be initiated, but the adjacent islands of No Name and Big Pine Key will be monitored for fire spread. Because of extreme fuel loads a fire in this unit will be readily visible from populated areas and there may be smoke impacts. It will be important to keep the public informed.

FMU #5 LITTLE PINE KEY VALUES TO PROTECT

- Key Deer, Lower Keys Marsh Rabbit, and Silver Rice Rat Habitat
- There is no infrastructure located in this FMU

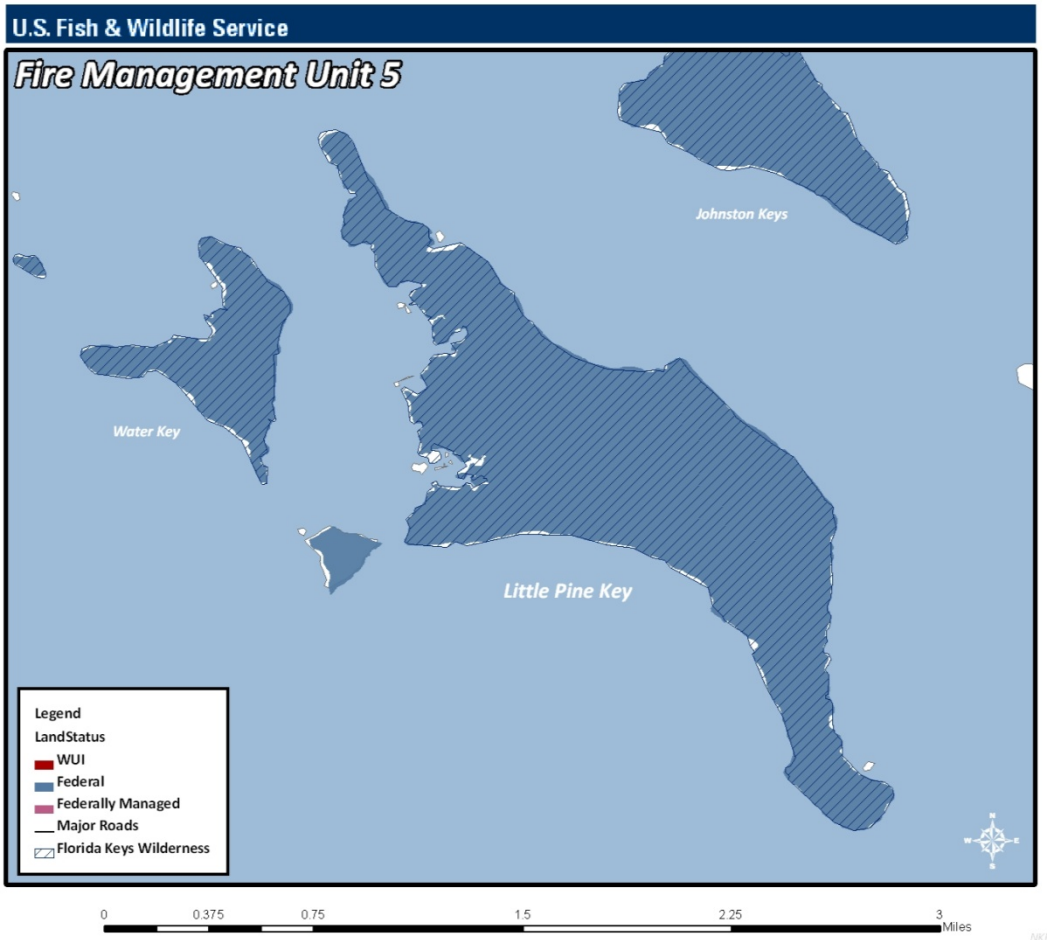


Figure 7. FMU #5 Little Pine Key

3.2.6 NATIONAL KEY DEER REFUGE FMU#7-- BACKCOUNTRY ISLANDS

FMU #7 BACKCOUNTRY ISLANDS - DESCRIPTION

This FMU includes all islands within National Key Deer National Wildlife Refuge that are not connected by road. Values to protect include Key deer, migratory birds, and sea turtles. Fire in all backcountry islands should simply be monitored unless active suppression is deemed necessary to protect ecosystem values at risk. These islands are remote and inaccessible other than by boat. Smoke may be visible from US 1 and populated areas.

FMU #7 BACKCOUNTRY ISLANDS - VALUES TO PROTECT

None of these islands contain refuge infrastructure.

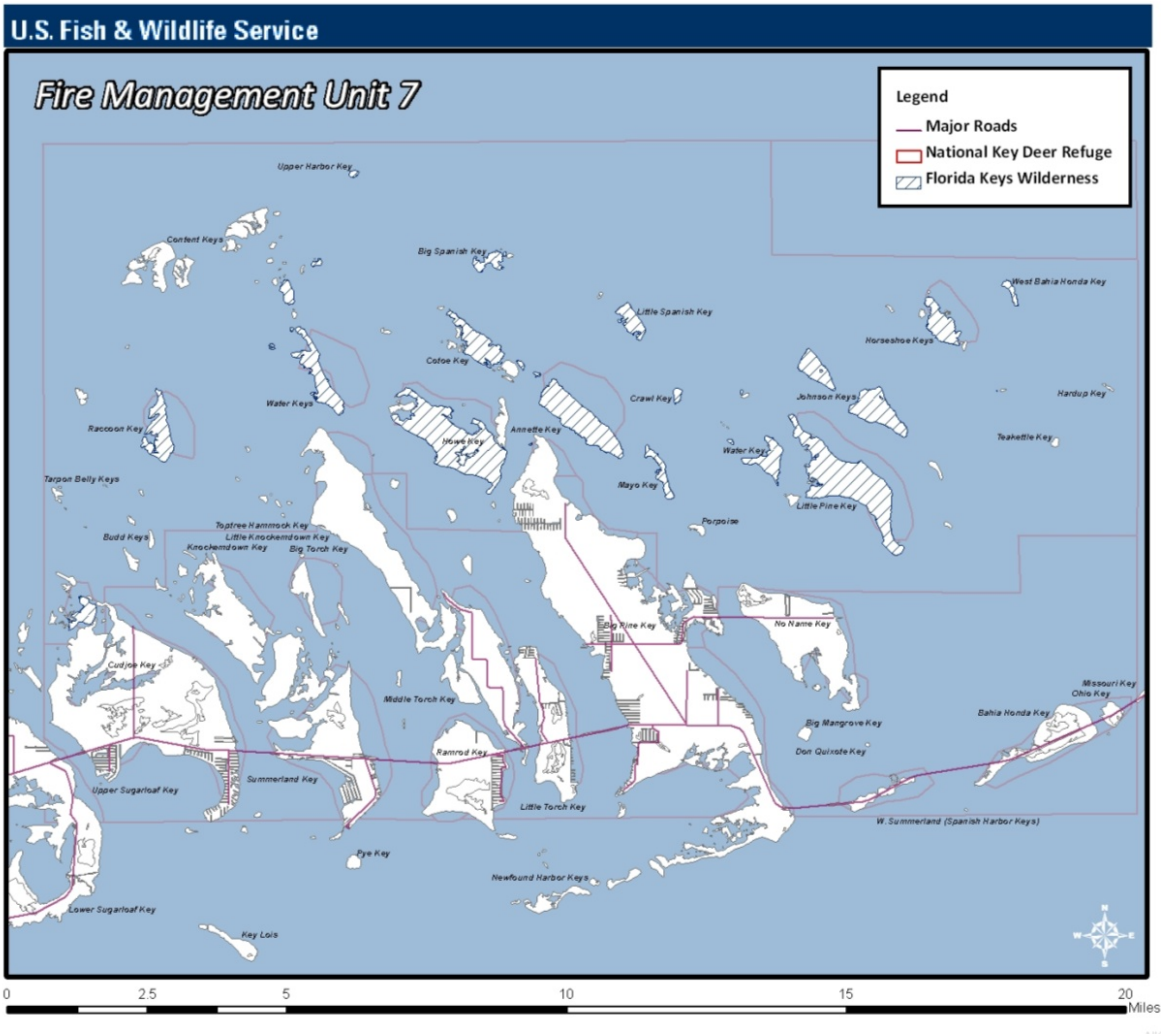


Figure 8. FMU #7 Backcountry Islands

4. WILDLAND FIRE OPERATIONAL GUIDANCE

The procedures used to implement the fire management plan (FMP) for NKDR are covered in this section. Information pertaining to this management is either directly provided or references are cited as to where it may be located. Operational Guidance for the refuge begins with FWS Fire Management Handbook (http://www.fws.gov/fire/handbook/Final%20FMH%202009.pdf) and the Interagency Standards for Fire and Fire Aviation Operations (hereafter called the Red Book; online at http://www.fws.gov/fire/redbook).

Federal wildland fire management policy states that every wildland fire will be assessed following a decision support process that examines the full range of response to wildland fire.

As stated before, the purpose of fire suppression is to put the fire out in a safe, effective, and efficient manner. Fires are easier and less expensive to suppress when they are contained to small areas on the refuge. Thus, the following procedures will be followed for all wildland fires to ensure optimum resource protection and firefighter safety.

4.1. MANAGEMENT OF UNPLANNED IGNITIONS

Structural fire suppression is the responsibility of Monroe County Fire Rescue. USFWS resources may assist with exterior structural protection activities under formal Fire Protection Agreements that specify mutual responsibilities, including funding. (Red Book 01-3)

Response to wildland fire at the refuge will include a range of suppression techniques in order to provide for protection of values at risk, natural resources, firefighter safety and cost efficiency. Response and tactics will be unique to each wildland fire, predicated by weather parameters, fuel conditions, safety consideration, resources, threats to improvements and cost containment, social understanding and tolerance and the involvement of other governmental jurisdictions having different missions and objectives.

Approved Department of Interior strategies for response to wildland fire include:

> Option 1: To restrict the wildland fire within determined boundaries, established either prior to, or during the fire. These identified boundaries should prevent further fire spread with no action being taken to put the fire out. Wildland fire resources will remain in a ready status while monitoring continues.
>
> Option 2: To hold and maintain a wildland fire to a defined area, using a combination of natural and constructed barriers that will stop the spread of the fire under the prevailing and forecasted weather conditions until out.
>
> Option 3: To aggressively fight a wildland fire through the skillful use of personnel, equipment and aircraft to establish firelines around a fire to halt the spread and to extinguish all hot spots, until declared out by the Incident Commander.

The primary criterion for choosing suppression strategies is to minimize costs with the fewest negative consequences with respect to firefighter and public safety. Planned and actual suppression costs must also be commensurate with the values to be protected. Wildfire management decisions will be documented in a decision support process (Wildland Fire Decision Support System). The decision support process will provide situational assessment, analyze hazards and risk, define implementation actions, and document decisions and rationale for those decisions. Whenever possible, suppression strategies should be tailored to achieve

resource benefit. Indirect containment strategies are appropriate only if they are the safest or least-cost option. Selection of these strategies must be carefully scrutinized when fire danger trends are rising. Long-duration wildfires need to be closely evaluated by cost-containment teams to ensure that operations are not occurring beyond the point of diminishing returns.

4.1.1. PREPAREDNESS

4.1.1 LOCAL STEP-UP PLAN

The step-up plan is designed to direct incremental preparedness actions in response to increasing fire danger. “Staffing levels”, based on daily determination of burning index (BI) and ERC for NFDRS Fuel Model 8G, are defined to delineate those actions. It should be noted that this is an initial step up plan, and should be assessed over the next year so that adjustments can be made to meet fire load requirements. The step up plan is found in Appendix K.

MORNING BRIEFING

On mornings when the refuge is determined to be at preparedness level 5, refuge personnel with fire responsibilities or duties will meet to discuss pertinent information and assignments for the day. This morning briefing will be mandatory during the refuge’s fire season. Topics will include safety, duties for the day, preparedness levels, equipment maintenance issues, predicted fire weather, and predicted fire behavior. When firefighters come to the National Key Deer Refuge they should be given a briefing on the Fire Danger Pocket card.

NKDR Fire Pocket Card

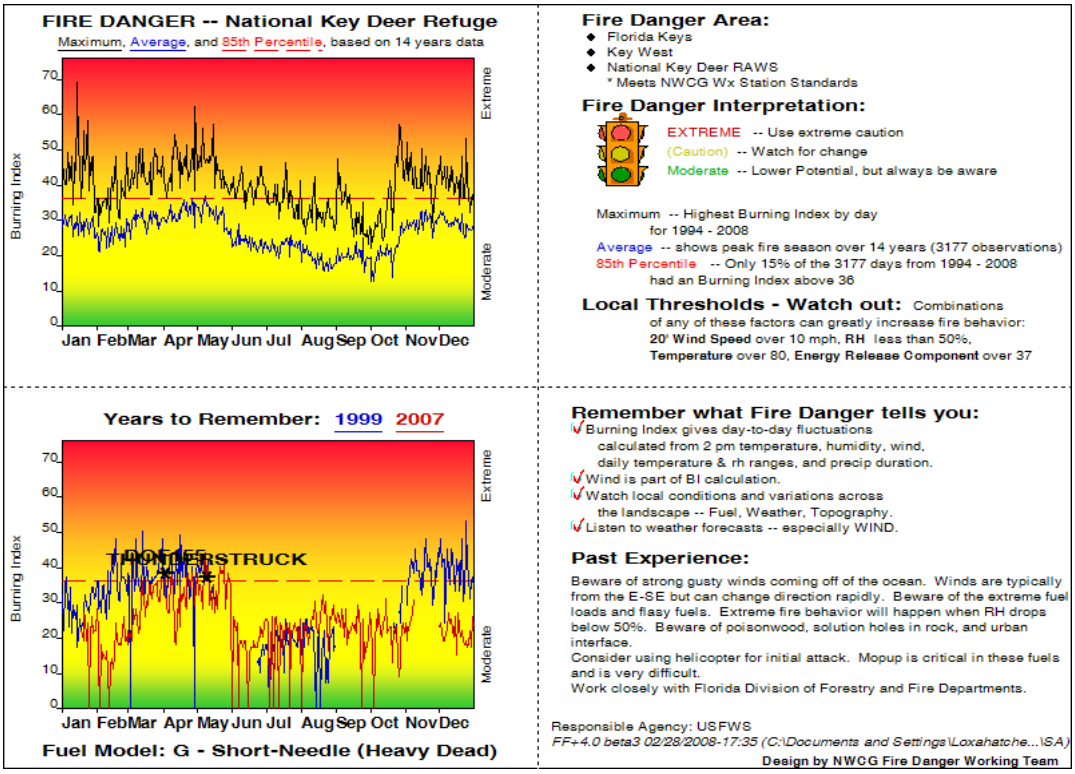


Figure 9. NKDR Pocket Card

Fire weather information is integrated with local fuel and topographic information to calculate NFDRS indices that describe the potential over a geographic area for fires to ignite, spread, and requires fire suppression action. To establish baseline indices at the NKDR, weather data for the years 2000-2008 from the refuge's Remote Automated Weather Station (RAWS) were processed using the Fire Family Plus program.

Of the indices available through the NFDRS, Burning Index (BI) has been selected as the basis to rank fire danger in the Service's Southeast Region, and therefore provides the basis for staffing levels and local preparedness. This index, utilizing the 1988 revision fuel model G has proven to be the most representative fuel model for the fire program in Monroe County and for the National Key Deer Refuge. This index has been implemented into the preparedness level step up plan.

BI, defined roughly as flame length times 10, is designed to reflect the difficulty in controlling a new fire start. It is driven by the variables of wind speed and fine dead fuel moisture. BI (and all NFDRS outputs) relates only to the potential of an initiating fire, one that spreads, without crowning or spotting, through continuous fuels on a uniform slope.

Annual Refuge Fire Readiness Activities

Activities – Complete before end of month	J	F	M	A	M	J	J	A	S	O	N	D
Update Interagency Fire Agreements/AOP's	X											
Inventory Fire Engine and Cache		X										
Complete Training Analysis										X		
Annual Refresher Training	X											
Annual Fitness Testing	X											
Pre-Season Engine Preparation			X									
Prescribed Fire Plan Preparation			X									
Review and Update Fire Management Plan				X								
Prepare Pre-season Risk Analysis			X									
Weather Station Maintenance and Calibration										X		

Table 4. Annual Refuge Fire Readiness Activities

4.1.2. INCIDENT MANAGEMENT

4.1.2.1. GENERAL RESPONSE TO WILDLAND FIRE

Evaluation and selection of an appropriate management response to a wildfire will include:

- Consideration of risks to public and firefighter safety.
- Threats to the values to protect, costs of various mitigation strategies and tactics, and potential wildfire benefits.

Wildfires will be staffed or monitored during active burning periods as needed to ensure that appropriate mitigation actions can be made to protect values threatened.

All wildfires will be supervised by a qualified incident commander (IC) responsible to:

- Assess the fire situation and make a report to dispatch as soon as possible.
- Use guidance in this FMP or a delegation of Authority to determine and implement an appropriate management response.
- Determine organization, resource needs, strategy and tactics.
- Brief incoming and assigned resources on the organization, strategy and tactics, weather and fire behavior, LCES, seasonal and historic ERCs, and radio frequencies.
- Advise dispatch of resources needed for the response to wildland fire.
- Manage the incident until relieved or the incident is under control.

The FMP and a delegation of authority can provide a general strategy to an IC, who has discretion to select and implement appropriate tactics within the limits described for the FMU(s), including when and where to use minimum impact suppression tactics (MIST) unless otherwise specified. All resources, including mutual aid resources, will report to the IC (in person or by radio) and receive an assignment prior to tactical deployment.

4.1.2.2 SAFETY CONSIDERATIONS

- The primary safety concern in all of the NKDR FMUs is the fuel loadings.

  Heavy fuel loads from years of fire exclusion will create fire behavior which will hamper direct attack in seemingly benign fire weather conditions.

- US Highway 1 runs through FMUs #1-4 and #6 in this plan. This is the only road in and out of the Florida Keys. Fire managers must consider this road quickly when any fire operation is planned. Every attempt must be made to minimize smoke on this road.

- Solution holes in rock will make foot travel difficult. As fire burns cap rock will

  frequently break and fall into the aquifer below the surface. This creates large holes and also unstable areas which may at first appear to be safe to walk on.

- Poisonwood smoke and oil is a substance that is not encountered anywhere but

  south Florida. This plant can cause severe allergic reactions; fire managers should always be on alert for firefighter exposure and reaction to this plant and seek medical attention quickly.

- Unauthorized transient camps are common in the wooded areas of FMU #1. Aerial observation is critical to finding these camps and other hazards prior to the implementation of a prescribed fire or prior to management action (such as burnouts) on a wildfire.

4.1.2.3. GENERAL CONSTRAINTS IN RESPONSE TO WILDLAND FIRE

NKDR is home to several federally listed endangered species as well as globally imperiled habitats. Care should be taken and standard minimum impact suppression tactics (MIST) should be employed whenever possible.

WATER AND FOAM CONSTRAINTS:

Due to the close proximity to water and the surrounding communities care must be taken when utilizing long term aerial retardants on any of the refuge units in the Florida Keys. Water drops utilizing foam from helicopters or Single Engine Air Tankers will be allowed, ***from approved water sources*****,** when utilized at a minimum of 300 feet from aquatic areas. Exceptions to the 300 foot rule are as follows:

- When alternative line construction tactics are not available due to terrain constraints, congested area, life and property concerns or lack of ground personnel, it is acceptable to anchor the foam or retardant application to the waterway. When anchoring a retardant or foam line to a waterway, use the most accurate method of delivery in order to minimize placement of retardant or foam in the waterway (e.g., a helicopter rather than a heavy air tanker).

- Deviations from these guidelines are acceptable when life or property is threatened and the use of retardant or foam can be reasonably expected to alleviate the threat.
- When potential damage to natural resources outweighs possible loss of aquatic life, the unit administrator may approve a deviation from these guidelines.

AQUATIC THREATENED AND ENDANGERED (T&E) SPECIES:

The following provisions are guidance for complying with the emergency Section 7 consultation procedures of the ESA with respect to aquatic species. These provisions do not alter or diminish an action or agency's responsibilities under the ESA.

Where aquatic T&E species or their habitats are potentially affected by aerial application of retardant or foam, the following additional procedures apply:

- As soon as practicable after the aerial application of retardant or foam near waterways, determine whether the aerial application has caused any adverse effects to a T&E species or their habitat. This can be accomplished by the following:

  1. Aerial application of retardant or foam outside 300 ft of a waterway is presumed to avoid adverse effects to aquatic species and no further consultation for aquatic species is necessary.
  2. Aerial application of retardant or foam within 300 ft of a waterway requires that the unit administrator determine whether there have been any adverse effects to T&E species within the waterway.

These procedures shall be documented in the initial or subsequent fire reports

4.1.2.4. INTERAGENCY OPERATIONS

All suppression will be done in coordination with the Florida Division of Forestry, Monroe County Fire Rescue, and local volunteer fire departments.

Training of local fire department resources is an important part of the fire program outlined in this FMP. Fire staff should consider hosting an S130-S190 class each year as well as an S-215 class for fire departments. Programs such as the yearly refresher training should also be conducted at the request of the fire departments.

If there are not qualified refuge fire suppression resources then at a minimum the refuge manager will provide a resource advisor to work with the assigned incident commander to provide guidance and information relevant to the protection of refuge resources.

4.1.2.5. DETECTION

The primary means for fire detection on Refuge lands is the E-911 telephone-based system. Citizen calls to the county dispatch center are routed to Monroe County Fire Rescue.

4.1.2.6. DISPATCH, INITIAL RESPONSE AND INITIAL ATTACK

The basic initial attack organization for local or interagency crews responding to fires on refuge lands will be an Initial Attack Incident Commander (IAIC). A Refuge Law Enforcement Officer

will be dispatched if necessary to provide security for firefighting resources or to provide initial investigation of human-caused fires.

No matter which strategy is employed, Incident Commanders should ensure that sufficient suppression resources are available on-scene to deal with any fire escape from the containment perimeter as well as providing for adequate patrol and mop-up. Mop-up will be a component of each type of attack with in the FMU. Water and foam use will be employed during mop-up. Foam use will be limited around drainages, branches, ponds and other water features.

4.1.2.7. UNPLANNED FIRE OPERATIONS AND PLANNING

- Managers will use a decision support process to guide and document wildfire management decisions. The process will provide situational assessment, analyze hazards and risk, define implementation actions, and document decisions and rationale for those decisions.
- Initial action on human-caused wildfires will be to suppress the fire at the lowest cost and with the fewest negative consequences with respect to firefighter and public safety.
- Wildland fire may be concurrently managed for one or more objectives and objectives can change as the fire spreads across the landscape. Objectives are affected by changes in fuels, weather, topography, varying social understanding and tolerance, and involvement of other governmental jurisdictions having different missions and objectives.
- Suppress all wildfires at the smallest size safely possible, to protect human life, public and private property, and resource values at risk; management of wildland fire for resource purposes.
- Suppress all wildfires at a reasonable cost, consistent with land, resource and fire management objectives; manage staffing level and availability in accordance with current and expected fire weather and behavior
- For wildfires that escape initial attack, establish a Type 3 Extended Attack incident management organization comprising qualified personnel from the program and nearby cooperating agencies
- For incidents that exceed the capability of a Type 3 organization, request dispatch of a Type 2 (Regional) or Type 1 (National) incident management team
- Mitigate fire suppression hazards before fire occurs, through use of hazard fuel reduction projects and fire education programs; accomplish fuel reduction using prescribed fire and/or mechanical means
- Specific wildfire suppression objectives are identified in section 4 of this document
- Suppression strategies and tactics shall be chosen to minimize smoke production and resulting impact on roads, Interstate highways, and urban interface
- Suppression strategies and tactics shall be chosen to minimize suppression impacts to habitat, groundwater drainage patterns, and refuge improvements.

4.1.2.8 WILDLAND-URBAN INTERFACE STRATEGIES

Wildland Urban Interface activities to implement *National Fire Plan* and the *Ten-Year*

Comprehensive Strategy include:

- Provide for a wide range of planning, coordination and cooperation, and community assistance efforts to urban interface organizations neighboring the refuge
- Generate intelligence as needed, including geographic information systems (GIS) mapping and risk-assessment databases for developed areas around the refuges
- Develop hazard fuel reduction plans as required to mitigate wildfire risk to developed areas around the refuges and facilitate community-based hazard fuel reduction efforts where feasible
- Manage the Rural Fire Assistance (RFA) and Ready Reserve (RR) grant programs to assist local fire departments in accomplishing their fire protection mission
- Coordinate planning and operations with State and local fire organizations providing fire protection to the refuges and surrounding lands and negotiate Annual Operating Plans
- Coordinate with county planning and zoning departments regarding provision of defensible space in all new construction and facilitate local Wildland-Urban Interface Council or FireWise organization
- Conduct all activities pursuant to guidance in the *U.S. Fish and Wildlife Service Fire Management Program Strategic Plan – Fiscal Years 2006-2010* , *Southern Wildfire Risk Assessment* (SWRA), and *Florida Wildfire Risk Assessment 2004*.
- Specific wildland-urban interface objectives will be identified annually in a work plan

4.1.2.9. EXTENDED ATTACK AND LARGE FIRE MANAGEMENT

Most extended attack fires will be managed as Type 3 incidents. In these cases, an Extended Attack Incident Commander (ICT3) must be ordered to assume control of the fire. On such incidents, some or all of the command and general staff positions may be activated, usually at the division/group supervisor and the unit leader levels. Only in very unusual circumstances would a Type 2 or Type I Incident Management Team (IMT) be ordered to manage an extended attack incident at NKDR. Should a wildfire go past initial attack the refuge manager or delegate will immediately notify the District FMO. All actions will be guided by the Red Book, Chapter 11, Incident Management. This will include but not limited to Complexity Analysis, Delegation of Authority, WFDSS Preparation, and Incoming Briefing.

4.1.2.10. AVIATION OPERATIONS

All fire-related aviation operations will follow applicable guidelines of the DOI National Business Center - Aviation Management Directorate (AMD), *the Interagency Helicopter Operations Guide* (IHOG) and the *Station Aviation Plan*.

4.1.2.11. REPORTS

Following a suppression action by the local cooperating agency the refuge manager will contact the District FMO, who will complete and file an Individual Fire Report for the following types of fires within 10 days of a fire being declared out:

- All wildfires on FWS and FWS-protected lands.

- Wildfires threatening our lands on which we take action.
- All escaped prescribed fires. When a fire exceeds or threatens to exceed prescription, treat may be declared a wildfire, and a separate new report filed to report acres burned by the wildfire from the time of declaration to the time of being declared out.
- All false alarms responded to by field office staff.

Fire Reports are required regardless of who takes action, e.g., FWS engine, cooperator, or contractor. When we take initial attack off our lands, the agency with jurisdiction where the fire occurs will file a report and we will file a limited report to document our response and to support potential billing to non-federal entities for trespass fires.

4.1.3 EMERGENCY STABILIZATION/POST WILDFIRE ACTIVITIES

Emergency stabilization actions are immediate post wildfire actions needed to minimize the threat to life and health and prevent unacceptable degradation to natural and cultural resources (see Interagency Burned Area Emergency Response Guidebook) and must be taken within one year following containment of a wildland fire and documented in a Burned Area Emergency Response Plan (BAER Plan) (*Interagency Standards for Fire and Fire Aviation Operations; Interagency Burned Area Emergency Response Guidebook,* http://fire.fws.gov/fm/policy/HANDBOOK/CHAPTER 5.HTM. DOI; and 620 DM 3 and 095 FW 3.9). The Red Book clearly differentiates between damages due to fire suppression actions and burned damages due to the wildfire itself. Different funding mechanisms and procedures are used to support these post-wildfire activities. The incident commander is responsible for fire suppression damage repair plan and the Agency Administrator is responsible for the actions of Emergency Stabilization (ES) and Burned Area Rehabilitation (BAR, see section 4.2).

4.1.3.1 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. These actions are usually implemented immediately after the containment of the wildfire by the Incident Management Team before demobilization. If necessary, engineers, hydrologists or other specialists will be consulted to determine the extent of damages incurred to refuge resources and facilities from suppression activities (Interagency Standards for Fire and Fire Aviation Operations).

Suppression action damages may be the result of suppression operations. Rehabilitation should start as part of the fire suppression action and should involve recovery of firelines, replacement of tools and equipment, etc. Suppression action damages include tools, equipment, roads, buildings, and resources damaged as a result of the suppression action; not damages actually caused by the fire. Also included is resource damage that must be immediately repaired to prevent erosion, further damage to resources, or to ensure safety. Rehabilitation actions carried out as part of the incident are funded by the incident.

Rehabilitation Standards in FMU1 and FMU2 are to repair as much suppression damage as possible as part of the suppression action. A rehabilitation plan will be submitted to repair suppression damages that must be repaired on a longer-term basis. Rehabilitation commonly required may include:

- Roads and firelines will be restored to their pre-fire condition. Ruts will be filled. The surface will be stabilized where heavy equipment has broken down the sand/clay mat, by incorporating organic material from the ditch area. Pavement will be repaired where equipment damage has occurred. Damages to bridges, culverts, and signs will be repaired.
- Damages to suppression equipment must be repaired.
- Suppression damage to refuge and cooperators facilities will be repaired.
- Fire cache inventory (NUS supplies) will be restored.
- Incident base, temporary camp, and service areas must be rehabilitated.
- All hazardous materials will be disposed of properly. Hazardous material spills and incidents shall be cleaned up and resolved.
- Exotic grass seed will not normally be sown on constructed lines, but rather they will be allowed to re-vegetate naturally. Emergency seeding of native seed sources and control techniques will be used in areas where erosion control is necessary (e.g. heavily disturbed areas like ICPs, parking areas, pump sites, and etc).
- Wetlands will be protected as needed.
- Snags will be preserved for cavity nesting wildlife where they do not pose a threat to life or property. Any snags will be removed if they pose a threat to life or property.

4.1.3.2 EMERGENCY STABILIZATION (ES)

Planned actions to stabilize and prevent unacceptable degradation to natural and cultural resources, to minimize threats to life or property resulting from the effects of a wildfire, or to repair/replace/construct physical improvements necessary to prevent degradation of land or resources. Emergency stabilization actions must be taken within one year following containment of a wildland fire and documented in a Burned Area Emergency Response Plan (BAER Plan) (Interagency Standards for Fire and Fire Aviation Operations; Interagency Burned Area Emergency Response Guidebook, DOI, 2006; and 620 DM 3 and 095 FW 3.9). Monitoring for treatment effectiveness will be conducted on all approved treatments and the results described in an annual or final report as stated in policy (620 DM 3 and 095 FW 3.9).

Natural recovery is the preferred emergency stabilization treatment for the refuge. No specific actions have been undertaken in the past to stabilize an area or implement a BAER Plan to date, however it is recognized that under certain possible scenarios stabilization treatments could be implemented. Allowable actions permitted on the refuge that may be deemed necessary to stabilize an area under an emergency response include:

<u>Assessments</u>: Burned area assessments will identify post-fire threats to federal and tribal listed or proposed threatened and endangered species and what, if any, cost effective stabilization measures can be implemented to prevent further post-fire condition degradation.

<u>Cultural Resources</u>: Site stabilization and Protection and NHPA Section 106 Compliance

<u>Non-native Invasive Control</u>:

- Assessments to determine the need for treatment. Contingent upon location of known infestations, possibility of new infestations due to management actions, suspected contaminated equipment use areas
- Treatments to prevent detrimental invasion by non-native species (not present on the site)
- Treatment of invasive plants introduced or aggravated by the wildfire. The treatment objective when the population is aggravated is to maintain the invasion at no more than pre-wildfire condition.
- Treatments to prevent permanent impairment of designated Critical Habitat for Federal and State listed, proposed or candidate threatened and endangered species.

Re-vegetation:

- Stabilize a site and minimize water or wind erosion
- Reduce invasion of non-native invasive plants
- Prevent Critical Habitat for federally listed threatened and endangered species from being more impaired than if nothing was done
- See Interagency Emergency Response Guidebook (DOI 2006) for further information

Federal Field Unit Infrastructure:

- Emergency stabilization of improvements and minor facilities (e.g., signs, kiosks, guardrails, pit toilets, and others as listed in Section 3) burned or damaged by wildfire is appropriate only for public health and safety reasons. If it is not an immediate threat to public health, it will be reviewed under the Burned Area Rehabilitation Plan
- HAZMAT and Facility Assessment and Stabilization
- Early Warning Flood and Evacuation Systems
- Emergency Road Repairs and Maintenance - Road closure is preferable unless the road is needed to provide immediate access to essential activities (e.g., hospital and post office access, threatened and endangered species management, communication systems). Damages due to suppression activities to roads will fall under “Wildfire Suppression Damage Activity Repair” as stated above.

4.1.3.3 BURNED AREA EMERGENCY RESPONSE TEAM (BAER TEAM) AND PLAN DEVELOPMENT:

An ad-hoc team of Agency Administrator (Refuge Manager, or Project Leader) and refuge staff and any additional personnel necessary will form an initial Burned Area Emergency Response Team. If warranted, a National BAER Team will be ordered to meet the refuge’s needs. The team, under the guidance of the Agency Administrator will:

1. determine the need for burned area assessments
2. determine what further expertise is needed to conduct assessments
3. develop a Burned Area Emergency Response Plan with identified treatments
4. Track treatments in NFPORS
5. implement treatments
6. monitor effectiveness of treatments
7. write report based on monitoring results including a final report

4.2. BURNED AREA REHABILITATION

Efforts taken within three years of containment of a wildland fire to repair or improve wildfire-damaged lands unlikely to recover naturally to management approved conditions, or to repair or replace minor facilities damaged by wildfire. These efforts are documented in a separate Burned Area Rehabilitation Plan (BAR plan) (Interagency Standards for Fire and Fire Aviation Operations; Interagency Burned Area Rehabilitation Guidebook, DOI, 2006; and 620 DM 3 and 095 FW 3.9).

4.2.1 REHABILITATION

Natural recovery is the preferred rehabilitation treatment for the refuge. No specific Burned Area Rehabilitation Plans have been implemented in the past following wildfires to date, however it is recognized that under certain possible scenarios rehabilitation treatments could be necessary. Allowable actions permitted on the refuge that may be deemed necessary to rehabilitate an area following wildfires in addition to those listed in the Interagency BAR Guidebook (2006) include:

CULTURAL RESOURCES:

- BAR funds are used to ensure burned area rehabilitation treatments conform to Section 106 of the National Historic Preservation Act (NHPA). Funds can not be used for restoration of any cultural resource or heritage sites.

NON-NATIVE INVASIVE CONTROL:

- Burned area rehabilitation funds can be used to control non-native invasive plants in burned areas only if an approved management plan and existing program is in place addressing non-native species control.
- Assessments to determine the need for treatment. Contingent upon 1) known infestations; 2) possibility of new infestations due to management actions; and 3) suspected contamination due to equipment.
- Treatments to prevent detrimental invasion (not present on site) by non-native invasive species.
- Treatment of invasive plants introduced or aggravated by the wildfire. The treatment objective when the population is aggravated is to maintain the invasion at not more than pre-wildfire conditions.
- Systematic inventories can not be funded by rehabilitation funds.

RE-VEGETATION

- Natural recovery by native plant species is preferable to planting or seeding, either of natives or non-natives. Re-vegetation of burned areas is not an appropriate use of BAR funds if natural regeneration will result in a vegetation type that meets BAR objectives.
- Planting of seed or seedlings for BAR is an appropriate treatment if seeding or planting of vegetation is prescribed to be effective with Departmental Policy and it repairs or improves land unlikely to recover naturally from wildfire damage by emulating historical or pre-fire ecosystem structure, function, diversity and dynamics consistent with existing land management plans.

FOREST MANAGEMENT:

Forest management may be considered if the ecosystem is unlikely to recover naturally from wildfire damage as prescribed by a certified silviculturalist to not regenerate for 10 years following fire. Tree planting is limited to the following: the use of BAR funds to plant trees must be addressed in an approved land management plan (see 620 DM 3):

- facilitating the succession and stabilization of forest ecosystems.
- re-establishing habitat for federally listed threatened or endangered species, or other special status species.
- re-introducing or re-establishing native tree species and seed sources lost in a stand replacement fire.
  - reforestation on Indian Trust Lands.

Minor Facilities:

- The repair or replacement of minor improvements and facilities (e.g., kiosks, fences, interpretive or boundary signs, recreation facilities, corrals, guzzlers, trails, permanent long-term monitoring plots or other as listed in Section 3 etc.) burned or damaged by wildfire to pre-fire specifications is authorized with the use of BAR funds only if these improvements or facilities are necessary for implementing an approved land management plan. It does not include the construction of new or upgraded facilities that did not exist before the fire. BAR treatments and maintenance of BAR improvements beyond 3 years from wildfire containment is funded with other program funding. Minor facility repair or replacement must be addressed in the BAR plan.

4.2.2 BURNED AREA REHABILITATION TEAM AND PLAN DEVELOPMENT:

An ad-hoc team of Agency Administrator (Refuge Manager, or Project Leader) and refuge staff and any additional personnel necessary will form an initial Burned Area Rehabilitation Team. The team, under the guidance of the Agency Administrator will:

1. determine the need for further burned area assessments
2. determine what further expertise is needed to conduct assessments
3. develop a Burned Area Rehabilitation Plan with identified treatments
4. track treatments in NFPORS
5. implement treatments
6. monitor effectiveness of treatments
7. write reports based on monitoring results including annual reports and a final report

4.2.3 LONG TERM RESTORATION

Restoration includes continuing the rehabilitation beyond the initial three years or the repair or replacement of major facilities damaged by the wildfire. Land management plans and other funding sources are available to continue the rehabilitation efforts beyond three years.

4.3. MANAGEMENT OF PLANNED FUELS TREATMENTS

4.3.1. PRESCRIBED FIRE PROGRAM FOR HAZARDOUS FUELS AND HABITATS

Broad prescribed fire management goals and authorities are listed in chapter 17 of the *FWS Fire*

Management Handbook and *Interagency Standards for Fire and Fire Aviation Operations*. This document directs and guides agency administrators and prescribed fire practitioners in all federal land management agencies. The *Interagency Prescribed Fire Planning and Implementation Procedures Reference Guide*, defines specific interagency processes and forms used to prepare and document prescribed fire activities on federal lands

4.3.1.1. PROGRAM OVERVIEW

The prescribed fire season on the NKDR is typically from June through September, this corresponds with the rainy season in the Florida Keys. Prescribed burns in marsh areas may take place at any time of the year that prescriptive elements are met

The annual prescribed fire and fuels treatment schedule (i.e., annual work plan) should be prepared soon after the fiscal year (October 1) and completed and approved by no less than 30 days prior to implementation (see annual program below). Prescribed fire plans (i.e., burn plans) should be completed and submitted prior to the burn season.

The refuge managers, in consultation with the wildlife biologist and fire management officer will formulate the prescribed fire program (work plan) that:

- Identifies the annual acreage scheduled for treatment.
- Designates the burn units to be treated.
- Prioritize burn units to be treated in order of need for fuels reduction.
- Determines prescribed burn unit complexities.
- Identifies the preferred treatment interval (this can vary by fuel type).
- Recommends the approved method of treatment (fire, fire/mechanical/chemical, etc.).
- Recommends an effective treatment sequence (rotation).
- Identifies the type of monitoring and frequency.

The FMO or burn boss qualified at the appropriate prescribed fire complexity level will write individual prescribed fire plans for the units to be treated. Prescribed burn plans should be prepared well enough in advance to allow for a minimum of a 30-day review period prior to the start of a burn season or burn execution phase.

All burn plans are prepared by a qualified burn boss, submitted for technical review, reviewed by the District Fire Management Officer (DFMO) and approved by the Refuge Manager. The approved burn plan's "Go-No Go Decision" form must be reviewed and signed by the designated Burn Boss and Refuge Manager before implementation. Procedures for prescribed fire are well covered within the *Interagency Prescribed Fire Planning and Implementation Procedures Guide*.

An after action review (AAR) must be completed and documented after all prescribed fires. The person responsible for the AAR will be noted in the burn plan. This will focus on performance standards to enable agency administrators and firefighters to discover what happened, why it happened, and how to sustain strengths and improve on weaknesses. The AAR will document the conditions under which the burn was conducted in order to evaluate how closely the fire conformed to planned fire behavior, what unanticipated difficulties were encountered during the

action, and how well the fire accomplished the desired results.

When a prescribed fire burns outside the planned burn unit boundary and cannot be mitigated by implementing the contingency plan in the prescribed fire burn plan, it may be converted to a wildfire. Similarly, a prescribed fire that is still within a burn unit boundary but outside prescription parameters and not meeting objectives may be converted to a wildfire. A wildland fire may be concurrently managed for one or more objectives and objectives can change as the fire spreads across the landscape. Objectives are affected by changes in fuels, weather, topography, varying social understanding and tolerance, and involvement of other governmental jurisdictions having different missions and objectives. Managers will use a decision support process to guide and document wildfire management decisions. The process will provide situational assessment, analyze hazards and risk, define implementation actions, and document decisions and rationale for these decisions.

Site-specific treatment objectives are developed to guide project operations. Prescribed fire objectives describe what a treatment must accomplish in order to meet a resource management objective.

Treatment objectives for the NKDR are the following:

- Reduce fuels to protect values at risk, and to:
- Establish defensible space along the refuge boundary where practical.
- Protect habitat from undesirable wildland fire encroachment.
- Maintain fuel loadings within natural range of variability (determined by fuel type). Seek to achieve a desired future condition of fire regime condition class 1 pine uplands.
- Control invasive plant species/noxious weeds in both upland and wetland habitats.
- Reduce woody mid and under-story occurrence within the pine uplands.
- Restore and maintain the historical native fire dependent herbaceous vegetation within the fresh and saltwater marsh ecosystems.

The District FMO shall assign the burn boss qualified as appropriate to the complexity level of the planned burn. The burn boss will follow all the guidelines and procedures that are contained in the prescribed fire plan.

Refuge staff shall meet or exceed standard and qualification requirements as outlined in *Fire Management Handbook* and *Wildland Fire Qualification System Guide* (NWCG publication 310-1). The refuge manager, in consultation with the FMO, will be responsible for ensuring that refuge personnel maintain the qualifications necessary to implement prescribed fire programs

4.3.1.2 PRESCRIBED FIRE STRATEGIES

Prescribed fire is the primary tool used to reduce hazardous fuels and restore habitat on refuges. In accordance with the 2000 FMP, burns will be conducted either during the winter (December/January) to capture the dry season burn or during the summer (July-September) to capture the growing/lightning season. Burn interval will vary depending on site-specific fuel loads and successional state of plant communities, but will likely vary between 8-12 years. The use of prescribed fire as an ecosystem management tool is more complicated than fuels reduction burning. Not only must the ecological role of fire in a particular ecosystem be

identified, but the relationship of this role to specific management goals must be determined. Ecological burns should be done during the seasons when natural fires occurred during late spring through summer (June-September)

Ignition shall be in accordance with Service policy as detailed in the *Interagency Standards for Fire and Fire Aviation Operations* (NFES 2724). No ignition shall occur without an approved prescribed fire plan and concurrence of the Project Leader.

Experience has shown that rigid scheduling of burns fails to address the complex biological processes that are involved in the NKDR. Furthermore, accomplishment of burns each year is very dependent upon weather, and other work being undertaken on the refuge, which cannot be controlled by the fire staff. Burning rotation lengths may be shortened or lengthened as vegetative and environmental changes occur to meet refuge management objectives.

4.3.1.3. NON-FIRE FUEL REDUCTION STRATEGIES

Non-fire fuel reduction activities including mechanical, chemical, biological or combination of these shall be used as needed and where appropriate to reduce hazardous fuel accumulations near refuge boundaries, near refuge administrative sites, visitor use areas, and urban interface areas. These methods may also be used to augment prescribed fire methods in achieving habitat improvement objectives. Strategies include:

- Thinning and clearing of large areas by mechanical brush cutters (mastication)
- Selective thinning by crews using chainsaws or hand tools

Specific mechanical fuels reduction objectives will be identified annually in a work plan.

4.3.1.4. EFFECT OF NATIONAL AND REGIONAL PREPAREDNESS LEVELS

The National Interagency Coordination Center establishes national preparedness levels to keep track of resource availability at a national level to ensure national preparedness. These levels may constrain prescribed fire activities in some Geographic Areas not experiencing significant activity to ensure sufficient resources are available for the national situation.

The Southern Area Coordination Center (SACC), in consultation with agency fire coordinators, determines regional preparedness levels. These levels are based on wildland fire activity within the Southern Area and the need for fire suppression resources.

Prescribed fires may be continued or ignited during the national preparedness levels as specified in the *National Interagency Mobilization Guide*. 4.2.1.3. Project Planning. At Preparedness Levels 4 and 5 prescribed fire application can be continued or be initiated if the proposed action is approved by the agency at the Regional Office level.

The Interagency *Prescribed Fire Planning and Implementation Procedures Reference Guide*, contains all the required burn plan elements used in preparing a prescribed fire plan.

4.3.1.5. PROJECT IMPLEMENTATION

Cooperators, contractors, and casual hires (AD) may be used to implement prescribed fires. ADs must meet FWS standards. Cooperators, such as members of Volunteer Fire Departments, must have appropriate qualifications certified by their agency. Those who supervise FWS employees during prescribed fires must meet FWS standards.

A prescribed fire may be declared a wildfire by those identified in the burn plan when that person(s) determines that the contingency actions have failed or are likely to fail and cannot be mitigated by the end of the next burning period. An escaped prescribed fire may be declared a wildfire when the fire has spread outside the project boundary, or is likely to do so, and cannot be contained by the end of the next burning period. A prescribed fire can be converted to a wildfire for reasons other than an escape. A response will be made to such incidents and a formal analysis (WFDSS) undertaken when needed. The Refuge Manager or Project Leader will be notified of an escaped prescribed fire.

The public will be informed of prescribed fires through news releases, interpretive messages, and educational programs. Individual prescribed fires should not be conducted without informing those agencies and members of the public likely to be impacted.

4.3.1.6. SMOKE MANAGEMENT

Because fires are not point sources but rather tend to be spatially distributed singular events, temporary impacts to visibility must be recognized, expected and managed. All refuges, including those with exclusive jurisdiction, are required to obtain necessary permits for prescribed fires, comply with the national ambient air quality standards (NAAQS) both inside and outside refuge unit boundaries, and to protect visibility in Congressionally-mandated Class I areas. There are certain absolute or minimum requirements that apply to Fish and Wildlife Service fire management activities, such as compliance with the NAAQS and the visibility protection regulations for Class I areas. There is currently no Class I airshed or air quality non-attainment area on or near the NKDR .

The Clean Air Act requires the USEPA to establish National Ambient Air Quality Standards based on public health. State and local agencies are responsible for monitoring their air and determining if they meet these air quality standards. If an area has higher levels of a pollutant than the standard allows, it may be classified "non-attainment" and an Implementation Plan must be established to bring the area into compliance. In Florida, the Department of Environmental Protection (DEP) is responsible for collecting the data and enforcing our Implementation Plans. A lack of progress toward compliance may evoke sanctions such as the loss of certain federal funds to the state.

In 1998, the USEPA suggested stronger standards for particulate matter, setting a maximum limit on particulate concentrations. Air quality monitors are currently collecting data across Florida to measure the concentration of small particulates in our air. These data will be averaged over three years to see if any region of Florida has a high level of particulates in the air. If some areas exceed the air quality standard, the DEP will have three years to create an approved Implementation Plan, and several years to implement controls.

Florida's Division of Forestry (DOF) has already submitted a Smoke Management Plan (SMP) to the USEPA that describes their current activities to authorize and control prescribed fires in the state. The new Florida Fire Management Information System, a GIS-based system for recording smoke sensitive areas, weather, and prescribed fires, will greatly enhance the DOF's ability to manage fires and air quality across the state. The Florida SMP includes the following components:

- To conduct a prescribed fire in Florida, the burner must receive authorization from the DOF. An authorization is given after considering all open burning activities in the region, the weather conditions, and the impacts on air quality. Prescribed Fire Plans, (PFP) will be prepared for all prescribed burns and are required of DOF certified burners. The PFP will address all twenty one elements identified in the Interagency Prescribed Fire Planning and Implementation Procedures Guide including; location, size, and description of the area to be burned, amount and type of vegetation, ignition patterns, acceptable weather conditions, responsible personnel, safety, contingency plans for smoke, appendices and Complexity Analysis.
- Alternative treatments to reach management objectives that do not affect air quality, such as mechanical and chemical treatments, should be considered. Extremely high fuel loads may be mechanically reduced prior to a prescribed burn to facilitate control and enhance air quality. Rapid and complete mop-up is required of a burner and helps to reduce lingering smoke emissions.
- The DOF authorization system relies on a state-of-the-art weather forecasting model regarding smoke dispersion conditions. The new GIS model forecasts size and direction of the smoke dispersion plume, allowing DOF to predict impacts to smoke-sensitive areas such as highways, schools, and airports. Atmospheric conditions must be appropriate for good smoke dispersion.
- Current operating procedures include a request for certified burners to notify adjacent community residents of the planned burn. It is also recommended that burners keep the public informed of the outcome of the burn, so that future burns may receive more positive support.

The Florida SMP is under constant evaluation. Statute changes are made by the Florida legislature after they receive extensive input from the DOF and their constituents. Rule changes are made in cooperation with the general public at public workshops and hearings

SMOKE MANAGEMENT IMPLEMENTATION

Prescribed fire program implementation at the refuge must always be sensitive to potential smoke impacts to the local communities, residential areas and travel corridors that could be impacted by smoke from refuge burns. While the use of prescribed fire may be desired throughout all seasons of the year, the combination of atmospheric conditions for excellent smoke dispersal and timing of the burn to achieve optimum fire effects on fuels or habitat seldom coincide. Because the refuge is surrounded by urban interface with many smoke sensitive areas, deference must be made to managing smoke. The strategies that the refuge may use in the smoke management program are as follows.

- Burn when winds are blowing away from critical targets.
- Reduce acreage burned at one time to control smoke production.
- Mop up heavy fuels within 50 feet of control lines.
- Place smoke signs on public roads adjacent to burn area.

However, additional strategies that are specific to individual burn units may be utilized and documented in each individual unit prescription.

4.3.1.7. AFTER ACTION AND ESCAPED FIRE REVIEWS

The Burn Boss will ensure an informal After Action Review (AAR) is conducted for each operational period on a prescribed fire, as in *Red Book*, Chapter 17.

- All prescribed fires that are converted to a wildfire will be reviewed by the refuge manager (or designated representative). This review may be included as part of a Regional or National Level review if necessary. The purpose of the review is to determine why and under what circumstances a prescribed fire had to be converted to a wildfire. It will identify the circumstances leading to the conversion of the fire, what actions were taken after conversion to a wildfire, and possible future actions that need to be taken to avoid similar situations.

A formal report will be prepared, signed by the refuge manager, and a copy forwarded to the Regional Fire Management Coordinator and the Fire Management Branch. At a minimum, the review report will include the following elements:

- An analysis of seasonal severity, weather events, and on-site conditions leading up to the wildfire declaration. Include fire weather forecasts, including any spot forecasts, Remote Automated Weather Station data and National Fire Danger Rating System data.
- An analysis of the actions taken leading up to the wildfire declaration for consistency with the prescribed fire burn plan. This will include whether it was followed.
- An analysis of the prescribed fire plan for consistency with policy.
- An analysis of the prescribed fire prescription and associated environmental parameters.
- A review of the approving line officer's qualifications, experience and involvement including adequate program oversight.
- A review of the qualifications and experience of key personnel involved.
- A summary of casual agents contributing to the wildfire declaration.
- Determine the level of awareness and understanding of procedures and guidance of the personnel involved.
- Establish accountability.

Any prescribed fire that is converted to a wildfire and requires the expenditure of suppression funds or results in property damage, injuries or fatalities will be investigated. The *Interagency Standards for Fire and Fire Aviation Operations* (*Redbook*, Chapter 19) details the specifics of investigations and reviews.

4.3.1.8. REPORTS

The completion of an approved prescribed fire plan (PFP) is the primary documentation that a prescribed fire has been attempted or completed. Various documents that record weather data or public comments may be attached to the completed plan, which includes a record of observed fire behavior and kind and amount of resources committed to the burn. All completed burn plans and associated documents will be kept in a binder at the refuge office as a permanent record of the burn day activities.

On the day of the burn, the Burn Boss will notify the appropriate State forestry commission dispatcher that a prescribed burn is planned and request a burning permit. The Burn Boss will

provide the State dispatcher with the size, time of ignition and the location of the burn. The Burn Boss will also notify the appropriate State interagency coordination center of the size of the burn to be attempted. Generally, by 1500 on burn day the Burn Boss will notify the state coordination center of the number of acres that were successfully burned.

The Burn Boss is responsible for obtaining a fire number from the Fire Management Information System (FMIS) and requesting that a charge code be established for the project. Following the burn, the Burn Boss is responsible for initiating a web-based fire report in FMIS and entering all data including a narrative of the day's activities. Within ten days following the completion of a prescribed burn a completed web-based fire report will be electronically submitted into the FMIS. Prescribed fire accomplishments must also be reported to the National Fire Plan Operations and Reporting System (NFPORS) within the same time frame as FMIS.

4.3.2. NON-FIRE HAZARDOUS FUELS TREATMENT PROGRAM

Non-fire treatment strategies are those that do not involve the use of prescribed fire to meet stated objectives. For NKDR, mechanical, biological and chemical treatment strategies are available as non-fire management tools. Normally, the refuge habitat management plan (HMP) establishes objectives and protocols for the use of these strategies. The following objectives for non-fire treatments of hazardous fuels on the refuge include:

- Establish defensible space along the refuge boundary and around refuge improvements and structures.
- Protect habitat from wildfire trespass.
- Restore early successional habitats to promote native species while minimizing invasive species encroachment.
- Maintain fuel loadings within natural ranges of variability for major vegetation types.
- Aid in control of invasive plants and weeds that contribute to the fuel hazard.

The annual work plan will list those non-fire projects that contribute to the stated objectives above. Any work requiring heavy equipment, such as mowing, hydro-axe work, fuel break construction, or vegetation removal, should be done with low ground-pressure vehicles to the extent possible when the site is dry enough to prevent damage to soils. Any other special conditions that may affect a proposed treatment should be identified in the workplan.

The refuge manager will report all non-fire treatments to the FMO. The information provided will be entered into the Fire Management Information System (FMIS) and the National Fire Plan Operations and Reporting System (NFPORS).

The FMO will retain a copy and be responsible for additional required reports such as an annual regional fire summary report and meeting national fire performance measures. This report will document treatment by type, acres treated by fuel type, cost summary, personnel utilized, and effects.

All non-fire treatment costs will be tracked using the specific fire project code generated from the FMIS and opened from the Denver Finance Center. The refuge managers will accurately track and document the costs and expenditures associated with the treatment. The refuge managers will also keep the FMO informed as to the expenditures and costs that will be included in the annual regional fire management summary report. The information will also be used in meeting

national fire performance measures.

4.3.3. PROCESSES TO IDENTIFY & PRIORITIZE HAZARDOUS FUELS TREATMENTS

At the request of the Refuge Manager the District FMO will survey the refuge, meet with local community organizations and local fire protection agencies to determine the location and need for fuel treatments. Approved hazardous fuels projects within the wildland urban interface receive the highest priority for funding and implementation.

The Refuge is currently revising its strategic planning approach to prioritizing treatments as part of the creation of the Habitat Management Plan and when complete, will also result in a concurrent FMP update.

4.4. PREVENTION, MITIGATION AND EDUCATION

4.4.1. PREVENTION/ MITIGATION

The objective of fire prevention activities is to prevent human-caused wildfires. The CCP has provided direction to prepare a Fire Prevention Plan for the refuge complex although that effort has not yet been initiated.

The inadvertent or intentional ignition of wildland fuels by humans is illegal. We will investigate all human-caused wildfires at the earliest possible time. The investigation may range from a documented determination of cause by the initial attack crew to criminal investigation by a qualified arson investigator.

The most effective strategy to prevent loss from wildfire is bringing “FireWise” program concepts and defensible space to the local public. Defensible space is created around structures and other values at risk to give firefighters a place to work from. This means removing flammable fuels, except scattered trees, from within 30 feet of the structure, keeping grass mowed and green within 100 feet of the structure, and moving flammables at least 30 feet away from the structure.

A complete listing of recommendations for creating defensible space is available online at www.firewise.com.

The Ready Reserve and Rural Fire Assistance grant programs are available to bolster local type 3 incident management capabilities by providing funding for the training and development of volunteer and rural fire departments who respond to fires on service lands. The primary responding agency for wildland fires typically leads the efforts for developing Community Wildfire Protection Plans (CWPP). Because of extensive land ownership fragmentation at NKDR, these efforts have been led jointly by the Nature Conservancy, Florida Division of Forestry, the local and county fire departments, and the refuge. The last effort to complete the local CWPP was not completed as of summer 2010. The refuge will be involved to provide information and coordination to assist in restarting and finalizing the planning activity.

4.4.2. EDUCATION

Our outreach goal is to enhance knowledge and understanding of wildland fire management policies and practices through internal and external communication and education. Specific actions that will be taken to achieve the public education goal are as follows:

- Assistance will be given to the Florida Division of Forestry and any local fire departments when requested to support their prevention programs. The emphasis of the refuge program will be in educating the local residents and refuge visitors to the importance of prescribed fire in preventing wildland fire and the role of fire in restoring and managing the Florida Keys ecosystems. This will be done through demonstrations and lectures at local schools, scouting events, clubs and organizations and one on one conversation with refuge visitors and local residents
- Disseminate press releases regarding wildfire and prescribed fire activities
- Specific public fire education objectives will be identified annually in a work plan

5. MONITORING AND EVALUATION

5.1. FIRE MANAGEMENT PLAN MONITORING

5.1.1. ANNUAL FMP REVIEW

This FMP will be reviewed annually and updated as needed, upon local agency administrator approval (Appendix F). Revisions of FMPs with Regional review and concurrence are required every five years and following completion of a new (or significantly revised) CCP or habitat management plan.

5.1.2. FIRE MANAGEMENT PLAN TERMINOLOGY

One of the purposes of this plan is to rationalize inconsistent terminology found in various direction and guidance documents. For the purposes of this plan:

- "Wildfire" means an unplanned, unwanted wildland fire, or escaped prescribed fire where the objective is to put the fire out.
- "W*ildland fire"* means any non-structure fire that occurs in the wildland. Two distinct types of wildland fire are wildfires and prescribed fire.
- *"Prescribed fire*" means any fire ignited by management actions to specific objectives. A written, approved prescribed fire plan must exist, and NEPA requirements (where applicable) must be met, prior to ignition.
- *"Fire management"* means those activities required to for the protection of burnable wildland values from fire and the use of prescribed fire to meet land management objectives.
- *"Goals"* are broad statements of desired results for the fire management program. Goals may be subjective and difficult to quantify.
- *"Objectives"* are specific statements of desired results that can be quantified and used to measure accomplishment. This plan describes strategic objectives for each fire management unit, and program management objectives for each program component.
- *"Strategies"* are statements of the tactical and program methods to be used to attain goals and accomplish objectives.
- *"Constraints"* are measures required to mitigate against undesirable outcomes.

- *"Considerations" are factors that affect* strategic and tactical decisions.

The National Wildfire Coordinating Group's (NWCG) *Glossary of Wildland Fire Terminology* is the standard of reference. See: http://www.nwcg.gov/pms/pubs/glossary/index.htm.

5.2. TREATMENT EFFECTIVENESS MONITORING

Monitoring and evaluation are the functions used to determine if the fire management plan is being implemented as planned to meet its goals and objectives. Naturally occurring wildfire (and prescribed fire that emulates these fires) is one of the primary sources of disturbance for the ecosystems comprising the Refuge Complex. As such, fire is integral to the management of the Refuge Complex wildlife and plant communities. Through monitoring and evaluation, we can better understand the relationships between fire and other Refuge resources. Monitoring also helps us improve our wildland-urban interface and hazardous fuels treatment techniques, and provides documentation to show how we address our performance measures.

5.3 FIRE EFFECTS MONITORING

Fire effects monitoring is focused on the ecological effects that result from fire management on the Refuge Complex. Implementation monitoring covers all fire management components in this fire management plan, and provides feedback to ensure that our actions in these areas meet the goals of the Refuges, and are in compliance with U.S. Fish and Wildlife Service policies.

Fire effects monitoring applies to all aspects of the fire program that involve changes on the ground. The goals of fire effects monitoring are:

- To understand the relationship of fire to Refuge resources, especially those dependent on advanced seral stage habitats
- To determine the natural variability of fires on the Refuges, including occurrence, extent and severity
- To better understand fire and treatment effects in different vegetation and fuel types in order to develop predictive capabilities for modeling fire distribution, spread and behavior
- To refine fire regime and condition class maps of the Refuges as new information becomes available
- To monitor the effectiveness of treatments to ensure that we are meeting project objectives or can document unexpected results

5.3.1. SCOPE OF FIRE EFFECTS MONITORING

The *Florida Keys NW Refuge Complex Fuels and Fire Effects Monitoring Plan* is in draft status. Until long-term monitoring plans are finalized, fire effects monitoring on prescribed fire will be limited to collecting pre-burn or pre-treatment data and to documenting effects within one year after the burn or treatment. Project plans, such as prescribed fire plans, should identify which monitoring level will be implemented and should specify funding for monitoring efforts. The minimum variables of the three monitoring levels are described below. An approved long-term monitoring plan must be completed if fire funding will be used to monitor sites beyond one year from the burn date.

Fire effects monitoring guidelines have been developed to complement preliminary recommendations for monitoring by the interagency Alaska Fire Effects Task Group (FETG) as well as U.S. Fish and Wildlife Service monitoring guidelines and *Fulfilling the Promise* WH-10 (1) action item. Although fire effects monitoring plans should be designed to meet the specific objectives defined in burn or treatment plans, or in long-term monitoring plans, these guidelines describe the minimum set of variables to monitor in three levels of monitoring intensity (Levels I - III). Recommended protocols for collecting data for these monitoring variables are found in the *U.S. Fish and Wildlife Service Fuel and Fire Effects Monitoring Guide* (available on-line: http://fire.r9.fws.gov/ifcc/monitor/RefGuide) and the *FWS Southeast Region Fuel and Fire Effects Monitoring Field Guide*.

Documentation of burn severity is useful for understanding fire effects and predicting vegetation response. Remote sensing techniques may be used to develop burn severity maps; however, because of the costs associated with this technique, regional office approval will be obtained prior to implementation.

5.4. FUELS MANAGEMENT MONITORING

5.4.1. PRESCRIBED FIRE

5.4.1.1. LEVEL I – RECONNAISSANCE MONITORING

The *Florida Keys NW Refuge Complex Fuels and Fire Effects Monitoring Plan* is has been approved by refuge staff and the regional fire ecologist and is awaiting signature from the RFMC and regional Biologist (Appendix G).

5.4.2. MONITORING MECHANICAL TREATMENTS

Mechanical treatments are typically designed to reduce the level of hazardous fuels or to alter vegetation structure and composition to meet Refuge resource objectives. The plan implementation monitoring goals for non-fire fuel applications are:

- To determine if non-fire fuel applications are compatible with refuge goals and objectives
- To determine if fuel treatment plans are adequate to perform a treatment activity

Fuel treatment activities are project-specific and will include monitoring of site characteristics that relate to fuel loading, vegetation change, residual vegetation density and the anticipated amount of fuel reduction. Fuel treatment activities will monitored before, during, and after the implementation phase as outlined in the project's monitoring specifications. Post-treatment assessment will include documentation of fuel reduction and vegetative change including whether the treatment met resource objectives. The level of post treatment fire effects monitoring may be similar to that of suppression or prescribed fire; however the treatment monitoring plan should specify the level and elements that will be monitored.

5.4.2.1. MONITORING EMERGENCY STABILIZATION AND REHABILITATION

The implementation monitoring goals for emergency stabilization and rehabilitation are:

- To determine during a wildland fire event if stabilization efforts are required to prevent the further degradation of natural resources

- To determine what actions of a non-emergency nature are required to rehabilitate a resource whether man-made or natural

Due to varied fire characteristics and the conditions under which they burn, monitoring elements should be determined by incident-specific attributes. Refer to the *Interagency Burned Area Emergency Stabilization and Rehabilitation Handbook* for guidance.

5.5. EVALUATION

IMPLEMENTATION MONITORING AND EVALUATION

The implementation of the Fire Management Plan is monitored for compliance with the *National Fire Plan* and resulting performance standards, the *National Wildlife Refuge System Wildland Fire Management Program Strategic Plan – Fiscal Years 2006-2010*, compatibility with Refuge management plans, for support of applicable National Wildlife Refuge promises, and national and regional policies of the U.S. Fish and Wildlife Service. Periodic reviews are conducted by staff to determine if the fire management plan goals and objectives are being adequately addressed.

The Refuge Complex shall use various methods of evaluating the relative success of the fire management program. The overall objective is to support the Department's GPRA Strategic Plan for Fiscal Years 2007-2012. No specific number targets have been assigned to the Refuge.

This fire management plan outlines four management components: Wildfire suppression, prescribed fire, mechanical treatments, and emergency stabilization and rehabilitation. All require some level of monitoring and evaluation. These four components may each require specific plans that define implementation strategies, ecological effects of fire or treatment, and relationships to monitoring goals. The goals listed in this section are not exhaustive and additional goals may be added as circumstances dictate. The Fire Management Officer and staff are responsible for the accomplishment and documentation of monitoring objectives.

5.5.1. WILDFIRE SUPPRESSION OPERATIONS

MONITORING WILDFIRE SUPPRESSION ACTIVITIES

Wildfire suppression activities can range from surveillance monitoring of limited fires to ground-disturbing suppression techniques such as installing fire breaks with bulldozers in order to control unwanted fires. Monitoring for any suppression level involves two phases. Phase One entails monitoring the fire while it is active, while Phase Two involves monitoring the ecological effects of the fire. During phase one, the cause and location, size, fuels, management option (limited, modified, full or critical), spread potential weather and smoke characteristics are documented. In addition, threats, tactics, constraints, public and firefighter safety, cultural resources and other sensitive natural resources factors are documented. Throughout the duration of the fire the following additional information is documented: Rate of spread, weather, fire behavior, smoke characteristics, potential threats, fire intensity and other information commensurate with the appropriate management response.

The Phase One implementation monitoring goals for suppression activities are:

- To ensure public and firefighter safety

- To determine if the suppression tactics being employed are compatible with the fire management plan, Refuge management plans, and the smoke management plan
- To determine if there are any critical sites or natural resources threatened
- To gather daily situation data to validate or change the selected WFDSS decision

Phase Two is monitoring the effects a fire has on natural resources (see Fire Effects Monitoring). For fires where ground-disturbing suppression measures are taken during control operations these additional monitoring objectives apply:

- Refuge fire staff will investigate the effects of firebreaks cut to mineral soil to determine if the risk of, or actual, erosion potential warrants stabilization measures; surveillance of firebreaks will occur during the same season as the fire, if possible, and during the following summer
- Firebreaks will be evaluated within one year of the fire to determine if rehabilitation activities are needed to meet Refuge objectives

5.5.1.1. REVIEW OF OUTSIDE RESOURCE PERFORMANCE

Evaluation of outside resources (State agencies, incident management teams, other overhead or resources) will be conducted in accordance with guidance in the *Interagency Standards for Fire and Fire Aviation Operations*.

5.5.1.2. REVIEW OF INTERNAL REFUGE ACTIONS

EFFECTIVENESS OF REFUGE SUPPRESSION ACTIONS

Review of internal refuge actions related to fire management activities will be conducted periodically and may involve fire district, regional and/or national fire management or other staff, and subject matter specialists, as appropriate.

After actions reviews (AARs) detailing what was successful about the fire related activity, unsuccessful, and/or how actions may be improved, will be conducted at the close of each shift. The AAR process is displayed in the *Incident Response Pocket Guide (IRPG*).

All fire suppression personnel assigned to an incident on the refuge will receive performance evaluations related to their individual performance on the particular incident. Supervisory personnel will evaluate all overhead, crews, incident management teams, and contractors using the appropriate performance evaluation forms, review the individual's performance with them, and provide copies of the performance evaluation to the individual and to the refuge manager. Performance evaluations shall be returned to the respective home units for documentation.

Individuals serving in training assignments must be further evaluated using a properly initiated *Fire Position Task Book* (PTB) for the particular position in which they are serving. Evaluators will initial any tasks in the PTB that have been satisfactorily completed to demonstrate proficiency. Copies of the training completed will be returned to the home unit for documentation in the training records.

If an incident management team has been employed to assist in managing an incident on the refuge, the agency administrator must complete a written evaluation of the incident management team. Certain elements of the evaluation should not be completed at the close

out; they should be completed within 30 days of the close out. These include: accountability and property control; completeness of claims investigation/documentation; completeness of financial and payment documentation; and effectiveness of suppression damage rehabilitation.

The Delegation of Authority, the WFDSS, and agency administrator's direction will serve as the primary standards against which the IMT is evaluated. The agency administrator will provide a copy of the evaluation to the IC, the State/Regional FMO, and retain a copy for the final fire package. The District FMO will review all evaluations and will be responsible for providing a copy of evaluations documenting performance to the geographic board that manages the IMT. The IMT evaluation form is listed in Appendix U of *the Interagency Standards for Fire and Fire Aviation Operations* (*Redbook*).

A prescribed fire may be converted to a wildfire when the assigned burn boss determines that one or more of the following conditions or events has occurred or is likely to occur, and if these conditions cannot be mitigated within the next burning period by implementing the contingency actions in the prescribed fire plan by on-site holding forces and listed contingency resources staged during the operation period:

- The prescribed fire leaves the planned unit boundary.
- The fire behavior exceeds limits described in the prescribed fire plan and/or is threatening to leave the planned unit boundary.
- The fire effects are unacceptable.
- Smoke production must be reduced because of adverse air quality impacts.
- Local and/or geographic area fire activity escalates and resources committed as contingency or holding forces are needed for re-assignment to other incidents.

After conversion to wildfire, a wildland fire may be concurrently managed for one or more objectives and objectives can change as the fire spreads across the landscape.

Objectives are affected by changes in fuels, weather, topography, varying social understanding and tolerance, and involvement of other governmental jurisdictions having differing missions and objectives.

Managers will use a decision support process (WFDSS) to guide and document management decisions. The process will provide situational assessment, analyze hazards and risk, define implementation actions, and document decisions and rationale for those decisions.

Any prescribed fire that is converted to a wildfire will receive an administrative review. The level and scope of the review will be determined by the injuries, damage, and cost associated with the wildfire.

Any prescribed fire that is converted to a wildfire and requires the expenditure of suppression funds or results in property damage, injuries or fatalities will be investigated. The *Interagency Standards for Fire and Fire Aviation Operations* (*Redbook*, Chapter 19) details the specifics of investigations and reviews.

5.5.2. PRESCRIBED FIRE OPERATIONS

MONITORING PRESCRIBED FIRE ACTIVITIES

The implementation monitoring goals for prescribed fire are:

- To determine if prescribed fires are compatible with Refuge goals and objectives
- To determine if prescribed fire plans are adequate to perform a prescribed fire

Prescribed fire activities are project-specific and will include monitoring of site characteristics that influence fire behavior. The following types of information should be obtained pre-burn: Fuel loading; topographic influences; drought index, anticipated fire behavior, and potential threats to people and resources. Prescribed fires will constantly be monitored during the burning phase as outlined in the project monitoring specifications. Post-fire assessment includes documentation of fuel reduction and vegetative change including whether the fire met resource objectives. The level of post-fire effects monitoring may be similar to that of suppression or fire use, however the burn monitoring plan should specify the level and elements that will be monitored.

5.5.1.4. EFFECTIVENESS OF PRESCRIBED FIRE OPERATIONS

Evaluation of prescribed fire operations will be made by the Burn Boss by conducting an After Action Review using the format listed in the *Incident Response Pocket Guide* (PMS 461). The effectiveness of prescribed fire operations on fuels and habitats will be judged using the monitoring results developed in the section on monitoring, above.

5.6. NATIONAL WILDLAND FIRE PERFORMANCE MEASURES

Projects or activities that relate to the *National Fire Plan* are entered into and reported via the National Fire Plan Operations and Reporting System (NFPORS) on-line database.

5.7 RESEARCH

Research in the Florida Keys currently is focused on developing an appropriate Fire Behavior Model that would better represent the fuels present on the site and provide greater predictability and guidance to fire management operations. A wide range of additional research is ongoing at the refuge and supports fire management as well as general ecosystem management (see Appendix H for a table of current fire-related research at the refuge.

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APPENDICES

APPENDIX A—AUTHORITIES FOR WILDLAND FIRE MANAGEMENT

The following statutes authorize and provide the means for managing wildland fires on FWS lands or threatening FWS lands and on adjacent lands:

A. Protection Act of September 20, 1922 (42 Stat. 857; 16 U.S.C. 594) Authorizes the Secretary of the Interior to protect, from fire, lands under his/her jurisdiction and to cooperate with other Federal agencies, States, or owners of timber.

B. Economy Act of June 30, 1932 (47 Stat. 417; 31 U.S.C. 1535). Authorizes Federal agencies to enter into contracts and agreements for services with each other.

C. Reciprocal Fire Protection Act of May 27, 1955 as amended by the Wildfire Suppression Assistance Act of 1989 (69 Stat. 66, 67; 42 U.S.C. 1856a)(102 Stat. 1615). Authorizes reciprocal fire protection agreements with any fire organization for mutual aid with or without reimbursement and allows for emergency assistance in the vicinity of agency facilities in extinguishing fires when no agreement exists.

D. National Wildlife Refuge System Administration Act of 1966, as amended by the National Wildlife Refuge System Improvement Act of 1997 and the Refuge Recreation Act of 1962.(80 Stat. 927)(16 U.S.C. 668dd-668ee)(16 U.S.C. 460k-460k4). Governs the administration and use of the National Wildlife Refuge System.

E. Alaska Native Claims Settlement Act of December 18, 1971. (88 Stat. 668; 43 U.S.C. 1601). Alaska Natives' lands are to continue to receive forest fire protection from the United States at no cost until they become economically self-sufficient.

F. Disaster Relief Act of May 22, 1974. (88 Stat. 143; 42 U.S.C. 5121). Authorizes Federal agencies to assist State and local governments during emergency or major disaster by direction of the President.

G. Federal Fire Prevention and Control Act of October 29, 1974 et seq. (88 Stat. 1535; 15 U.S.C. 2201) as amended. Authorizes reimbursement to State and local fire services for costs incurred in firefighting on Federal property.

H. Federal Grants and Cooperative Act of 1977. (Pub. L. 95-244, as amended by Pub. L. 97-258, September 13, 1982. 96 Stat. 1003; 31 U.S.C. 6301-6308). Eliminates unnecessary administrative requirements on recipients of Government awards by characterizing the relationship between executive agencies and contractors, States and local governments and other recipients in acquiring property and services in providing U.S. Government assistance.

I. Alaska National Interest Lands Conservation Act of December 2, 1980. (94 Stat. 2371, 43 U.S.C. 1602-1784). Designates certain public lands in Alaska as units of the National Park, National Wildlife Refuge, Wild and Scenic Rivers, National Wilderness Preservation, and National Forest systems resulting in general expansion of all systems. Any contracts or agreements with the jurisdictions for fire management services listed above that were previously executed will remain valid.

J. Supplemental Appropriation Act of September 10, 1982. (96 Stat. 837). Authorizes Secretary of the Interior and Secretary of Agriculture to enter into contracts with State and local government entities, including local fire districts, for procurement of services in pre-suppression, detection, and suppression of fires on any unit within their jurisdiction.

K. Wildfire Suppression Assistance Act of 1989. (Pub. L. 100-428, as amended by Pub. L. 101-11, April 7, 1989). Authorizes reciprocal fire protection agreements with any fire organization for mutual aid with or without reimbursement and allows for emergency assistance in the vicinity of agency facilities in extinguishing fires when no agreement exists.

Other Policy References

Federal Standards

The federal standards related to fire management are:

- Departmental Manual, 620 DM 1-3, Wildland Fire Management, General Policy and Procedures; Wildland Fire Management, General Policy and Procedures – Alaska; and Burned Area Emergency Stabilization and Rehabilitation.
- United States Fish and Wildlife Service Manual sections 095 FW 3 Emergency Preparedness and Response -- Wildland Fire Management, 241 FW 7 Wildland Fire Safety, 232 FW 6 Training Standards for Wildland and Prescribed Fire Operations, 621 FW 1 Wildland Fire Policies and Responsibilities, 621 FW 2 Fire Management Planning, and 621 FW 3 Prescribed Fire.
- *Interagency Standards for Fire and Fire Aviation Operations Handbook* (*Redbook*) NFES #2724)
- *FWS Fire Management Handbook* (linked with the *Redbook*)
- *Guidance for Implementation of Federal Wildland Fire Management Policy, 2009*
- *Interagency Qualification Certification System* (IQCS) , http:/iqcs.nwcg.gov
- *Interagency Fire Program Management Qualifications Standards and Guide* (IFPM)

Federal Guidelines

The federal guidelines related to fire management are:

- *Interagency Fire and Aviation Preparedness Review Guide*
- *Interagency Helicopter Operations Guide*, NFES 1885
- *National Interagency Mobilization Guide*, NFES 2092
- *Southern Area Interagency Mobilization Guide*, June 2006
- *Incident Response Pocket Guide* (IRPG), NFES #1077
- *Fireline Handbook* NFES #0065
- *Wildland Fire Qualifications System Guide*, NFES #1414
- *Interagency Fire Program Management Qualifications Standards and Guide* (IFPM)
- *Interagency Business Management Handbook*, NFES #2160
- *Interagency Burned Area Emergency Stabilization and Rehabilitation Handbook* (
- *Fuel and Fire Effects Monitoring Guide, Southeast Region*, US Fish & Wildlife Service, September 2006
- *FWS Manual (Firefighting Safety)* 241 FW7
- *Investigating Wildland Fire Entrapments* (Missoula Technical Development Center) TE02P16, August 1995
- *Interagency Prescribed Fire Planning and Implementation Procedures Reference Guide 2006*. (http://www.nifc.gov/fire_policy/rx/rxfireguide.pdf)

APPENDIX B—REGIONAL DISPATCH PLAN

FY 2008

Regional Dispatch Plan

A. Introduction

The purpose of this plan is to detail the proper procedures for obtaining emergency help during wildland fire suppression. Many refuges are currently covered by contracts/agreements with State Divisions of Forestry which are the first source of help. We also have a National agreement with the U.S. Forest Service (USFS) and Department of the Interior agencies (DOI) to furnish assistance during wildland fire suppression.

The objective of this plan is to ensure the cost-efficient use of available fire support services. In most cases the closest resource will be used, but consideration will be given to the use of distant resources to avoid excessive commitments from local units with critical fire weather or suppression activities.

B. Sequence for Requesting Support When Wildland Fire Exceeds Station Suppression Capabilities

- State Division of Forestry. Your local Division of Forestry is the first place you should go for assistance (personnel or equipment).
- Neighboring Refuges. If your State Division of Forestry is unable to assist you, aid from nearby refuges should be solicited.
- State Interagency Coordination Center. If you are unable to obtain local assistance; contact your State Coordination Center. They can provide assistance in locating and dispatching resources for any emergency situation.

STATE	DISPATCHER	TELEPHONE (O)	TELEPHONE (C)
Alabama	Cathy Cline	334-241-8107	334-324-9254
Arkansas	Randy Nichols	501-321-5232	501-622-0284
Florida	Eva Moore	850-523-8602	850-524-2676
Georgia	Renee Bishop	770-297-3022	770-932-2568
Kentucky	Bonnie Truett	859-745-3172	859-986-5643
Louisiana	Sheryl Roach	318-473-7152	318-613-7271
Mississippi	VACANT	601-528-6203	601-408-7139
North Carolina	VACANT	828-257-4805	828-777-2075
Puerto Rico	Bruce Drapeau	787-888-1880	787-549-0083
South Carolina	Dave Kuhn	803-561-4057	803-960-2943
Tennessee	Laney Cutshaw	423-476-9761	423-368-1707

C. Regional Fire Management Coordinator (RFMC)

IF YOU HAVE A WILDLAND FIRE ON YOUR REFUGE THAT EXCEEDS 80 ACRES IN SIZE OR IS COMPLEX ENOUGH TO REQUIRE A COMMITMENT OF SIGNIFICANT RESOURCES, NOTIFY EITHER THE RFMC OR ARFMC AS SOON AS POSSIBLE AT WORK, HOME, OR BY CELL PHONE AND THEY WILL RETURN YOUR CALL.

RFMC (Bob Eaton)

Office: 404-679-7191

Cellular 404-386-1873

ARFMC (Pete Kubiak)

Office: 404-679-7190

Cellular: 404-386-1872

The RFMC and Assistant RFMC will obtain help from other U.S. Fish & Wildlife Service installations in the Region or from the Southern Area Coordination Center.

D. Southern Area Coordination Center (SACC),

Pat Boucher, Fish and Wildlife Service, Assistant Area Coordinator.

Office: 678-320-3003

Cellular: 404-229-8440

The Center will obtain the necessary personnel and/or equipment for you from the closest available source. The source may be the USFS, NPS, BLM, BIA, other State agencies or even contract, but they will find what you need. If your needs are not available in the Southern Area, SACC will place your Resource Order request through ROSS to the National Interagency Coordination Center (NICC) and fill your requests from other Geographic Areas (GACC).

E. Notification of Refuge Supervisors

The respective Refuge Supervisors need to be kept informed of large fire situations at all times. If you are working through the RFMC, he will keep the responsible refuge supervisor informed. However, if you are working through your State Division of Forestry or State Dispatch Center, you should inform your supervisor at the earliest opportunity. You do not need to go through your supervisor when requesting assistance, but as soon as the situation allows you should contact him/her. The supervisor's home telephone numbers are:

Area	Area Supervisor	Assistant Area Supervisor
Area 1	Ricky Ingram (AR, LA, TN, KY)	Steve Brock
	404-679-7167 (Office)	404-679-7267 (Office)
	770-517-8684 (Home)	678-383-4613 (Home)
	770-329-1740 (Cell)	678-296-9876 (Cell)
Area 2	Elizabeth Souheaver (FL, MS)	Holly Gaboriault
	404-679-7163 (Office)	404-679-7224 (Office)

	678-482-5005 (Home)	770-535-9146 (Home)
	404-394-0820 (Cell)	404-825-7014 (Cell)
Area 3	Pete Jerome (AL, NC, SC, GA, PR)	Brett Hunter
	404-679-7157 (Office)	404-679-7164 (Office)
	770-622-4832 (Home)	770-924-1552 (Home)
	770-329-1772 (Cell)	404-536-4306 (Cell)

RSE

2/26/08

APPENDIX C – STAFF QUALIFICATIONS & DIRECTORY, NON-REFUGE CONTACT LIST

NKDR Staff ICS Qualifications Current as of 7/19/2010 Refuge Phone: 305 872 2239

Name	Unit Title	Office Ext.	Cell/Home	ICS Qualified	ICS Trainee/Target
Anderson, Chad	Wildlife Biologist	x205	(727) 744-3278	FFT2/Unit READ	FEMO(t)
Bell, Jim	Visitor Center Mgr	872-0774	304-9625/872-2716		PIO
Berger, Steve	LEO	x224	304-9627/872-4265		
Cohen, Dana	Fire Mgmt Specialist	x207	(802) 778-0937	ICT4, FIRB, HECM, FEMO, ENGB,	RXB2, FOBS, TFLD, HMGB
Killam, Kristie	SCA		(410) 919-8062		READ/PIO
Gallagher, Mike	Maintenance	872-9676	304-9630/872-1911		RXB2, FALC,
Hillier, Karen	Deputy Project Leader	x226	304-9623		RXCM
Hughes, Phillip	Refuge Ecologist	x227	505-3155/606-3559	Unit READ	FFT2/RXCM
Landrum, Kathy	Administration	x208	872-2589		Finance
Morkill, Anne	Project Leader	x209	304-4907/872-3390	Line Officer	RXCM
Nelms, Steve	Maintenance	872-9676			
Perry, Kate	Wildlife Intern		304-6939		PIO
Pulley, Les		239-353-8442, x226			
Simons, Dave	LEO	223	304-8013		
Wilmers, Tom	Wildlife Biologist	X228	304-7252/872-5475	Unit READ	RXCM

FIRE CONTACTS			
FWS			
Name	**Duty Station/Title**	**Phone**	**Email**
Vacant	Panther NWR/District 6 FMO	239-657-5476 (o)/ 239-253-6465 (c)	
Billy Snyder	Panther NWR/Station Manager	239-657-7637 x-26 (o)/239-707-9280 (c)	
Fed Privett	Panther NWR/Equipment Operator	239-253-3923 (c)	
Paul Ryan	Ding Darling NWR/For Tech IQCS Mgr for District 6	239-472-1100 x239(o)/239-826-6755(c)	
	Florida Panther NWR Dispatch	1-239-657-5476	
Jon Wallace	Loxahatchee/Prescribed Fire Specialist	561-735-6036(o)/ 561-329-2685 (c)	
Grant Gifford	Loxahatchee-NKDR forestry tech	808-393-0686 (c)	
Cynthia Branham	Merritt Island NWR Dispatch	321-861-0846 (o)/ 321-302-3467 (c)	
Florida Division of Forestry			
Amy Langford	Big Pine Key/Florida Divs. Of Forestry	872-9010(o)/ 904-626-8345 (c)	langfoa@doacs.state.fl.us
Joe Congemi	Big Pine Key/Florida Divs. Of Forestry	872-9010(o)/ 305-896-2392 (c)	cangemjp@doacs.state.fl.us
Area County and Volunteer Fire Department Contacts			
Malcom Yaple	Big Pine Key VFD/Chief	305-797-1183 (c)	
Mike Bowdin	Sugarloaf VFD/Chief	305-797-1184 (c)	
	Big Pine Key/Monroe County FD	305-289-6010 (o)	
Nature Conservancy			
Chris Bergh	Summerland Key/Florida Keys Conservation Program Manager	(305) 745-8402 ext 108(o)	

Alison Higgins	Summerland Key/Land Conservation Program Manager	305-923-1783 (c)	
Other Area Red Carded Resources			
Jesse Bellam	Big Pine Key VFD/Firefighter	305-879-0278 (c)	
Chris Ziegler	Dry Tortugas NP/Interpretive Ranger	305-304-9277 (c)/305-809-4735(o)	
National Weather Service, Key West Station			
Jonathan Rizzo	Warning Coordination Meteorologist	305-295-1316, x223(o)	Jonathan.rizzo@noaa.gov
Chip Kasper	Meteorologist/Marine Program Leader	305-295-1316, x241(o)	Kennard.kasper@noaa.gov

APPENDIX D – FLORIDA STATE MEMORANDUM OF UNDERSTANDING

USFWS Agreement No. 401813K006

NPS Agreement No. H5023-02-0515

FDACS CONTRACT NO. 007491

Memorandum of Understanding

Between the United States Department of Interior

(National Park Service, Southeast Region and the

U.S. Fish & Wildlife Service, Southeast Region)

and the

Florida Department of Agriculture and Consumer Services (Division of Forestry)

ARTICLE I – BACKGROUND AND OBJECTIVES

This Memorandum of Understanding is hereby entered into this October 30, 2002 by and between the **Florida Division of Forestry**, a state agency (the STATE), and the **National Park Service and the U.S. Fish and Wildlife Service**, agencies of the U.S. Department of the Interior (DOI), (the SERVICE), covering a reciprocal fire protection agreement.

The SERVICE is mandated to protect and perpetuate natural and cultural resources found within national parks and wildlife refuges, and is responsible for conducting fire management activities in federal parks and wildlife refuges in Florida which are adjacent to areas protected by the STATE; and The STATE is responsible for conducting fire management activities on state owned and privately owned lands in Florida which are adjacent to and interspersed with National Park and National Wildlife Refuge lands; and

It is to the mutual advantage of both the STATE and the SERVICE to coordinate their efforts in the prevention, detection, suppression, and investigation of wildfires in and adjacent to their areas of responsibility.

ARTICLE II - AUTHORITY

This agreement is entered into under the authority of 42 USC § l856a (1994) and Florida Statute, Title XXXV, Chapter 589.04 AND 590.02.

ARTICLE III - STATEMENT OF WORK

The SERVICE and the STATE agree to:

A. General Operations

1. Working in close consultation with one another, the corresponding field units may conduct fire management activities and preliminary fire-related investigations on the lands located within each other's jurisdictions, all in accordance with the provisions of this Memorandum of Understanding (MOU) and their respective annual operating plans. The plans will be drafted upon execution of this MOU and will be revised or modified as necessary on an annual basis. The prescribed content and format for the plans are set forth in the Attachment "A", the Annual Operating Plan.
2. Each corresponding field unit, upon the request of the other field unit, will dispatch

firefighting equipment and personnel to assist in the emergency suppression of fires in areas for which the requesting field unit is responsible, provided that in the judgment of the sending field unit, the fire danger and risk on lands for which it is responsible are such that the said equipment and personnel may safely be released.

3. Each corresponding field unit, to the best of its knowledge and ability, when suppressing fires for the receiving field unit will adhere to the suppression and mop-up standards of the receiving field unit insofar as resources are available. The fire management strategy to be used within the lands under the jurisdiction of the each field units will be addressed in the annual operating plans or specific Incident Action Plans. If adequate resources are not available to meet such standards, the field unit providing assistance shall notify the field unit requesting assistance at the earliest possible time.
4. Each corresponding field unit will report on wildfires under its jurisdiction. Coordination activities will be outlined in the annual operating plan.
5. Each corresponding field unit will keep the other field unit informed of major changes within its own unit with respect to facilities, personnel, equipment, services, and supplies that affect day to day operations.
6. Fire prevention and education programs will be coordinated to achieve the fire prevention objective outlined in the annual operating plans, without duplication of effort.
7. Field units will ensure that coordinated dispatching of resources will be initiated as rapidly as can be provided.
8. For purposes of making employment compensation claims, personnel dispatched by either corresponding field units for the benefit of the other field unit will be considered as employees of their own government agency. The STATE and the SERVICE will instruct their employees to act under the direction of the receiving field unit when so dispatched. When personnel of a sending unit is working for the benefit of a receiving unit, the receiving unit shall provide or arrange for immediate medical treatment of any injuries which may be incurred at the scene of the fire.
9. Each corresponding field unit will be responsible for the training of its respective fire management personnel and will invite representatives at all levels of the other field unit to attend and participate in training sessions and meetings.
10. Each agency shall provide authorization and identify radio frequencies for cooperative fire management use. Space and or facilities for electronic equipment, radios, and antennas shall be set forth in the annual operating plan. Applicable federal and state laws and regulations will govern use of radio communications.
11. Either corresponding field unit in accordance with its applicable rules and regulations may restrict activity or close areas to the public. However, before such action is taken, the corresponding field units will determine the severity of the situation. Every reasonable effort will be made to insure uniform and simultaneous action by both corresponding field units.
12. Fuel management and prescribed fire activities will be coordinated in order to provide training opportunities and to increase experience and qualifications. Either agency may provide personnel to assist the other on a non-reimbursable basis for fuel management and prescribe fire activities. Local managers may include language in the Annual

Operating Plan to further clarify the roles and expectations of fuel management and prescribed fire cooperation. Assistance may also be provided on a reimbursable basis when both parties agree to this beforehand. Actual cost for personnel and prevailing rates for equipment as described in the Annual Operating Plan may be used or the parties will mutually agree upon the reimbursement rate prior to the activities being conducted.

13. Wildfires resulting from escaped prescribed fires ignited by or at the direction or under the supervision of one of the parties to this agreement shall be the financial responsibility of that party. All suppression costs shall be borne by the responsible party. A party may take appropriate suppression action when lands under its protection jurisdiction are involved in or threatened by the fire. Such suppression action may be taken on its own initiative or at the request of the responsible party. A party may take appropriate suppression action, at the request of the responsible party, when lands under its protection jurisdiction are not involved in or threatened by the fire. The responsible party shall reimburse the other party for all suppression costs incurred in accordance with this claim.

B. Operations within Mutual Threat Zones

For those Service lands where a mutual threat zone is applicable, the SERVICE and STATE agree to define mutual threat zone as a geographical area between two or more jurisdictions onto which representatives from these jurisdictions would respond on initial attack. Due to complexities of boundary locations and maintaining detailed maps on these mutual threat zones, both agencies agree to define the mutual threat zones in the respective Annual Operating Plans.

1. Mutual aid, which is any form of free direct assistance from one entire agency in support of another during an emergency, based upon a pre-arrangement between the agencies involved is detailed in the Annual Operating Plan. Initial attack and extended attack responsibilities of each agency within and outside the mutual threat zone are included in the Annual Operating Plan.
2. SERVICE personnel acting as authorized agents of the STATE, or anyone acting at the direction of the STATE, shall have the same rights the STATE has, pursuant to Georgia Code 12-6-5(b)(4)&(5) at any or all times upon state or privately owned lands for the purpose of taking fire suppression actions.

C. The parties further agree as follows:

- Each party to this agreement waives all claims against the other party for compensation for any loss, damage, personal injury, or death occurring in consequence of the performance of this agreement.

ARTICLE IV - TERM OF AGREEMENT

This MOU shall be effective on the date herein above first written and shall terminate five (5) years from that date. The term of this Memorandum of Understanding may be extended for an additional five (5) years if warranted and agreed to in writing by both parties.

ARTICLE V - KEY OFFICIALS

National Park Service

Sam Larry
Southeast Regional Fire Management Officer
National Park Service
Atlanta Federal Center
1924 Bldg., 100 Alabama St., S.W.
Atlanta, GA 30303
404-562-3108 ext. 653

U.S. Fish and Wildlife Service
Robert Eaton
Southeast Regional Fire Coordinator
U.S. Fish and Wildlife Service
1875 Century Boulevard
Atlanta," GA 30345
404-679-7191

State of Florida
Jim Karels
Chief, Forest Protection Bureau
Florida Division of Forestry
3125 Conner Blvd.
Tallahassee, FL 32399-1650
850-488-6106

ARTICLE VI - PRIOR APPROVAL
Not applicable.

ARTICLE VII - REPORTS AND/OR OTHER DELIVERABLES

A. **Reports**

1. Each corresponding field unit will furnish to the other field unit, or make available upon request, any maps, documents, instructions, records and reports, including fire reports and law enforcement reports, which either field unit considers necessary in connection with this Agreement. Provision of such information shall be subject to the rules and regulations of the federal government, the State of Florida, and the DOI.

2. For statistical purposes each corresponding field unit will report fires in accordance with its current procedures. The field units will exchange fire report data as they deem appropriate.

B. General Payment Provisions

1. When assistance with fire management activities is requested and received by one corresponding agency, said agency may reimburse the agency that rendered the assistance. If a reimbursement is to be made, payment will be made in accordance with this MOU and the annual operating plan. Payment will be based on the actual costs incurred by the field unit rendering assistance.

2. To the extent possible, rates to be charged or reimbursed for equipment used in fire fighting shall be set forth in the annual operating plan. If one corresponding field unit agrees to reimburse the other field unit for equipment, (including aircraft), reimbursement will be

made at the rates set forth in the annual operating plan. If rates for certain equipment used for fire management activities are not specified in the annual operating plan, the reimbursement rate will be mutually agreed upon by the parties upon conclusion of the fire.

3. One corresponding field unit also may reimburse the other field unit for the cost of the personnel services. Salary or wages will include the actual cost to the sending field unit for work performed during the time between departure from and return to the official station. Overtime may be included, if and when overtime is earned under the laws or rules governing the employees of the sending field unit. It is not intended that .salary, overtime, travel or subsistence costs will be reimbursed for the administrative personnel not directly associated with the fire management activities unless specifically agreed upon in the annual operating plan.

4. Payments for reimbursable services rendered under this MOU may be made only upon receipt of an itemized statement that conforms to the requirements set forth herein. Within 60 days of each reimbursable fire. the field unit rendering the assistance shall furnish the field unit receiving the assistance an itemized statement containing the following information:

a. The date and location of the fire.

b. Name(s) of person(s) who ordered equipment and name(s) of person(s) from whom the equipment was ordered.

c. Type of truck or transportation furnished, number of miles traveled, rental rate, and the total evaluated cost as set forth in the annual operating plan.

d. Type of tractor, plow, engine, aircraft, or other equipment furnished, hours actually operated, rental rate, and total evaluated cost as set forth in the annual operating plan.

e. Names of personnel dispatched to the fire, time of dispatch and time of return to official station, total elapsed time, rate of pay, and total pay.

5. Equipment owned and used by one corresponding field unit to suppress fires on lands for which the other field unit is responsible will be operated, serviced, and repaired by the field unit that owns the equipment unless specified otherwise in the annual operating plan.

D. Reimbursements to the State

1. After a reimbursable fire occurs upon SERVICE lands, the STATE Forester or designee may prepare and send to the SERVICE's Park Superintendent or Refuge Manager at the receiving unit an itemized statement in accordance with the provisions set forth herein and in the annual operating plan for the field unit involved. The SERVICE, upon receipt of the itemized statement, shall ensure the proper processing of a funding document package.

2. Reimbursements to the STATE shall be made payable to the State Forester at the Florida department of Agriculture and Consumer Services, Division of Forestry..

3. The SERVICE shall not be bound to make any expenditure under the terms of this MOU or any annual operating plan except as funds are appropriated by the Congress of the United States, or otherwise are made available for such purpose.

E. Reimbursements to the Service

1. After a reimbursable fire occurs upon STATE lands, the Park Superintendent or Refuge

Manager may prepare and send to the STATE Forester an itemized statement in accordance with the provisions set forth herein and in the annual operating plan for the field unit involved. The STATE, upon receipt of the itemized statement, shall ensure the proper processing of a funding document package.

2. Reimbursements to the SERVICE shall be made payable to the National Park Service or the U.S. Fish and Wildlife Service.

3. The STATE shall not be bound to make any expenditure under the terms of this MOU or any annual operating plan except as funds are appropriated by the State of Florida, or otherwise are made available for such purpose.

ARTICLE IX - MODIFICATION AND TERMINATION

A. This agreement may be modified only by a written instrument executed by all the parties.

B. Either party may terminate the MOU by providing sixty (60) days advance written notice. In the event that one party provides the other party with notice of its intention to terminate, the parties shall meet promptly to discuss the reasons for the notice and to try to resolve their differences amicably. The parties commit to using every reasonable means available, including the use of a neutral mediator if necessary, to try to avoid terminating this agreement.

ARTICLE X -STANDARD CLAUSES

A. Civil Rights

During the performance of this agreement, the participants agree to abide by the terms of USDI-Civil Rights Assurance Certification, non-discrimination, and will not discriminate against any person because of race, color, religion, sex, or national origin. The participants will take affirmative action to ensure that applicants are employed without regard to their race, color, sexual orientation, national origin, disabilities, religion, age or sex.

B. Promotions

The State of Florida shall not publicize or otherwise circulate promotional material (such as advertisements, sales brochures, press releases, speeches, still and motion pictures, articles, manuscripts, or other publications) which states or implies Governmental, Departmental, bureau, or Government employee endorsement of a product, service, or position which the State of Florida represents. No release of information relating to this agreement may state or imply that the Government approves of the State of Florida's work product or considers the States work product to be superior to other products or services.

C. Public Information Release

Both the Service and the State will cooperate in seeking out an9 utilizing media opportunities associated with fire management activities in on state and federal lands. When both agencies are involved in a joint fire suppression effort, or when a news release by one agency is likely to have a direct impact on the other agency, a joint release will be developed and issued by the spokesperson of each agency. Specific information procedures and interface requirements with Incident Management Teams are addressed in the Annual Operating Plan.

D. Liability Provision

Each party to this agreement will indemnify, save and hold harmless, and defend each other

against all fines, claims, damages, losses, judgments, and expenses arising out of, or from, any omission or activity of such person organization, its representatives, or employees.

ARTICLE XI – SIGNATURES

IN WITNESS HEREOF, the following authorized representatives of the parties have signed their names on the dates indicated, thereby executing this agreement.

For the National Park Service:

_/S/_ Patricia A. Hooks_____ Date: __10/31/02____

Southeast Regional Director

For the U.S. Fish and Wildlife Service:

_/S/_ Sam D. Hamilton_____ Date: __11/25/02____

Southeast Regional Director

U.S. Fish and Wildlife Service

For the State of Florida:

_/S/_ Walter Garber _____ Date ___2/3/03_____

Director of Administration

Florida Department of Agriculture and Consumer Services

COOPERATING AGENCIES

National Park Service
Superintendent
Big Cypress Natl. Preserve
HCR 61, Box 110
Ochopee, FL 33943
Telephone (941) 695-1101

Superintendent
Biscayne National Park
PO Box 1369
Homestead, FL 33090-1369
Telephone (305) 230-1144 x 3002

Superintendent
Canaveral National Seashore
308 Julia Street
Titusville, FL 32799-3521
Telephone (321) 267-110

Superintendent

State of Florida
District Manager
Caloosahatchee District, D-17
10941 Palm Beach Blvd.
Fort Myers, FL 33905
Telephone (239) 690-3500

District Manager
Everglades District, D-18
3315 SW College Avenue
Fort Lauderdale, FL 33314
Telephone (954) 475-4120

District Manager
Orlando District, D-10
8431 S. Orange Blossom Trail
Orlando, FL 32809
Telephone (407) 856-6512

District Manager

Castillo De San Marcos Natl. Monument
Fort Matanzas National Monument
1 South Castillo Drive
St. Augustine, FL 32084
Telephone
(904) 829-6506 X221

Superintendent
DeSoto National Monument
PO Box 15390
Bradenton, FL 34280-5390
Telephone (941) 792-0458 X14

Superintendent
Everglades National Park
40001 State Road 9336
Homestead, FL 33034
Telephone (305) 242-7710

Superintendent
Fort Caroline National Monument
Timucuan Ecological & Historic Preserve
13165 Mount Pleasant Road
Jacksonville, FL 32225
Telephone (904) 221-7567 X10

National Park Service
Superintendent
Gulf Islands National Seashore
1801 Gulf Breeze Pkwy
Gulf Breeze, FL 32563
Telephone (912) 786-5787

US Fish & Wildlife Service
Refuge Manager
ARM Loxahatchee NWR
Hobe Sound NWR
19216 Lee Road
Boynton Beach, FL 33437-4796
Telephone (561) 732-3684

Refuge Manager
Chassahowitzka NWR
1502 SE Kings Bay Drive
Crystal River, FL 34429
Telephone (352) 563-2088

Refuge Manager

Bunnell District, D-10
5001 US 1 North
Bunnell, FL 32110
Telephone
(386) 446-6785

District Manager
Myakka River District, D-15
4723 53rd Avenue
Bradenton, FL 34203-4138
Telephone (941) 751-7629

District Manager
Everglades District, D-18
3315 SW College Avenue
Fort Lauderdale, FL 33314
Telephone (954) 475-4120

District Manager
Jacksonville District, D-7
7247 Big Oaks Road
Bryceville, FL 32009
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State of Florida
District Manager
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3315 SW College Avenue
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Telephone (954) 475-4120

State of Florida
District Manager
Everglades District, D-18
3315 SW College Avenue
Fort Lauderdale, FL 33314
Telephone (954) 475-4120

Center Manager
Withlacoochee Forestry Center, D-11
15019 Broad Street
Brooksville, FL 34601
Telephone (352) 754-6777

District Manager

Florida Panther NWR
Ten Thousand Islands NWR
1860 Tollgate Blvd, Suite 300
Naples, FL 34114
Telephone (239) 353-8442

Refuge Manager
JN Ding Darling NWR
1 Wildlife Drive
Sanibel, FL 33957
Telephone (239) 472-1100

Refuge Manager
Lake Woodruff NWR
PO Box 488
DeLeon Springs, FL 32130-0488
Telephone (904) 985-4673

Refuge Manager
Lower Suwanee National Wildlife Refuge
Cedar Key National Wildlife Refuge
16450 NW 31st Place
Chiefland, FL 32626
Telephone (352) 493-0238

US Fish & Wildlife Service

Refuge Manager
Merritt Island National Wildlife Refuge
Archie Carr National Wildlife Refuge
Lake Wales Ridge National Wildlife Refuge
Pelican Island National Wildlife Refuge
St. Johns National Wildlife Refuge
PO Box 6504
Titusville, FL 32782
Telephone (321) 861-0667

Refuge Manager
National Key Deer National Wildlife Refuge
Crocodile Lake National Wildlife Refuge
PO Box 430510
Big Pine Key, FL 33043-0510
Telephone (305) 872-2239

Refuge Manager
St. Marks Wildlife Refuge
PO Box 68
St. Marks, FL 32355.
Telephone (850) 925-6121

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Telephone (239) 690-3500

District Manager
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Gainesville, FL
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State of Florida

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8431 S. Orange Blossom Trail
Orlando, FL 32809
Telephone (407) 856-6512

District Manager
Everglades District, D-18
3315 SW College Avenue
Fort Lauderdale, FL 33314
Telephone (954) 475-4120

District Manager
Tallahassee District, D-4
865 Geddie Road
Tallahassee, FL 32304
Telephone (850) 488-1871

Refuge Manager
St. Vincent Wildlife Refuge
PO Box 447
Appalachicola, FL 32329-0447
Telephone (850) 653-8808

District Manager
Tallahassee District, D-4
865 Geddie Road
Tallahassee, FL 32304
Telephone (850) 488-1871

Attachment A

GUIDELINES FOR THE

ANNUAL OPERATING PLAN

(to be formulated between the units of the Florida Division of Forestry and the NPS or FWS areas)

PURPOSE:

Describe the purpose of this plan and how it is to function. Describe the operating procedures between the participating agencies within the framework of the Memorandum of Understanding. Cite the Memorandum of Understanding by title and effective date.

RESOURCE MANAGEMENT:

Discuss each agency's mandates; fire management policies; resource issues and concerns; consequent resource management objectives.

MUTUAL THREAT ZONES:

Discuss the initial attack suppression strategies that are acceptable where the boundary between the two agency's suppression responsibilities are not immediately distinguishable. Include a geographic description and map.

PRESCRIBED BURNING:

List any arrangements for the issuance of burning authorizations by agency. Detail arrangements. Discuss State and local notification procedures for conducting prescribed burns.

OPERATIONS:

Outline the fire organization in the mutual threat zone; list personnel in fire jobs. Discuss procedure for releasing resources and transitioning the fire to the responsible agency. Address acceptable fire suppression strategies. Detail who has first call, second call, support, ICS procedures, and unified command and how it is to function.

COMMUNICATIONS:

Include dispatch procedures and the procedures for keeping each other informed on fire potential and activity, and the status of fire equipment and personnel. Include under what condition radios will be made available including the type of equipment and where it is located.

PERSONNEL AND EQUIPMENT:

Detail resource listing of available equipment and personnel. Include a telephone directory. Discuss the types of equipment and under what conditions and where they may be used. List key personnel and any applicable qualifications. If applicable, list

rates for equipment and personnel. Require full Personal Protective Equipment on fire activities, prescribed or wildland fire.

FIRE PREVENTION:

Detail interagency cooperation in fire prevention and fire education efforts.

INCIDENT REPORTS:

Detail arrangements to furnish incident reports to each agency.

TRAINING:

Discuss interagency training to be carried out at the local level. Include courses to be offered, qualified instructors, and location and facilities.

FACILITIES:

List facilities for meeting, training, and for emergency management functions.

FINANCIAL ARRANGEMENTS:

Include under what condition reimbursements will be made. Address the procedures for making reimbursements as outlined in the Memorandum of Understanding.

OTHER:

Detail any other applicable considerations.

PLAN APPROVAL:

District Forester and Park Superintendent approve the annual operating plan.

(FDACS Contract # 007491)

ADDENDUM TO

MEMORANDUM OF UNDERSTANDING

BETWEEN

UNITED STATES DEPARTMENT OF INTERIOR

(National Park Service, Southeast Region and the

U.S. Fish & Wildlife Service, Southeast Region)

AND THE

FLORIDA DEPARTMENT OF AGRICULTURE AND CONSUMER SERVICES

(Division of Forestry)

WHEREAS, parties entered in that certain Memorandum of Understanding dated February 3, 2003, concerning reciprocal fire protection; and

WHEREAS, the parties now desire to extend the term of said Memorandum of Understanding and modify the terms thereof.

NOW THEREFORE, the parties agree as follows:

1. The foregoing recitations are true and correct and are incorporated herein by reference.
2. The term of the Memorandum of Understanding is hereby extended for an additional five (5) years from the date of the last signature below.
3. Article X, Section D is deleted in its entirety.
4. Except as herein modified, the Memorandum of Understanding shall remain in full force and effect.

In witness hereof, the following authorized representatives of the parties have signed their names on the dates indicated, thereby executing this Addendum

For the National Park Service:

/S/ Paul R. Anderson Date: 2/6/08

Southeast Regional Director

National Park Service

For the U.S. Fish & Wildlife Service:

/S/ Sam D. Hamilton Date: 1/24/08

Southeast Regional Director

US Fish & Wildlife Service

For the State of Florida:

/S/ Walter Garber Date: 2/3/03

Director of Administration

Florida Department of Agriculture and Consumer Services

APPENDIX E – DELEGATION OF AUTHORITY TO THE INCIDENT COMMANDER

DELEGATION OF AUTHORITY

Name of Incident Commander is assigned as Incident Commander of the ***Name of Incident***, ***Name of Refuge or Unit*** for the US Fish and Wildlife Service, effective ***Time and Date.***

The Incident Commander has full authority and responsibility for managing the fire suppression activities within the framework of the law and Fish and Wildlife Service policy and direction as provided by this office. The Resource Advisor will provide Habitat Management Plans and other appropriate documents.

Names of Resources Advisors and Contact Information are assigned as Resource Advisors. They or the Project Leader will be consulted in situations where natural resource decisions or trade- offs are involved unless life safety issues require immediate attention and those actions will be documented.

Specific direction and fire suppression priorities for the ***Name of Incident*** are as follows, and are in priority order:

1. Provide for firefighter and public safety.

2. Use of minimal impact techniques should be employed to reduce habitat damage. Use natural barriers and roads if possible for burnout operations.

3. Use of dozers or tractors requires approval of the Refuge Manager or their designee (Resource Advisors) prior to implementation.

TRANSITION BACK TO REFUGE

1. All (***Name of Incident)*** contracts, agreements, bills, medical problems, equipment repairs, and fire cache resupply shall be closed out prior to team being released.

2. Road or levee damage during suppression efforts will be repaired prior to the team's departure.

3. Fire perimeter mopped up (***Specify)*** and all lines checked for heat and integrity.

4. Rehabilitation Plan will be completed in coordination with the Refuge Biologists and Resource Advisors.

5. Fire perimeter mapped by GPS and loaded into the Refuges GIS Database.

6. Tort claims reviewed by Project Leader or their designee.

Refuge Manager _____,(***Name of Refuge or Unit)***,

Date and Time _____

APPENDIX F—ANNUAL FMP REVIEW AND CHECKLIST

Annual Fish and Wildlife Fire Management Plan Review and Checklist Process

The annual review of the Fire Management Plan (FMP) is a requirement of the Service which is documented in the *Fire Management Handbook*, Chapter 9 – section 4. The language in the Handbook states:

> "To maintain currency, fire management plans must be reviewed each year using the nationally established annual review process. Plans must be revised when significant changes occur or substantial changes in management are proposed. Minor plan revisions may be accomplished through an amendment added to the plan and signed by the line officer and servicing fire management officer. Major scheduled revisions to fire management plans will follow the 15 year Comprehensive Conservation Plan revision cycle to provide consistency in objectives and management strategy formulation. Without a current FMP, prescribed fires cannot be conducted and response to unplanned ignitions can only consider suppression strategies. Preparedness and prevention activities can continue in the interim period as outlined in the expired plan."

The review is essential to ensure that the FMP continues to contain relevant information for the management of the unit and that it conforms to current laws, objectives, procedures, and strategies. The review is intended to keep the FMP as current as possible and in line with changes that may occur in components of the FMP. Updating federal fire policy, terminology, agreements, and wildland urban interface acres in close proximity to the refuges/units are examples of appropriate revisions to an FMP using this review and update format.

This review process requires the refuge/unit line officer and servicing fire management officer to review the FMP currently in place using the annual review checklist. During the review, they will discuss and update the sections as needed and complete an amendment containing the updates. Once this update/amendment is complete and signed off by the reviewing officials, the Fire Management Plan is deemed to once again be current and meeting Service requirements.

The process will be more efficient if the fire management officer (FMO) does some pre-work on the checklist prior to meeting with the line officer. The regional and national fire planners will be filing changes to policy, terminology, etc. in a Sharepoint file as they receive them and these changes, recommendations can be added as needed during the annual review.

<u>The Review Process Steps are as Follows:</u>

1. Select the appropriate review form for the process – Short or Long. Note: For the first review of the FMP, it is suggested that the Long Form of the template be used so that a solid baseline of update information is completed and documented for future reviews.
2. The Fire Management Officer should look through the file in Sharepoint for suggested updates placed there by regional and national planners.
3. The FMO incorporates all the update changes found in the Sharepoint file into the document before meeting with the refuge/line officer.

4. The FMO then schedules a discussion with the line officer to determine other changes that may be needed to the remaining portions of the document.
5. The FMO and line officer then determine if the changes warrant a rewrite or just local approval.
6. If determined to not need a rewrite, the line office and the FMO must sign signature blocks to show approval of the review.
7. The FMO will list the changes addressed in the FMP in an amendment.
8. The completed amendment and signature page must be stapled to the fire management plan that was reviewed.
9. The Fire Management Officer faxes the signed signature page to the regional fire planner for filing.
10. The regional fire planner will insert the review completion date into the Sharepoint spreadsheet.

If there are any questions about this process, please call Becky Brooks at (208) 387-5345.

FWS REVIEW CHECKLIST (SHORT FORM)

FOR

FISH AND WILDLIFE FIRE MANAGEMENT PLANS

Based on the template of April 9, 2009

Name of Plan Reviewed for Annual Update Process:	Review Date:
Refuge or Unit Name (Include Complex if applicable):	
Fire Management Officer Reviewer(s) Name and Phone Number:	Fire Management Officer Reviewer(s) Signature (for review concurrence):
Line Officer Reviewer(s) Name and Phone Number:	Line Officer Reviewer(s) Signature (for review approval):

Amendment Completed and attached to Plan	Date:
Review information sent to Regional Office	Date:
Review date entered in Database (Regional Office)	Date:

The 'Short Form' of the Review Checklist was developed to be used the year(s) following the completion of the Long Form. The Long Form, with the required amendment, will provide baseline data to the reviewers. The significant headers from the 2009 Interagency Fire Management Plan Template make up the rows of the document and are intended to spark talking points between the FMP reviewers. The Long Form and Amendment should be utilized as reference documents during this discussion.

Please review the Fire Management Plan (FMP) and complete the columns as follows: A check-mark in the "No Update" column means that this portion of your FMP has been reviewed and determined not to need an update; if an element requires an update (answering yes to the question (s)), check the "Update Needed" column and provide an explanation of the changes in the "Notes/Comments" section. This information will be included in the amendment (including chapter, section and comments) to be attached to the plan annually following the review. Be sure to adequately describe the changes so they are easily understandable to the outside reader. Put an N/A in the "No Update" column for lines that do not pertain to your refuge/unit to document the element was considered and to make it easier for future reviewers to complete the annual review process.

If the reviewers determine that the changes are substantial, the original intent of the document is compromised, or necessary changes cannot be accomplished with an amendment, then a formal revision of the document must be completed. The review discussion between the line officer and lead fire staff may support the conclusion that a formal revision is required, but the responsibility for making this decision ultimately rests with the unit line officer.

No Update or N/A	Update Needed	Sec-tion	Title – Content	Notes/Comments	Date
		Chapter 1. Introduction			
		1.1	**Purpose of the FMP**		
		1.2	**General Description** (of FMP area)		
		1.3	**Significant values to Protect**		
		Chapter 2. Policy, Land Management Planning, and Partnerships			
		2.1	**Fire Policy**		
		2.2	**Land/Resource Management Planning**		
		2.2.2	**Environmental Compliance**		
			• **National Environmental Policy Act (NEPA)**	**What type?**	

No Update or N/A	Update Needed	Sec-tion	Title – Content	Notes/Comments	Date
			• Endangered Species Act (ESA)	Date of consultation:	
		2.3	Partnerships (internal/external)		
		Chapter 3. Fire Management Unit Characteristics			
		3.1	Area -wide Management Considerations		
		3.1.1	CCP Goals, strategies, and actions		
		3.1.2	CCP Standards and Guidelines/Desired Conditions		
		3.1.3	FMU #Common Characteristics		
		3.2	Fire Management Unit - Specific Descriptions		
		3.2.1	FMU #Description(s)		
		3.2.2	FMU #Values to Protect		
		3.2.3	FMU #Fire Management Guidance		
		3.2.4	FMU #Safety Considerations		
		3.2.5	FMU #Wildfire Response Objectives		
		3.2.6	FMU #Fuels Treatments and Methods		
		Chapter 4. Wildland Fire Operational Guidance			
		4.1	Management of Unplanned Ignitions		
		4.1.1	Preparedness		
		4.1.2	Incident Management		
		4.1.3	Emergency Stabilization (ES)		
		4.2	Burned Area Rehabilitation (BAR)		
		4.3	Management of Planned Fuels Treatments		
		4.3.1	Processes to Identify and Prioritize Fuels Treatments		
		4.3.2	Prescribed Fire Project Implementation		
		4.4	Prevention, Mitigation, and Education		
		Chapter 5. Monitoring and Evaluation			
		5.1	FMP Monitoring		
		5.2	Treatment Effects Monitoring		

No Update or N/A	Update Needed	Sec-tion	Title – Content	Notes/Comments	Date
		References			
		Appendices			

Additional reviewer comments:

FWS REVIEW CHECKLIST (LONG FORM)

FOR

FISH AND WILDLIFE FIRE MANAGEMENT PLANS

Based on the template of April 9, 2009

Name of Plan Reviewed for Annual Update Process:	Review Date:
Refuge or Unit Name (Include Complex if applicable):	
Fire Management Officer Reviewer(s) Name and Phone Number:	Fire Management Officer Reviewer(s) Signature (for review concurrence):
Line Officer Reviewer(s) Name and Phone Number:	Line Officer Reviewer(s) Signature (for review approval):
Amendment Completed and attached to Plan	Date:

Review information sent to Regional Office	Date:
Review date entered in Database (Regional Office)	Date:

Please review the Fire Management Plan (FMP) and complete the columns as follows: A check-mark in the "No Update" column means that this portion of your FMP has been reviewed and determined not to need an update; if an element requires an update (answering yes to the question (s)), check the "Update Needed" column and provide an explanation of the changes in the "Notes/Comments" section. This information will be included in the amendment (including chapter, section and comments) to be attached to the plan annually following the review. Be sure to adequately describe the changes so they are easily understandable to the outside reader. Put an N/A in the "No Update" column for lines that do not pertain to your refuge/unit to document the element was considered and to make it easier for future reviewers to complete the annual review process.

If the reviewers determine that the changes are substantial, the original intent of the document is compromised, or necessary changes cannot be accomplished with an amendment, then a formal revision of the document must be completed. The review discussion between the line officer and lead fire staff may support the conclusion that a formal revision is required, but the responsibility for making this decision ultimately rests with the unit line officer.

No Update or N/A	Update Needed	Sec-tion	Title – Content	Notes/ Comments	Date
		Chapter 1. Introduction			
		1.1	**Purpose of the FMP**		
		1.2	**General description** of the FMP area (location/vicinity map, size, land ownership, etc.)		
			• Has your vicinity map changed due to new acres added or from complexing for FMP?		
			• Total acreage changed? If it is the same management?		
			• Are there significant changes in land ownership in lands surrounding unit and/or in-holdings? New subdivisions?		
			• FWS units included in the FMP – have you recently complexed multiple units or added new units to a complex?		

No Update or N/A	Update Needed	Sec-tion	Title – Content	Notes/ Comments	Date
		1.3	Are there any new **Significant values to Protect?** If so, add them in the spaces provided below. mission, special resource/ management designations (e.g., wilderness, cultural sites, T & E species, etc.		
			•		
			•		
		Chapter 2. Policy, Land Management Planning, and Partnerships			
		2.1	**Fire Policy**		
		2.1.1	Federal Interagency Policy change?		
			• Terminology changes?		
		2.1.3	DOI policy change? (e.g., Departmental manuals).		
		2.1.4	Service policy change?		
		2.1.5	Regional/unit-specific policy change?		
		2.2	**Land/Resource Management Planning**		
		2.2.1	Planning Documents:		
			• Does Habitat Management Plan (HMP) align with FMP at unit? Is it being revised? Does management want HMP and FMP revisions to take place simultaneously?		
			• Is the Comprehensive Conservation Plan (CCP) currently being developed? Revised?	CCP date:	
			• Others: (list) •		
		2.2.2	Environmental Compliance – are your compliance documents up to date in the following areas?		
			• National Environmental Policy Act (NEPA)	What type?	
			• Endangered Species Act (ESA)	Date of consultation:	
			• National Historic Preservation Act (NHPA)		

No Update or N/A	Update Needed	Sec-tion	Title – Content	Notes/ Comments	Date
			• **Archaeological Resources Protection Act** (ARPA)		
			• Others: (list) •		
		2.3	**Partnerships**		
		2.3.1	Internal Partnership changes? (Use spaces below to add new partnerships)		
			•		
			•		
		2.3.2	External Partnerships changes?		
			•		
			•		
		Chapter 3. Fire Management Unit Characteristics			
		3.1	**FMP-wide Management Considerations**		
		3.1.1	Have the CCP Goals, strategies, and actions for FMP-wide fire management changed? If so, describe the changes in the comment box.		
		3.1.2	Have the Standards and guidelines/desired conditions from the CCP or other planning documents/handbooks changed? If so, describe the changes in the comment box.		
		3.1.3	Common Characteristics of the FMUs		
			•		
		3.2	**Fire Management Unit - Specific Descriptions**		
		3.2.1	Have the FMUs changed in your FMP? Do they need to be revised or more added/deleted? If so, fill out the information below.		
			Description of the FMU # (add new information about FMU #below)		
			• FMU #name		
			• vicinity map		

No Update or N/A	Update Needed	Sec-tion	Title – Content	Notes/ Comments	Date
			• adjacent ownership and jurisdiction		
			• fire management objectives		
			• vegetation types		
			• fuel models		
			• burnable acres		
			• Unique physical characteristics affecting fire management (topography, soils, access, fire effects, etc.)		
			• values to protect / uses that affect (or are affected by) fire management decisions		
		3.2.2	Values to Protect (use space below to add new)		
			•		
			•		
			•		
		3.2.3	Fire Management Guidance		
			Have any of the following changed? If so, add comments/changes in comment box or use space below to add new.		
			• Wildfire response objectives		
			• Potential size and scope of fuels treatments		
			• Approved fuels treatments and methods		
			• Restrictions, limitations, constraints		
			• Suppression Damage Repair, ES, and BAR considerations		
			•		
		3.2.4	FMU #Safety Considerations (use space below to add new)		
			•		
			•		
			•		
			•		
		Chapter 4. Wildland Fire Operational Guidance			

No Update or N/A	Update Needed	Sec-tion	Title – Content	Notes/ Comments	Date
		4.1	**Management of Unplanned Ignitions**		
		4.1.1	**Preparedness**		
			Have any of the following changed? If so, describe changes in the comment box.		
		4.1.1.1	Training and Qualifications		
		4.1.1.2	Refuge/Unit Delegation of Authority to Fire Staff		
		4.1.1.3	Readiness		
		4.1.1.4	Aviation Management		
		4.1.1.5	Fire Detection		
		4.1.1.6	Initial Report of Fire and Initial Attack dispatch		
		4.1.1.8	Mutual Aid and Cross Boundary Operations		
		4.1.2	**Incident Management**		
			Have any of the following changed? If so, describe changes in the comment box.		
		4.1.2.1	Dispatching beyond IA		
		4.1.2.2	Delegation of Authority to Incident Commander		
		4.1.2.3	Resource Allocation and Prioritization		
		4.1.2.4	Regulatory Compliance for Managing Unplanned Ignitions		
		4.1.2.5	Use of Decision Support Tools – (WFDSS etc.)		
		4.1.2.6	Wildfire Reporting Requirements		
		4.1.2.7	Suppression Damage Repair		
If no potential for ES and BAR exist on your unit, please skip sections 4.1.3 and 4.2					
		4.1.3	**Emergency Stabilization (ES)**		
		4.1.3.1	ES Planning and Post-fire Assessments		
		4.1.3.2	ES Post-wildfire Issues and Values to Protect		
		4.1.3.3	ES Treatment Maintenance and Monitoring		
		4.1.3.4	ES Reporting Requirements		
		4.2	**Burned Area Rehabilitation (BAR)**		

No Update or N/A	Update Needed	Sec-tion	Title – Content	Notes/ Comments	Date
		4.2.1	BAR Planning		
		4.2.2	BAR Issues and Values to Protect		
		4.2.3	BAR Regulatory Compliance		
		4.2.4	BAR Monitoring Protocols		
		4.2.5	BAR Contact Information		
		4.2.6	BAR Public Information and Public Concerns		
		4.2.7	BAR Reporting Requirements		
		4.3	**Management of Planned Fuels Treatments**		
		4.3.1	Processes to Identify and Prioritize Fuels Treatments		
		4.3.2	**Prescribed Fire Project Implementation**		
			Have any of the following changed? If so, describe changes in the comment box.		
		4.3.2.1	Prescribed Fire Planning		
		4.3.2.2	Prescribed Fire Operations		
		4.3.2.3	Prescribed Fire Public Notification		
		4.3.2.4	Multiple Prescribed Fires		
		4.3.2.5	Prescribed Fire on Private Lands		
		4.3.2.6	Prescribed Fire Conversions and Reviews		
		4.3.3	Planning, Preparing, Implementing Non-fire Fuels Treatments		
		4.3.4	Fuels Treatment Regulatory Compliance		
		4.3.5	Fuels Treatment Monitoring		
		4.3.6	Fuels Treatment Reporting Requirements		
		4.3.7	Fuels Committees/Local Coordinating groups		
		4.3.8	Funding Processes		
		4.3.9	Debris Burning (if applicable)		
		4.4	**Prevention, Mitigation, and Education**		
			Have any of the following changed? If so, describe changes in the comment box.		

No Update or N/A	Update Needed	Sec-tion	Title – Content	Notes/ Comments	Date
		4.4.1	Wildfire Investigation and Trespass Policies		
		4.4.2	Prevention/Mitigation Activities		
		4.4.3	Education/Outreach Activities		
		Chapter 5. Monitoring and Evaluation			
		5.1	**FMP Monitoring**		
		5.1.2	FMP Terminology (update as needed)		
		5.2	**Treatment Effects Monitoring**		
			Have any of the following changed? If so, describe changes in the comment box.		
		5.2.1	Fire Effects Monitoring		
		5.2.2	Non-fire Treatment Effects Monitoring		
		5.2.3	Collaborative Monitoring with other Disciplines		
		5.2.4	Fuels Treatment Performance Information/Targets		
		Chapter 6. References			
			(Review Optional)		
		Appendices			
			(Dynamic process - updated annually - Review Optional)		

Additional reviewer comments:

APPENDIX G – FUELS & FIRE EFFECTS MONITORING PLAN

(pdf file attached separately)

APPENDIX H—FIRE AND HABITAT RELATED RESEARCH AT NKDR

Current as of 7/2010

Project Title	Organization
Development of high resolution LIDAR-derived digital terrain map and vegetation classification for modeling past vegetation change and future sea level rise scenarios	International Hurricane Research Institute, Florida International University
Plant community response to interactions between disturbance regimes, sea-level rise, and hydrology	Southeast Environmental Research Center, Florida International University
Determining management priorities for Lower Keys marsh rabbit through a structured decision making process	USGS, Univ. New Hampshire, US Forest Service, Univ. Central Florida
Applying an integrated and adaptive management framework to prescribed fire	Ron Myers, Consultant
Analyzing sediment records and slash pine tree rings to establish fire history and vegetation change in pine rockland habitat	Laboratory of Paleoenvironmental Research, University of Tennessee
The role of fire in marsh and buttonwood ecosystems and the abundance of rare plants in coastal habitats in the Lower Florida Keys	Institute for Regional Conservation
Developing a fire behavior model for the Florida Keys to enhance application of prescribed fire in tropical fuel types	National Fire Sciences Laboratory, U.S. Forest Service
Geophysical investigation to evaluate current extent of freshwater lens on Big Pine Key and recommendations for long-term monitoring	TNC & GeoView
Determine direct and indirect effects of mosquito control pesticides on listed species inhabiting DOI managed lands in the Florida Keys	Mote Marine Laboratory & USGS

APPENDIX I – LIST OF FLORIDA COMMUNITIES AT RISK FROM WILDFIRES 2004

Florida Communities at Risk of Wildfire 2004					
CARs Within Counties of Florida Keys NWR Complex					
CITY_COUNT	MIN_COUNTY	PLACENAME	DISTRICT	RANK	CWPP
Big Coppitt Key_MONROE	MONROE	Big Coppitt Key	18	Low	
El Chico (subdivision)_MONROE	MONROE	El Chico (subdivision)	18	Low	
Garden Cove_MONROE	MONROE	Garden Cove	18	Low	
Islamorada_MONROE	MONROE	Islamorada	18	Low	
Key Colony Beach_MONROE	MONROE	Key Colony Beach	18	Low	
Key Largo_MONROE	MONROE	Key Largo	18	Low	
Key West_MONROE	MONROE	Key West	18	Low	
Key West_MONROE	MONROE	Key West	18	Low	
Layton_MONROE	MONROE	Layton	18	Low	
Lower Matecumbe Beach_MONROE	MONROE	Lower Matecumbe Beach	18	Low	
Marathon Shores_MONROE	MONROE	Marathon Shores	18	Low	
Marathon_MONROE	MONROE	Marathon	18	Low	
North Key Largo_MONROE	MONROE	North Key Largo	18	Low	
Plantation Key_MONROE	MONROE	Plantation Key	18	Low	
Stock Island_MONROE	MONROE	Stock Island	18	Low	
Summerland Key_MONROE	MONROE	Summerland Key	18	Low	
Tavernier_MONROE	MONROE	Tavernier	18	Low	

APPENDIX J – CATEGORICAL EXCLUSION & INTRA SERVICE SECTION 7 CONSULTATION

NEPA COMPLIANCE CHECKLIST

State: FL **Federal Financial Assistance Grant/Agreement/Amendment Number:**
Grant/Project Name: National Key Deer Refuge Fire Management Plan 2010 Update

This proposal ✔ is; ☐ is not completely covered by categorical exclusion 1.11 **in 516 DM 2, Appendix** 1 **; and/or 516 DM 6, Appendix** B(4-5)
(*check (✓) one*) *(Review proposed activities. An appropriate categorical exclusion must be identified before completing the remainder of the Checklist. If a categorical exclusion cannot be identified, or the proposal cannot meet the qualifying criteria in the categorical exclusion, or an extraordinary circumstance applies (see below), an EA must be prepared.)*

Extraordinary Circumstances:
Will This Proposal (*check (✓) yes or no for each item below*):

Yes	No		
☐	✔	1.	Have significant adverse effects on public health or safety.
☐	✔	2.	Have significant adverse effects on such natural resources and unique geographic characteristics as historic or cultural resources; park, recreation or refuge lands; wilderness areas; wild or scenic rivers; national natural landmarks; sole or principal drinking water aquifers; prime farmlands; wetlands (Executive Order 11990); floodplains (Executive Order 11988); national monuments; migratory birds (Executive Order 13186); and other ecologically significant or critical areas under Federal ownership or jurisdiction.
☐	✔	3.	Have highly controversial environmental effects or involve unresolved conflicts concerning alternative uses of available resources [NEPA Section 102(2)(E)].
☐	✔	4.	Have highly uncertain and potentially significant environmental effects or involve unique or unknown environmental risks.
☐	✔	5.	Have a precedent for future action or represent a decision in principle about future actions with potentially significant environmental effects.
☐	✔	6.	Have a direct relationship to other actions with individually insignificant but cumulatively significant environmental effects.
☐	✔	7.	Have significant adverse effects on properties listed or eligible for listing on the National Register of Historic Places as determined by either the bureau or office, the State Historic Preservation Officer, the Tribal Historic Preservation Officer, the Advisory Council on Historic Preservation, or a consulting party under 36 CFR 800.
☐	✔	8.	Have significant adverse effects on species listed, or proposed to be listed, on the List of Endangered or Threatened Species, or have significant adverse effects on designated Critical Habitat for these species.
☐	✔	9.	Have the possibility of violating a Federal law, or a State, local, or tribal law or requirement imposed for the protection of the environment.
☐	✔	10.	Have the possibility for a disproportionately high and adverse effect on low income or minority populations (Executive Order 12898).
☐	✔	11.	Have the possibility to limit access to and ceremonial use of Indian sacred sites on Federal lands by Indian religious practitioners or significantly adversely affect the physical integrity of such sacred sites (Executive Order 13007).
☐	✔	12.	Have the possibility to significantly contribute to the introduction, continued existence, or spread of noxious weeds or non-native invasive species known to occur in the area or actions that may promote the introduction, growth, or expansion of the range of such species (Federal Noxious Weed Control Act and Executive Order 13112).

(If any of the above extraordinary circumstances receive a "Yes" check (✓), an EA must be prepared.)
☐ Yes ✔ No This grant/project includes additional information supporting the Checklist.

Concurrences/Approvals:
Project Leader: Anne A. Morkill Date: 7/26/10

State Authority Concurrence: N/A Date: _____
(with financial assistance signature authority, if applicable)

Within the spirit and intent of the Council of Environmental Quality's regulations for implementing the National Environmental Policy Act (NEPA) and other statutes, orders, and policies that protect fish and wildlife resources, I have established the following administrative record and have determined that the grant/agreement/amendment:

- ☐ **is a categorical exclusion as provided by 516 DM 6, Appendix 1 and/or 516 DM 2, Appendix 1. No further NEPA documentation will therefore be made.**
- ☐ **is not completely covered by the categorical exclusion as provided by 516 DM 6, Appendix 1 and/or 516 DM 2, Appendix 1. An EA must be prepared.**

Service signature approval:

RO or WO Environmental Coordinator: _____ Date: _____
Staff Specialist, Division of Federal Assistance: _____ Date: _____
(or authorized Service representative with financial assistance signature authority)

FWS Form 3-2185
Revised 02/2004

Appendix G. Intra-Service Section 7 Biological Evaluation

United States Department of the Interior

FISH AND WILDLIFE SERVICE
South Florida Ecological Services Office
1339 20th Street
Vero Beach, Florida 32960

December 12, 2007

Memorandum

To: Anne Morkill, Refuge Manager, Florida Keys National Wildlife Refuge Complex

From: Paul Souza, Field Supervisor, South Florida Ecological Services Office

Subject: Intra-Service Section 7 Consultation on "Draft Comprehensive Conservation Plan and Environmental Assessment for the Lower Florida Keys National Wildlife Refuges"

Attached is our signed concurrence with your intra-Service section 7 Biological Evaluation for the project referenced above. Thank you for coordinating this project with us. If you have any questions, please contact Mark Salvato at 772-562-3909, extension 340.

Attachment

TAKE PRIDE IN AMERICA

INTRA-SERVICE SECTION 7 BIOLOGICAL EVALUATION FORM

Originating Person: Anne Morkill, Project Leader
Telephone Number: (305)872-2239
E-Mail: Anne_Morkill@fws.gov
Date: September 28, 2007

PROJECT NAME:

I. Service Program:
___ **Ecological Services**
___ **Federal Aid**
___ **Clean Vessel Act**
___ **Coastal Wetlands**
___ **Endangered Species Section 6**
___ **Partners for Fish and Wildlife**
___ **Sport Fish Restoration**
___ **Wildlife Restoration**
___ **Fisheries**
_X_ **Refuges/Wildlife**

II. State/Agency: Florida/U.S. Fish and Wildlife Service

III. Station Name: National Key Deer Refuge (complex headquarters)

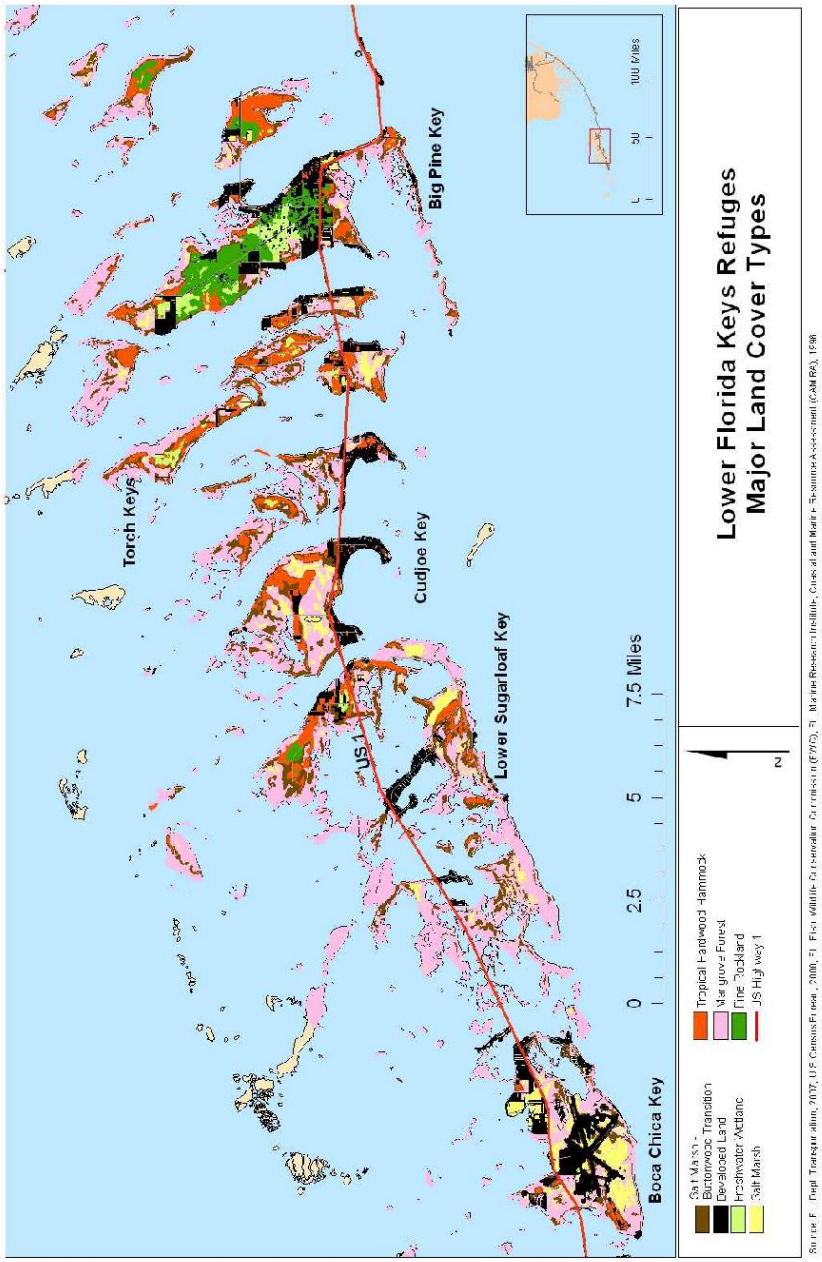
IV. Description of Proposed Action

The proposed action would result in the approval and implementation of the preferred alternative in the Comprehensive Conservation Plan (CCP) and Environmental Assessment (EA) for the following refuges: National Key Deer Refuge, Great White Heron and Key West National Wildlife Refuges. This plan would direct management actions on these refuges for the next 15 years. Prior to implementation of identified management actions that affect listed species, the refuge will consult with Ecological Services.

The preferred alternative identified in the plan outlines proposed actions to improve refuge management. It supports the purposes for which the refuges were established and the mission of the National Wildlife Refuge System. It identifies 7 broad goals for habitat, wildlife, imperiled species, visitor services, cultural resources, wilderness, and administration. Specific objectives and strategies for achieving these goals are detailed. The goals, objectives and strategies were developed to support international, national, regional and local conservation plans and initiatives in partnership with other agencies and organizations.

V. Pertinent Species and Habitat:

A. Include species/habitat occurrence map: Maps are not available for most species. A land cover map is attached.


Lower Florida Keys Refuges
Major Land Cover Types
Salt Marsh - Buttonwood Transition
Developed Land
Freshwater/Atlantic
Salt Marsh
Tropical Hardwood Hammock
Mangrove Forest
Pine Rockland
US Highway 1
0 2.5 5 7.5 Miles
Boca Chica Key
US 1
Torch Keys
Lower Sugarloaf Key
Cudjoe Key
Big Pine Key

VI. Location (see attached map):

A. Ecoregion Number and Name: 52 South Florida

B. County and State: Monroe County, Florida

C. Section, township, and range (or latitude and longitude): 24°41'25.650", 81°22'53.075"

D. Distance (miles) and direction to nearest town: Marathon is 20 miles driving distance and only a few miles from the approved acquisition boundaries of Great White Heron National Wildlife Refuge and National Key Deer Refuge. Key West is water-ward several miles east of Key West National Wildlife Refuge.

E. Species/habitat occurrence:

LISTED SPECIES HABITATS FOR LOWER KEYS REFUGES

MAMMALS

Key Deer (E) – A variety of habitats in close proximity to fresh water, pine rocklands and tropical hardwood hammocks. Buttonwood and mangrove swamps provide a small, but essential part of this animal's annual habitat needs. Recently burned areas provide nutrient-rich forage.

Lower Keys marsh rabbit (E) – Higher elevations within saltmarsh or freshwater marsh. Occasionally uses mangrove communities and shrubby edges to wetlands, but depends on herbaceous plants for food and cover.

Rice Rat (E) (CH) – Transition from upland to marine and freshwater marsh communities, including buttonwoods and black mangroves, coastal strand, saltgrass flats and other communities within this zone that have moderate to abundant herbaceous cover.

West Indian Manatee (E) (CH) – coastal waters, sheltered coves for feeding, nursing, resting

BIRDS

Kirtland's Warbler (E) – This rare bird has been documented in Canada, Michigan, Wisconsin and South Carolina. Habitat in the mid-west is very specific to jack-pine forests. The wintering locations of the bird include the Bahamas, Turks, Caicos and Hispanola Islands.

Piping plover (T) (CH) - open, sandy beaches and tidal mudflats, sandflats

Roseate tern (T) – Nest sites include bare limestone, sand-shell beaches, newly-deposited rock and marl fill, dredge material, and heaps of broken coral deposited by storms. Also nests on roof tops. Forages for small, schooling fish in open water over sandbars, reefs and tide channels.

red knot (C) – marine habitats, especially near coastal inlets, estuaries and bay

REPTILES

American alligator (T) (S/A) – Most permanent bodies of fresh water including marshes, swamps, lakes and rivers. Occasionally wanders into salt or brackish water, but rarely remains there.

American crocodile (E) (CH) – Coastal estuarine mashes, tidal swamps and creeks along edges of mainland and islands. Usually associated with mangroves. Nests on beaches, stream banks and levees.

eastern Indigo snake (T) – In the Lower Florida Keys these snakes are broad habitat generalists inland potentially inhabiting all terrestrial habitats.

green sea turtle (E) (CH) – inhabit marine coastal and oceanic waters and nest on sand beaches. Hatchlings use offshore floating sargassum mats; juveniles frequent coastal bays, inlets, lagoons, and offshore worm reefs.

Hawksbill sea turtle (E) (CH) – Marine and oceanic waters, commonly associated with coral reefs, keys, and mangroves. Nests on coastal sand beaches, often in vegetation.

Kemp's ridley sea turtle (E) – shallow coastal and estuarine waters often in association with subtropical shorelines of red mangroves

leatherback sea turtle (E) (CH) – oceanic waters; nests on coastal sand beaches

loggerhead sea turtle (T) – marine coastal and oceanic waters, nest on sand beaches. Hatchlings use offshore floating sargassum mats; juveniles frequent coastal bays, inlets and lagoons.

INVERTEBRATES

Bartram's hairstreak (C) -- pine rocklands. Extirpated throughout most of its native range, this butterfly is now restricted to Big Pine Key, where it is found primarily in pine rockland areas that harbor its sole host plant, pineland croton.

Florida Leafwing (C) -- pine rocklands. Extirpated throughout most of its native range, this butterfly is now restricted to Big Pine Key, where it is found primarily in pine rockland areas that harbor its sole host plant, pineland croton.

Miami blue butterfly (C) -- primarily coastal scrub hammocks containing its host plants: gray nickerbean, blackbead and balloon vine. Forages on both woody and herbaceous flowering plants. Thought to be extirpated, a small population was rediscovered in 1999 at Bahia Honda State Park. Refuge-wide surveys in 2006-2007 revealed eight additional populations collectively numbering more than 1,000 individuals in KWNWR where blackbead was the sole host plant.

Stock Island tree snail (T) – tropical hardwood hammock (rockland hammock). Host trees are gumbo limbo, strangler fig, stoppers, pigeon plum, Jamaican dogwood, poisonwood, and other smooth-barked trees.

staghorn coral (T) – shallow to intermediate depths between 10 and 60 feet in clear, calm water. Most colonies are on reefs but may grow on open, clean areas of sand. Areas of surge on fore reefs located between 2 and 12 feet of water are ideal.

elkhorn coral (T) – Most common between 1 to 35 feet of water. Shallow areas where wave action causes constant water movement are ideal habitat.

FISH

smalltooth sawfish (E) – Inhabit shallow coastal waters very close to shore over bottoms. They prefer sheltered bays and shallow banks.

PLANTS

Garber's spurge (T) – sandy soils over limestone in pine rocklands, hammock edges, coastal rock barrens, grass prairies, sandflats, beach ridges and swales.

Key tree cactus (E) – Openings in hardwood hammocks, cactus hammocks, and thorn scrub, over oolitic limestone.

Big Pine partridge pea (C) -- open understory in pine rocklands.

Blodgett's silverbush (C) -- open, sunny areas in pine rocklands, edges of rockland hammock, edges of coastal berm, and sometimes disturbed areas at the edges of natural areas.

Cape Sable thoroughwort (C) -- rock barrens and edges of tropical hardwood hammocks. Within the refuge, it is present only on Boca Grande Key.

Florida Sempaphore Cactus (C) -- grows close to salt water on bare rock with a minimum of humus-soil cover in or along the edges of hammocks near sea level.

sand Flax (C) -- pine rockland, marl prairie, and disturbed areas on limestone.

wedge spurge (C) -- bare limestone rock in pine rockllands.

VII. Determination of Effects:

A. Explanation of effects of the action on species and critical habitats in item V. B:

Authorization of the Lower Florida Keys Refuges CCP and selection of the preferred alternative will have no effect on endangered, threatened and candidate species. Endangered species Act consultation will be initiated separately for implementation of any management actions that may affect any of the endangered, threatened, or candidate species listed below.

SPECIES/ CRITICAL HABITAT	IMPACTS TO SPECIES/CRITICAL HABITAT
Key deer	The project is not likely to adversely affect the species.
Lower Keys marsh rabbit	The project is not likely to adversely affect the species.
silver rice rat	The project is not likely to adversely affect the species.
West Indian manatee	The project is not likely to adversely affect the species.
Kirtland's Warbler	The project is not likely to adversely affect the species.

Piping plover	The project is not likely to adversely affect the species.
roseate tern	The project is not likely to adversely affect the species.
red knot	The project is not likely to adversely affect the species.
American alligator	The project is not likely to adversely affect the species.
American crocodile	The project is not likely to adversely affect the species.
eastern indigo snake	The project is not likely to adversely affect the species.
green sea turtle	The project is not likely to adversely affect the species.
hawksbill sea turtle	The project is not likely to adversely affect the species.
leatherback turtle	The project is not likely to adversely affect the species.
loggerhead sea turtle	The project is not likely to adversely affect the species.
Kemp's ridley sea turtle	The project is not likely to adversely affect the species.
Stock Island tree snail	The project is not likely to adversely affect the species.
staghhorn coral	The project is not likely to adversely affect the species.
elkhorn coral	The project is not likely to adversely affect the species.
smalltooth sawfish	The project is not likely to adversely affect the species.
Big Pine partridge pea	The project is not likely to adversely affect the species.
Blodgett's silverbush	The project is not likely to adversely affect the species.
Cape Sable thoroughwort	The project is not likely to adversely affect the species.
Florida semaphore cactus	The project is not likely to adversely affect the species.
Garber's spurge	The project is not likely to adversely affect the species.
Key tree cactus	The project is not likely to adversely affect the species.
sand flax	The project is not likely to adversely affect the species.
wedge spurge	The project is not likely to adversely affect the species.
Bartram's hairstreak	The project is not likely to adversely affect the species.
Florida leafwing	The project is not likely to adversely affect the species.

Miami blue butterfly	The project is not likely to adversely affect the species.

Prescribed burning, mechanical removal and/or hardwood fuel reduction may benefit the Key deer, Lower Keys marsh rabbit, silver rice rats, and eastern indigo snakes throughout their range by improving understory conditions of pine rocklands, freshwater wetlands, and coastal saltmarshes. These habitat management actions would perpetuate these habitats in the long-term. Potential adverse effects could occur during burning or maintenance of fire lines to these listed species: Lower Keys marsh rabbit, silver rice rat, eastern indigo snake. Candidate species, such as the Bartram's hairstreak and Florida leafwing butterflies and the following plants--Blodgett's Silverbush, Big Pine Key partridge pea, sand flax, and wedge spurge-- could also be impacted during burning or maintenance of fire lines. For the referenced butterfly species, burning would likely encourage the growth of pineland croton, the butterflies' sole host plant. For the referenced plant species, any impacts associated with burning would likely be temporary and more than offset by the benefits conferred since each plant is fire-dependent and adapted to an open pineland understory. Implementation of prescribed fire is likely to increase deer numbers, which may exacerbate documented impacts to species that are preferred browse for deer. Herd management to reduce deer densities in areas where the population is above carrying capacity will reduce or mitigate impacts to species already reduced and may facilitate their recovery by providing additional food sources, fawning and resting areas.

Measures to control exotic animal species, particularly feral cats, are proposed. Beneficial effects are expected for lower Keys marsh rabbits and silver rice rats, but will also likely benefit the eastern indigo snake and all native wildlife.

Propagation and translocation of Key tree cactus to suitable habitat that is less vulnerable to coastal flooding than that occupied by the extant refuge population will prevent the probable extirpation of this species. Maintaining a captive population and establishing the species over as wide an area in the refuge as possible will reduce the threat of a single event (e.g., hurricane, disease, poaching) from extinguishing the refuge population.

Frequent monitoring for and treatment of invasive exotic pest plants (IEEP) will ensure that native vegetation will not be displaced, benefiting all listed terrestrial wildlife and plant species. Maintaining native dune vegetation and curtailing the spread of non-native plant species will buffer the effects of coastal erosion and storms, prevent the accelerated loss of nesting habitat for sea turtles, and preserve the foraging and breeding areas of the Miami blue butterfly. IEEP will be treated only with herbicides that have been approved through the Service's Pesticide Use Proposal review process, with strict adherence to application rates and Service guidelines. Adherence to these guidelines will ensure that no negative effects on listed species will occur.

Increased law enforcement will afford additional protection to listed terrestrial mammals and plants, such as the Key tree cactus. On backcountry islands, increased enforcement will benefit piping plovers and roseate terns by reducing trespass and human-induced disturbance. This action will aid nesting sea turtles by reducing nocturnal human disturbance and poaching on nesting beaches. The American crocodile occurs irregularly in the Lower Florida Keys as a transient, but does not nest there. Poaching of Key deer, Lower Keys marsh rabbit, and eastern indigo snakes (for pet trade) is rare.

Augmented law enforcement would provide an additional measure of protection for all species.

Restricting public access to selected beaches to reduce resulting damage to dune vegetation will benefit nesting sea turtles and Miami blue butterflies by preserving the integrity of their nesting habitat. This action will foster beach occupancy by piping plovers, a species that is intolerant of the high level of public use that now occurs on northwest Boca Grande Key.

Garber's spurge occurs most frequently in plant communities in the early stages of succession. Thus, it will likely benefit from prescribed burning in areas where fire has been suppressed.

The Stock Island tree snail is not endemic to the refuge, but release by collectors has resulted in the establishment of a small population that persists in at least one tropical hardwood hammock on the refuge. No management is proposed for the latter habitat.

Kirtland's warblers are extremely rare in the Florida Keys. Lott et al. (2005) did not record Kirtland's warbler during 5 migration seasons in Upper and Lower Florida Keys study sites over a two-year period (26,785 trap hours). Its occurrence here is likely limited to a rare vagrant or a possible fall-out of migrants during severe weather. Nothing in the project would adversely affect the species.

Staghorn and elkhorn corals and the smalltooth sawfish occur within the refuges' administrative boundaries, but they occur in waters under the jurisdiction of the State of Florida and the Florida Keys National Marine Sanctuary. Representatives of both agencies and the National Marine Fisheries Service will be reviewing this document within the CCP/EA.

B. Explanation of actions to be implemented to reduce adverse effects:

Project modification ideas may be found in the recovery plans. Although Section 7 of the Endangered Species Act prohibits only those actions by Federal agencies which are likely to jeopardize listed species or adversely modify critical habitat, the Service has a commitment to recovering listed species and trying to prevent the need to list additional species.

SPECIES/CRITICAL HABITAT	ACTIONS TO MITIGATE/MINIMIZE IMPACTS
Key deer	No actions are needed or planned.
Lower Keys marsh rabbit	Actions to minimize/mitigate impacts are discussed below.
silver rice rat	Actions to minimize/mitigate impacts are discussed below.
West Indian manatee	No actions are needed or planned.
Kirtland's Warbler	No actions are needed or planned.
piping plover	No actions are needed or planned.
roseate tern	No actions are needed or planned.
red knot	No actions are needed or planned.
American alligator	No actions are needed or planned.
American crocodile	No actions are needed or planned.

eastern indigo snake	Actions to minimize/mitigate impacts are discussed below.
green sea turtle	No actions are needed or planned.
hawksbill sea turtle	No actions are needed or planned.
leatherback turtle	No actions are needed or planned.
loggerhead sea turtle	No actions are needed or planned.
Kemp's ridley sea turtle	No actions are needed or planned.
Stock Island tree snail	No actions are needed or planned.
staghhorn coral	No actions are needed or planned.
elkhorn coral	No actions are needed or planned.
smalltooth sawfish	No actions are needed or planned.
Big Pine partridge pea	No actions are needed or planned.
Blodgett's silverbush	No actions are needed or planned.
Cape Sable thoroughwort	No actions are needed or planned.
Florida semaphore cactus	No actions are needed or planned.
Garber's spurge	No actions are needed or planned.
Key tree cactus	No actions are needed or planned.
sand flax	Actions to minimize/mitigate impacts are discussed below.
wedge spurge	No actions are needed or planned.
Bartram's hairstreak	Actions to minimize/mitigate impacts are discussed below.
Florida leafwing	Actions to minimize/mitigate impacts are discussed below.
Miami blue butterfly	No actions are needed or planned.

VII B. continued

Lower Keys marsh rabbit and silver rice rats – During fireline maintenance and prescribed burning, visual searches will be conducted to flush individuals from the area. Implementation of habitat management will be scheduled to avoid peak nesting periods. The use of heavy machinery will be minimized in habitats suitable to both species to avoid injury or death to individuals.

eastern indigo snakes – Eastern indigo snakes are believed to be locally extirpated from Lower Florida and are not likely to be impacted by proposed activities. Visual searches will be conducted prior to habitat management to ensure no individuals are in the area. In the unlikely event that an individual is observed, the individual will be temporarily removed from the area or activities will be postponed.

Garber's spurge_- The relationship between Garber's spurge and fire is poorly understood. The species occurs in a variety of coastal habitats that are clearly not fire dependent plant communities, such as the populations on Boca Grande and Marquesas Keys. Garber's spurge may be present in refuge areas slated for prescribed burning. Fire may directly kill existing plants. Due to the plant's current rarity, a pre-burn search for this species will be made. If found, plants on site will be protected. If warranted, an experimental design may be applied to evaluate the use of fire on small test sites incorporating pre-and post-burn monitoring of the test sites.

sand flax– .Due to the plant's extreme rarity, a pre-burn search for this species will be made. If found, plants on site will be protected. Possible measures include pre-burn mechanical fuel reduction in the vicinity of the plants to allow post-burn pioneering into burned areas.

Bartam's hairstreak-- Prescribed fire would generate the early plant successional stage that favors this species host plant, pineland croton -- which is currently rare in the refuge -- and ultimately favor the butterfly. Burning, however, could kill pineland croton as well as hairstreak larvae. It could displace adult butterflies. Given the rarity of this butterfly and pineland croton, a search for both species will be undertaken prior to a prescribed burn. If significant numbers of either species are found, measures to preserve them (e.g., pre-burn black-lining or mechanical fuel reduction) will be considered to allow pioneering into burned areas.

Florida leafwing-- Prescribed fire would generate the early plant successional stage that favors this species host plant, pineland croton-- which is currently rare in the refuge -- and ultimately the butterfly. Burning, however, could kill this plant species, as well as hairstreak larvae, and displace adults. Given the rarity of this butterfly and pineland croton, a search for both species will be undertaken prior to a prescribed burn. If significant numbers of either species are found, measures to preserve them (e.g., pre-burn black-lining or mechanical fuel reduction) will be considered to allow pioneering into burned areas.

VIII. Effect Determination and Response Requested:

SPECIES/CRITICAL HABITAT	DETERMINATION[1]			REQUESTED
	NE	NA	AA	
Key deer		X		Concurrence
Lower Keys marsh rabbit		X		Concurrence
silver rice rat		X		Concurrence
West Indian manatee		X		Concurrence
Kirtland's Warbler		X		Concurrence
piping plover		X		Concurrence
roseate tern		X		Concurrence
red knot		X		Concurrence
American alligator		X		Concurrence
American crocodile		X		Concurrence
eastern indigo snake		X		Concurrence
green sea turtle		X		Concurrence
hawksbill sea turtle		X		Concurrence
leatherback turtle		X		Concurrence
loggerhead sea turtle		X		Concurrence
Kemp's ridley sea turtle		X		Concurrence
Stock Island tree snail		X		Concurrence
staghorn coral		X		Concurrence

elkhorn coral		X		Concurrence
smalltooth sawfish		X		Concurrence
Garber's spurge		X		Concurrence
Blodgett's silverbush		X		Concurrence
Big Pine partridge pea		X		Concurrence
wedge spurge		X		Concurrence
Cape Sable thoroughwort		X		Concurrence
sand flax		X		Concurrence
Florida semaphore cactus		X		Concurrence
Key tree cactus		X		Concurrence
Bartram's hairstreak		X		Concurrence
Florida leafwing		X		Concurrence
Miami blue butterfly		X		Concurrence

*DETERMINATION/ RESPONSE REQUESTED:
NE = no effect. This determination is appropriate when the proposed action will not directly, indirectly, or cumulatively impact, either positively or negatively, any listed, proposed, candidate species or designated/proposed critical habitat. Response Requested is optional but a "Concurrence" is recommended for a complete Administrative Record.

NA = not likely to adversely affect. This determination is appropriate when the proposed action is not likely to adversely impact any listed, proposed, candidate species or designated/proposed critical habitat or there may be beneficial effects to these resources. Response Requested is a" Concurrence".

AA = likely to adversely affect. This determination is appropriate when the proposed action is likely to adversely impact any listed, proposed, candidate species or designated/proposed critical habitat. Response Requested for listed species is "Formal Consultation". Response requested for proposed and candidate species is "Conference".

Anne E. Morkill — 27 Sept. 2007
Signature (originating station) — **Date**

Refuge Manager
Title

IX. Reviewing Ecological Services Office Evaluation:

A. Concurrence ✓ **Non-concurrence** _____

B. Formal consultation required _____

C. Conference required _____

D. Informal conference required _____

E. Remarks (attach additional pages as needed):

Signature	12-18-07 Date
AS Title	SFESO Office

APPENDIX K – NKDR STEP-UP PLAN

Table 5. NKDR Step-Up Plan

Local Preparedness Level	Actions to be Taken
Preparedness Level 1:	Normal Activities—No Fire Readiness
Preparedness Level 2:	Normal Activities—Prescribed Burning Possible Personnel should have fire line gear in office or vehicle.
Preparedness Level 3:	Normal Activities-- Prescribed Burning Possible—Personnel should have fire line gear in office or vehicle. Fire equipment should be ready to move within thirty minutes of dispatch.
Preparedness Level 4:	Meet with Division of Forestry to discuss readiness, have fire equipment filled with fuel and water and ready to respond to a fire.
Preparedness Level 5:	Discuss readiness with Division of Forestry and Monroe County Fire Rescue. Consider bringing in detailers to staff engine. Consider helicopter availability. There should be no prescribed burning attempted at this preparedness level. Daily Briefings will be conducted in accordance with agenda established in section below.

APPENDIX L – NKDR DISPATCH PLAN

When report of smoke or fire is received get as much information as possible from the caller. Take the following information:

- Location of smoke or fire:
- Location of caller:
- Name and telephone number of caller:
- Color of smoke:
- Size of fire:
- Type of Fuel:
- Character of fire (running, creeping, etc.):
- Resources on scene
- Anyone in the area or vehicles leaving the area:

DISPATCH CHECK LIST

1. Check map location and ownership/protection status.
2. If fire is on or threatening refuge notify district FMO at Florida Panther Refuge and FMS at National Key Deer Refuge
3. Notify Project Leader
4. Notify Division of Forestry Everglades Dispatch
5. If fire danger is high to extreme, order helicopter. Refer to AMD carded aircraft list for most current information.
6. Maintain log of all radio and telephone communications.
7. Remain on duty and dispatch further assistance as ordered from the fire.

Notifications

Florida DOF Big Pine Key
Joe Cangemi 1-305-872-9010

Florida DOF Evergaldes Dispatch
1-954-475-4120

Everglades National Park Dispatch
1-305-242-7850

Florida Panther Dispatch
1-239-657-5476

Florida Keys NWR LEO
1-305-304-9627

Merritt Island Dispatch
1-321-861-0846

Anne Morkill, Project Leader	304-4907 (c)
Karen Hillier, Deputy PL	304-9236
Dana Cohen, FMS	802-778-0937
Bob Eaton, RFMC	404-679-7190
Pete Kubiak,ARFMC	404-386-1872
Vacant, DFMO	239-253-6465
FICC	850-523-8600
Monroe County Fire Rescue	305-289-6010
Monroe County Sheriff	305-745-3184
Florida Hwy Patrol	800-240-0453

Cooperators

The Nature Conservancy	2-type 6 engines	305-745-8402
Kip Watson, Fire Contractor	2-type 6 engines	305-872-6658